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### **Anticipatory Planning for the Great Lakes: Workshop Report: Volume 1, Summary, Held March 5-7, 1979, Windsor, Ontario**

Great Lakes Science Advisory Board. Societal Aspects Expert Committee

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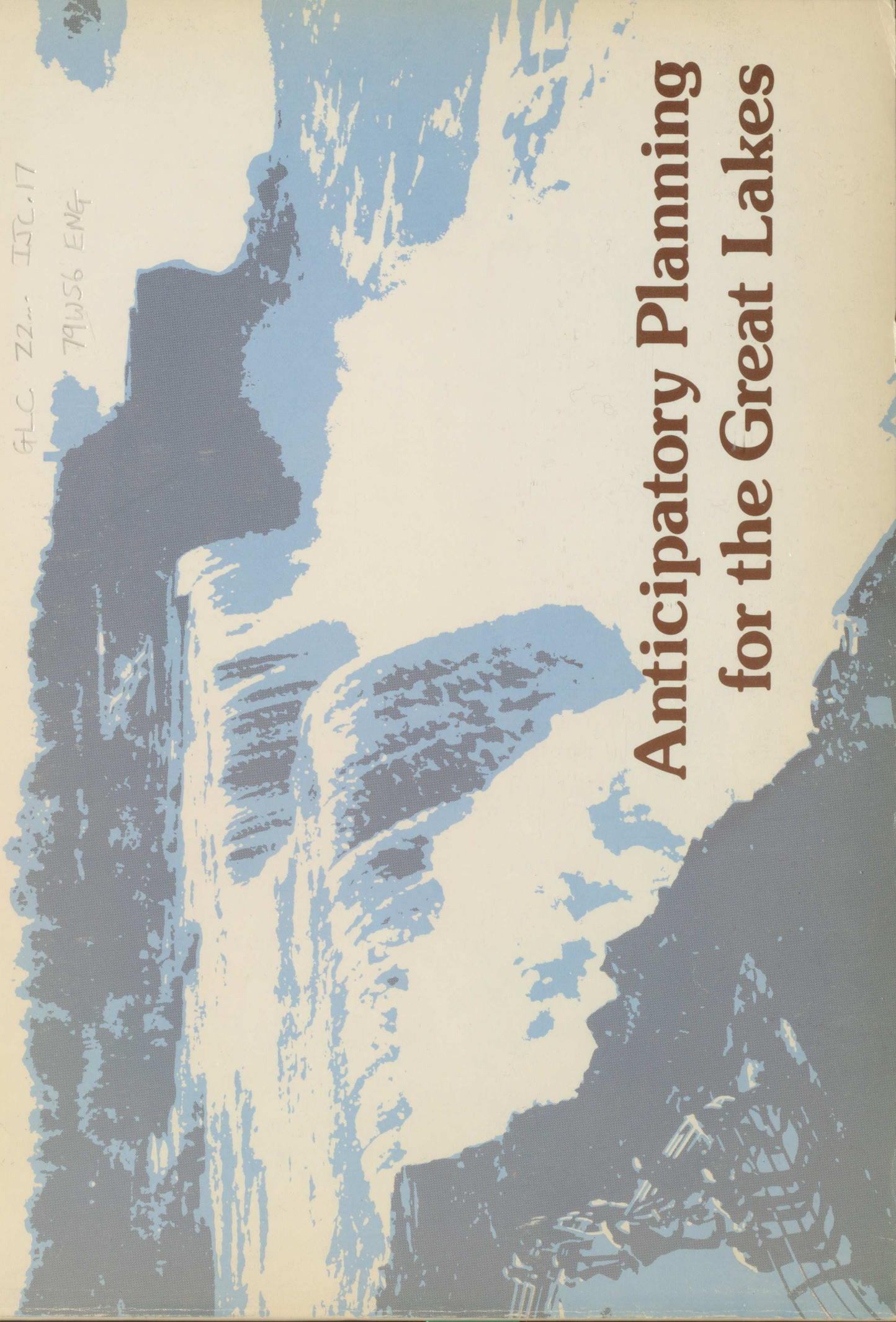
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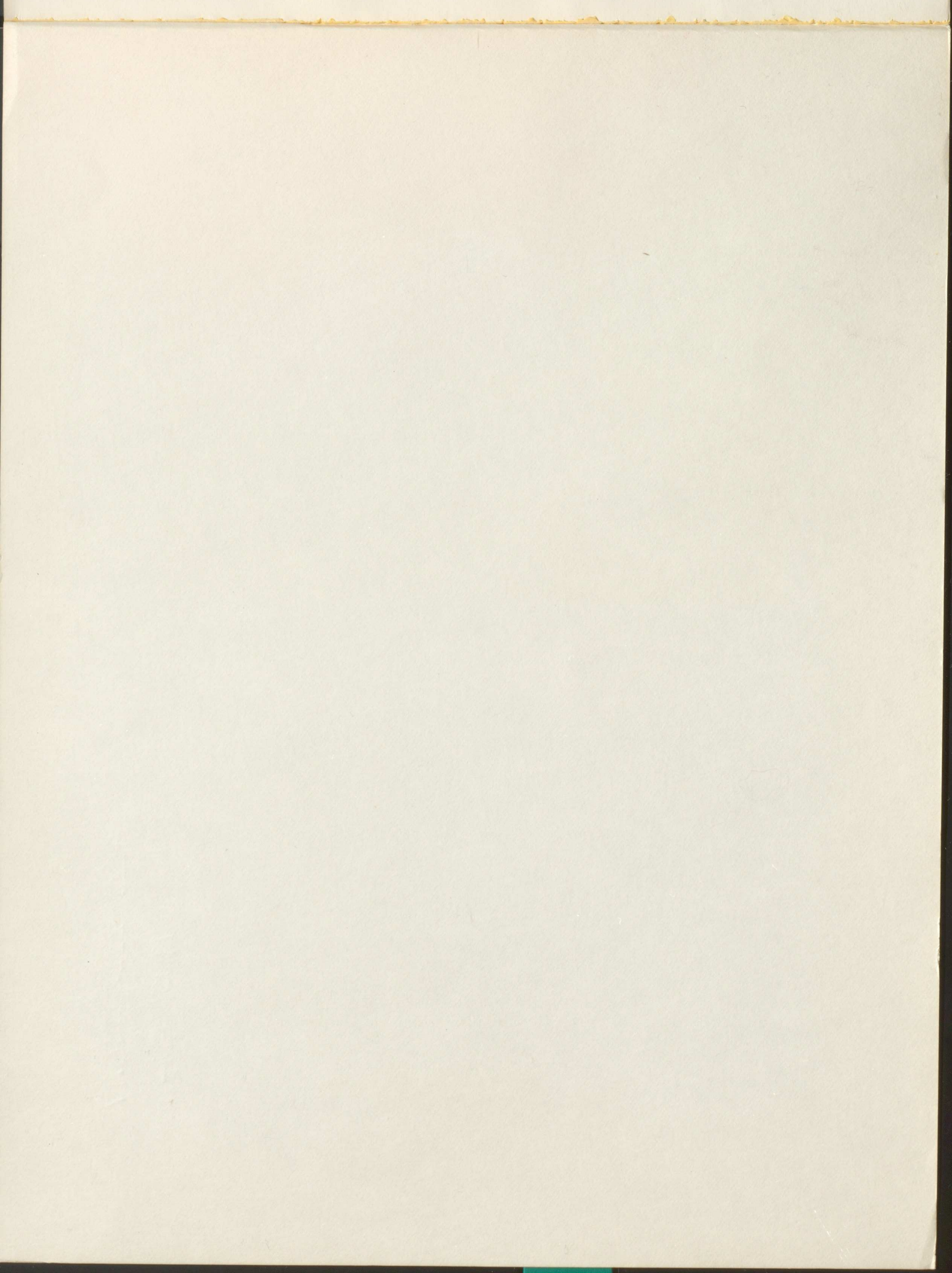
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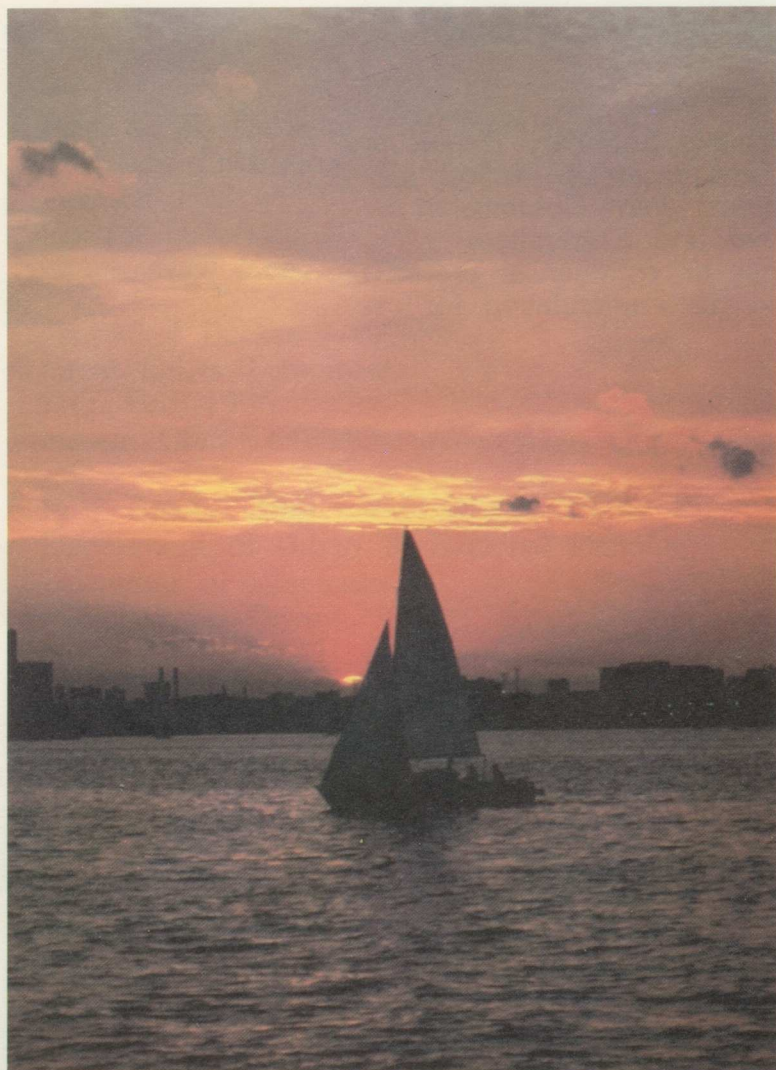
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# Anticipatory Planning for the Great Lakes







**Workshop Report**  
**Anticipatory Planning**  
**for the Great Lakes**  
**Volume 1 ~ Summary**

Held  
March 5-7, 1979  
Windsor, Ontario

Sponsored by the

International Joint Commission's  
Science Advisory Board  
through its  
Societal Aspects Expert Committee

**IJC Great Lakes Regional Office**  
**Windsor, Ontario**

December, 1979

## Notice

Statements and views presented in this Summary Report are those of the participants and do not necessarily reflect the views and policies of the International Joint Commission or those of its Science Advisory Board and Committees framework. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

## Membership, Workshop Committee

Prof. L. B. Dworsky (Co-Chairperson)  
Civil and Environmental Engineering  
Hollister Hall  
Cornell University  
Ithaca, New York 14853

Ms. Mimi Becker  
Great Lakes Tomorrow  
P.O. Box 1935  
Hiram, Ohio 44234

Prof. Steven Born  
Department of Urban & Regional Planning  
University of Wisconsin  
925 Lathrop Drive  
Madison, Wisconsin 53706

Mr. Leonard T. Crook  
Natural Resources Mgmt. Consultant  
3355 Yellowstone Drive  
Ann Arbor, Michigan 48105

Dr. George R. Francis (Co-Chairperson)  
Faculty of Environmental Studies  
University of Waterloo  
Waterloo, Ontario N2L 3G1

Mr. James Lagowski  
Planning and Research  
Detroit Edison Company  
2000 2nd Avenue  
Detroit, Michigan 48226

Mr. Walter A. Lyon  
Director  
Bureau of Water Quality Management  
Department of Environmental Resources  
P.O. Box 2063  
Harrisburg, Pennsylvania 17120

Mrs. Caroline Raymond  
Consultant, Urban Planning  
99 Ridgeview Road  
Poughkeepsie, New York 12603

Mr. Nigel Richardson  
Executive Director  
Royal Commission on the Northern Environment  
Manulife Centre  
55 Bloor Street, W., Room 801  
Toronto, Ontario M4W 1A5

Mr. Michael Stephens  
Deputy Head  
Futures Planning Group  
Ministry of State for Science & Technology  
270 Albert Street  
Ottawa, Ontario K1A 1A1

Workshop Secretary & Committee Consultant

Dr. A. E. P. Watson  
Research Scientist  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

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## The International Joint Commission, Canada - United States

The International Joint Commission (IJC) was established under the Boundary Waters Treaty of 1909. It consists of six Commissioners, three from Canada and three from the United States. A Commissioner of each section is chairman. The Commissioners act as a single body seeking common solutions, with decision reached by majority.

The Treaty was established to aid in settling and preventing disputes regarding the use of boundary waters, by means of joint deliberations of the Commission. Headquarters of the Commission are located in Ottawa, Ontario, and in Washington, D.C., for the Canadian and United States Sections, respectively.

Three categories of Commission responsibility derive from the 1909 Treaty:

- decisions regarding the approval of applications for the use, obstruction or diversion of boundary waters or of works affecting boundary water levels;
- undertaking investigations and studies of specific problems along the common frontier when requested by one or both Governments as a Reference; and

- decisions on questions or matters of difference referred by the Governments.

The international advisory Boards assist the Commission by organizing and preparing required technical studies and field work. Board reports to the Commission are made public and public hearings are held so that individuals, organizations and governments may comment. The resulting information together with the Board report, is used when the Commission reports to both Governments with its recommendations. These reports are also made public.

In 1972 the Great Lakes Water Quality Agreement was signed by both countries. After extensive review a new Agreement was signed in 1978, to restore and enhance the water quality of the Great Lakes. The Governments have given to the Commission specific responsibilities and functions to assist them in the implementation of the Agreement. Included in these responsibilities is the requirement to tender advice and recommendations. The Agreement also provided for two international boards to assist the Commission, the Great Lakes Water Quality Board and the Science Advisory Board. Secretariat functions are provided by the IJC Regional Office, established under the Agreement in Windsor, Ontario, in 1973.



## Foreword

This report presents a summary of the findings of the Workshop on Anticipatory Planning held March 5-7, 1979, Windsor, Ontario. The Workshop was sponsored by the Expert Committee on Societal Aspects, Science Advisory Board of the IJC under the Commission's authority to carry out the terms of the Great Lakes Water Quality Agreement of 1978.

The Workshop was an experiment to determine how the IJC could be better informed about unmet current or emerging problems affecting the Great Lakes in order to increase its ability to advise the Governments of the United States and Canada. During this experiment the participants were asked three questions:

1. On the basis of what you are aware of now, to what particular issues should the IJC be alerted and monitor, and what do you see their implications to be in terms of possible consequences or impacts on the resources and environment of the Great Lakes Basin?
2. Assuming that the IJC should be in touch with important developments and events in

the making, in your considered opinion what particular organizations, groups or individuals should they get in touch with in the areas with which you are familiar?

3. How would you suggest this communication be organized and carried out: that is, what would be the best way to proceed; how closely should contacts be maintained; and so on?

This summary (Volume 1) is supported by the detailed reports of the work groups engaged in the Workshop, which have been published separately (Volume 2).

The Societal Aspects Expert Committee expresses its gratitude to the Workshop Committee which organized the Workshop, prepared these reports, and to the 95 persons who volunteered valuable time to participate. Names of persons involved in these activities are listed in Appendix 1.

Our thanks go to those members of the IJC Windsor Office who made significant contributions to the Workshop and to preparing this report.

## Foreword

The report is the result of a series of studies conducted by the National Commission on the Causes and Prevention of Violence, which was established in 1969.

This report is the first of a series of reports that will be published over the next few years. It is intended to provide a comprehensive overview of the problem of violence in the United States.

The National Commission on the Causes and Prevention of Violence was established by Executive Order in 1969. Its mandate was to study the causes and prevention of violence in the United States.

The Commission's report is the result of a series of studies conducted by the National Commission on the Causes and Prevention of Violence, which was established in 1969.

Our hope is that this report will provide a comprehensive overview of the problem of violence in the United States.

The report presents a summary of the findings of the National Commission on the Causes and Prevention of Violence, which was established in 1969. The Commission was created by Executive Order and is composed of members from various government departments and private organizations.

The Commission's report is the result of a series of studies conducted by the National Commission on the Causes and Prevention of Violence, which was established in 1969.

Our hope is that this report will provide a comprehensive overview of the problem of violence in the United States.

## Major Recommendations

**The five major recommendations that emerged from the participants at the Workshop are:**

1. It is imperative that the Governments of Canada and the United States confirm in writing their expectation that the IJC take the initiative to advise them on unmet current or emerging problems in order for the countries to respond to these problems in a timely manner, with emphasis to be placed on preventive measures.
2. The Anticipatory Planning process initiated by the Workshop be continued as a means of providing up to date information to the IJC on these problems.
3. The IJC should establish a special panel or advisory board to assist in developing specific program elements to carry out this process.
4. The need for an integrated/ecosystem management approach, recognizing the interrelationships of water, land, air, and biological and social systems, be strongly supported and continue to be the adopted policy of the IJC and the two Governments. Close collaboration among the Parties to develop improved implementation strategies is essential if this policy is to be successful.
5. The underlying priority task to facilitate the above recommendations as well as the more specific "next steps" noted in this report, is an arrangement to provide the IJC with information and analysis capability from a Great Lakes Basin wide perspective.

## Major Recommendations

The five major recommendations that emerged from the participants at the Workshop are:

1. The need for an integrated, cross-sector approach to water resources management, recognizing the interrelationships of water, land, air, and biological and social systems. An integrated approach is needed to address the complex water issues of the 21st century. This approach should be based on a systems perspective, recognizing the interrelationships of water, land, air, and biological and social systems. An integrated approach is needed to address the complex water issues of the 21st century. This approach should be based on a systems perspective, recognizing the interrelationships of water, land, air, and biological and social systems.

2. The need for a national water policy that provides a clear, consistent, and comprehensive framework for water resources management. A national water policy is needed to provide a clear, consistent, and comprehensive framework for water resources management. A national water policy is needed to provide a clear, consistent, and comprehensive framework for water resources management.

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## Introduction

The IJC and its supporting institutions are now faced with the need to become "anticipatory" and "forward looking" in dealing with problems in the Great Lakes Basin. There is no other way that commitments to "ecosystem quality" objectives and the intent of the 1978 Great Lakes Water Quality Agreement can be fully carried out.

The main responsibilities of the Commission derive now from its role in responding to requests from the United States and Canada to investigate problems arising within the common environment shared by both countries. For various reasons, the investigations are often lengthy, taking years to complete, especially when they must deal with complex and poorly understood problems like those in the Great Lakes Basin ecosystem. This approach is reactive. In practice, problems have had to be quite severe or likely to become so before the Commission has been asked to investigate them. Since authorities have delayed acting until problems reach a stage when they can no longer be ignored, solutions have proved to be much more costly and difficult, if not virtually impossible, to implement. Early detection and prevention is preferable by far.

The Governments have given the Commission a series of requests, formally called References, asking it to: determine the extent of water pollution

in the Great Lakes; examine the seriousness of pollution arising from land use activities; monitor the concerted attempts by both countries to reduce pollutants discharged directly into the Great Lakes by industries and municipalities; monitor air quality at selected transboundary points; investigate additional engineering possibilities for controlling Great Lakes levels; assess the impacts of diverting water into and out of the Great Lakes Basin; and study the extent of consumptive uses of water from the Great Lakes.

The strongest commitment by Canada and the United States to do something about water quality problems is evidenced by the Great Lakes Water Quality Agreements of 1972 and 1978. Under the first agreement, Governments reduced the rate of degradation of Great Lakes aquatic ecosystems. This was done by pollution control strategies which required quite stringent reductions in the point source wastes discharged directly into the Great Lakes. Concurrently, through studies coordinated by the IJC, a better understanding of the overall extent and seriousness of the presence of toxics and hazardous substances in the aquatic ecosystems and the impact of land based activities on water quality became evident. The 1978 Agreement is a commitment to tackle these latter problems as a



matter of high priority. Because water quality was the initial concern of citizens, and subsequently of Governments, it is quite understandable that attention was devoted first to data gathering and research on water quality and aquatic fauna. The hoped for improvements from pollution control measures will also have to be looked for in the water and the biota. Preventive measures, however, require more than just a concern with water and its associated resources. Ecosystem quality problems arise from human activities on land and they ultimately have to be solved there.

This means that, in addition to stringent point source controls over waste discharges into the Great Lakes, other preventive measures will have to be incorporated more directly and explicitly into land use practices, industrial production processes and the design of development schemes. Prevention requires anticipation and early action. For the Great Lakes Basin this entails a substantially new dimension in the collective capabilities and activities of institutions dealing with Great Lakes problems. As a start it means taking the initiative to work more closely with organizations and individuals who make and implement decisions about infrastructure developments, industrial activities and land use. This requires establishing effective arrangements for communication and consultation that will allow those responsible for ecosystem quality within the overall Great Lakes Basin perspective to be alerted to

impending developments before they become fixed commitments. This will at least give an opportunity to have ecosystem quality considerations taken into account early in the planning and decision processes, when there is still ample flexibility to examine options and remedial measures.

The IJC has a crucial and timely role to play. It is authorized to view the entire Great Lakes Basin, irrespective of jurisdictional boundaries. It is the chosen instrument of the two countries for dealing with ecosystem quality issues. In responding to a challenge to expand working perspectives and supporting activities, the IJC has other important assets. It is a venerable institution whose commissioners have enjoyed an enviable reputation for objectivity and balanced judgement in carrying out the tasks assigned to them over the years. In turn, they continue to receive good cooperation and support from governmental organizations in both countries. It was, essentially, for these reasons that a workshop was convened to explore what the IJC might do to help develop an anticipatory capability by drawing upon expertise from a number of sources.

### **Approach Of The Workshop**

The practical question was how to develop an anticipatory capability for a binational region of some 37 million people embracing much of the urban-industrial heartland of North America. Clearly,

all a workshop could do was to help develop some feasible guidelines for a futures-anticipatory process which would evolve over time. It is impossible to make definitive statements about what the results of this process will turn out to be.

The workshop was also intended to serve as one example of the kinds of consultations which are needed to create a sense of mutual awareness and cooperation among all concerned parties. It brought together over 95 people affiliated with organizations directly involved with decisions leading to development and change in the Great Lakes Basin, or who were otherwise knowledgeable about important trends and circumstances.

The participants were asked to give guidance on three interrelated questions as follows:

- On the basis of what you are aware of now, to what particular issues should the IJC be alerted and monitor, and what do you see their implications to be in terms of possible consequences or impacts on the resources and environment of the Great Lakes Basin?
- Assuming that the IJC should be in touch with important developments and events in the making, in your considered opinion what particular organizations, groups or individuals should it be in touch with in the areas with which you are familiar?

- How would you suggest this communication be organized and carried out: that is, what would be the best way to proceed; how closely should contacts be maintained; and so on?

Discussion groups were convened to address these questions in the context of seven broad, overlapping subject areas: human settlements and urbanization trends; land uses and resource management; local and regional planning; transportation development; energy issues; regional economics; and future technological and social change. These general areas were chosen because, collectively, they constitute important determinants of resource uses and ecosystem quality. Decisions made in regard to them go a long way towards determining the kind of future that will eventually unfold in the Great Lakes Basin.

Participants in the workshop discussions had not previously had an occasion to meet and exchange views on these subjects before. Some had only recently learned of the IJC and its responsibilities. None were there to formally represent some organization. None were invited as the appointed "expert" for some one field of endeavor, and none were assumed to have special powers to divine the future.

Nevertheless, the expectations of what such a first round of discussions could produce remained

high. It was nothing less than sound advice on how the IJC can begin to tune into the forces of change, become part of the informal "intelligence" which links those whose decisions significantly help create the future, and initiate the two-way consultations necessary to make more certain that all concerned - be they governments, corporations, or citizen groups, - become more alert and responsive to the likely consequences of these changes on the resources and environment of the Great Lakes Basin.

The participants succeeded admirably in meeting these expectations. The discussion group reports highlighting their views and suggestions were published in their entirety separately from this conference summary report. It is from such modest first steps that the more comprehensive futures oriented perspective urged on the IJC can now begin to evolve.

## **Methodology Of Preparing The Workshop Reports**

### **Volume I - Summary Report**

Analysis of the individual work group reports revealed eight major themes in common, viz: Great Lakes Basin wide planning; environmental control elements, land/water/air; regional perspective; economic aspects; regulatory aspects; communication for implementation; institutional arrangements and capabilities; and integrated (ecosystem) water resources management.

The Workshop Committee prepared the report based on the above themes. Adherence to a consistent format was requested, where the problem would be outlined on a left hand page and "the next steps" on the opposite.

After consideration, the main themes eventually chosen for this report were as follows: information, a basis for wise use; integrated (ecosystem) water resources management; regional and economic perspectives; environmental control and regulation, land/water/air; institutional arrangements and capabilities; communication for implementation; and dealing with the future.

### **Volume II - Workshop Work Group Reports**

This volume contains the reports of the work groups, developed initially during the workshop and revised, clarified and edited by the work group co-chairpersons.

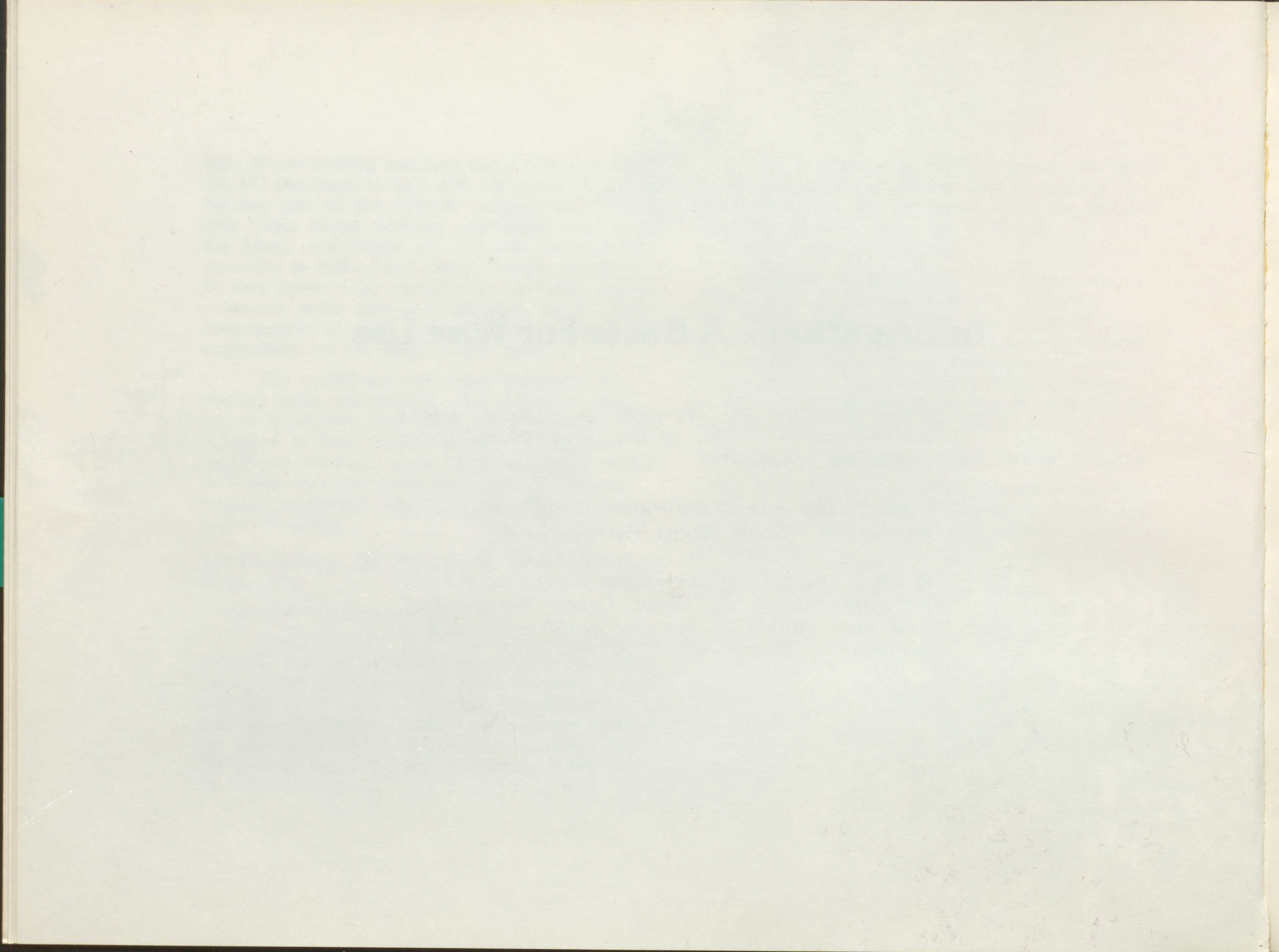


## Information - A Basis For Wise Use

*How are we to develop a "Great Lakes Perspective" - a view of the international Great Lakes as a whole?*

*What is the role of information and analysis in creating a "Great Lakes Perspective?"*

*What is the role of the IJC in arranging for the development of a "Great Lakes Perspective" and how should it use the results of such a process?*



## Background

If Canada and the United States wish to manage the Great Lakes with wisdom, they must have knowledge. If the public in both the United States and Canada wish to "speak out for the Great Lakes" they must have information. If the IJC wishes to pursue an "ecological approach" to the Great Lakes it must have information about the Great Lakes as a whole.

One of the main considerations of the work group reports dealt with the need for and development of a process to manage information for the entire Great Lakes Basin. Their reports referred to the following points:

- no binational comprehensive plan exists for the Great Lakes Basin that can provide guidance for development or conservation policy;
- there is a lack of comprehensive land and water resources data for the Great Lakes;
- there are conflicting and overlapping policies; and
- there is no coordination of decision-making or program implementation which recognizes ecosystem impacts.

While the United States through the Great Lakes Basin Commission has completed the first round of developing a framework for planning for their side, no such activity is underway for the Canadian side of the Great Lakes Basin.

The IJC, under the Great Lakes Water Quality Agreement, already has a mandate from both Parties to the Agreement to act as a watchdog over any activity, program or policy which is likely to have a detrimental impact upon the Great Lakes ecosystem and upon those human and natural environmental activities that depend on the Great Lakes.

Local/regional planning on the United States side is strongly dominated by the "home rule" concept. Sufficient evidence exists that comprehensive planning at the state level is adopting and developing institutional arrangements suited to the task of integrating and prescribing public plans.

On the Canadian side a clear hierarchy exists for planning from the provincial level down through county/regional planning to the local or area bases. The structure for vertical coordination of planning in Ontario seems reasonably well established.

Despite all this planning action, horizontal integration between United States and Canadian

plans does not occur at the local/regional level nor at the state/provincial level. Yet, as a consequence of the high level of planning activity on both the United States and Canadian sides of the Great Lakes Basin, extensive information gathering, analyses and related planning actions are already underway in both countries. A wealth of information exists.

Much of this information has been analyzed, sometimes on the basis of the whole Great Lakes Basin but more often at the county/regional level. Thus, it can be concluded that the informational base exists to permit the development of an initial comprehensive, generalized, view for the entire Great Lakes Basin.

### **Next Steps**

In order to move toward a strengthened collaborative arrangement that will allow Canada and the United States, acting through the IJC, to have access to the results of a substantially improved information and analysis procedure reflecting the Great Lakes Basin as a whole and from which mutually acceptable future actions can be planned more intelligently, the following "next steps" are proposed:

- To develop a "future looking" role, the IJC should establish a Standing Board on

Information Acquisition and Analysis including a core staff qualified to integrate, synthesize and interpret such information with the objective of improving the capability of the IJC to advise Governments on needed programs and policies affecting the entire Great Lakes Basin.

- An initial alternative to the above would be for the Science Advisory Board to develop a special panel on Great Lakes Basin information and analysis to design an appropriate procedure for consideration by the two Governments and the IJC.
- The Canadian Federal Government and the Province of Ontario should develop an agreement to establish their information acquisition and analysis programs on a basis that the preparation of reports for the Canadian portion of the Great Lakes will allow necessary coordination with reports already prepared or to be prepared by United States institutions, such as the Great Lakes Basin Commission, for the United States portion of the Great Lakes. If needed, the IJC should use its influence to establish such an agreement.
- Under its mandate in the Great Lakes Water Quality Agreement of 1978, the IJC should monitor the evolution of human settlements in

the Great Lakes Region from a comprehensive, holistic stance. It should also reorient its operations to include a prospective view as well as considering the past. This reorientation will, in addition, require a review of long term demographic and economic prospects of the Great Lakes region and of their implications for its mandate.



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## **Integrated (Ecosystem) Water Resources Management**

*What new tasks are imposed on the Governments of Canada and the United States and the IJC as greater recognition emerges of the interrelationships of water, land, the atmosphere, plant and animal life and the effect of man's works?*

*Does this emerging awareness suggest an early broadening of governmental concern and cooperation beyond water quality to a consideration of Ecosystem/Integrated water resources management for the Great Lakes Basin?*

# Integrated Ecosystems Water

of Canada and the United States  
in an effort to recognize the  
relationships of water and the  
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## Background

Major consideration was given to the impact of land management and resource development within the Great Lakes Basin on the latter's ecosystem. The ecosystem was defined to include land, air, water, biological and social systems.

General problem areas to which specific attention was given related to agriculture, forestry, recreation, environmentally sensitive lands such as wetlands and nearshore fisheries habitats, shorelands, natural hazard lands, and mining.

Impacts and pressures are also posed by: urban land; industrial development; waste management practices; the conversion of agricultural lands to urban or industrial uses; the indiscriminate clearing of land for agriculture; airborne emissions, particularly of PCBs, other chlorinated hydrocarbons and of the oxides of nitrogen and sulphur which result in "acid rain" or atmospherically caused contamination; the widespread use of chloride salts for de-icing roads; and the treatment of industrial wastes, are examples of specific problems which reinforce the need for an ecosystem approach to Great Lakes management.

Transportation and energy issues further point to the need for an integrated approach to Great Lakes management involving physical, social, economic and political considerations. For example,

transportation issues relating to dredging and the disposal of dredged materials, regulatory policy, length of navigation season, continuing development of the Seaway, intermodality and intersystem waterway considerations, size and character of locks and channels and port planning and management are all of concern to effective Great Lakes management.

Energy issues address explicitly the problems of "acid rain", the increasing gap of energy supply and demand between 1980 and the year 2000, the need to import most of the energy consumed in the Great Lakes Region from outside the region, the increased dependence on western coal with the associated problems of transportation and the environment, and the pressure to tap oil and gas supplies in the Great Lakes Basin. Other problems may arise as a result of closer ties between transboundary electrical generating plants, of managing electrical peaking requirements, and the question of nuclear electrical generating facilities.

Issues of Great Lakes levels management, diversions out of and into the Great Lakes, the effective use of ground water resources, demands for water supplies in areas outside the Great Lakes Basin boundaries, and consumptive uses of waters for irrigation and cooling purposes, further underline the need for an improved management arrangement.

Many of the problems encountered in the Great Lakes stem from the lack of comprehensive, coordinated planning and policy implementation arrangements which recognize impacts of resource management of land use decisions on the Great Lakes ecosystem.

There are presently no effective means for referring major proposals which might impact the Great Lakes ecosystem to the IJC for evaluation prior to development or construction. The IJC is without the tools to effectively consider emerging problems unless they affect Great Lakes levels, diversion of waters out of the system, or a matter that the two countries have traditionally set before it.

### **Next Steps**

- The IJC should continue to pursue its mandate with reference to the ecosystem concept of real world interrelationships that link land, air, water and biological and social systems.
- The IJC and the two countries need new ways to hasten their responses so that problems that impact on each other can be dealt with sooner in a more holistic manner.
- Because integrated management of the wide variety of problems/issues that exist within the

Great Lakes Basin is a very large task, priorities will have to be established. The development of an effective management process will extend over several years. Nevertheless, a substantial start toward integrated management should be undertaken at an early date.

- As first steps in this process, the two countries with the assistance of the IJC, should: undertake appropriate studies to consider, among other matters, program linkages and priorities; expanding the roles and the technical capabilities of the standing boards to serve the objective of ecosystem/integrated management; and strengthen the role and staff capabilities of the regional office to insure that it serves as an effective operating arm of the IJC in carrying out a program responsive to ecosystem/integrated management of the Great Lakes.

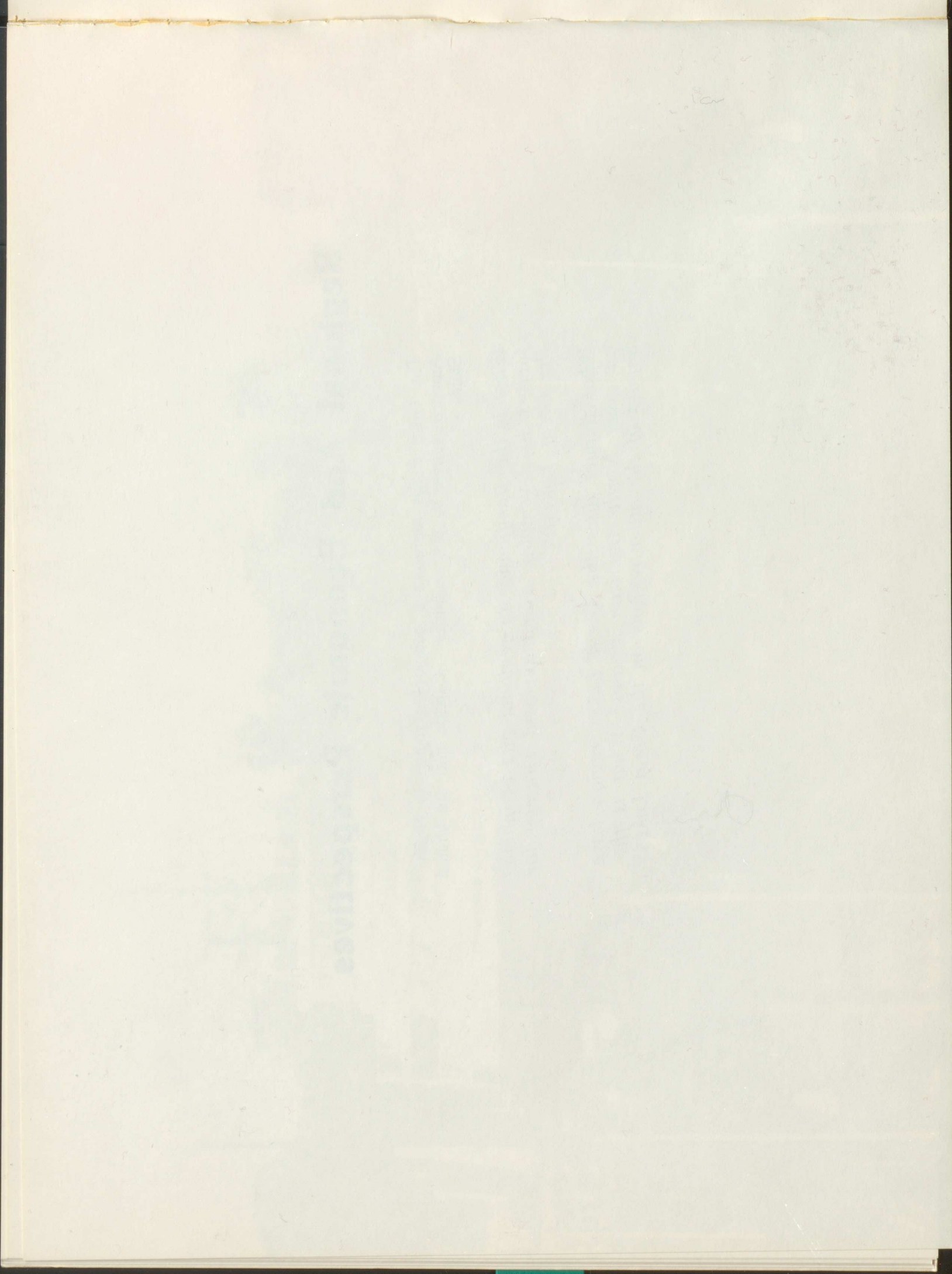


## Regional And Economic Perspectives

The Great Lakes represent a geographic region in North America shared by two countries - Canada and the United States.

*What is the significance of regional and economic factors in developing a management strategy for the Great Lakes?*

*What impact does the Great Lakes region have on other North American regions? What is the impact of the other regions on the Great Lakes?*



## Background

### The Region

The Great Lakes Basin is not an "island unto itself". Waterway navigation routes connect the Great Lakes to the Atlantic Ocean and the Canadian eastern maritime provinces as well as to the Mississippi heartland of the United States. Energy flows into the Great Lakes Basin as gas and oil from western Canada's prairie provinces, coal from the Ohio River Basin's mines and as hydroelectrical power from Hudson Bay. Raw material inflows from outside the Great Lakes Basin and resulting finished industrial and commercial product transfers outside the Great Lakes Basin maintain the region as a major economic force in both Canada and the United States, (from centers such as Detroit, Chicago, Duluth, Cleveland, Buffalo, Rochester; the Kingston, Toronto, Hamilton and Niagara Falls corridor; Windsor and Sarnia; and the Sault Ste. Marie to Thunder Bay corridor).

The Great Lakes drainage basin is an easily defined hydrologic unit. The series of step lakes in the system contains in reservoir-like sections approximately 20% of all the earth's fresh water. The secondary basins are Superior, Michigan, Huron, Erie and Ontario. These large lakes, a geological endowment, give a second level of planning and management to the overall unitary level of the entire system.

The Great Lakes drainage basin is shared by two sovereign nations: Canada and the United States. A high level of cooperation (as measured by international standards) exists in the Great Lakes Basin under the Boundary Waters Treaty of 1909 as a responsibility of the IJC. Canada and the United States, as nations, evolved as federal systems. The provinces and the states are sovereign within the specific terms (and interpretation thereof) of the British North America Act and the Constitution. An important geopolitical observation shows that Ontario, in Canada, stands alone at the province/state level whereas eight states in the United States share the responsibility of managing the Great Lakes drainage basin. In Canada the lines of responsibility from the federal to the provincial level are direct. In the United States the lines of responsibility are mixed, involving the federal government directly, a combination of federal/state action, or combined or separate state action. While the "search" for a counterpart of the Great Lakes Basin Commission in Canada is not necessary, the "search" for a program to produce information directed toward the kind produced by the Great Lakes Basin Commission is necessary.

In the 1970's the work of the IJC showed that the achievement of water quality goals involved



the entire Great Lakes drainage basin. Accordingly, Canada and the United States, through the Great Lakes Water Quality Agreement, have extended the holistic approach to the waters and lands of the Great Lakes Basin through understanding that wise management of the land/water/air resource complex (the "Ecosystem Approach" as defined by the IJC) reaches back to the farthest headwaters of the streams of the Great Lakes Basin.

The Great Lakes drainage basin is one of the world's leading economic regions. In itself it may be considered as a unit. In most regional analyses the Great Lakes Basin is part of other regions. The regional approach in geoeconomics and geopolitics is commonly used as a tool for understanding. It is not necessary to devise a new regional framework for Great Lakes problem solving inasmuch as the basic region, under the Agreement, is the drainage basin itself.

With the drainage basin taken as a "given" region the question of "inputs-outputs" to the environmental system becomes important. The new concept of a "problem shed" of varying dimensions becomes significant. Air pollution (atmospheric loading of land and water) may transgress the drainage basin bounds, either coming in or going out. Raw materials as well as manufactured goods enter and leave. The flow of goods, people and environmental elements, can be measured and

described in statistical as well as in more general ways.

The IJC should encourage agencies and institutions to think of ways in which a comprehensive Atlas of the Great Lakes may be produced. Many governmental departments and universities have the technical capability and imaginative editorial skills to advise on the feasibility of such a project. The Atlas need not be produced in the conventional style. The present state of the art of computer graphics and computer capabilities permits many possible innovative procedures. A workshop on the topic may be productive in exploring its usefulness and feasibility.

The *future* at the sovereign level of cooperation provides new opportunities. The writing of the *Boundary Waters Treaty* and its subsequent signing by Canada and the United States stands out as a monumental example of international cooperation. A review of how the treaty came about and the history of the IJC, a matter of record, is useful in assessing where we are and what we must do next. A *Boundary Lands Treaty* that will do for the entire Great Lakes drainage basin what the *Boundary Waters Treaty* does for the boundary waters, specifically, was discussed. The intellectual and political resources of Canada and the United States are capable of examining the level of cooperation necessary to take us into the next century.

## The Economy

The Great Lakes region, as defined by varying criteria, is one of the world's major economic regions. Many scholars have labelled it as the "Number One" region.

An important positive point to make at the outset is related to the productivity balance of the region. The year 1979 is filled with many difficult economic problems on the global scale. The Great Lakes region in 1979, however, is planning a future based on an excess of water, developed energy, manufactured products, and agricultural products. No other region in the world stands in the same position.

However, economic development and the relative position of economic regions in a global framework are subject to a number of short range and long range influences that must be analyzed carefully in the planning process. For example, energy futures in the Great Lakes must reflect a number of changing patterns: inputs of petroleum and gas; low sulphur coals; and the development of safe systems of nuclear power.

Competition from other North American economic areas must categorize the Great Lakes area as a slow growth area. The rapid economic explosion of the Sun Belt, California and Alberta relegates the steady, plodding, growth of Ontario and the eight United States Great Lakes states to

"slow". The "tyranny of percentages" applies here. The absolute growth of the Great Lakes region is significant, but the percentage growth against a substantial base is minor.

Detailed analysis of the present (and possible future) trends is significant. The automobile industry is retooling and expanding in the Great Lakes area. Basic steel is expanding in the Lake Erie region in Canada as well as in the United States. Skilled labor, being skilled, tends to be sticky in its mobility. The Great Lakes still retains its position as a repository of skilled labor and the facilities for expanding the skilled labor force. This is a significant asset.

Within the Great Lakes region itself there are many economic disparities. For example, the Upper Peninsula of Michigan has a different economic status from that of the Lower Peninsula. A similar distinction between southern and northern Ontario exists in Canada. The Royal Commission on the Northern Environment (Ontario) clearly delineates the nature of the situation.

The disparities between north and south, difficult as they may seem at present, may be coalesced into a strategy of development that guarantees a strong regional future for the Great Lakes drainage basin. The planning strategies of Minnesota, Wisconsin, Michigan, and Ontario are geared to the possibility and necessity of economic

integration. These strategies must be studied seriously by the IJC.

It is essential that the IJC encourages the means whereby conscientious citizens may work together to achieve agreed upon goals. The Michigan-Ontario conferences are good examples of the kinds of conferences at the secondary level that could be duplicated in other parts of the drainage basin. Michigan and Ontario share a 900 mile boundary and it is useful to devise ways in which residents of the shared regions can get together and talk about mutual concerns.

The educational curricula in Ontario and in the eight Great Lakes states of the United States should be reviewed in the light of increasing understanding of the Great Lakes Basin, the "home" region of 37 million persons in both Canada and the United States. There is considerable opportunity here for making people more aware of the Great Lakes Basin system they share and use, a prerequisite for the long term support of management measures.

The dimensions and properties of the Great Lakes drainage basin as a physical hydrologic unit can be stated in fairly definite terms. The characteristics of a Great Lakes economic region, however, are difficult to describe in general terms to fit all situations. The Anticipatory Planning Workshop attempted the difficult task of relating the physical

properties of the Great Lakes region to the resource uses which affect the regional environment.

Management of resources implies, in its fullest sense, wise use of resources for beneficial uses with not only the satisfaction of present needs as a criterion but also the continuing productivity of the resource base into the future as a necessary constraint.

### **Next Steps**

- The IJC should continue to show, by significant implementing action, that it takes seriously its adopted policy of ecosystem (integrated) management of the Great Lakes system.
- The Governments of the United States and Canada should apply the ecosystem (integrated) concept to the multi-purpose management of the Great Lakes system, recognizing the interrelationships of water quality, water quantity, land, the atmosphere, plant and animal life and the effect of man's works.
- A program to develop information and arrange for its analysis is needed on the Canadian portion of the Great Lakes so that, when considered with the information produced by the Great Lakes Basin Commission,

a "whole" view of the Great Lakes will be available for public use.

- The IJC should encourage the production of an appropriate/usable, comprehensive, "Atlas" of the Great Lakes Basin to facilitate understanding of the region, its natural and economic resources, and its relationship to other regions in Canada and the United States.
- The nature and effects of economic disparities between the western and eastern and the northern and southern regions of the Great Lakes Basin need consideration in developing a unified Great Lakes management strategy.
- The IJC and the two countries should encourage communication between the citizens of both countries in order to deal more effectively with problems of mutual concern. Educational institutions should strive to increase understanding of the Great Lakes Basin - the "home" region to 37 million persons in Canada and the United States.

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## **Environmental Control And Regulation: Land/Water/Air**

The philosophies expressed by the two nations in the 1978 Water Quality Agreement indicate their continuing intentions to improve Great Lakes ecosystem quality through regulatory programs. New legislation and regulation with respect to hazardous waste management, toxic substances control and environmental assessment is still being readied for implementation. Meanwhile, the impacts of urban growth, agricultural production, resource development and industrial processes continue to affect the Great Lakes ecosystem causing increasing pollution from land use, waste disposal, water quality management systems and from the atmosphere. The environmental and economic implications of the evolution of human settlements in the Great Lakes Basin pose serious questions for the effectiveness of environmental control/regulation programs.

*How can the nature of these complex issues be more clearly identified so that effective regulatory programs can be implemented and monitored?*

*How should the Boundary Waters Treaty and/or the Water Quality Agreement be modified, if necessary, in order to allow the two nations to solve regulatory problems arising as a result of: energy development; human settlements; water transportation; lake levels regulation; increasing pressures for diversions into and out of the Great Lakes Basin; increasing consumptive use of water in the Great Lakes Basin; and atmospheric pollution of land, lakes, rivers and human settlements?*

*How can the IJC address the emerging problem of scarce economic resources for support of water quality regulatory and control programs?*

# Department of Energy and Regulation

## Annual Report

The Department of Energy and Regulation has been established to ensure the efficient and effective use of energy resources. The Department's primary objective is to promote the development of a sustainable energy sector that meets the needs of the economy and the environment. This report provides a comprehensive overview of the Department's activities and achievements over the past year.

The Department has focused on several key areas of work, including the promotion of renewable energy, the improvement of energy efficiency, and the regulation of energy markets. In the area of renewable energy, the Department has supported a range of initiatives aimed at increasing the production and use of renewable energy sources. This has included the provision of financial incentives, the development of regulatory frameworks, and the promotion of research and development in the sector.

In addition, the Department has worked to improve energy efficiency across a wide range of sectors, including industry, transport, and buildings. This has involved the implementation of energy efficiency standards, the provision of technical assistance, and the promotion of energy efficiency programs. The Department has also been active in the regulation of energy markets, ensuring that they are competitive, transparent, and fair to all participants.

Overall, the Department has made significant progress in its work over the past year. This has been achieved through the close cooperation of all staff and the support of the Government and the public. The Department remains committed to its mission and will continue to work hard to ensure that the energy sector is sustainable and meets the needs of the economy and the environment.

oil and gas under the Great Lakes; and acid precipitation from industrial and energy generation processes which pollute the atmosphere. Some of these problem areas or issues were addressed by the Pollution from Land Use Activities Reference Group, with resulting recommendations. Some were dismissed. Neither the United States nor Canada is presently addressing these problems with any observable, effective, regulatory control.

The North American energy problems represent for the IJC a host of serious challenges under its program responsibilities for the Great Lakes. Emerging and potential energy related ecosystem problems include increasing the amount of acid rain resulting from coal fired generating plants, thus increasing the impact of acid precipitation on the air and water resources of both tributary waters and the lakes themselves as well as on the human resources of the Great Lakes Basin. This problem is being exacerbated due to increasing pressure for the transport and use of fossil fuels along the Great Lakes and for the drilling of wet gas and oil from under the Lakes. Specific environmental concerns will arise from the use of synthetic or supplemental fuels or biomass to produce methanol and ethanol, coal gasification, production of hydrocarbons from shale (and the increased development of nuclear energy) in the Great Lakes Basin. The potential problem implications of these energy production processes and related facilities must be anticipated and avoided.

The Great Lakes Basin is an economic slow growth region at present. It has even been experiencing emigration of population and economic resources on the United States side. There is a necessity for producing cost competitive energy supplies within the region. The pressure for development of synthetic fuels has begun. These higher cost, higher environmental impact fuels could affect the Great Lakes Basin. The pressure for reduction of environmental controls and regulation may result in significant pollution both in and out of the Great Lakes Basin and may be a serious future problem. It is anticipated that the development of large, coal fired generating plants may exacerbate the existing situation if the environmental regulations are relaxed for the accelerating synthetic fuel development and production and increasing coal fired electrical generating capacity. Requirements for meeting air quality standards have been lessened or postponed for certain Ohio coal fired generating plants.

Industrial development westward from the Great Lakes to Montana, the Dakotas and the western provinces may also impact regional air quality over the Great Lakes Basin as a whole, given the prevailing wind direction. This, along with basin originated pollution affecting areas to the east, may result in continuing serious environmental and economic consequences for which the present control policies are inadequate.



Large scale consumptive uses of water or diversions from the Great Lakes Basin are likely to have continuing and increasing impacts on both water quality and system capacity for other uses. The present regulatory strategies and systems may be inadequate for preventing future problems. Present monitoring systems for determining the effects of consumptive uses are inadequate.

Water transportation depends upon management of Great Lakes resources as well as, specifically, navigation channels, adequate port and harbor facilities and dredging of sediment from channels and harbors. Maintenance of navigation depths in ports and channels requires dredging on a periodic basis. Since much of the dredged sediment creates water quality problems, there is difficulty in finding proper disposal sites. Some of the sediment is highly toxic. Since the source of the polluted material may not lie within the port itself, a situation has arisen where the water transportation system is burdened by the cost of controlling pollution which it did not cause. There is increasing evidence that the confined disposal techniques for dredged sediments currently practiced in the Great Lakes may have greater adverse environmental impacts than originally anticipated. Since polluted dredge spoil is the result of polluted sediment input, it may be wiser to prevent the pollution of sediments at their source rather than to have to dispose of highly polluted dredge spoil.

The physical and economic impacts of water level fluctuations and attempts at regulation have been or are being evaluated. There is pressure from riparian interests to change the current priority system for regulation to lower Great Lakes levels to reduce rates of shoreline erosion. Lake level regulation may impact wetland and hazard areas adversely.

Population and development pressures have resulted in the disturbance of wetland environments and increased flooding and erosion. Existing regulatory and management responsibilities for wetlands are held by multiple jurisdictions, making coordination and implementation of programs extremely difficult.

### **Next Steps**

- The Parties and the IJC should assure the development of water quality control plans and regulatory programs of sufficient scope and comprehensiveness to ensure that the implementation of the water quality objectives and other provisions of the Great Lakes Water Quality Agreement will be carried out.
- The Parties should make the necessary amendments, or broaden the interpretation of the Treaty of 1909, such that the increasingly serious problems related to atmospheric inputs

of various pollutants, including toxics and acid rain, can be controlled or prevented by appropriate regulatory programs.

- Programs for control and regulation of storm, sanitary and combined sewers must be assessed. The assessment should consider: municipal economic capabilities, especially in light of greater limitations on the financial resources available for cleanup programs; less general public support for environmental regulatory programs than in the past; and the general decline of United States central cities in the Great Lakes Basin. Alternative regulatory strategies, including diffuse source regulation, may be required.
- The Parties, under the Great Lakes Water Quality Agreement, should require coordination of the dredged material disposal regulatory programs with those controlling waste sources. The long range cost-effectiveness and environmental impact of prevention of polluted sediments should be evaluated against the cost-effectiveness and environmental impact of dredged spoil containment.
- The Parties and the IJC need a better understanding of the natural background levels for heavy metals and other toxics found in the Great Lakes, if we are to avoid a loss

of public confidence over water quality standards, objectives and existing regulatory programs.

- The IJC should forward the Pollution from Land Use Activities Reference Group's recommendations to the Governments. The Governments should develop their action plans and report back to the Commission so that the implementation can be monitored. The IJC should use its knowledge and powers of persuasion to encourage the Governments to act on IJC findings with respect to effective implementation of programs.
- A new or expanded Air Pollution Treaty may have to be considered by the Parties, or additional parameters may have to be added to the Water Quality Agreement, in order to provide for the development of adequate regulatory control of acid rain and other atmospheric pollution inputs to the Great Lakes Basin.
- Regulatory programs to prevent pollution of the Great Lakes Basin from agricultural practices, leaching of mine tailings, new uses of chemicals in industrial processes and from gas and oil drilling in the Great Lakes, should be developed by the Parties and coordinated under the Water Quality Agreement.

- New regulatory strategies may have to be developed under the Treaty to recognize and deal with impacts on water quality and system capacity caused by large scale consumptive uses of water or diversions of water from the Great Lakes Basin. A uniform accounting system should include consumptive uses on both sides of the Great Lakes Basin. Arrangements for control should establish means of compensation between countries and states.
- The IJC should move forward with developing the institutional arrangements to monitor the effects of existing Great Lakes levels regulatory efforts. It should involve affected special interest representatives in developing proposals for water level regulation.
- The IJC should bring the wetlands issue to the attention of the two Governments so that timely action by the Parties can be instituted to prevent further destruction of Great Lakes wetlands. It should also evaluate the effectiveness of programs for controlling development in hazard areas and the impact of such development on Great Lakes ecosystems.

The first part of the report is devoted to a description of the general situation in the country at the end of 1954. It is followed by a chapter on the economic situation and a chapter on the social situation. The report concludes with a summary of the main findings and a list of recommendations.

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## **Institutional Arrangements And Capabilities**

*What changes may be needed in the institutional arrangements which have been established within and between the United States and Canada for dealing with Great Lakes issues in an anticipatory and forward looking manner?*

*What changes do these in turn imply for the IJC as the major binational "bridging agency" for the Great Lakes?*

# International Associations and Organizations

The following is a list of international associations and organizations that are active in the field of international development and cooperation. These organizations are engaged in various activities such as research, advocacy, and implementation of development projects.

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## Background

The basic policy framework for governance over the Great Lakes Basin is set primarily by the international boundary between Canada and the United States, the constitutional division of powers among levels of governments within both countries and the major statutes bearing on planning, management and use of the Great Lakes Basin ecosystem within each of the major jurisdictions. The secondary, but nonetheless crucial, components of this framework are the various intergovernmental coordinating devices which have been created to help facilitate the handling of specific kinds of problems arising from the many uncoordinated uses of Great Lakes resources.

The binational commissions, the IJC and the Great Lakes Fishery Commission, are the only bodies whose mandates permit them to view the lakes ecosystem as a totality. Within the United States, there is an additional complementary role for water and land use planning provided by the Great Lakes Basin Commission, and some coordination of user group interests by the Great Lakes Commission. In Canada, several federal-provincial agreements, especially the Canada-Ontario Environmental Accord, also serve to facilitate joint inter-jurisdictional cooperation on matters concerning the Great Lakes.

The question now raised is that of the overall sufficiency of these collective, institutional, arrange-

ments for developing some measure of an anticipatory capability within the perspective of the whole Great Lakes Basin and the collective capacity to act to prevent newly emergent problems from becoming intractable ones, or new crises.

The main prerequisite for developing or strengthening these capabilities is the creation of a Great Lakes Basin wide "intelligence" operation which monitors changes in ecosystem quality in a number of different ways and exercises surveillance over on going activities and new initiatives which tend to impact most heavily on the Great Lakes Basin ecosystem. The proposals for developing a "futures orientation" towards the Great Lakes indicates some of the ways in which an intelligence function can be created.

Beyond this is the need for a wider measure of informal binational and interorganizational consultation on policy issues and the common goals to be sought for the Great Lakes by each country working through its own system of governance. Should major policy differences arise during these more informal consultations, they would then have to be taken up by the formal structures for international negotiations between the two countries.

## Next Steps

- The development and strengthening of an anticipatory capability for the Great Lakes Basin ecosystem can be done within the basic policy framework for governance as outlined above.
- The IJC has a crucial role to play as a major facilitator for consultations on goals, issues and problems requiring the attention of both countries.
- The existing intergovernmental arrangements within each country should be modified and strengthened where necessary to provide the "intelligence" function in support of binational cooperation on various matters pertaining to the Great Lakes ecosystem.
- Steps need to be taken to strengthen the involvement of municipal governments in working out implementable programs for resolving problems pertaining to the Great Lakes ecosystem.
- Elected officials, at all levels of government, have to be brought much more into the consultation process to create the necessary political will to act.

- Public awareness and involvement must also be widened to assure continuing commitment and support necessary to achieve "forward looking" responses to emerging problems.

The commitments already agreed to by the United States and Canada under the 1978 Water Quality Agreement will necessitate modifications in the institutional arrangements along the lines indicated. The problems posed by the need to deal with toxic substances and land use planning issues exemplify this.

## Further

- A strong statement by the two countries confirming their expectations that the IJC will take the initiative to advise them on:
  1. current or emerging problems in order that the countries respond in a timely manner; and
  2. what specifically has to be done to create a strengthened anticipatory capability and a "forward looking" response to emerging problems in the Great Lakes Basin ecosystem.
- The creation by the IJC of a special panel or advisory board to develop the strategies needed to implement such a directive, in part



by reviewing the nature and extent of on-going planning and developmental activities which bear significantly on Great Lakes issues, and in part through consultations with other Great Lakes commissions on the programs they are facilitating or coordinating.

- The initiation by such a panel or board of consultations with various individuals or groups of "professionals" and "impacted publics" along the lines proposed for creating the communications networks necessary to develop a "futures orientation" towards planning and management of the Great Lakes ecosystem.

## Next Steps

- The development and implementation of an anticipatory capability for the Great Lakes Basin should be a high priority for the Basin States. This capability should be developed through a process of consultation and cooperation among the Basin States and the Great Lakes Commission.
- The IJC has a special role to play in the development of this capability. It should continue to provide technical assistance and information to the Basin States and the Great Lakes Commission.
- The Basin States should continue to work together to develop a common approach to the management of the Great Lakes Basin. This approach should be based on the principles of equity, efficiency, and sustainability.
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## Communication For Implementation

Strategies to improve the "ecosystem quality" of the Great Lakes Basin cannot succeed without widespread public understanding and acceptance of whatever goals the strategies are meant to achieve. They also require mobilization of strong political support.

*How can effective communication networks be brought together with one another to facilitate information sharing and a greater degree of public involvement in matters affecting ecosystem quality in a large region such as the Great Lakes Basin?*

*What is the crucial role of the IJC in helping to bring this about, given that it is the major instrument of Canada and the United States for overseeing binational cooperation on Great Lakes matters?*

*How can the IJC develop effective two-way information sharing and communication processes with local groups, elected officials and citizens in both countries, even though it must also formally work through official channels of communication to Governments ?*

# Introduction

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## Background

The liberal democratic traditions of the United States and Canada make public understanding and support a prerequisite for implementing governmental policies. To improve ecosystem quality in the Great Lakes Basin requires a long term commitment and this makes it all the more necessary to have solid and sustained understanding and support.

Implementation of the intent of the 1978 Great Lakes Water Quality Agreement will require more reliance to be placed on preventive measures applied directly to land use practices, industrial production processes and infra-structure development projects (e.g., transportation, waste management, energy). This in turn is of direct concern to a number of private corporations, most municipal governments and many private landowners as well as to federal, state and provincial agencies.

Many people who now will be affected by or otherwise involved in activities overseen by the IJC, have not before been confronted with questions about the possibly negative impacts their activities may be having on Great Lakes ecosystem quality. Many may view this as unwarranted, bureaucratic intervention into their rights and freedoms. Given the prevailing "deregulation" moods in both countries, this raises the serious prospect of Governments defaulting on their commitment as

expressed by the Great Lakes Water Quality Agreement.

"Communication" obviously pervades all activities concerning the Great Lakes. The challenge is to find effective ways of creating widespread awareness and commitment to ecosystem quality goals among a substantial proportion of the 37 million citizens of the Great Lakes Basin. Special attention has to be given to reaching key citizen groups, elected officials, business executives, civil servants and professional associations; all of whom have some influence over Great Lakes futures. Development of more active constituencies to support longer term measures to improve ecosystem quality is also essential.

The importance of having objective information openly accessible to all who may be interested cannot be overstressed. This emphasizes the importance of governments' adopting or extending their freedom of information policies with regard to the Great Lakes, strengthening public information services dealing with Great Lakes Basin issues and continuing to explore ways for involving citizens more directly in the ecosystem quality programs affecting them. The IJC has an important role to play because of its pivotal position in Great Lakes matters. The question which the IJC faces is how to

strengthen its communication role and its contact with various publics, while at the same time being formally required to work through official channels to Governments.

### **Next Steps**

- The IJC should continue its public information and participation activities in close association with its other responsibilities, including whatever new role it may evolve in developing anticipatory capabilities for Great Lakes matters.
- There are many state of the art problems in developing effective public participation in the binational setting of the Great Lakes Basin and the IJC should review its experiences continually with a view to improving them.
- The Governments need to report publicly on their response to all IJC recommendations so that the policy and program issues they entail are opened to public inspection and debate.
- Developing more effective communication flows pertaining to Great Lakes matters should be seen mainly as identifying priority groups and constituencies with whom to

interact and seeing how best to interconnect communication networks which already exist among the various groups.

- The IJC can help initiate the process by pursuing strategies proposed in the "Futures" section of this report for establishing contacts with both the impacted publics and the informed groups in the Great Lakes Basin.

### **Further**

As part of the necessary preparations to implement the intent of the 1978 Agreement, the Governments and the IJC should:

- Make a firm commitment to open up their strategy and program development to much greater public inspection and involvement.
- Review the experience of public participation measures initiated by the IJC during the 1972 Agreement with a view to assessing desirable changes and improvements.
- Convene meetings similar to the Anticipatory Planning Workshop periodically, to consult with particular groups on selected topics.

- Give priority to developing information and analyses from a Great Lakes Basin wide perspective as an integral component to developing anticipatory capabilities and public support.

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### Next Steps

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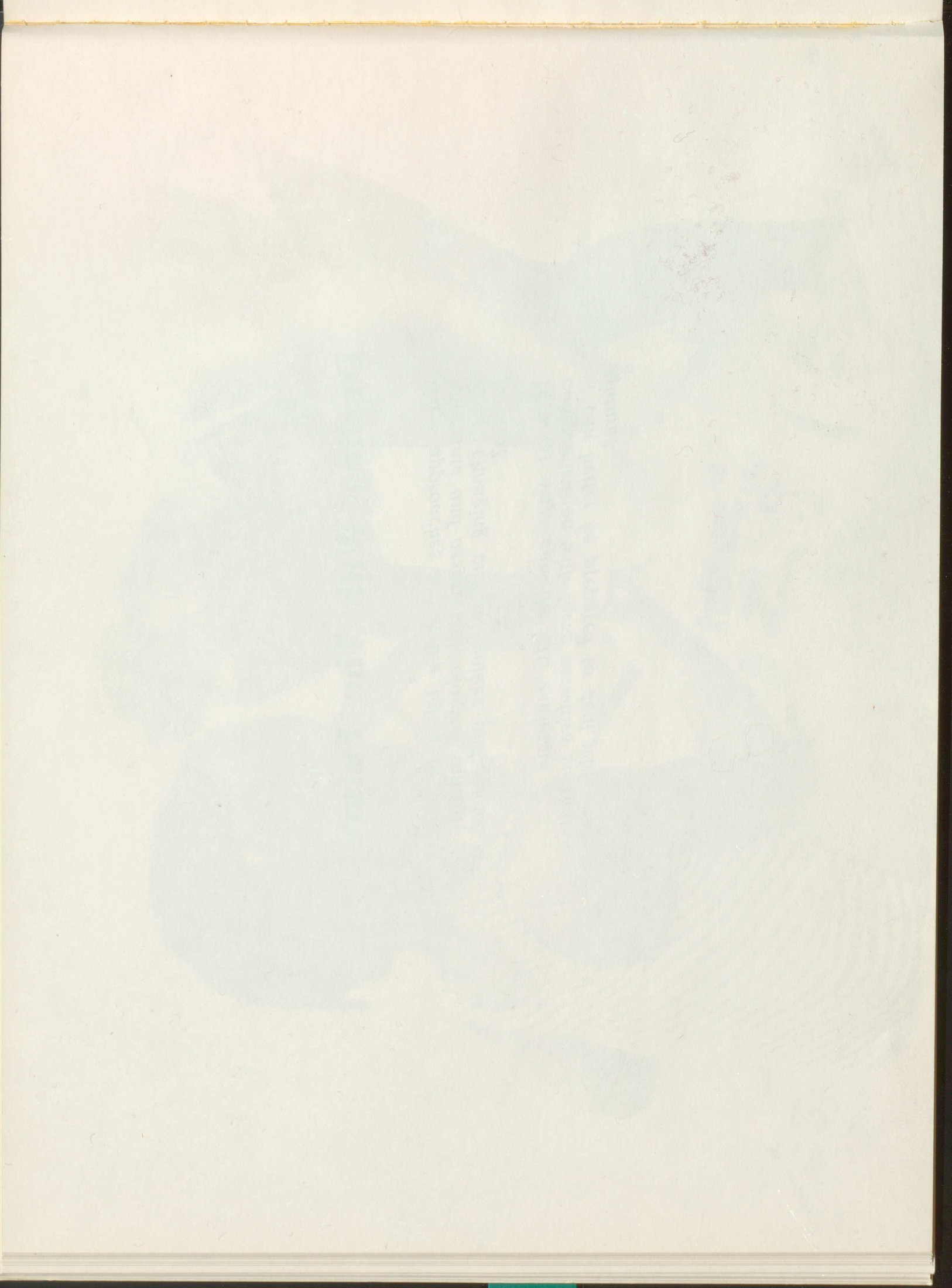




## Dealing With The Future

*What approaches are being taken to anticipate and assess technological innovations, changing cultural values and social futures?*

*In what ways can the IJC maintain communication with these activities so that it can better be prepared to deal with the future?*



## Background

Canada and the United States should have an interest in developing within the IJC a capability to move from an essentially reactive to a forward looking posture. This shift in orientation will be difficult and time-consuming, but it is essential and possible.

This report attempts to outline what is involved in developing a futures oriented, holistic, focus. It also seeks to assure the IJC of the need for and merits of such a role. In moving in this direction, it would be both impractical and unwise to attempt too rapid a transition. Rather, the approach should be iterative and should include experimental testing and evaluation in a learning process.

The future is not dictated by any single cause. It is rather, a combination of events, including those resulting from conscious human decisions or choice and others which are externally induced.

The future, in fact, is characterized by only one quality-uncertainty. We see anticipatory planning, i.e. a futures orientation, as a way of reducing uncertainty associated with taking action directed towards future conditions and of limiting the magnitude and number of surprises.

The problems we face demand new perspectives. Functional, single purpose approaches which

compartmentalize problems are inadequate to deal with today's complex problems. Forces for change result, for example, from energy scarcity, technological innovations such as telecommunication, and from other challenges addressed by the several work groups. In our opinion, the framework for planning, policymaking, implementation and information transfer needs to be accomplished in a decentralized system, with a mix of public and private decisions which will respect Canadian and American political and cultural traditions.

### Next Steps

#### Basic Considerations In Developing A Futures Orientation

- Developing a futures orientation is an experimental process proceeding stepwise.
- The IJC commitment must be sufficient and sustained to attempt the task.
- Activities undertaken must be relevant to the IJC.
- Activities should relate to the critical publics and policymakers.

### Primary Elements of an Anticipated Planning Framework

- the linkages among interested, affected and knowledgeable parties; and
- the strategies and processes which link the parties together.
- Knowledgeable parties can be drawn from people working in:
  - business and industry;
  - universities;
  - labor;
  - government;
  - research organizations;
  - consulting firms;
  - public interest groups;
  - adversary groups;
  - professional societies;
  - media/journals.
- Additionally, members should be drawn from affected publics; that is, individuals or groups affected by site specific events at the local level and who are concerned about problem solving and change in that context.
- Reaching out and interacting with both groups requires communication and related devices tailored for the several groups.

### Strategies and Processes to Link Interested Parties

Action possibilities are suggested in keeping with an iterative, experimental approach, viz:

- developing an information capacity, including a newsletter devoted to "linkage" development and maintenance;
- developing a research capacity involving universities and others with the IJC;
- holding workshops to identify major technological, economic and social trends;
- convening a conference on "The Future of the Great Lakes Basin"; and
- developing several "future" scenarios to explore how the IJC might carry out its responsibilities.

## **Appendices**

- 1. Workshop Participants**
- 2. Terms of Reference, Societal Aspects Expert Committee**
- 3. Membership, Societal Aspects Expert Committee**
- 4. Terms of Reference, Science Advisory Board**
- 5. Membership, Science Advisory Board**

## Appendices

1. Workshop Participants
2. Terms of Reference, Societal Aspects Expert Committee
3. Membership, Societal Aspects Expert Committee
4. Terms of Reference, Science Advisory Board
5. Membership, Science Advisory Board

## Workshop Participants

Mr. Jim Bauer  
Chairman  
Grand River Conservation Authority  
400 Clyde Road  
P.O. Box 729  
Cambridge (Galt), Ontario N1R 5W6

Mr. Bernard Beaupré  
IJC Commissioner  
128 Sixth Avenue  
Richelieu, Quebec J3L 3M9

Ms. Mimi Becker  
Great Lakes Tomorrow  
P.O. Box 1935  
Hiram, Ohio 44234

Mr. Al Behm, Chief of Planning  
North Central Division  
U.S. Corps of Engineers  
536 S. Clark St.  
Chicago, Illinois 60605

Mr. Charles A. Bigenwald  
Manager Central Ontario Region  
Ontario Ministry of Treasury and Economics  
6th Floor, Frost Building  
Queen's Park  
Toronto, Ontario M7A 1Y1

Mr. Lazlo Bodnar  
Ministry of The Treasury and Economics  
Economic Analysis Branch  
4th Floor  
Frost Building North, Queen's Park  
Toronto, Ontario M7A 1Y7

Mr. Daniel A.J. Bondy  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

Prof. Stephen Born  
Department of Urban and  
Regional Planning  
University of Wisconsin  
925 Lathrop Drive  
Madison, Wisconsin 53706

Ms. Lee Botts  
Chairman  
Great Lakes Basin Commission  
P.O. Box 999  
Ann Arbor, Michigan 48106

Mr. Rodney E. Boulanger,  
Vice President  
Planning and Diversification  
American Natural Resources  
One Woodward Avenue  
17th Floor, Main Office  
Detroit, Michigan 48226

Ms. June Brown  
Project Director of Energy  
Toledo Metropolitan Area Council  
of Governments  
420 Madison Avenue, Suite 725  
Toledo, Ohio 43604

Mr. John Bruce  
House Committee on Merchant Marine  
and Fisheries  
U.S. House of Representatives  
Longworth Building, Room 1337  
Washington, D.C. 20515

Mr. Patrick Brunett  
Southeastern Michigan Council of Governments  
800 Book Building  
Detroit, Michigan 48266

Mr. Dave Buchanan  
Lake Carriers Association  
1411 Rockefeller Building  
Cleveland, Ohio 44113

Mr. S.T. Byerley  
Sr. Economic adviser  
Marine Services Policy Branch  
Marine Policy & Planning Directorate  
Transport Canada  
Tower A, 17th Floor  
Place de Ville  
Ottawa, Ontario K1A 0N7

Dr. Tom Carney  
Department of Communications  
University of Windsor  
Windsor, Ontario

Prof. John Carroll  
Institute of Natural and  
Environmental Resources  
University of New Hampshire  
Durham, New Hampshire 03824

Mr. Don Caveen  
Director  
Northeastern Ontario  
Dept. of Regional Economic Expansion  
128 Larch St., Suite 603  
Sudbury, Ontario P3E 5J8

Mr. Raymond Charbonneau  
Direction Production  
75 West Dorchester  
Montreal, Quebec H2Z 1A4



Mr. Ray Christman  
Associate Director  
Western Pennsylvania Conservancy  
Pennsylvania Land Policy Project  
316 Fourth Avenue  
Pittsburgh, Pennsylvania 15222

Mr. Richard Clayton  
Future Studies Program  
Institute for Research on Public Policy  
3535 Queen Mary Road  
Montreal, Quebec H3V 1H8

Dr. Jim Cowden  
Great Lakes Tomorrow  
P.O. Box 1935  
Hiram, Ohio 44234

Mr. Glen Crewe  
Inspector  
Ministry of Natural Resources  
R.R. #3  
Merlin, Ontario NOP 1W0

Mr. L.T. Crook  
Natural Resources Mgmt. Consultant  
3355 Yellowstone Drive  
Ann Arbor, Michigan 48105

Mr. Wayne Crosly  
Economic Development  
Frost Building North, 6th Floor  
95 Grosvenor Ave.,  
Toronto, Ontario M9A 1Y7

Mr. Gary Davidson  
Director of Planning for Huron County  
Courthouse  
Goderich, Ontario N9A 1M2

Mr. Graham Day, Director  
Canadian Marine Transportation Centre  
Dalhousie University  
Halifax, Nova Scotia

Ms. Arlene Dietz, Study Manager  
National Waterways Study  
Institute for Water Resources  
U.S. Army Corps of Engineers  
Kingman Building  
Fort Belvoir, Virginia 22060

Prof. Leonard Dworsky  
Civil and Environmental Engineering  
Hollister Hall  
Cornell University  
Ithaca, New York 14853

Mr. Jim Fish, Executive Secretary  
Great Lakes Commission, IST Bldg.  
2200 Bonisteel  
Ann Arbor, Michigan 48105

Dr. H.F. Fletcher  
Guelph-Western Research  
251 Bank Street, Suite 251  
Ottawa, Ontario K2P 1X3

Mr. Paul D. Foley  
Coordinator, Development & Research Group  
Pollution Control Branch  
Ontario Ministry of the Environment  
135 St. Clair Avenue West  
Toronto, Ontario M4V 1P5

Mr. Harry Forgey  
Executive Engineer  
Consumers Power Company  
Power Resources and System Planning Dept.  
P26-412A  
1945 West Parnall Road  
Jackson, Michigan 49201

Mr. Derek Foulds  
Acting Director General  
Environmental Management Service  
Fisheries and Environment  
3050 Harvester Road  
Burlington, Ontario L7R 3J1

Dr. George R. Francis  
Faculty of Environmental Studies  
University of Waterloo  
Waterloo, Ontario N2L 3G1

Mrs. F. Edna Gardner  
110 North Drive  
Islington, Ontario M9A 4L2

Mr. Charles P. Girdwood  
River Road West  
R.R. #1  
Prescott, Ontario K0E 1T0

Mr. Bill Glen  
Researcher  
Energy Probe  
43 Queen's Park Ave. East  
Toronto, Ontario M5S 2C3

Mr. Bernard Gorniak  
Executive Vice President  
Erie Area Chamber of Commerce  
1006 State St.  
Erie, Pennsylvania 16501

Mr. Peter Gusen  
Conference Board of Canada  
25 McArthur Lane, Suite 100  
Vanier, Ontario K1L 6R3

Mr. Loren Habegger  
Argonne National Laboratory  
Energy & Environmental Systems  
Division  
9700 South Casse Avenue  
Argonne, Illinois 60439

Ms. Linda Haverfield  
Sierra Club  
142 W. Gorham  
Madison, Wisconsin 53703

Mr. Douglas Hearnshaw  
Marine Transport Technology  
Research & Development Center  
100 Sherbrooke St. W., P.O. Box 549  
Place de l'Aviation  
Montreal, Quebec H3A 2R3

Mr. Hubert Hinote  
Project Manager  
Regional Economic Projects  
Tennessee Valley Authority  
270 Liberty Building  
Knoxville, Tennessee 37902

Mr. Roger Hinterlighter  
Senior Economist  
Federal Reserve Bank  
East 6th Street and Superior St.  
Cleveland, Ohio 44101

Capt. Philip Hurcomb  
Canada Marine Association  
350 Sparks St., Suite 703  
Ottawa, Ontario K1R 7S8

Mr. Neal Irwin  
Transportation Consultant  
IBI Group  
40 University Avenue, 6th Floor  
Toronto, Ontario M5J 1T1

Mr. Richard Isle  
Arrowhead Regional Development Commission  
2000 Arrowhead Place  
Duluth, Minnesota 55802

Mr. Steven Janes  
James F. MacLaren Ltd.  
320 Adelaide Street South  
London, Ontario N5Z 3L2

Dr. Art Johnson  
Ontario Ministry of Energy  
56 Wellesley St. W., 12th Floor  
Toronto, Ontario M7A 2B7

Professor John Judd  
Michigan Sea Grant Program  
2200 Bonisteel Blvd.  
University of Michigan  
Ann Arbor, Michigan 48109

Mr. James Keenan  
Executive Coordinator  
Lands and Waters Group  
Ontario Ministry of the Environment  
Whitney Block, Room 6626  
Toronto, Ontario M7A 1X5

Mr. James Lagowski  
Planning and Research  
Detroit Edison Company  
2000 2nd Avenue  
Detroit, Michigan 48226

Dr. J. H. Leach  
Research Scientist  
Lake Erie Fisheries Research Station  
Fish & Wildlife Research Station  
Ministry of Natural Resources  
R.R. #2  
Wheatley, Ontario N0P 2P0

Mr. A. B. Leman  
Leman Architect Planners  
87 St. Nicholas St.  
Toronto, Ontario M4Y 1W8

Miss Karin J. Lenman  
Information Branch  
Ontario Ministry of Agriculture and Food  
1200 Bay Street  
Toronto, Ontario M5R 2A6

Professor Jose Llamas  
Faculty of Science and Engineering  
Director, Water Resources Center  
Pavillon Pouliot  
University of Laval  
Centreau, Room 3717  
St. Foy, Quebec G1K 7P4

Mr. Bud Luce  
St. Lawrence Seaway Authority  
320 Queen's Street, Place de Ville  
Tower A, 15th Floor  
Ottawa, Ontario

Mr. Leo Maarse, Chief Planner  
Toronto Harbour Commission  
60 Harbour St.  
Toronto, Ontario M5J 1B7

Dr. Floyd Mann  
Director  
Public Affairs  
1100 14th Street  
University of Colorado  
Denver, Colorado 80202

Mr. Jim McIntosh  
R.R. #4  
Seaforth, Ontario

Professor Edward Miles  
Dept. of Canadian Studies  
Old Mill  
University of Vermont  
Burlington, Vermont 05405

Dr. John Moore  
The Academy for Contemporary  
Problems  
1501 Neil Avenue  
Columbus, Ohio 43201

Dr. Habte Neghassi  
Economic Affairs Officer, Water Resources  
Programme Planning and Coordination Office  
United Nations  
New York, New York 10017

Mr. Ruben Nelson  
Canadian Association for  
Future Studies  
Square One Management  
100 Gloucester Street, Room 302  
Ottawa, Ontario K2P 0A4

Ms. Susan Nelson  
Information Officer  
Great Lakes National Programs Office  
U.S. Environmental Protection Agency  
536 South Clark St.  
Chicago, Illinois 60605

Dr. Paul Nickel  
Great Lakes Basin Commission  
P.O. Box 999  
Ann Arbor, Michigan 48106

Dr. Glen Norcliffe  
Dept. of Geography, Room South 412  
York University  
4700 Keele St.  
Downsview, Ontario M3J 1P3

Mr. Kenneth A. Oakley, Director  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

Dr. Dora Passino  
(Alternate for)  
Dr. Joseph Kutkuhn  
Director  
U.S. Department of the Interior  
Fish and Wildlife Service  
Great Lakes Fishery Laboratory  
1451 Green Road  
Ann Arbor, Michigan 48105

Mr. J.A.S. Peck  
Vice-President, Technical Services  
Hall Corporation Shipping Ltd.  
4333 St. Catherine's St. West  
Montreal, Quebec H3Z 1P9

Mr. Richard Picherack  
Administrative Officer  
City of Thunder Bay  
500 Donald Street  
Thunder Bay, Ontario P7E 5V3

Dr. E. Pleva  
Department of Geography  
Social Science Center  
University of Western Ontario  
London, Ontario N6A 5C2

Mr. Mel Plews  
Ministry of the Environment  
135 St. Clair Avenue West  
Toronto, Ontario M4V 1P5

Mrs. Caroline Raymond  
Consultant, Urban Planning  
99 Ridgeview Road  
Poughkeepsie, New York 12603

Mr. Nigel Richardson  
Executive Director  
Program of the Ontario Royal  
Commission on the Northern Environment  
Manulife Center, Room 801  
55 Bloor St. West  
Toronto, Ontario M4W 1A5

Mr. David Roellig  
Army Corps of Engineers  
Detroit District  
P.O. Box 1027  
Detroit, Michigan

Mr. J. Douglas Roseborough  
Director, Wildlife Branch  
Ontario Ministry of Natural Resources  
Queen's Park, Parliament Building  
Whitney Block  
Toronto, Ontario M7A 1W3

Mr. Charles R. Ross  
IJC Commissioner  
P.O. Box F  
Hinesburg, Vermont 05461

Professor Carlisle Runge, Director  
Center for Public Policy and Administration  
University of Wisconsin - Madison  
322 North Hall  
Madison, Wisconsin 53706

Mr. George Ryan  
Great Lakes Regional Director  
Maritime Administration  
U.S. Dept. of Commerce  
666 Euclid Avenue  
Cleveland, Ohio 44114

Mr. Ken Schoener  
Basin Engineer for Lake Erie  
and Ohio  
Bureau of Water Quality Management  
Department of Environmental Resources  
P.O. Box 2063  
Harrisburg, Pennsylvania 17120

Mr. Norman Sexton  
Steel Company of Canada  
Stelco Tower  
Hamilton, Ontario L8N 3T1

Dr. William Shelson  
Fuel Resources Planning  
Room H13E27  
Ontario Hydro  
700 University Avenue  
Toronto, Ontario M5G 1X6

Mr. Vacys Soulys  
Physical Scientist  
Great Lakes National  
Program Office  
U.S. Environmental Protection Agency  
536 South Clark St.  
Chicago, Illinois 60605

Mr. William Steggle  
Environmental & Technical Advisor to  
the Deputy Minister  
Ontario Ministry of the Environment  
135 St. Clair Avenue West  
Toronto, Ontario M4V 1P5

Ms. Mary Lee Strang  
League of Women Voters  
1831 Balmoral Lane  
Glenview, Illinois 60025

Professor John L. Sullivan  
Director  
Occupational Health and Safety  
Resource Center  
Faculty of Engineering Science  
University of Western Ontario  
London, Ontario N6A 5B9

Mr. J. Thornburn  
International Joint Commission  
100 Metcalfe Street  
Ottawa, Ontario K1P 5M1

Mr. Kenneth H. Walker  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

Mr. Brian Ward  
Ministry of the Environment  
135 St. Clair Avenue West  
Toronto, Ontario M4V 1P5

Dr. Andrew Watson (Secretariat)  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

Mr. Walter Webb  
St. Lawrence Seaway Authority  
320 Queen's Street, Place de Ville  
Tower A, 15th Floor  
Ottawa, Ontario

Mr. Robert E. White  
International Joint Commission  
100 Ouellette Avenue  
Windsor, Ontario N9A 6T3

Mr. Don Wilson  
President  
Institute for Canadian Futures  
2 Toronto St.  
Suite 205  
Toronto, Ontario M5C 2B6



## **Terms of Reference, Societal Aspects Expert Committee**

### **1. Scope of Activities**

The Science Advisory Board appoints three expert committees, including the Societal Aspects, to consider all matters pertaining to Great Lakes water quality, especially those relevant to the interests of the Water Quality Agreement.

The Expert Committee on Societal Aspects of Great Lakes Water Quality, encompassing the jurisdictional, political, institutional, legal, educational and other nonmaterial measures influencing the effects of man's activities on receiving water, includes expertise representative of economics, planning, citizen/public interest, political science, human behaviour, legal aspects, resource conservation and attitude change, and regulatory activities.

### **2. Responsibilities**

The Expert Committees shall consider the full scope of matters pertaining to Great Lakes water quality with emphasis on those relevant to the intent of the Water Quality Agreement and shall:

#### **A. On their own initiative:**

1. provide continuing independent advice

and synthesis of expert opinion on new and continuing problems based on their own personal expertise and familiarity with problematic issues raised in IJC generated reports;

2. identify oversights, weaknesses, and opportunities in research activities in Canada and the United States;
  3. solicit additional expertise in specific areas as necessary, but with approval of the Science Advisory Board Co-Chairmen if this involves expense to the Board;
  4. function as a committee not less than twice a year;
  5. assist the Science Advisory Board in advising the IJC by recommending specific activities, such as Task Forces and workshops, their nature, scope and organization.
- B. At the request of the Science Advisory Board through its Co-Chairmen:

1. provide advice and synthesis of expert opinion of specific issues;
2. comment on the charges and recommend appointments to task forces or other special purpose bodies under consideration by the Science Advisory Board.

## Membership, Societal Aspects Expert Committee

Ms. Mimi Becker (Chairman, Effective July 1979)  
Great Lakes Tomorrow  
P.O. Box 1935  
Hiram, Ohio 44234

Professor L. B. Dworsky (Chairman Until July 1979)  
Civil and Environmental Engineering  
Hollister Hall  
Cornell University  
Ithaca, New York 14853

Dr. George R. Francis  
Faculty of Environmental Studies  
University of Waterloo  
Waterloo, Ontario N2L 3G1

Dr. Paul Nickel  
Planning Director  
Great Lakes Basin Commission  
P.O. Box 999  
Ann Arbor, Michigan 48106

Mr. H.D. Paavila  
Director  
Environmental, Energy and Supply Services  
Canadian Pulp & Paper Association  
2300 Sun Life Building  
Montreal, Quebec H3B 2X9

Professor J.L. Sax (Until December, 1979)  
Faculty of Law  
University of Michigan  
Ann Arbor, Michigan 48104

Professor C.P. Runge  
Director  
Center for Public Policy & Admin.  
University of Wisconsin-Madison  
322 North Hall  
Madison, Wisconsin 53706

Dr. Edward G. Pleva  
Department of Geography  
Social Science Center  
University of Western Ontario  
London, Ontario N6A 5C2

Mr. J. Castrilli  
Research Director  
Canadian Environmental Law Assoc.  
Law Advisory Clinic  
1 Spadina Crescent, Suite 303  
Toronto, Ontario M5S 2J5

SAB Liaison Member

Dr. J. Vallentyne  
Senior Scientist  
Fisheries & Marine Service  
Ontario Region  
Canada Centre for Inland Waters  
P.O. Box 5050  
Burlington, Ontario L7R 4A6

Secretariat Responsibilities

Dr. A.E.P. Watson  
Research Scientist  
Great Lakes Regional Office  
International Joint Commission  
100 Ouellette Avenue, 8th Floor  
Windsor, Ontario N9A 6T3

## Terms of Reference, Science Advisory Board

1. As used herein, "research" includes development, demonstration and research activities, but does not include regular monitoring and surveillance of water quality.
2. The functions and responsibilities of the Science Advisory Board relating to research activities in Canada and the United States concerning the quality of the waters of the Great Lakes System shall be as follows:
  - (a) to review at regular intervals these research activities in order to:
    - (i) examine the adequacy and reliability of research results, their dissemination, and the effectiveness of their application;
    - (ii) identify deficiencies in their scope, and inadequacies in their funding and in completing schedules;
    - (iii) identify additional research projects that should be undertaken;
    - (iv) identify specific research programs for which international cooperation will be productive;
  - (b) to provide advice and consolidations of scientific opinion to the Commission and its boards on particular problems referred to the Advisory Board by the Commission and its boards on particular problems referred to the Advisory Board by the Commission or its boards;
  - (c) to facilitate both formal and informal international cooperation and coordination of research; and
  - (d) to make recommendations to the Commission.
3. The Science Advisory Board on its own authority may seek analyses, assessments and recommendations from other professional, academic, governmental or intergovernmental groups about the problems of Great Lakes water quality research and related research activities.
4. The IJC shall determine the size and composition of the Science Advisory Board. The Commission should appoint members to the Advisory Board from

appropriate Federal, State and Provincial Government agencies and from other agencies, organizations and institutions involved in Great Lakes research activities. In making these appointments the Commission should consider individuals from the academic, scientific and industrial communities and the general public. Membership should be based primarily upon an individual's qualifications and potential contribution to the work of the Advisory Board.

5. The Science Advisory Board should work at all times in close cooperation with the Great Lakes Water Quality Board.

## Membership, Science Advisory Board

### United States Section

Dr. Donald I. Mount (Chairman)  
Environmental Research Laboratory - Duluth  
6201 Congdon Blvd.  
Duluth, Minnesota 55804

Dr. Joseph Kutkuhn, Director  
U.S. Department of the Interior  
Fish and Wildlife Service  
Great Lakes Fishery Laboratory  
1451 Green Road  
Ann Arbor, Michigan 48105

Dr. Robert Ragotzkie  
Sea Grant College Program  
University of Wisconsin  
1800 University Avenue  
Madison, Wisconsin 53706

Mr. Dolloff F. Bishop  
Chief, Technology Dev. Support Branch  
Wastewater Laboratory  
U.S. EPA  
26 West St. Clair Street  
Cincinnati, Ohio 45268

### *Great Lakes Fishery Commission*

Mr. Carlos M. Fetterolf, Jr.  
Executive Secretary  
Great Lakes Fishery Commission  
1451 Green Road  
Ann Arbor, Michigan 48105

Dr. John. R. Sheaffer  
President  
Sheaffer and Roland, Inc.  
130 North Franklin  
Chicago, Illinois 60606

Dr. Anne Spacie  
Department of Forestry and Natural  
Resources  
Purdue University  
West Lafayette, Indiana 47907

Dr. Mitchell R. Zavon  
Medical Director  
Hooker Chemicals  
222 Rainbow Blvd. North  
P.O. Box 728  
Niagara Falls, New York 14302

*International Association for Great Lakes Research (IAGLR)*

Dr. R.A. Sweeney, Biology Professor  
Great Lakes Laboratory  
State University College  
1300 Elmwood Avenue  
Buffalo, New York 14222

**Canadian Section**

Dr. G.K. Rodgers (Chairman)  
Director  
National Water Research Institute  
Canada Centre for Inland Waters  
P.O. Box 5050  
Burlington, Ontario L7R 4A6

Mr. Paul D. Foley  
Coordinator, Development & Research Group  
Pollution Control Branch  
Ontario Ministry of the Environment  
135 St. Clair Avenue West  
Toronto, Ontario M4V 1P5

Professor J. Llamas  
Director, Water Resources Centre  
Faculty of Science and Engineering  
Pavillon Pouliot  
University of Laval  
Centreau, Room 3717  
Ste. Foy, Quebec G1K 7P4

Mrs. F. Edna Gardner  
100 North Drive  
Islington, Ontario M9A 4L2

Dr. J. R. Vallentyne  
Senior Scientist  
Fisheries and Marine Service  
Ontario Region  
Canada Centre for Inland Waters  
P.O. Box 5050  
Burlington, Ontario L7R 4A6

Dr. James H. Day  
Division of Allergy  
Kingston General Hospital  
Kingston, Ontario K7L 2V7

Dr. G. H. Tomlinson, II  
Senior Research Advisor  
Domtar Limited  
P.O. Box 7210  
Montreal, Quebec H3C 3M1

Dr. J. H. Leach  
Research Scientist  
Lake Erie Fisheries Research Station  
Fish & Wildlife Research Branch  
Ministry of Natural Resources  
R.R. 1  
Wheatley, Ontario NOP 2P0



Secretariat Responsibilities

Dr. W. R. Drynan  
Senior Engineer  
Great Lakes Regional Office  
International Joint Commission  
100 Ouellette Avenue, 8th Floor  
Windsor, Ontario N9A 6T3