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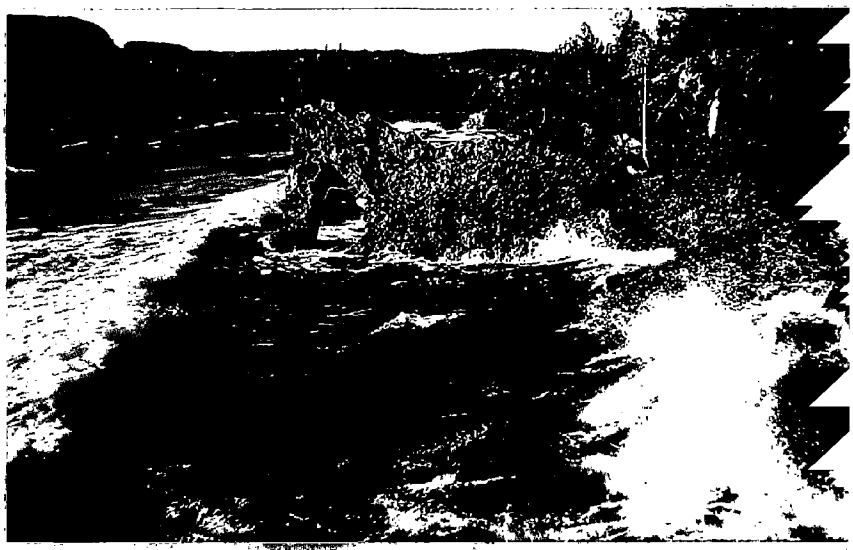
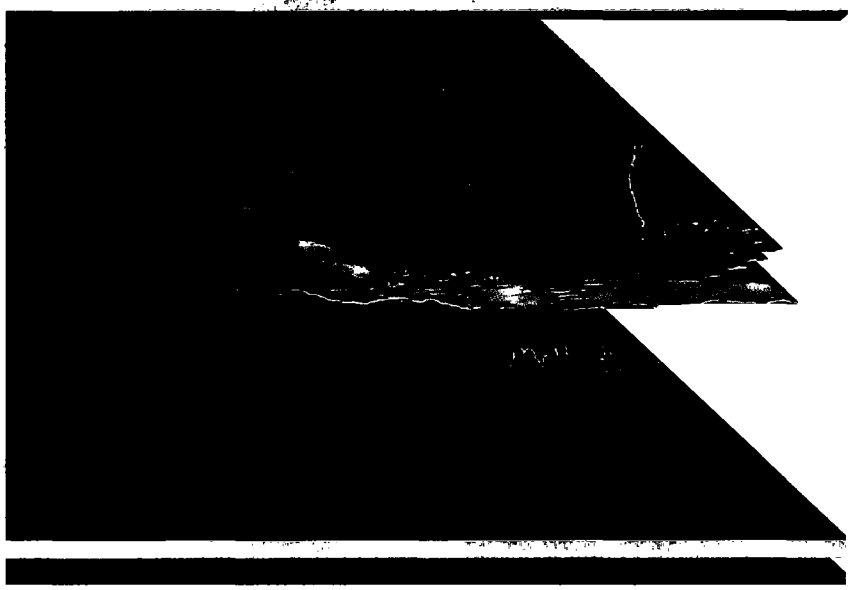
70 YEARS

OF ACCOMPLISHMENT





REPORT

INTERNATIONAL JOINT COMMISSION

Great Lakes. International Joint Commission

AUTHENTICATED
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INFORMATION
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15648

70 YEARS
OF ACCOMPLISHMENT

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GREAT LAKES INTERNATIONAL JOINT COMMISSION

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Report For Years 1978-1979

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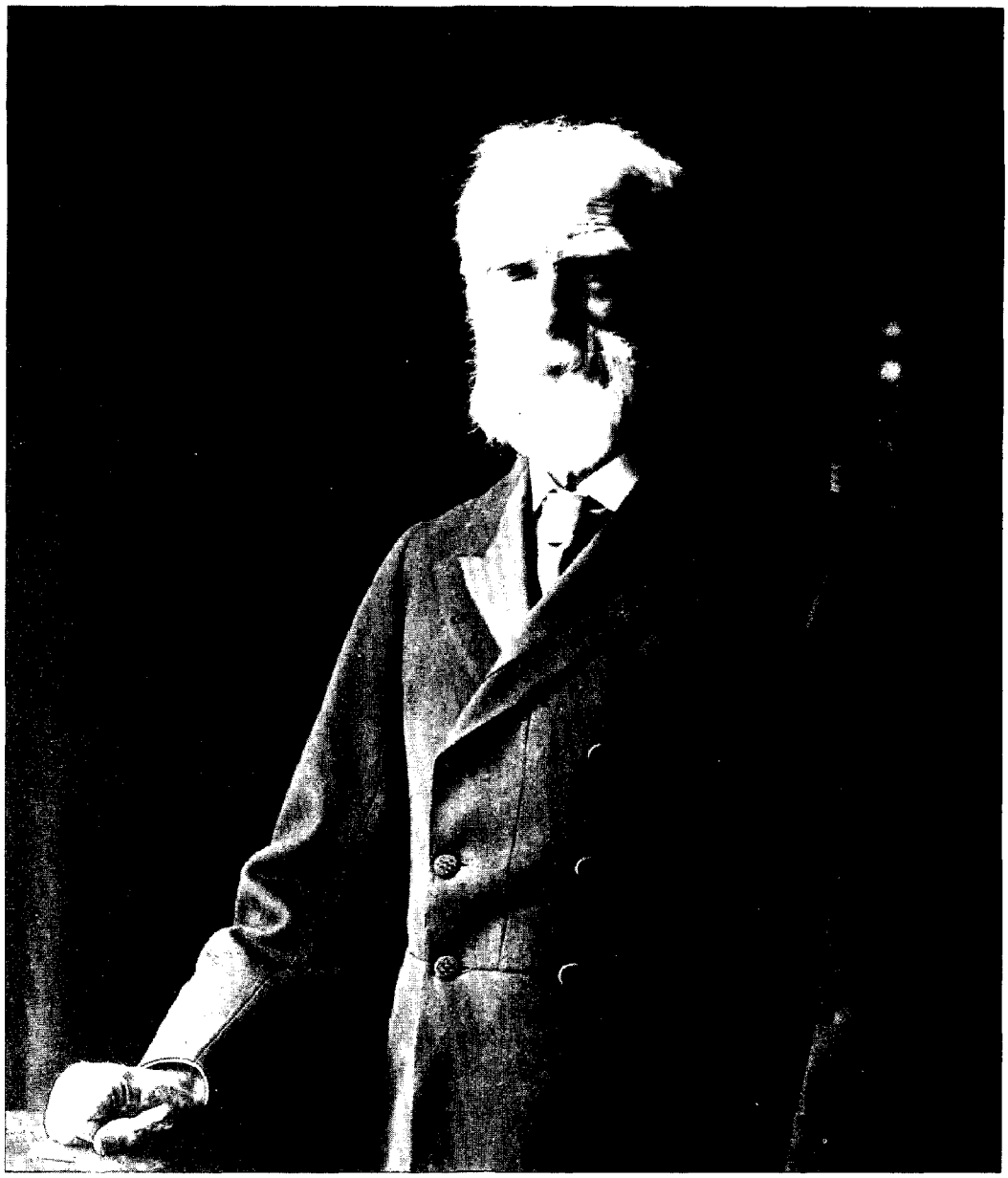
The Founders

This report is dedicated to those pioneers in international relations who conceived the concept and brought into being the Boundary Waters Treaty of 1909.[1]



James Bryce, Ambassador in Washington for Great Britain.

[1] Treaty between the United States and Great Britain relating to boundary waters, and questions arising between the United States and Canada.

The Treaty is unique in relations between two independent states. The drafters of the treaty developed an organization to solve problems between two countries through the unitary deliberations of a permanent body composed equally of Canadians and Americans, rather than the usual bilateral negotiations.

The institution, the International Joint Commission, has operated since 1912 in this spirit of trust and cooperation. The Commission's positive record in resolving trans-boundary disputes paved the way for the signing of another significant agreement by the United States and Canada 61 years later, the Great Lakes Water Quality Agreement of 1972.

Elihu Root, United States Secretary of State.

Pierre Elliott Trudeau, Prime Minister of Canada and Jimmy Carter, President of the United States.

International Joint Commission

The International Joint Commission is composed of six members, three from the United States and three from Canada. The United States members are appointed by the President with the advice and consent of the U.S. Senate. The Canadian members are appointed by the Governor in Council of Canada. The Commission is directed by U.S. and Canadian co-chairmen who serve in their positions on a full-time basis while the other Commissioners serve part-time.

The Commissioners conduct their business as a single body, not as separate national delegations representing their respective governments, but effectively seeking common impartial solutions in the mutual interest of both countries.

IJC

International Joi

One of the earliest References referred to the International Joint Commission was an investigation of the water quality of the Great Lakes.

When reporting to governments, the Commission takes into account the report of its board along with the information gathered at public hearings and any other information it is able to compile on the subject.

The Commission has three principal functions:

— **Regulatory** — Approves or disapproves APPLICATIONS from government, companies or individuals for obstructions, uses or diversions of water which affect the natural level or flow of boundary water on the other side of the international boundary or raise the level of transboundary rivers at the boundary.

— **Investigative** — Investigates questions or matters of difference along the common frontier. These investigations and studies which are referred to the Commission by the two Governments are called REFERENCES. In such cases the Commission reports the facts and circumstances to the Governments of Canada and the United States and recommends appropriate action by them. The Governments decide whether or not the Commission's recommendations will be accepted or acted upon.

— **Surveillance/Coordination** — Monitors compliance with the terms and conditions set forth in Orders of Approval it has issued. When requested by the two governments, the IJC monitors and coordinates actions or programs that result from governmental acceptance of recommendations made by the Commission.

(A fourth function has never been utilized. It permits the Governments to refer any issues to the Commission for binding decision rather than only for a report and recommendations.)

The technical studies and field work required by the Commission to carry out these functions is performed by 28 bi-national advisory boards appointed by the Commission. These boards include engineers, scientists and other experts, most of them public servants whose services are supported by their agencies.

nt Commission

Annual surveillance programs are performed on Lake Ontario because its position at the downstream end of the Great Lakes system makes it more susceptible to eutrophication and contamination.

Board reports are released to the public and the Commission holds public hearings to collect comments on the Board's findings and recommendations. The 1909 Treaty requires that all parties interested in a matter before the Commission "shall be given convenient opportunity to be heard" and, to that end, the Commission initiated early in its history, public hearing procedures to obtain input to Commission decisions. When reporting to governments, the Commission takes into account the report of its board along with the information gathered at public hearings and any other information it is able to compile on the subject.

The Commission is continuing to consider how best to obtain public input and has conducted public workshops and seminars and will continue to make its activities more open to the public.

The IJC has separate headquarters in Ottawa and Washington, each staffed with a small group of advisors and a secretary for each section. A permanent binational staff is located in Windsor, Ontario to assist the Commission in its responsibilities under the Great Lakes Water Quality Agreement.

The Great Lakes Water Quality Agreement is an example of the Governments formally conferring additional responsibilities on the Commission by requesting the Commission to monitor the implementation of the Agreement and to advise Governments on the adequacy of programs specified in it. The Agreement also provides for the establishment of two international boards, the Great Lakes Water Quality Board and the Science Advisory Board, to assist and advise the Commission.

The Great Lakes Water Quality Agreement is an example of the Governments formally conferring additional responsibilities on the Commission by requesting the Commission to monitor the implementation of the Agreement and to advise Governments on the adequacy of programs specified in it.

The Commissior

COMMISSIONERS

UNITED STATES

Robert J. Sugarman
Chairman,
United States Section

Charles R. Ross, Commissioner,
Lawyer/Farmer,
Hinesburg, Vermont

Jean L. Hennessey, Commissioner
Hanover, New Hampshire

CANADA

Stuart M. Hodgson
Chairman, Canadian Section

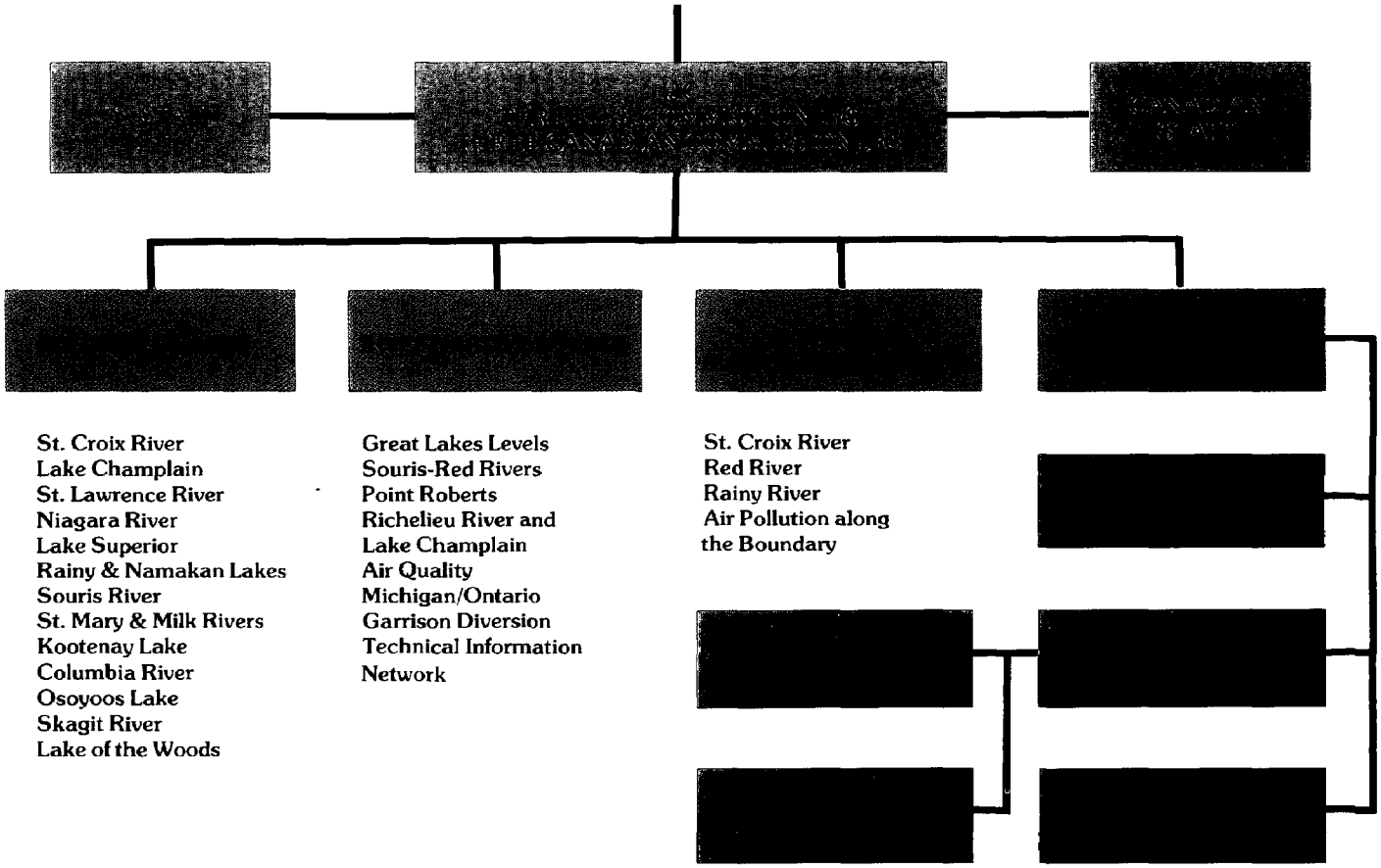
Bernard Beaupré, Commissioner,
Public Health Engineer
Richelieu, Québec

Jean R. Roy, Commissioner,
Businessman,
Timmins, Ontario

* The six Commissioners in office as of December 31, 1979 were responsible for this report.

and Its Boards

IJC Organizational Arrangement and Boards



70 Years of Acco

First meeting of the International Joint Commission in 1912.

The genesis of the Boundary Waters Treaty and the International Joint Commission is generally attributed to resolutions introduced by the Canadian delegate to the International Irrigation Congresses held at Denver, Colorado and Albuquerque, New Mexico in 1894 and 1895. The resolutions, adopted unanimously by the United States, Mexican and Canadian delegations on both occasions, recommended to the United States "the appointment of an international commission to act in conjunction with the authorities of Mexico and Canada in adjudicating the conflicting rights which have arisen, or may hereafter arise, on streams of an international character."

As a result, an International Waterways Commission was formed in 1903, between Canada and the United States. This commission functioned officially from 1905 to 1913 although some of its work continued until 1919. In 1906 and 1907 the commission made a series of recommendations to the Canadian and United States governments calling for negotiations to be undertaken to adopt principles of law governing uses of all international waters between Canada and the United States; the recommendations also called for creation of an international body endowed with authority to study and regulate the use of these waters.

Two lawyers, George Gibbons from London, Ontario and George Clinton, from Buffalo, New York, both members of the Waterways Commission, were instructed to informally negotiate formation of a special commission. In August, 1907 they completed a draft treaty, having decided that a treaty was the best way in which to proceed.

After much drafting and a great deal of negotiating, the Boundary Waters Treaty was signed January 11, 1909 by the United States secretary of State Elihu Root and Britain's Ambassador in Washington James Bryce, on behalf of their governments.

"We have undertaken in this Treaty, with the consent of Great Britain, to create a commission which will enable Canada and ourselves to settle our own affairs to a very great degree without going through the long and serious circumlocution," said Root when supporting the Treaty before the Senate's Foreign Relations Committee.

Both countries appointed Commissioners in late 1911 and the first meeting was held January 10, 1912 at Washington, D.C.

mplishment

The bulk of Commission activities in recent years has been concerned with the use of the great common water resources shared by Canada and the United States.

Seventy years later the Treaty remains a unique document and a tribute to the Governments of two countries who displayed a willingness to cast aside parochial jealousies and give to an international body such unheard of, at that time, responsibilities and authority.

The conviction of those who negotiated the Boundary Waters Treaty between Canada and the United States was that solutions to boundary problems should be sought, not in the normal bilateral negotiations of diplomacy, but in the deliberations of a permanent institution composed equally of Canadians and Americans. The Treaty sanctioned this principle and so was born the International Joint Commission.

The search for the common interest as a basis for settlement has marked the activities of the Commission over 70 years. Not only the proceedings of the IJC but also those of the joint technical boards created by the Commission to assist its investigations are based upon this principle of mutual cooperation for the common good.

The Treaty provides that the Commission is to act as a unit in all matters coming before it. Decisions are made by a majority of the Commissioners, irrespective of their nationality. Though allowance was made in the Treaty for separate reports to each Government, the authors of the Treaty believed — and the governments intended — that resort to this provision would be infrequent and that the Commission would normally be able to function in unison to achieve equitable solutions in the common interest of both countries.

Over the years there has been striking evidence of the Commission's attachment to this basic philosophy of impartiality. In only three of more than 100 cases with which the Commission has dealt have the Commissioners divided on national lines or failed to reach agreement. Dealing as they do, with more than 5,000 miles of boundary, this is truly a remarkable record.

The Treaty provides that the Commission is to act as a unit in all matters coming before it.

Problems have touched closely on the lives of a few citizens living in remote areas to many millions of citizens living on both sides of the boundary in the industrial heartland of the Great Lakes area.

Predictions were made at the time the Treaty was signed that this unique approach to international problems would prove to be a short-lived experiment. However, events have vindicated the faith of those who wrote the Boundary Waters Treaty and created the International Joint Commission. The philosophy which continues to guide IJC Commissioners today was well expressed by an early U.S. Chairman, James A. Tawney, when speaking not only of the Commission but also of the many boards which assist it with its technical work, who said, "We are neither Canadians nor Americans but we are each and all representatives of all the people on both sides."

President John F. Kennedy also spoke of the unique relationship shared by Canada and the United States, as manifested in the IJC, when he told members of the two Houses of Parliament in 1961, "Geography has made us neighbours. History has made us friends. Economics has made us partners. And necessity has made us allies . . . Ours is a unity of equal and independent nations, co-tenants of the same continent, heirs of the same legacy, and fully sovereign associates in the same historic endeavour."

Throughout its history, the International Joint Commission has endeavored to carry out its responsibilities to reflect this spirit of cooperation between sovereign nations. The problems have been and are complex and difficult at times but the history of the Commission shows that the principles upon which the IJC is based are still sound and workable.

Commission activities have touched on problems of air pollution and because of the growing awareness of the interrelationships between air and water pollution, this aspect of its work may well increase in importance in the years ahead. However, the bulk of Commission activities has been concerned with the use of the great common water resources shared by Canada and the United States, from the Atlantic to the Pacific.

IJC "business" has involved boundary area questions of domestic and sanitary water supply, navigation, power development, irrigation and pollution. It has varied in nature and extent from the extraction of maximum benefit from small prairie streams to multi-million dollar developments in our great rivers.

Problems have touched closely on the lives of a few citizens living in remote areas to many millions of citizens living on both sides of the boundary in the industrial heartland of the Great Lakes area.

Article IV of the Boundary Waters Treaty prohibits the pollution of boundary and transboundary waters on either side of the border "to the injury of health or property on the other side." Under this provision, the International Joint Commission has been increasingly drawn into the battle against water pollution.

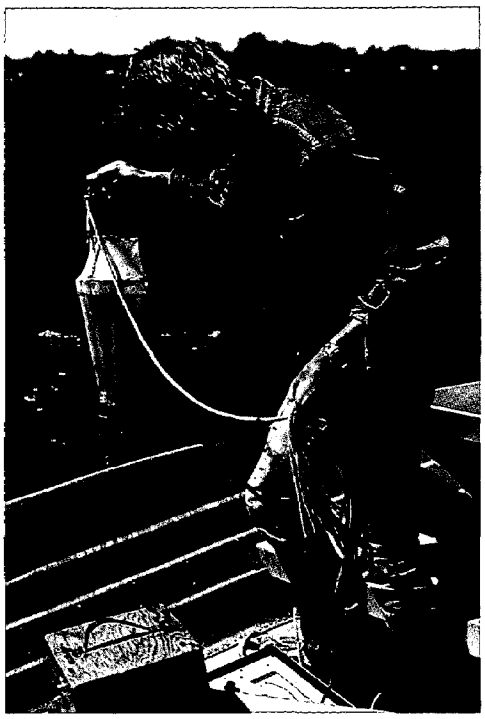
The Commission was first engaged in a study of water pollution as early as 1912 and in 1918 the Commission found the situation in parts of the Great Lakes "generally chaotic, everywhere perilous and in some cases disgraceful". But even such forceful language failed to produce any positive results and the Commission's warnings of things to come were ignored.

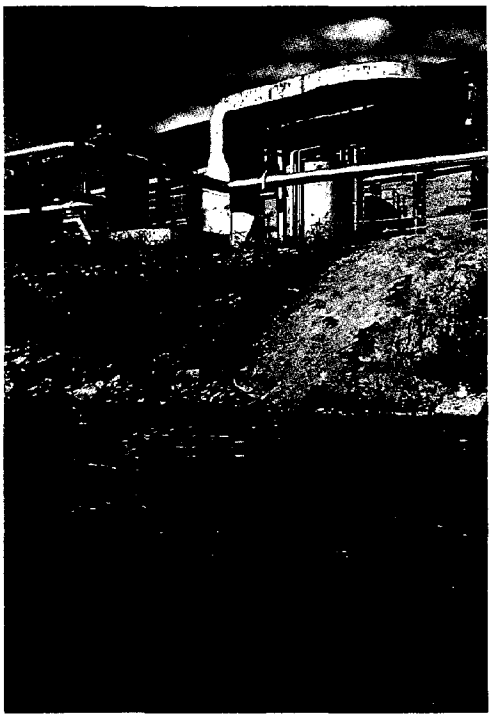
The Governments took up the problem again after the Second World War. There were several References and investigations on aspects of pollution involving principally the "connecting channels" of the Great Lakes, the St. Croix River, the Rainy River-Lake of the Woods area, the Red River (of the North) and the Great Lakes themselves.

In most cases where the IJC has completed its investigations and submitted recommendations to governments, the results have been constructive and the situation has been improved. Local authorities have in several instances accepted the Commission's objectives for water quality and taken action accordingly. Unfortunately, in some cases, progress has been disappointingly slow.

One of the major achievements of the Commission during its first 70 years was the work carried out which led to the signing in 1972 and again in 1978 of the Great Lakes Water Quality Agreement.

In 1964 the Governments of Canada and the United States asked the International Joint Commission to study pollution problems in the lower Great Lakes and the International Section of the St. Lawrence River, and to recommend measures to restore and protect the quality of these waters. The Great Lakes Water Quality Agreement was based on the Commission's findings and recommendations, reported in 1970.





Constant monitoring of water quality is required to determine the effectiveness of water quality control programs.

◀ *Industry has a vital role to play in efforts to restore and protect Great Lakes water quality.*

The Agreement gave the International Joint Commission a number of specific responsibilities and functions for overseeing government and industry action in the implementation of the accord and to assist the two countries in their efforts to restore and protect Great Lakes water quality. These responsibilities were renewed and expanded when a new Agreement was signed in 1978.

Activities of the Commission concerned with the Great Lakes Water Quality Agreement now make up a very important part of the ongoing agenda of the Commission.

Over the past decade, the growing public interest in the environment has been reflected in the work of the Commission. More and more, the Commission has been called upon to study and report on ways and means of protecting the natural environment shared by Canada and the United States.

More and more, environmental considerations have touched upon the work of the Commission, not only when considering such things as water quality but also when considering applications for construction which will affect levels and flows.

The world has grown more complex since the Boundary Waters Treaty was signed in 1909 and this complexity has been reflected in the problems handled by the International Joint Commission. The basic philosophy of working in the common interest, espoused by the creators of the Boundary Waters Treaty, continues to guide the Commission as it enters the 80s.

I.J.C. in 1978 - 19

When schedules permit, Commissioners make themselves familiar with the areas of Canada and the United States touched by IJC activities.

The years 1978-1979 were ones of change for the International Joint Commission. Two Canadian and three American Commissioners left the Commission in this period.

The term of Canadian Commissioner Keith Henry expired in September, 1978 and he was replaced by Jean R. Roy in March, 1979. Mr. Roy was a Member of Parliament for 11 years. The term of Maxwell Cohen, who served as Chairman of the Canadian section since January, 1974 expired in mid-April 1979 and he was replaced by Stuart M. Hodgson. Mr. Hodgson, former Commissioner of the Northwest Territories, became Chairman of the Canadian section on April 15.

Robert J. Sugarman became United States section chairman on April 26, 1978 following the resignation of Henry P. Smith III. Mr. Sugarman is a lawyer who has specialized in environmental and land use law. Kenneth Curtis replaced Victor L. Smith as U.S. Commissioner in May, 1978. Mr. Curtis, a lawyer and former governor of Maine, was named United States Ambassador to Canada in September, 1979. Mrs. Jean L. Hennessey replaced Mr. Curtis on the Commission on September 5, 1979. Mrs. Hennessey is the former Director, New Hampshire Council of Management and Budget in the office of the governor.

Travel and meetings continued to demand a great deal of the Commission's time. In 1978 the Commissioners devoted about 110 travel days to executive meetings, public hearings and various other meetings necessary to carry out their duties. About 125 days were required for similar purposes in 1979.

When schedules permit, Commissioners make themselves familiar with the areas of Canada and the United States touched by IJC activities. They are usually accompanied by IJC Board members with responsibilities in the area, and other qualified experts. The Commissioners carried out two field trips in 1978, one to inspect engineering and pollution control projects in the St. Croix River basin in Maine and New Brunswick, and another to the state of Washington and province of British Columbia to inspect Zosel Dam on the Okanagan River, for regulation and safety at the dam.

The St. Croix River is of particular interest to the Commission since the IJC in late 1977 reported to the Governments of Canada and the United States that the water quality of this river which flows through Maine and New Brunswick is now capable of supporting a rehabilitated anadromous (e.g. salmon) fishery.

Zosel Dam controls the levels of Osoyoos Lake which straddles the border of British Columbia and the state of Washington. The dam, operated pursuant to an IJC Order of Approval, has deteriorated in recent years, making corrective repairs necessary. Canadian Chairman Hodgson also inspected this facility after joining the Commission in 1979.

Another such trip in 1979 saw co-chairmen Hodgson and Sugarman, along with Commissioners Beaupré and Roy inspect the Rainy-Namakan chain of lakes in northern Minnesota and northwestern Ontario where the Commission has both water quality and water levels and flows responsibilities.

Levels and flows, in particular, present special problems in this region between Thunder Bay and Winnipeg. The Commission and its regulation board must operate with severe limitations imposed by relatively old control structures (built prior to 1910) which limit the degree to which water levels and flows can be regulated. The desires of various interest groups are often in conflict when considering water levels and these conflicts are exacerbated by extreme conditions of wet and dry weather. On-site inspection trips enable Commissioners to gain a better insight into problems faced by Boards and citizens alike and such visits also enable Commissioners to talk with those people directly concerned with such problems on a day-to-day basis.

During 1979 both Commission chairmen endeavoured to visit as many government leaders as possible in provinces and states along the Canada-United States boundary. As Commission activities affect these states and provinces it is imperative that mutual understanding and cooperation be fostered wherever and whenever possible.

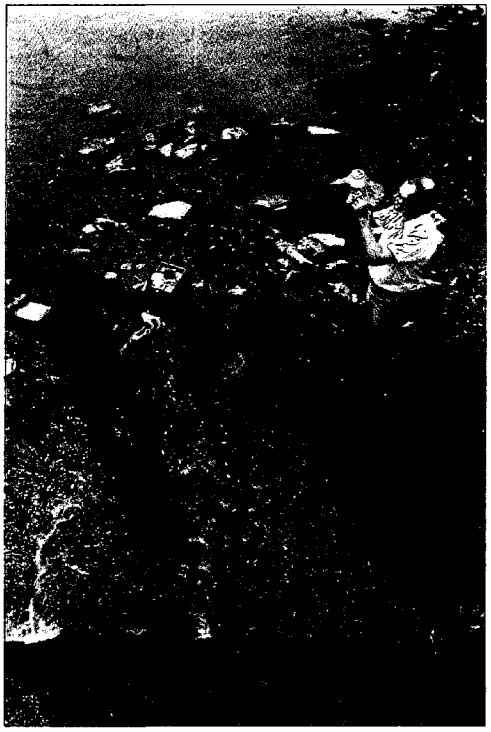
Other major projects included approval in 1978 of the redevelopment of Great Lakes Power Corporation's hydroelectric generating plant at Sault Ste. Marie, Ontario, and a supplementary Order of Approval in 1979 for the regulation of Lake Superior outflows and consequently a new plan of regulation for Lake Superior. This new plan of regulation is based upon systemic regulation under which the protection of both upstream and downstream power, riparian, navigational and environmental interests is provided. A study of Great Lakes diversions and consumptive uses, and a study of the feasibility of regulating the levels in Lake Erie continued pursuant to References from the Governments of Canada and the United States which had been received in 1977.

The signing of a new Great Lakes Water Quality Agreement by Canada and the United States in November, 1978 created new duties and responsibilities for the Commission. The new Agreement provides for review of various provisions in the Agreement within specified time frames. This necessitated several meetings to deal with this aspect alone. Chief of these was a two-day meeting of the Commissioners and selected staff members in Virginia, in April, 1979. Commissioners reviewed the Agreement, received briefings on selected items and delegated a variety of tasks to be shared by Commissioners and staff in meeting the obligations of the Agreement.

The International Joint Commission continues its efforts to inform the public about its activities affecting citizens in Canada and the United States. The Commission has a long history of citizen involvement through its public hearings process but is aware that in today's complex society additional efforts are required.

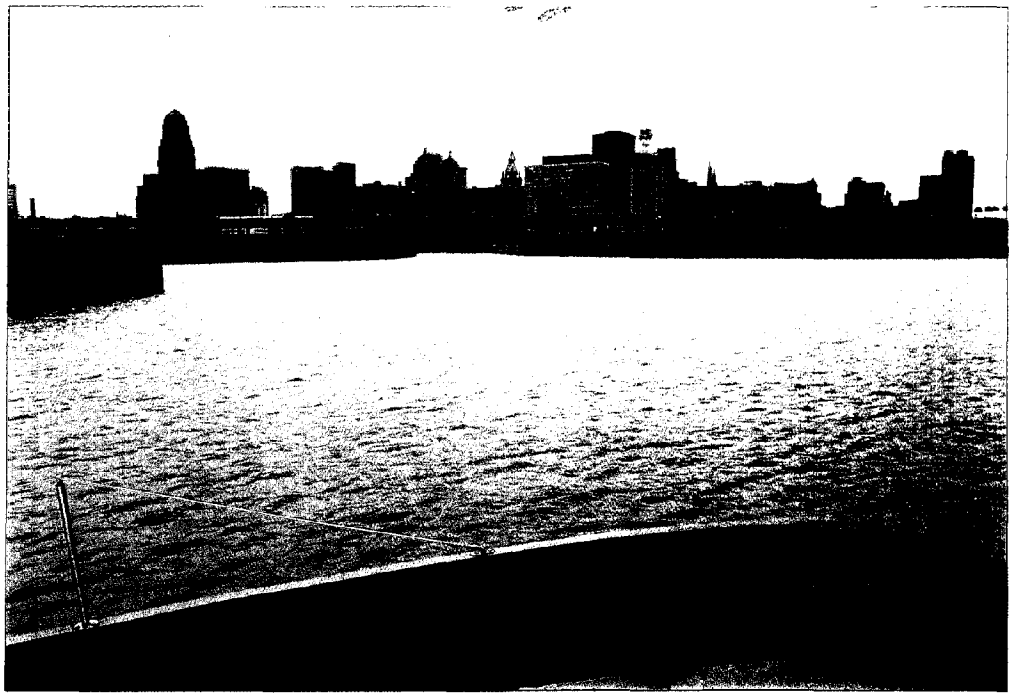
The Commission is committed to informing the citizens of Canada and the United States about its activities so that the public may more actively participate in the numerous decisions which affect the people of both countries. Exhibits have become a part of the public affairs effort and displays were used during 1979 to inform and educate the public about IJC activities.

A new exhibit telling the International Joint Commission story was displayed for the first time in 1979 at the annual meeting of the Canadian Water Resources Association meeting in Ottawa. It was also used at the annual meeting of the Commission with the Water Quality Agreement institutions in Detroit and was part of the Our Canada exhibit viewed by about 3,000,000 visitors at the Canadian National Exhibition in Toronto, Ontario. Following the CNE, it was mounted at the Ontario Science Centre for the last three-and-a-half months of 1979.



In a world grown more complex since the signing of the Boundary Waters Treaty in 1909, constant vigilance is necessary to protect the waters shared by the United States and Canada.

Travel and meetings in such border locations as Buffalo, N.Y. continue to demand a great deal of the Commission's time.

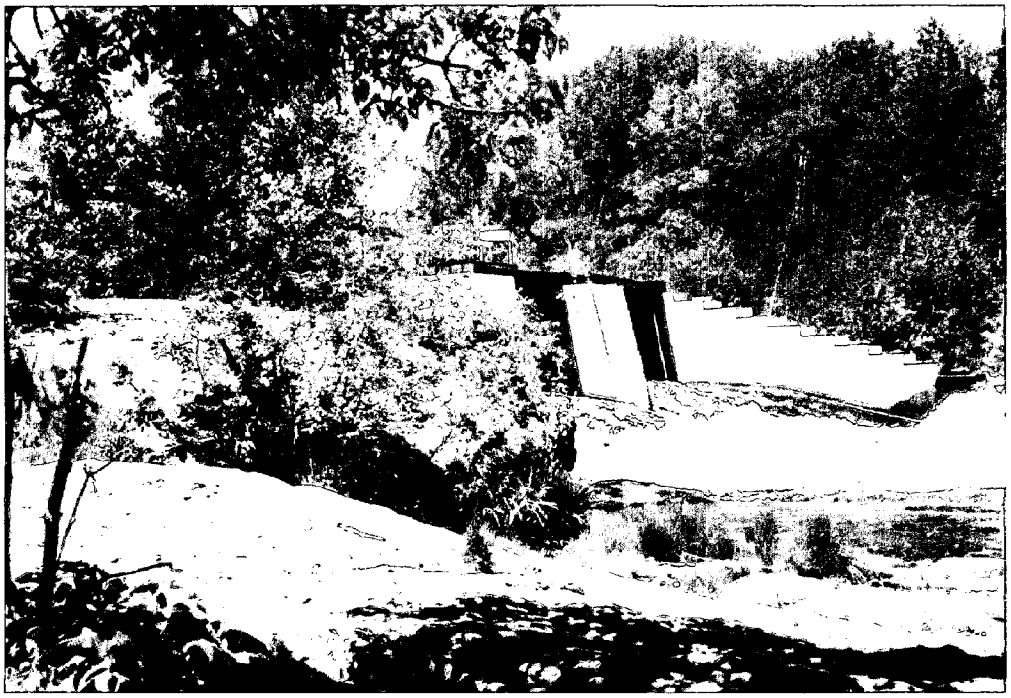


The Commission is committed to informing the citizens of Canada and the United States about its activities so that the public may more actively participate in the numerous decisions which affect the people of both countries.

The Commission also played a part in a Year-of-the-Child project involving Canadian and United States students. The students, from Lisgar Collegiate in Ottawa, Ontario and Canton Central School in Canton, New York joined together to conduct a "mini IJC" in Ottawa and Canton. The Commission provided resource assistant in the form of literature and personnel.

In June 1979, at the special invitation of the Trans-Frontier Pollution Study Group of the Organization for Economic Cooperation and Development, (OECD), Chairman Sugarman and Commissioner Beaupré, accompanied by the Canadian Secretary, David Chance, attended a special meeting of the Group in Paris. Commissioner Beaupré addressed the Group on public participation in trans-frontier pollution problems, with Chairman Sugarman commenting on certain aspects of Mr. Beaupré's paper. The participation by the Commission was well received by the Group. Chairman Sugarman and Commissioner Beaupré also attended a European Interparliamentary Symposium on the Environment in Europe held in Geneva in October.

The year 1979 saw the formation of a new Great Lakes Levels Advisory Board to assist the Commission. Half the membership of this Board consists of members of the public with the other half coming from government agencies. The Commission also established the International Great Lakes Technical Information Network Board to examine into and advise the Commission on water levels and flows data needs and collection in the Basin. Establishment of these Boards was authorized by the Governments of Canada and the United States after the Commission suggested the need for such panels in its 1976 report on Further Regulation of the Great Lakes.



The Kettle Falls dam was one of the sites inspected by Commissioners during a working tour of the Rainy-Namakan chain of lakes in 1979.

The Great Lakes Water Quality Agreement directs the Commission to carry out a public information service for the Agreement programs. In compliance with this responsibility, the Commission in 1979 undertook to expand its public information program for the Regional Office at Windsor, Ontario.

The Commission continues to strive to shorten the time required to complete reports to Governments. This has been a matter of serious concern to the Commission. Many people and many agencies at various governmental levels are usually involved with studies and reports, in addition to the Commissioners and staff in the two sections. Sometimes, the seasons and the weather can play a role in delaying reports, since certain environmental data can only be gathered in a specific season under a specific weather condition. IJC rules of procedure call for the holding of public hearings before reports are written to governments; adequate time must be given to the public and every effort is made to encourage active participation in hearings. Even such things as farm harvests can tend to delay holding of public hearings and the reports that follow.

As the 70s drew to a close the Commission was devoting an all-out effort to complete reports on difficult issues which had demanded a great deal of its time throughout 1978-79. At the same time, procedures were being modified and streamlined to enable the Commission to better meet its responsibilities in the 80s.

Many people and many agencies at various governmental levels are usually involved with studies and reports, in addition to the Commissioners and staff in the two sections.

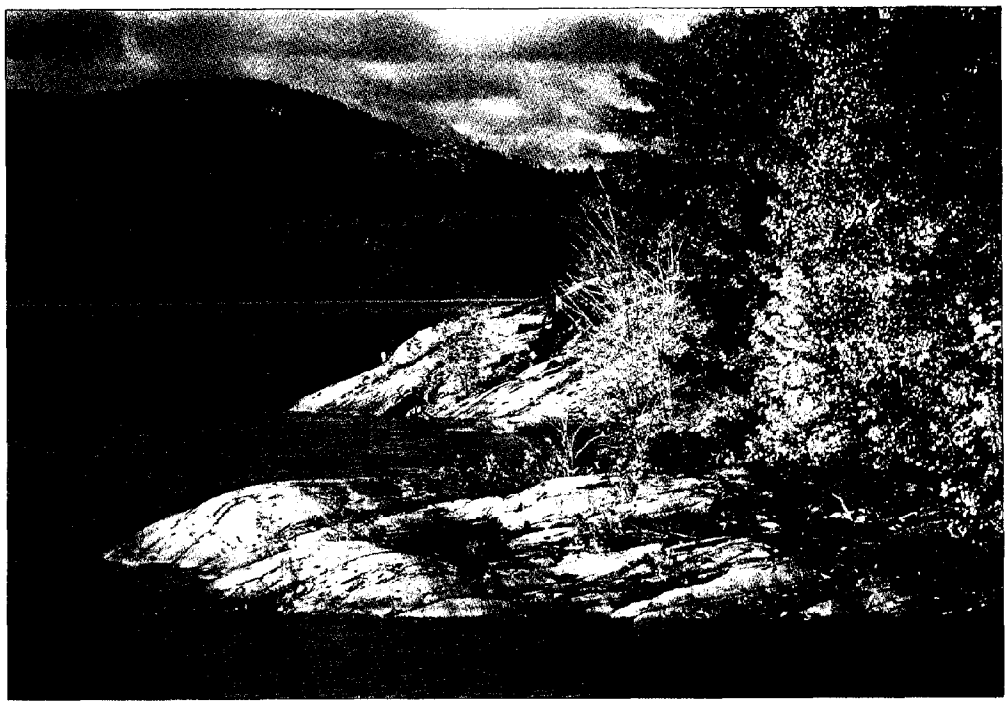
Protection of water quality in the boundary and transboundary waters has been a major concern of the Commission since its founding.

Water Quality

1

Water Quality

The Commission is striving through an expanded public information program to inform the public about the value of the water resources shared by Canada and the United States.



Today, the Commission is working to evolve recommendations for the control of toxic substances as they affect water quality, while simultaneously seeking to learn the extent of the impact of both chemical discharges and acid rain.

Protection of water quality in the boundary and transboundary waters has been a major concern of the Commission since its founding. Although the Treaty assigned the Commission no role in enforcing the provision of Article IV regarding transboundary water pollution, the United States and Canada immediately requested the Commission in a Reference in 1912 to identify the extent and source of pollution of the Detroit and Niagara Rivers and to make recommendations for improvements in affected waters. Over the years, as the Commission has submitted its reports on various investigations, the Governments increasingly made mutual commitments and have employed the Commission to monitor progress and problems and to make recommendations for improving programs.

Today, the Commission has 5 active water quality references. In examining and reporting on these and previous References the Commission has had to become familiar with many esoteric pollutants unheard of seventy years ago, and to keep abreast of the evolving awareness and scientific knowledge of harmful pollutants, and to make recommendations for their control or elimination. Such major problems as acid rain and toxics are the most recent and dramatic examples. Today, the Commission is working to evolve recommendations for the control of toxic substances as they affect water quality, while simultaneously seeking to learn the extent of the impact of both chemical discharges and acid rain. These matters are both being accorded urgent attention by the Commission and its appropriate Boards.

Great Lakes

GREAT LAKES WATER QUALITY BOARD

Canadian Chairman
Dr. R.W. Slater
Environment Canada

U.S. Chairman
Mr. John C. McGuire
Environmental Protection Agency

SCIENCE ADVISORY BOARD

U.S. Chairman
Dr. Donald I. Mount
Environmental Protection Agency

Canadian Chairman
Dr. G.K. Rodgers
Environment Canada

A new Water Quality Agreement for the Great Lakes, signed November 22, 1978 called for increased efforts and tougher goals for the clean-up of the Great Lakes. The 1978 Agreement replaced the 1972 Great Lakes Water Quality Agreement which had been entered into following the Commission's earlier study of the Lower Lakes.

Under the new Agreement, as in the old one, the IJC is responsible for analyzing and disseminating information on water quality and the effectiveness of government pollution control programs, advising the Governments of the United States and Canada on Great Lakes water quality problems and making recommendations.

Recommendations for measures required to meet the water quality objectives of the Agreement are developed by two advisory boards to the Commission. The boards, established by the Agreement, are the Great Lakes Water Quality Board and the Great Lakes Science Advisory Board (formerly the Research Advisory Board).

The Water Quality Board has 18 members with nine from each country. The 18-member Science Advisory Board, with eight from each country plus ex-officio members from the International Association for the Great Lakes Research and the Great Lakes Fishery Commission, is primarily responsible for evaluating the water quality research activities in the Great

The new Great Lakes Water Quality Agreement signed in 1978 calls for increased efforts and tougher goals for clean-up of the Great Lakes.

Industrial waste sites must be closely monitored if the waters of the Great Lakes are to be protected from hazardous materials.

Progress has been made on reducing eutrophication although eutrophication of Lakes Erie and Ontario and Saginaw Bay in Lake Huron remains a major problem.

Lakes, recommending additional research for achieving the Agreement's water quality goals and advising on all scientific matters.

The Commission reported in 1978 that progress has been slow in cleaning up the lower Great Lakes since 1972, although public surveys show that those who use the Great Lakes see overall improvements in water quality.

Major problems identified by the IJC which must be dealt with to achieve goals of the Agreement include the presence of persistent toxic substances, concentrations of phosphorus and heavy metals and the disposal of hazardous industrial wastes.

The Commission restated its concern about the critical problem of toxic substances which remains to be solved. The full scope of the threat to human health and the environment has yet to be defined and effective controls are needed promptly.

Studies reported during 1978 show that the problem of toxic substances is larger and more complex than previously realized. The Commission's Science Advisory Board completed an inventory of known chemicals being manufactured, used or imported into the United States portion of the Great Lakes Basin. The Commission recommended that legislation be enacted to require industry to provide appropriate information so that a similar inventory can be developed for Canada. In addition, Governments should develop an accurate inventory of chemical dumps and toxic waste disposal sites so that adequate control programs can be implemented.

Remedial programs have begun to show limited results in the reduction of levels of PCBs, DDT, DDE, mercury and Mirex in some parts of the Lakes. Significant decreases reported included levels of DDT in eastern Lake Michigan, mercury levels in western Lake Erie and levels of PCBs, DDE and Mirex in Lake Ontario. The Commission is aware, however, that these improvements have not yet reached substantial proportions nor are they basin wide. Furthermore, the Water Quality Board reported to the Commission that a number of additional compounds have been identified in the Lakes as potential problems.

Measurements of water quality to assess compliance with the objectives of the Agreement show that there are 48 problem areas — most located near highly populated areas — where water quality continues to be degraded by industrial, municipal and non-point sources. Although progress was noted in the control of industrial sources of pollution, particularly in the U.S., 42 percent of the industries reported in the U.S. and 59 percent reported in Canada failed to meet their pollution control requirements.

Progress has been made on reducing eutrophication although eutrophication of Lakes Erie and Ontario and Saginaw Bay in Lake Huron remains a major problem. Significant decreases in phosphorus concentrations and reductions in algae growth were found in nearshore locations of western Lake Erie and Lakes Ontario and Michigan.

Phosphorus pollution continues at unacceptable levels in Lakes Erie and Ontario and local areas of the Upper Lakes, despite extensive construction of municipal sewage treatment facilities, particularly in Canada. In Canada, in 1978, 78 percent of the municipalities met their negotiated loading requirement while 41 percent of those in the United States met theirs. Further limitation of phosphorus in detergents and the implementation of sewage treatment methods, such as land application to drastically reduce phosphorus, have also been recommended for consideration by governments.

Some areas of the Lakes are showing a decline in total phosphorus concentrations, with Lake Ontario indicating a significant downward trend. This was matched with the knowledge that there are still numerous problem areas where water quality objectives or standards were exceeded and the battle to control pollution in the Great Lakes is far from over.

It is becoming apparent that water quality of the Great Lakes can not be improved significantly unless such factors as long-range transport of airborne pollutants and non-point land use sources are dealt with along with the more obvious point-source pollution problems. The Commission strongly recommends a comprehensive ecosystem approach to water quality management which considers the interaction of air, water, minerals and living organisms — including man — within the Great Lakes Basin.

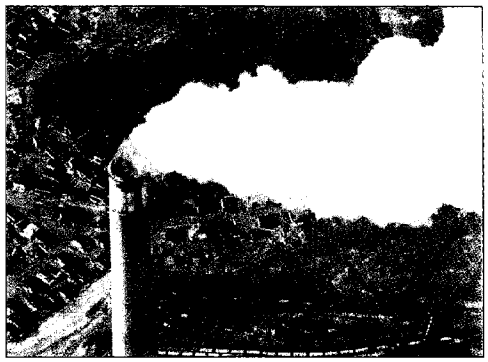
Pollution problems remain in the Great Lakes but certainly in 1979, the International Joint Commission did not have to report conditions "chaotic . . . perilous . . . and disgraceful" as it did in 1918 in its first report on those lakes.

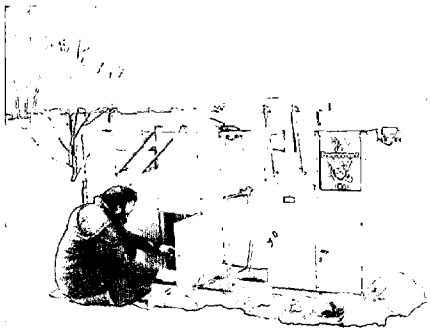
There was reason for some satisfaction when surveying the water quality of the Great Lakes at the end of 1979 but the satisfaction was balanced by the realization that the problems which remain are serious and will be difficult to overcome.

Similarly, evidence of improvement in the return of fish resources of the lakes was a cause for cautious optimism. Although such improvement was not reflected in markedly better water quality, the evidence of more stable and more productive fish populations now existing in parts of the Great Lakes than existed a decade ago gave a positive sense of general improvement.

An ecosystem approach which considers the interaction of air, water, minerals and living organisms, including man, is recommended by the Commission to protect the Great Lakes.

The transport of pollutants to the waterways through the air is a major problem in the fight to protect the water quality of the Great Lakes.





The study of acid rain is important to the Commission as its Science Advisory Board has warned that this problem may indirectly result in transboundary injury to health and property.

Perhaps the two biggest problems confronting the water quality of the Great Lakes as 1979 drew to a close were (1) those involving pollutants distributed by long-range air transport and (2) toxic and hazardous materials which find their way into the lakes.

The most dramatic evidence of the long-range transport problem is that of acid rain and this subject dominated the headlines during the Commission's meeting in Detroit with the Great Lakes Water Quality Board and the Science Advisory Board. Both Boards reported on this subject and the news was not good.

Parts of the Great Lakes Basin, including the Sudbury, Muskoka and Haliburton areas of Ontario and the Adirondacks of northern New York are now recognized as among some of the most heavily impacted areas in the world. These areas have already been subjected to precipitation which is more than twice as acidic as that which caused losses of major fish stocks from thousands of Scandinavian lakes and streams.

Since the Great Lakes are large in volume and relatively well buffered, acid rain in the open waters is not expected to be a problem. However, it is possible that the presence of acid rain in the Basin will create other pollution problems such as increased heavy metals in these lakes and this calls for further study and investigation. The Science Advisory Board has warned that acid rain may indirectly result in transboundary injury to health and property. The Commission is aware that the subject is receiving the attention of the Governments of Canada and the United States, and stands ready to assist in any way the Governments may decide.

The other major problem confronting the lakes, that of toxics and hazardous wastes, presents a serious hazard to human health and the environment. Many species of fish are already subject to bans or warnings regarding human consumption and there is a significant threat of further worsening for fishing and drinking. Many agencies in both countries are attempting to come to grips with the issue but these efforts have only recently begun to produce solid results. In the United States, biomonitoring is being instituted to verify short and long term toxic discharges; in Canada new legislation has been tabled for discussion. Every effort must be made in both countries to prevent hazardous chemicals from entering the waterways. Chemicals whose use implies environmental threats should be banned.

The disposal of hazardous wastes is a serious problem in the Great Lakes Basin. Both Canada and the United States are faced with the task of locating abandoned sites scattered throughout the Basin and implementing clean-up and control programs. In addition, new ways and means must be found to handle, store and dispose of hazardous wastes as they are generated and indeed, to prevent their production at the source. Resistance of citizens to locating sites for disposal in their communities is a major factor in the denial of site approval. It is apparent that safe, acceptable sites and methods of disposal and control must be found. Meanwhile, hazardous wastes continue to accumulate and present a growing menace to the water quality of the world's richest fresh-water supply.

Pollution From Land Use Activities

INTERNATIONAL REFERENCE GROUP ON LAND USE ACTIVITIES

Canadian Chairman
Dr. Murray G. Johnson
Environment Canada

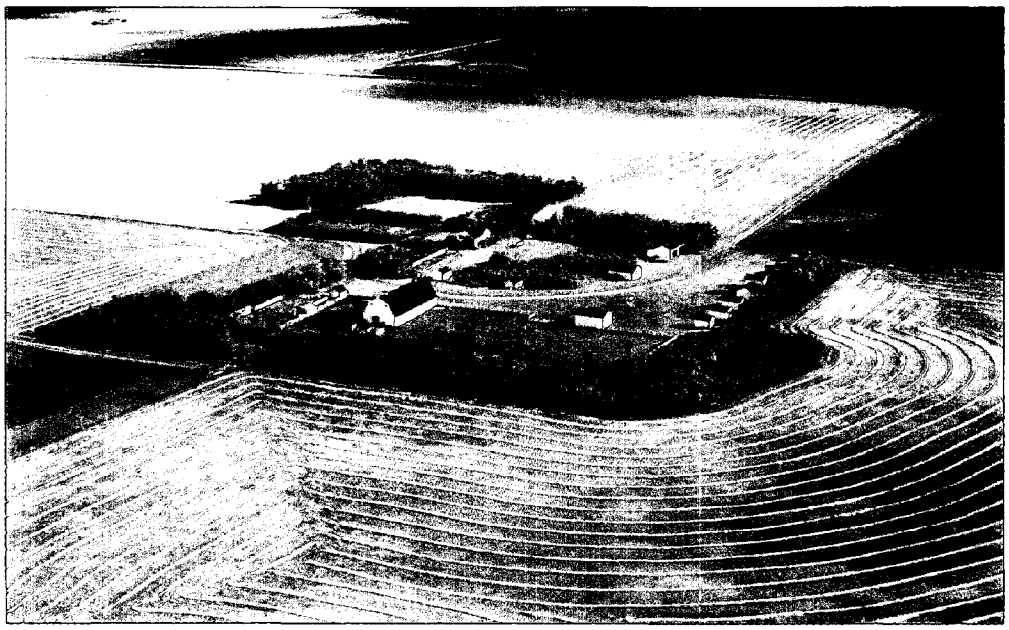
United States Chairman
Mr. Norman A. Berg
U.S. Dept. of Agriculture

The Commission in 1978 received the final report of its Pollution from Land Use Activities Reference Group (PLUARG). The report was the culmination of a five-year comprehensive study of non-point source pollution of the Great Lakes. Supplemental reports were submitted by the Reference Group in March and June 1979. The IJC report to Governments was scheduled for early 1980.

The PLUARG study began in late 1972 as a result of a Reference to the Commission appended to the Canada-United States Great Lakes Water Quality Agreement of the same year. The Reference requested the Commission to enquire into and report upon: whether the Great Lakes were being polluted by land drainage from various land use activities; if so, the extent, causes and locations of such pollution; and to recommend practicable remedial measures and to report on the costs.

PLUARG found that the Great Lakes are being polluted from non-point sources by phosphorus, sediments, some industrial organic compounds, some previously-used pesticides and potentially, some heavy metals. Atmospheric deposition was determined to be a significant source of pollution to the Great Lakes Basin ecosystem. PLUARG found that Lakes Erie and Ontario were most affected by non-point phosphorus and toxic substances pollution. Green Bay, Saginaw Bay, Southern Georgian Bay, Lake St. Clair, and the Bay of Quinte were identified as having local problems with phosphorus, sediment or micro-organism pollution.

Intensive agricultural activities were identified as the major non-point contributors of phosphorus. Such agricultural activities as the cultivation of row crops or the maintenance of feed lots on fine-textured soils were major non-point con-



The value of preserving prime agricultural lands in the Great Lakes ecosystem has been stressed by the Commission in a report to Governments.

Erosion of fine-textured soils from agricultural areas and construction activities in urban areas were identified as the main non-point sources of sediment.

tributors of phosphorus to the Great Lakes. Southwestern Ontario and northwestern Ohio were identified as important contributing areas. Overall it was found that soil type, land use intensity and materials usage were the most important land-related factors affecting the magnitude of non-point pollution in the Basin.

Erosion of fine-textured soils from agricultural areas and construction activities in urban areas were identified as the main non-point sources of sediment. Urban runoff and atmospheric deposition were the major non-point sources of toxic substances.

For the first time, citizen participants were given the opportunity to review a study report prior to submission to the Commission. Comments and suggestions made by 17 public panels were incorporated into the PLUARG report to the IJC.

Public hearings were held in 11 cities around the Basin during 1978 and many topics were of special interest to hearing participants. Suggestions relating to information/education recommendations were extensive. Frequently, those giving statements expressed willingness to assist in informing people of PLUARG's findings and in local implementation of recommendations, particularly those on phosphorus control and toxic substances.

The phosphorus target loadings recommended by PLUARG for the Upper Lakes differed from those presented in the 1978 Great Lakes Water Quality Agreement. In addition, the phosphorus load estimates for 1976 (the base year for determining the target loads) differed between PLUARG and the Water Quality Board. A Phosphorus Management Strategies Task Force, established to study the problem, is expected to resolve these differences. The findings of the Task Force will be considered by the Commission in preparing its report to Governments.

The Water Quality Board recommended that the Commission delay acting on phosphorus levels until the Task Force completed its work and the Board could comment to the Commission. The control of phosphorus inputs to the Lakes is regarded as critical to water quality improvement and the Commission wishes to provide Governments with the most accurate and up-to-date information possible.

The problem of pollution from non-point sources is a pressing one for Governments since the Water Quality Agreement commits the parties to consider recommendations based on the PLUARG study.

Water Quality of the Upper Great Lakes

UPPER LAKES REFERENCE GROUP

United States Chairman
Mr. Christopher M. Timm
Environmental Protection Agency

Canadian Chairman
Dr. G.K. Rodgers
Environment Canada

Controls on growth and development and on phosphorus and toxic substances around Lakes Superior and Huron are required to protect the excellent water quality of these lakes, the Commission reported to the Governments of Canada and the United States in May, 1979.

Proponents of development should be required to assure Governments, before they are given approval to proceed with such development, that water quality degradation will not occur. The "news" contained in this 1979 report on the water quality of the upper lakes was certainly brighter and more encouraging than reports the Commission made in years gone by about the lower lakes. Notwithstanding some instances of pollution, the overall water quality of the main bodies of the Upper Lakes is much better than both the Great Lakes Water Quality Agreement objectives and the federal, state and provincial standards. The Commission told Governments that it considers it imperative that the Upper Lakes be maintained at their present high quality if existing and future uses are to be maintained.

The Commission reported that growth and development could be accommodated in the area but stringent point source control should be applied as part of an offset policy to ensure that overall loadings from point sources do not increase with growth. Sediments, water and fish in many nearshore areas of both lakes exhibit unacceptably high concentrations of heavy metals and toxic organic substances as a result of their discharge, both intentionally and inadvertantly, into the environment.

For the particular metals in the locations cited in the Commission report as exhibiting high concentrations in either the water, sediment or fish, no further inputs should be allowed to those areas unless the discharger can show no injury to health and property.

The report on the Water Quality of the Upper Great Lakes followed a comprehensive five-year study launched after the Commission received a Reference from the Governments of Canada and the United States in 1972. The Commission was asked to enquire into and report on pollution in the Upper Lakes; the extent, causes and locations of such pollution; the remedial measures necessary to restore and protect water quality and the preventive measures needed to protect high-quality waters from pollution in the future.

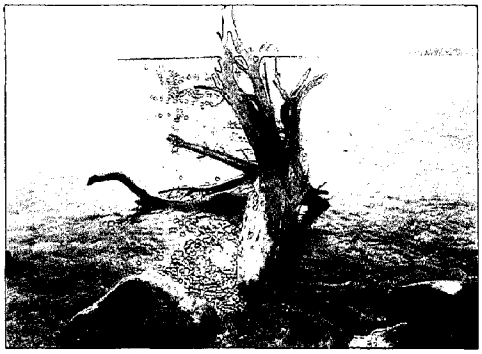
The Commission recommended that the Governments adopt as policy for those waters of Lake Huron and Lake Superior which are better than the water quality objectives the philosophy of non-degradation as proposed by the Commission. Inherent in the adoption of such a policy is the obligation to develop the scientific and technical information base required for proper management; encourage development of new and innovative manufacturing and waste treatment technology; encourage public education and involvement in long-range planning and in the decision-making process; and encourage industrial participation.

Although the overall water quality of the Upper Lakes is excellent, there are many localized sources of pollution which should be reduced or eliminated if the existing high quality is to be maintained.

In the report to Governments, the Commission pointed out that transboundary pollution was occurring in the St. Marys River because of the discharge of phenolic substances from the Algoma Steel Corporation at Sault Ste. Marie, Ontario. The major adverse influence on the western arm of Lake Superior was the discharge of taconite tailings waste from Reserve Mining Company which results in deposits of tailings on the Lake bottom and dispersal of asbestiform fibres. As a result of recent

Growth and development can be accommodated in the Upper Lakes region but stringent controls on growth and development and on phosphorus and toxic substances should be applied to protect the generally high quality of the waters of Lakes Superior and Huron.

Studies have shown that atmospheric inputs may be responsible for up to 40 per cent of the loadings of certain pollutants to the Upper Great Lakes.



court action, the company is scheduled to start using a land disposal system in 1980.

The Commission asked the Governments to establish as soon as possible a drinking water standard for asbestos. It urged governments to complete research into the effects of asbestos fibre size, shape and concentration on all biological forms in the Upper Lakes, especially when ingested by man.

Water use problems occur in several areas, particularly Saginaw Bay on Lake Huron and Duluth-Superior Harbor on Lake Superior, as a result of inputs of nutrients and organic substances. The nutrient inputs to Saginaw Bay are also degrading the open waters of southern Lake Huron.

The Commission identified for future action new concerns which have arisen from the study by its Upper Lakes Reference Group. The Group's study indicated that atmospheric inputs may be responsible for up to 40 percent of the loadings of certain pollutants to the lakes. The Commission has asked the Governments to address this problem on a scale broad enough to permit the tracing of significant sources of input to the lakes, especially as many of the sources may be located outside the Great Lakes Basin.

It is evident that if the goals of nondegradation and restoration of water quality in the Upper Lakes are to be met, society must develop new and innovative technologies. These must include resource conservation methods as well as new treatment processes. The Commission perceives the role of Governments to be one of encouraging and coordinating development and implementation of these measures and of providing incentives toward this end.

Poplar River

INTERNATIONAL POPLAR RIVER WATER QUALITY BOARD

U.S. Chairman
Dr. Robert C. Averett
U.S. Geological Survey

Canadian Chairman
Dr. Robert K. Lane
Canada West Foundation

The Reference on the water quality of the Poplar River in Saskatchewan and Montana occupied an important position on the Commission's agenda throughout 1978-1979; at the end of 1979, the IJC was preparing its report to Governments for submission in 1980.

The Commission was requested in August, 1977 to undertake a water quality study of the River and to include in the study the transboundary water quality implications of the Saskatchewan Power Corporation's thermal power plant and ancillary works including coal mining at Coronach, Saskatchewan. Construction of the project was started before the Governments issued the Reference to the IJC.

In early March, 1979 the Commission submitted an interim report to the Governments of Canada and the United States. The Commission recommended that Saskatchewan Power Corporation be formally advised that mitigation of the discharge of boron, and possibly total dissolved solids and other substances, will be required to assure that the concentrations of boron and other substances in the East Poplar do not exceed the objectives to be proposed for application at the international boundary, such objectives to be based upon a level which will provide adequate protection for water uses downstream of the boundary. The Commission has further recommended that the responsibility for implementing adequate mitigation should rest with the Corporation and that it should bear full technical and financial responsibility for it.

The Commission recommended that Governments withhold approval of operation of the power facility until they are satisfied that adequate mitigation has been provided.

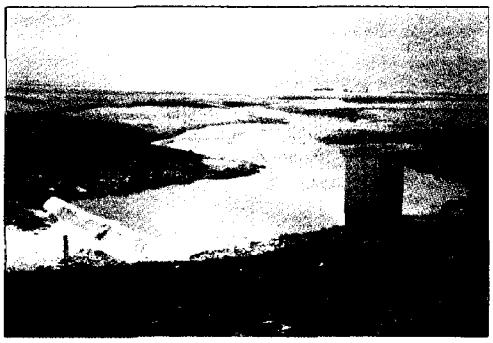
The Commission received the report of its International Poplar River Water Quality Board in July 1979. Copies were forwarded to the Governments of Canada, the United States, Montana and Saskatchewan, in addition to the general public.

The Board reported that the proposed developments will not present new problems but will aggravate existing ones. A number of alternatives are possible for mitigation of all expected adverse water quality effects of SPC development. The Board cautioned, however, that information available to it was inadequate in many important aspects. Future water quantity and quality considerations of boundary waters should be examined simultaneously, the Board said.

Future water quantity and quality considerations of boundary waters should be examined simultaneously, the Board said.

The Commission held public hearings in Scobey, Montana, and Coronach, Saskatchewan, in September to receive testimony and evidence related to the Board's report. Because many citizens and interest groups advised the Commission that they had not had sufficient time to fully assess the report and to prepare submissions to the Commission prior to the hearings, a second round of hearings was scheduled.

Additional hearings were held in mid-October at Regina, Saskatchewan and again in Scobey. In mid-November the Government of Saskatchewan announced that it had approved construction of the second unit (unit one was almost completed). The province indicated that it will consider the recommendations of the Commission in the Commission's report to Governments.



The Commission's study of Poplar River water quality was initiated in 1978 to consider the transboundary implications of various proposed uses and developments.

Red River

INTERNATIONAL RED RIVER POLLUTION BOARD

Canadian Chairman
Mr. Denis A. Davis
Environment Canada

United States Chairman
Mr. Irwin L. Dickstein
U.S. Environmental Protection

During 1978 there were several large spills of wastewater to the river but no serious adverse transboundary environmental impacts were reported.

The Commission's Red River Pollution Board reported in 1979 that the issue of dike stability of the waste treatment ponds of all Red River Valley sugar beet mills is of great concern. Dike failures and/or leaks have occurred from five of the six sugar beet plants in the valley during the past five years, resulting in the discharge of substantial amounts of de-oxygenating waste to the river.

Better maintenance and inspection programs must be instigated by all sugar beet processing plants in the Red River Valley to provide better protection for the water quality of the Red River.

A work group representing federal, state and provincial regulatory agencies has been formalized to address monitoring needs and to exchange technical information relating to river flows and velocities. This group will develop a coordinated monitoring plan which can be used to evaluate the effects on Red River water quality when accidental spills occur.

During 1978 there were several large spills of wastewater to the river but no serious adverse transboundary environmental impacts were reported. A spill in the spring of 1979 caused no severe water quality impacts.

North Dakota carried out enforcement action against the sugar beet plant responsible for the 1979 spill and obtained monetary damages. The state also planned further dike inspections to determine maintenance needs at the other two North Dakota sugar mills in the Valley. Minnesota undertook an investigation of the maintenance status of the dikes at the three Minnesota sugar mills in the Valley.

Fecal coliform concentrations have consistently exceeded the IJC objective of 200 organisms per 100 millilitres. Land runoff appears to be the main source. The Board is reviewing the data gathered over the last 10 years to examine trends.

Rainy River

INTERNATIONAL RAINY RIVER WATER POLLUTION BOARD

Canadian Chairman
Mr. Kim Shikaze
Environment Canada

U.S. Chairman
Mr. David Wagner
Environmental Protection Agency

No new major water quality problems were evident in the Rainy River during 1978-79.

The Commission has monitored pollution of the Rainy River since 1959. No new major water quality problems were evident in the Rainy River during 1978-79. The International Rainy River Water Pollution Board reported to the Commission that dissolved oxygen levels were above (better than) the IJC objective of 5 milligrams per liter during 1978 and 1979. However, total coliform bacteria remained higher than the objectives as they have for a number of years and while this was of some concern the cause for the high counts was unknown.

In 1979, utilization of the new seasonal discharge waste stabilization pond serving the town of Rainy River led to a striking decrease in 5-day Biochemical Oxygen Demand (BOD 5) and suspended solids loadings in comparison to previous years. A significant decline in phosphorus loadings was also noted.

In the meantime, the Boise-Cascade pulp and paper mills at International Falls, Minnesota, and at Fort Francis, Ontario, were at varying stages in constructing new waste treatment plants. The company on the U.S. side had received a permit to begin construction of a new oxygen activated sludge system to replace another recently installed system that had failed to provide an acceptable effluent. This new facility was scheduled for completion by April 1, 1980.

On the Canadian side, the company had completed and started up the major paper mill mechanical clarifier but it had not achieved maximum operating efficiency by year's end.

St. Croix River

ST. CROIX RIVER BOARD OF CONTROL

U.S. Chairman
Colonel Max B. Scheider
U.S. Army Corps of Engineers

Canadian Chairman
Mr. John E. Peters
Environment Canada

During 1978 and 1979 the Commission continued to monitor water quality in the lower reaches of the St. Croix River to determine if previously reported improvements in water quality were being maintained.

The Commission had earlier reported to governments in 1977 that water quality was adequate to again support the migration of anadromous fish and particularly the Atlantic Salmon.

Monitoring through 1978-79 indicated that water quality continued to be adequate and that the pollution control program undertaken at the Woodlands, Maine, mill of the Georgia Pacific Company was meeting with success. Spills of wastes were reported on five occasions throughout 1978-79 but these did not have a serious impact on water quality in the river.

The Commission recommended in its 1977 Annual Report that Governments undertake steps to determine the feasibility of implementing a joint program for the rehabilitation of the salmon fishery in the St. Croix River. The Commission has now been advised that the New Brunswick Power Commission is expected to start construction of a new fish ladder at Milltown, New Brunswick, in 1980 toward that end.

In 1912, the Commission's first year of work on boundary problems, four out of the five dockets handled concerned levels and flows.

Water Levels and Flows

2

Water Levels an

Only Lake Superior and Lake Ontario are regulated by control structures and even on these lakes there are limitations to the amount of control which man can attain.

Since it was created 70 years ago the International Joint Commission has been involved with the regulation of water levels and flows of water on the boundary or crossing it. Indeed, this aspect of the Commission's responsibilities was the dominant one for the first 50 years of its existence. In 1912, the Commission's first year of work on boundary problems, four out of the five dockets handled concerned levels and flows.

While the increased public interest in environmental matters over the past decade or so has greatly influenced the work of the Commission, the question of levels and flows also continues to be important. The International Joint Commission receives reports at least once a year from its many international boards of control and questions of levels and flows still occupy the attention of the Commissioners regularly.

Great Lakes Levels Advisory Board

INTERNATIONAL GREAT LAKES LEVELS ADVISORY BOARD

U.S. Chairman
Mr. Robert C. Hansen
New York State Department of State

Canadian Chairman
Mr. N.H. James
Environment Canada

The Commission recognized the need for public input into the lake level decision making process in its 1976 report of "Further Regulation of the Great Lakes". The report recommended the formation of a panel to advise the Commission of concerns by riparian and other citizen interests.

In response, the Governments of Canada and the United States provided the Commission with a Reference which asked the Commission to establish a new advisory board to assist it in obtaining information regarding a number of matters which are related to the Commission's continuing responsibilities concerning Great Lakes water supplies, levels and flows.

In 1978 both the U.S. and Canadian sections of the Commission began to enlist the aid of interested individuals and groups in seeking nominations for the new Board. The Commission established the Great Lakes Levels Advisory Board in 1979 and named eight persons from each country; four are private citizens and four are persons who hold governmental positions with duties connected with levels and flows issues. All members were appointed for two-year terms. The Board held its first meeting in December, 1979.

It is responsible for advising the Commission on activities that might have a significant impact on water supplies, levels and flows on the Great lakes, connecting channels and the St. Lawrence River. The Board also will study and make recommendations on practical methods of further increasing public awareness of and involvement in all issues relating to Great Lakes supplies, levels and flows.

The Board will keep informed and will advise the Commission on the effect of programs such as new structures, structural alterations, landfill, shoreline development and dredging for navigation or other purposes, proposed programs of winter ice management for navigation or other purposes, potentially significant weather modification activities, and other activities affecting levels and flows. The Commission is hopeful that this Board will assist it in advising the Governments on further steps to encourage public participation in all issues relating to Great Lakes water problems.

It is hoped that formation of this advisory board will lead to the involvement of many more citizens living around the lakes. The Board has been empowered to establish committees and task forces consisting of members from as wide a range of disciplines and public interest groups as may be required.

l Flows

Great Lakes

The year 1979 provided graphic evidence of the influence on lake water levels exerted by changes in the weather. At the beginning of the year, Lake Superior levels were slightly lower than they had been at the same time a year previous, Lakes Michigan-Huron were about the same level and Lakes Erie and Ontario were just slightly higher.

Precipitation over the Great Lakes Basin during the first six months of the year averaged 20 percent higher than normal. This above-average condition was present in all portions of the drainage basin but was most pronounced in the upper lakes.

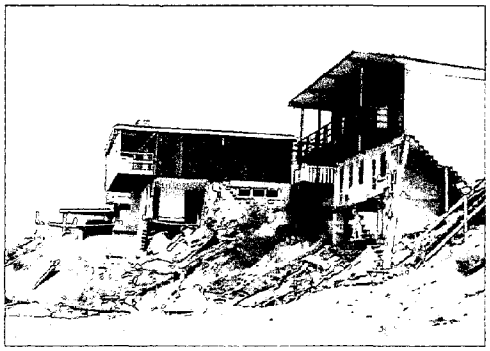
At the end of July, Lake Superior levels were about six inches above those recorded at the same time in 1978 while Michigan-Huron levels were about 11 inches higher. Lake Erie levels were about three inches above the previous year and Lake Ontario about six-and-a-half inches higher. Outflows of Lake Superior were increased gradually from 70,000 cfs to 83,000 cfs (cubic feet per second) in May to 108,000 cfs in June, to maximum outflows in July of 116,000 cfs.

Above normal precipitation over the Great Lakes Basin slowed the seasonal decline of water levels of the Great Lakes over the last few months of the year. At year's end, Lake Superior levels were about eight inches higher than they had been at the same time one year earlier; Huron and Ere were about 10 inches higher and Ontario about six inches higher than the previous year.

Only Lake Superior and Lake Ontario are regulated by control structures and even on these lakes there are limitations to the amount of control which man can attain. Weather and the natural features of the system continue to play very important roles.

On April 6, a severe wind storm (80 mph) hit eastern Lake Erie causing extensive flooding and ice damage (estimated at $3-4 million). The water level rose more than seven feet above pre-storm level and there was a 16-foot difference in elevation between the west and east end of Lake Erie during the storm. In September, Hurricane Frederick brought near-record water supplies and produced short term rises of about three inches on Lakes Erie and Ontario. Despite this, levels of Lake Ontario remained within the ranges specified by the IJC order.

As 1979 drew to a close, all the lakes had levels exceeding their long-term averages. Given the most probable water supplies over the first six months of 1980, Lake Ontario levels were expected to be approximately the same at the end of March, 1980 as they had been a year earlier under similar conditions. Lake Superior levels were expected to be about four-and-a-half inches above the long term average. However, even with extremely wet conditions levels on all lakes would be expected to remain below their recorded extremes.



Water levels influenced by weather changes can lead to erosion problems for those living on the shores of the Great Lakes.

Lake Superior

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

Canadian Chairman
Mr. David Witherspoon
Environment Canada

U.S. Chairman
Major General Richard Harris
U.S. Army Corps of Engineers

In the past, the Commission has recommended to the Governments of Canada and the United States that the control works at the head of the St. Mary's River which help regulate Lake Superior levels be operated in a manner to suitably and adequately protect all interests throughout the Great Lakes system.

Consequently, in 1978 the International Joint Commission held informal public information meetings in seven cities to provide information about possible changes to its Orders of Approval for the regulation of Lake Superior. Public hearings followed in December 1978 and January 1979. In October, 1979 the Commission amended its 1914 Orders of Approval to permit regulating the levels of Lake Superior within a specified range so as to keep the levels of Lake Superior and Michigan/Huron at the same relative position in relation to their mean levels. The Commission implemented Plan 77 to achieve these objectives in October 1979.

Prior to the amendment, outflows from Lake Superior were based on the lake's levels and the danger of flooding on the St. Mary's River, without taking into consideration the levels of Lakes Michigan/Huron.

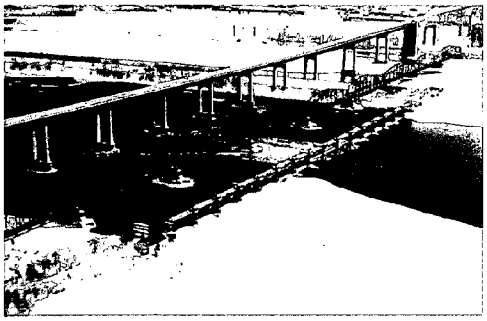
In September, 1978, the Commission issued two Supplementary Orders of Approval. One permitted the Great Lakes Power Corporation to rebuild its hydroelectric power facilities at Sault Ste. Marie, Ontario while the other provided for the maintenance of proper flows over the rapids section of the river to protect the fishery.

The stage 1 cofferdam for the new generating facilities was completed by the end of 1978. Water quality monitoring specified by the Commission began before the start of construction and has continued in accordance with an approved program. All water quality data have been within recommended tolerance limits.

The IJC's International Lake Superior Board of Control prepared a plan for the monthly regulation of Lake Superior prior to the closure of the Canadian power canal required for removal of the old Great Lakes power plant and the dredging of the channel to the new plant. This predischarge plan was implemented in October, 1979. The canal is slated for temporary closure in October, 1981. Since closure of the power canal will shut off an outlet from Lake Superior during construction of the hydroelectric power project, it is necessary to release extra water prior to the closure to compensate for the reduction in discharge capacity following closure. The power canal is scheduled to be reopened in 1982.

Before amending the Orders, the Governments of the United States and Canada advised the Commission that preliminary work would be undertaken to construct remedial works in the rapids area at Sault Ste. Marie which would protect the fishery as had been recommended by the Commission in a 1975 report to Governments.

The United States carried out detailed testing of its portion of the compensating works during 1979. The Commission has requested a report on the total condition of the control structure but work on the Canadian section has been delayed by a lack of funding. The Commission has stressed to Governments the importance of testing the works and is hopeful that action will be taken on the Canadian side in the near future. The Great Lakes Fishery Commission has also stated its support for such testing.



The compensating works (to the right of the bridge) at the head of the St. Marys River are used to regulate the levels of Lake Superior within a specified range.

Lake Erie

INTERNATIONAL LAKE ERIE REGULATION STUDY BOARD

U.S. Chairman
Maj. Gen. Richard L. Harris
U.S. Army Corps of Engineers

Canadian Chairman
Mr. Derek M. Foulds
Environment Canada

The Governments of Canada and the United States asked the Commission to determine the possibilities for limited regulation of Lake Erie and the anticipated effects throughout the Great Lakes Basin and the St. Lawrence River, taking into account the applicable Orders of Approval of the Commission and the recommendations of the Canada-Quebec study of flow regulation in the St. Lawrence River in the Montreal region.

The study also is reviewing St. Lawrence River dredging and regulation plans to ascertain how any increased flow could be handled without affecting Lake Ontario levels.

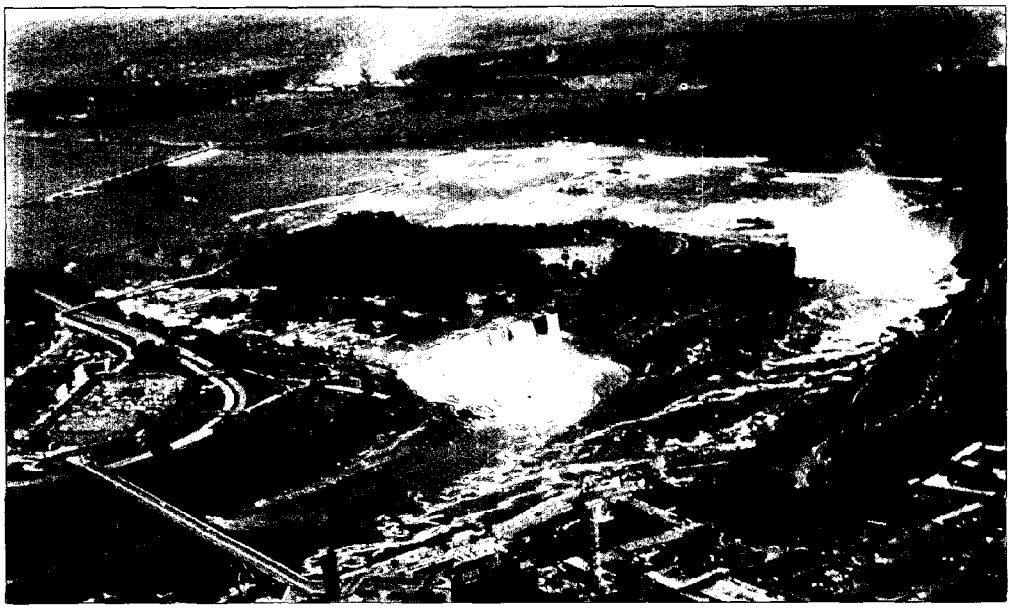
Investigations of the works necessary to implement regulation as well as the effects of the regulation on the navigation and power interests and on the environment are underway by the Commission's International Lake Erie Regulation Study Board.

Navigation forecasts are being considered along with fleet compositions and vessel characteristics. Evaluations for power generating stations on the Niagara and St. Lawrence rivers are being carried out as is a wide-reaching study of the environmental effects. These studies are necessary to determine the impacts of regulation, if any, on navigation, power and the environment.

Due to funding restraints, the environmental study will be confined to the Ontario portion of the Great Lakes from Port Huron-Sarnia to the Quebec border of the St. Lawrence River. Economic evaluations on coastal zones, navigation and power will cover the entire Great Lakes — St. Lawrence River system.

The Board has prepared a public information program and the first newsletter was mailed to the public in both Canada and the United States in the fall of 1979. An interim report in the form of a briefing to the IJC was scheduled by the Board for early 1980.

Navigation forecasts are being considered along with fleet compositions and vessel characteristics.



A study on the possibilities for limited regulation of Lake Erie will include an evaluation of the effects of such regulation on power generating stations on the Niagara River along with environmental effects.

Niagara River

INTERNATIONAL NIAGARA BOARD OF CONTROL

Canadian Chairman
Mr. E.T. Wagner
Environment Canada

U.S. Chairman
Maj. General Richard L. Harris
U.S. Army Corps of Engineers

Low winter air temperatures were not confined to this area as four of the five Great Lakes were frozen over.

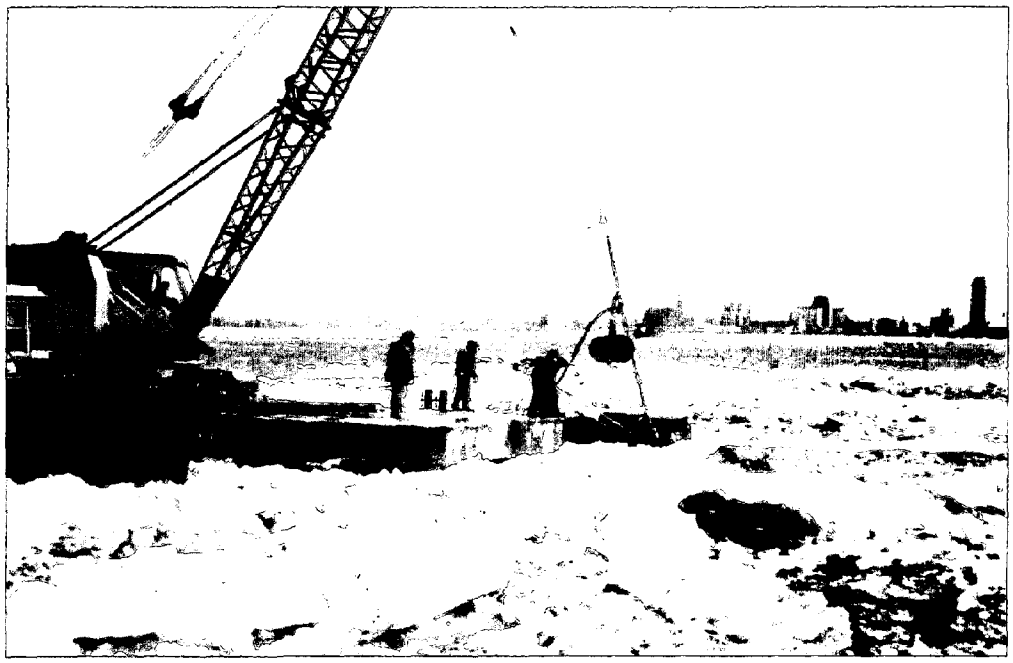
Since 1965 an ice boom has been installed by power companies at the head of the Niagara River each winter to accelerate the formation of the natural ice arch and to reduce ice runs into the river. The ice boom helps to prevent excessive flows of ice from entering the Niagara River and damaging downstream shore property and hydro power equipment. It has been alleged that the ice boom causes longer, more severe winters in the area. The Commission held a public hearing in Buffalo in March 1979 to receive comment on operation of the boom.

The Order of Approval for the ice boom, which has been renewed from time to time, is scheduled to terminate in May 1980. In late 1979 the power agencies asked the IJC for an indefinite extension of permission to continue installing the boom each year. The Commission will hold public hearings in 1980 before deciding to terminate, extend or revise approval for the ice boom.

Although Lake Erie was 100 percent ice covered in the winter of 1979 for the third consecutive year and numerous low temperature records were set in the eastern Lake Erie area, all spans of the ice boom had been removed by April 17, 18 days earlier than the previous year. Low winter air temperatures were not confined to this area as four of the five Great Lakes were frozen over.

In mid-February, an ice jam consisting entirely of river generated ice formed at the mouth of the lower Niagara River and extended upstream seven-and-a-half miles. The ice jam, the first to occur in this location since 1964, resulted in as much as a three-foot head loss to the Robert Moses and Sir Adam Beck power plants.

The ice boom at the head of the Niagara River is installed each winter to accelerate the formation of the natural ice arch and to reduce ice runs into the river. Here, the boom is being removed at the end of the ice season.



Lake Ontario and The St. Lawrence River

INTERNATIONAL ST. LAWRENCE RIVER BOARD OF CONTROL

U.S. Chairman
Maj. General Richard L. Harris
U.S. Army Corps of Engineers

Canadian Chairman
Mr. R.H. Smith
Department of Transport

Throughout the year, the Commission's International St. Lawrence River Board of Control continually monitors the outflows of the river to assure that the Commission's Order of Approval is followed.

In 1978 the Board initiated a study at the request of the Commission to update a 1975 report of its working committee on studies to improve the regulation of Lake Ontario. The studies include an assessment of the relative costs and benefits of alternative regulation plans, using the economic data being developed by the Lake Erie Regulation Study Board. The study is expected to be completed in 1980.

In 1978 water supplies to Lake Ontario were considerably above normal but well within the range of the historical supplies which the plan of regulation was designed to accommodate.

Numerous flow changes through the international section of the St. Lawrence River were made in January 1979 to assist the formation of a stable ice cover. Ice booms are used to assist this process.

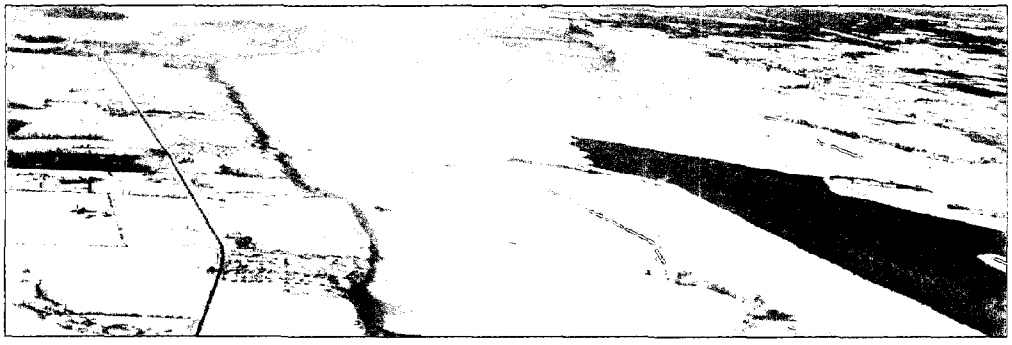
Ice jams reduce the outlow from Lake Ontario and raise its level, cause problems with power generation and lead to the exposure of drainage outlets and municipal water intakes. Open water conditions prevailed in the international section of the river by March 22 and all ice boom sections were removed before the April 2 Seaway opening.

In each winter the Board used its winter operating discretion to optimize winter flows.

Water supplies to Lake Ontario from April through December, 1979 were well above normal. The supply for September was almost a record. As the year drew to a close, Lake Ontario levels were about eight inches above those recorded at the same time a year previous; however, these levels were still well within the range provided for in the Plan of Regulation and were about one-and-a-half feet below what would have prevailed in pre-St. Lawrence River Power Project conditions. The Board released substantial additional flows in December 1979 to create an added safety factor.

The St. Lawrence Seaway Authority for the first time in its history imposed surcharges on vessels which moved through the Seaway after the official closing date of December 18. Ice Booms are placed across the river at the beginning of the winter to assist the formation of a stable ice cover and prevent ice jams which can interfere with water flows.

In each winter the Board used its winter operating discretion to optimize winter flows.



Ice formation was in progress above the ice booms in the St. Lawrence River near Ogdensburg, N.Y. and Prescott, Ontario when this picture was taken in the winter of 1979.

Diversions and Comsumptive Uses

INTERNATIONAL GREAT LAKES DIVERSIONS & CONSUMPTIVE USES STUDY BOARD

Canadian Chairman
Mr. Ralph L. Pentland
Environment Canada

U.S. Chairman
Maj. General Richard L. Harris
U.S. Army Corps of Engineers

Hydrologic effects of increased consumptive uses for the next 60 years are also being evaluated.

The International Great Lakes Diversions and Consumptive Uses Board was established by the Commission to investigate, in accordance with a Reference from Governments February 21, 1977, the effects of existing and proposed diversions within, into or out of the Great Lakes Basin, and the effects of consumptive uses on Great Lakes water levels and flows.

The study has three major components-diversion, consumptive uses and environmental evaluations.

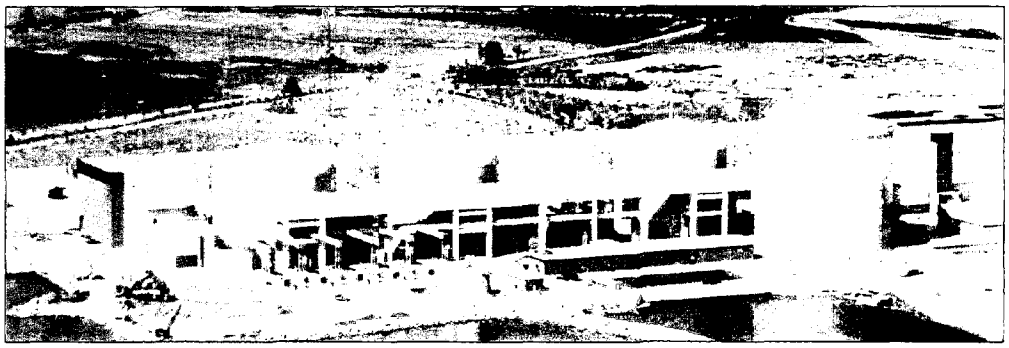
In 1978 basic water supply data for the diversions studies were fully coordinated. Work was completed on the projections of consumptive uses in the Great Lakes System to the year 2035. A preliminary determination of the effects of these increased usages on the Great Lakes levels and flows has been made. The environmental evaluation studies have been divided into three areas: 1) the Great Lakes - St. Lawrence River systems, 2) the Illinois Waterway (Lake Michigan Diversion at Chicago), and 3) Long Lac/Ogoki Diversions. A public involvement program has been developed and the first issue of a newsletter titled "Diversion" was distributed in November, 1978; a second issue followed in June, 1979. The third issue of the Board's newsletter, scheduled for early 1980 will publicize the dates and locations of public workshops which the Board will hold in the spring of 1980.

The evaluation will also include a study of the impacts of consumptive uses on the current operating regulation plans for lakes Superior and Ontario.

Among the five alternatives chosen by the Board for detailed hydrologic and economic evaluation on the diversions side of the study, is one which assumes no water would go through the three principal diversions now existing (Long Lake/Ogoki, Chicago and Welland Canal). This alternative was included to determine present effect of the existing diversions on the Great Lakes.

Hydrologic effects of increased consumptive uses for the next 60 years are also being evaluated. This will include an estimate of the time at which the diversion alternatives would become totally impractical due to the lowered levels of the lakes caused by increasing consumptive uses.

A study is underway on the effects of consumptive uses on Great Lakes water levels and flows. One category of user on the lakes is that of power stations such as this nuclear power plant on Lake Ontario.



Osoyoos Lake

INTERNATIONAL OSOYOOS LAKE BOARD OF CONTROL

Canadian Chairman
Mr. Gordon Tofte
Environment Canada

U.S. Chairman
Mr. Charles R. Collier
Department of the Interior

Osoyoos Lake is an expanse of the Okanagan River running from British Columbia into the state of Washington; the international boundary intersects the lake. Zosel Dam, constructed at the lake's outlet in Washington in 1927 to create a pond for log storage partially controls the water level of the lake.

The International Osoyoos Lake Board of Control was formed by the Commission to see that the Commission's 1946 Order of Approval for the dam is carried out.

The Zosel Dam was inspected by the United States Corps of Engineers for structural integrity in accordance with an April, 1978 request from IJC. The Corps reported that the dam was in poor condition.

Public hearings were held by the IJC in September 1978, at Osoyoos, British Columbia and Oroville, Washington. The public was invited to comment on possible improvement of water levels on Osoyoos Lake and the Okanagan River above Zosel Dam. Following the hearings, the State of Washington made temporary repairs on Zosel Dam in early 1979.

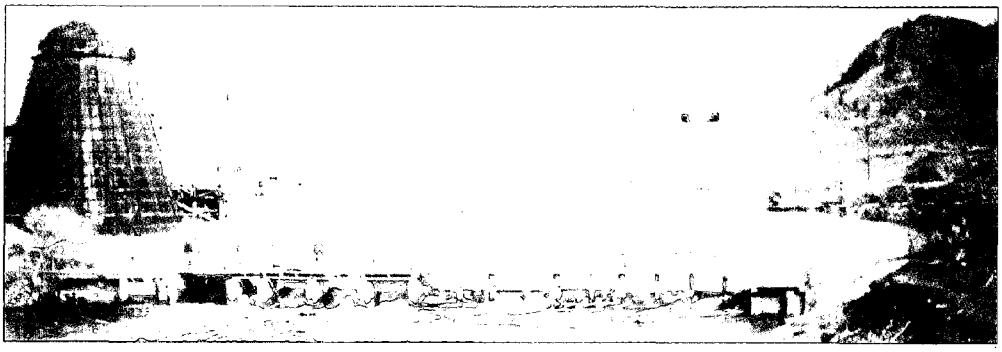
The Commission's International Osoyoos Lake Board of Control formed an Operations Committee, consisting of one U.S. and one Canadian citizen, to channel concerns of recreational and riparian interests to the Board for consideration when making regulation decisions.

The International Joint Commission has deferred action in order to encourage continued cooperation and progress by those citizens in Canada and the United States directly concerned with the issues.

The Commission has been encouraged by the cooperation exhibited by the State of Washington and the Province of British Columbia. The State and the Province are working within the terms of a Memorandum of Understanding to develop a long-term program which would satisfactorily deal with the question of the best water levels for the citizens of both countries and to keep the Commission informed of progress. At the end of 1979 the Commission was awaiting a report.

The United States Army Corps of Engineers has prepared a conceptual design and estimate of construction costs for a structure to replace Zosel Dam. Such a structure would permit more controlled regulation and the acceptance of a higher maximum water level than 911 feet, if it is decided that this would be beneficial.

The Commission has been encouraged by the cooperation exhibited by the State of Washington and the Province of British Columbia.



In response to a request from the IJC, the U.S. Army Corps of Engineers inspected the Zosel Dam for structural integrity and reported that the dam was in poor condition.

Richelieu River-Lake Champlain Reference

INTERNATIONAL CHAMPLAIN-RICHELIEU BOARD

U.S. Chairman
Mr. Terrence P. Curran
New York Department of Environmental Conservation

Canadian Chairman
Mr. Harry B. Rosenberg
Environment Canada

The Commission is considering ways of providing relief from flood damage while not harming the environment in either country.

In 1975 the Commission reported to the Governments of Canada and the United States that aside from the undetermined environmental consequences, regulation to control flooding of lands along the Richelieu River and Lake Champlain was desirable. The Commission formed an International Champlain-Richelieu Board to study the environmental, physical and economic effects of regulation in both countries.

Lake Champlain is located mostly in the states of Vermont and New York. Its outlet, the Richelieu River, flows northward through Quebec for 80 miles to the St. Lawrence River. Flooding and low water conditions have caused considerable damage in both countries. The Commission is considering ways of providing relief from flood damage while not harming the environment in either country. The lake and the river support a great diversity of animal and plant life, fish, fur-bearing animals and waterfowl. The shallows of the lake and adjoining wetlands are important to the lake's biotic diversity.

The Board submitted its report to the Commission in January 1978 and the Commission held public hearings at Burlington, Vermont, Plattsburg, New York and St. Jean, Quebec in June. In response to a number of issues raised at the hearings, the Commission asked the Board to prepare a supplementary report. That report was the basis for additional hearings in Burlington and St. Jean in September. In January 1979 the Board submitted a supplemental report responding to additional issues raised during the public hearings.

In the spring of 1979 the Commission formed an ad hoc committee to observe tests being conducted by Parks Canada to ascertain the effects of Canal bank widening and the feasibility of using the Canal to discharge flood waters and to monitor the hydraulic effects of the program. The tests involved admitting water during flood conditions into the Chambly Canal and returning the water to the Richelieu River through a temporary breech in the Canal wall downstream of the St. Jean rapids.

The purpose of the tests was to determine the structural and hydraulic competency of the canal to serve as a bypass channel during flood conditions, thereby alleviating high water conditions upstream. The committee concluded that the tests were too limited to draw firm conclusions although they did provide some indication of the effects of the widening of the canal banks on levels and flows.

This Reference has proven to be a particularly difficult and complicated one. The Commission expects to report to governments in 1980.

Although most of the work of the International Joint Commission over its first 70 years of existence has involved the waters on and flowing across the boundary, problems of air pollution have also been dealt with. And with success.

Air Quality

3

Although most of the work of the International Joint Commission over its first 70 years of existence has involved the waters on and flowing across the boundary, problems of air pollution have also been dealt with. And with success.

Air Quality

3

The question of air pollution in the Detroit-Windsor area has been the subject of Commission study and report since the Commission was first asked in 1949 to report on the problem of smoke from area vessels using the Detroit River.

Progress in the improvement of air quality with respect to suspended particulates and sulphur dioxide slowed considerably after showing dramatic improvement from 1972 to 1975.

So despite an emphasis on water quality and water levels work, the Commission is no stranger in the world of air pollution and its attendant problems.

In recent years, the Commission has reported to Governments about the threat posed to water quality by the long-range transport of pollutants through the air. This includes, but is not limited to, the problem of acid rain. Clearly, the atmosphere provides an important source for a variety of pollutants which plague the Great Lakes, including phosphorus, nitrogen, lead, copper, other heavy metals, sulphates, PCBs and other substances. Studies have indicated that direct atmospheric deposition onto the surface of Lake Superior accounts for 37 per cent of the total phosphorus loading (excluding shoreline erosion).

The problem of pollution through the airways sprang into the headlines in dramatic fashion in 1979 when the two Boards advising the IJC on the Great Lakes (Great Lakes Water Quality Board and the Science Advisory Board) reported on the menace presented by acid rain. Since aerial pathways followed by pollutants honor no boundaries, this is very much an international problem. The Commission was pleased to see the Governments of Canada and the United States recognize the urgency and the need for joint action on the problem. The Commission will be following this matter with deep interest and stands ready to assist in any way the Governments may decide.

Whatever programs are adopted, it has become very evident that there is a need to closely control atmospheric emissions of oxides of nitrogen and sulphur in both Canada and the United States.

As the International Joint Commission approached its eighth decade, the matters which concerned it involved old issues of the past and new issues of the future.

70 Years Later

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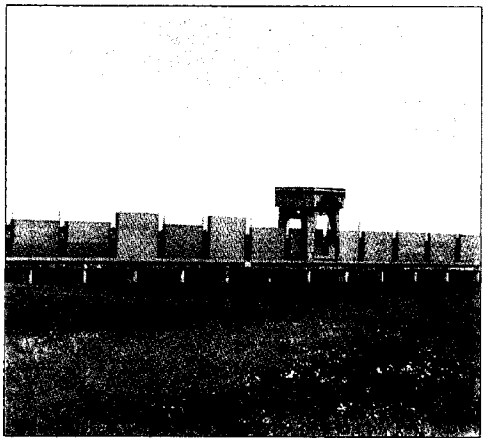
70 Years Later

Water levels and flows are still very much matters which Canada and the United States must deal with together.



The protection and maintenance of water quality is a year-round job.

As the International Joint Commission approached its eighth decade, the matters which concerned it involved old issues of the past and new issues of the future.

Water levels and flows are still very much matters which Canada and the United States must deal with together, just as they were when the Commission was created 70 years ago. The Osoyoos Lake matter discussed in a previous section is an example.

New problems and new approaches are also touching on the work of the Commission. Winter navigation on the Great Lakes has been the subject of study on the United States side of the boundary although it has not been referred to the Commission.

In 1979 the Commission informed Governments that public concern about environmental effects of navigation season extension have been noted. At the Commission's request, its Great Lakes Water Quality Board reviewed the matter to determine if winter navigation could have significant adverse impacts on water quality. The Board concluded that there is insufficient material upon which to base a decision.

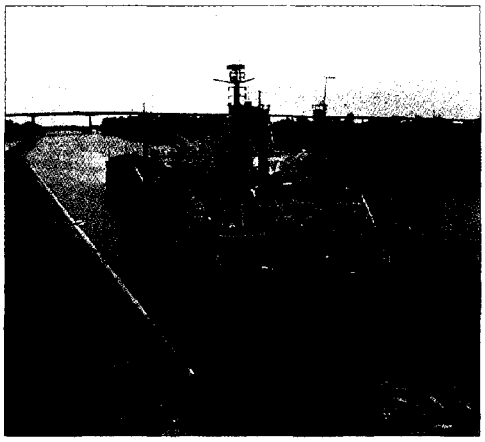
The Governments were so informed by the Commission and it was recommended that a thorough and timely background study should be undertaken so that possible water quality impacts of winter navigation can be assessed. The Commission is aware that major programs, once underway, are extremely difficult to stop if adverse environmental impacts are discovered later.

Public concern has also been noted that changes in levels and flows of the connecting channels could possibly result from navigation season extension. The Commission has informed Governments that this matter will be referred to the Great Lakes Levels Advisory Board for advice.

Problems of energy supply and economics which occupy important priorities in the minds of many Canadians and Americans may have a growing role to play in the work of the Commission in the future.

Both countries will have many anxieties as to the impact of the energy crisis and economic problems on temptations to "go easy" on polluters and take other short-cuts in the name of finding pragmatic answers. As industries expand and resources are exploited, it will become more important than ever that both countries cooperate to protect the environment.

The environmental movement gained momentum in the 60's as a "quality of life" concept but it has since been transformed into a much more serious debate because of the public health aspects of environmental contamination. Both Canada and the United States will increasingly be confronted by the dilemma of what will appear conflicting choices - protecting the environment or protecting the economy. The IJC believes that the temptation to choose economic gains at the expense of a healthy environment should be resisted in both countries. In the long term the maintenance of a healthy environment is not incompatible with economic gain.



◀ *The Commission has advised the governments of Canada and the United States that any study of extending winter navigation on the Great Lakes should consider any impacts on water quality.*

Industrial wastes continue to pose water quality problems, 70 years after the signing of the Boundary Waters Treaty.

Especially necessary is a clear commitment to control and eliminate toxic and hazardous materials from the environment before further and even more serious harm is caused to water resources.

If coal replaces oil as a fuel on a major scale, care will have to be taken to see that this does not produce additional air pollution; such pollution could also have a major impact on the quality of vital water resources essential to the well-being of both countries. Similarly, nuclear facilities must not be permitted to have adverse environmental impacts on water shared by Canada and the United States.

The development of a common resource-environmental protection policy along the boundary and beyond is becoming increasingly important. The Commission is aware of the need for cooperation amongst all groups with an interest in preserving and protecting the environment shared by Canada and the United States.

The International Joint Commission has met with the Great Lakes Fishery Commission to discuss matters of mutual interest. Such meetings assist in the effort to find an accurate understanding of the importance of environmental quality to fishery management and of what steps are being taken to remedy problems. Contact with such agencies and organizations as the Great Lakes Basin Commission and Great Lakes Tomorrow serve to further the understanding of environmental problems - these contacts will continue.

New problems or old, the International Joint Commission after 70 years, will continue to seek solutions in the manner foreseen by the creators of the Boundary Waters Treaty of 1909. That is, with the Commission acting, not as separate national delegations under instruction from their respective governments, but as a single body seeking common impartial solutions in the joint interest.

The Commission is aware that it will be of little use to Governments if it does not have wide public confidence and it will not be able to maintain that confidence without a public belief in both countries in the Commission's impartiality as well as its actual and legal autonomy. Seventy years after the signing of the Boundary Waters Treaty, the Commission remains determined to carry out the tasks assigned to it in the spirit envisioned by those who created the Treaty and the International Joint Commission.

Appendices

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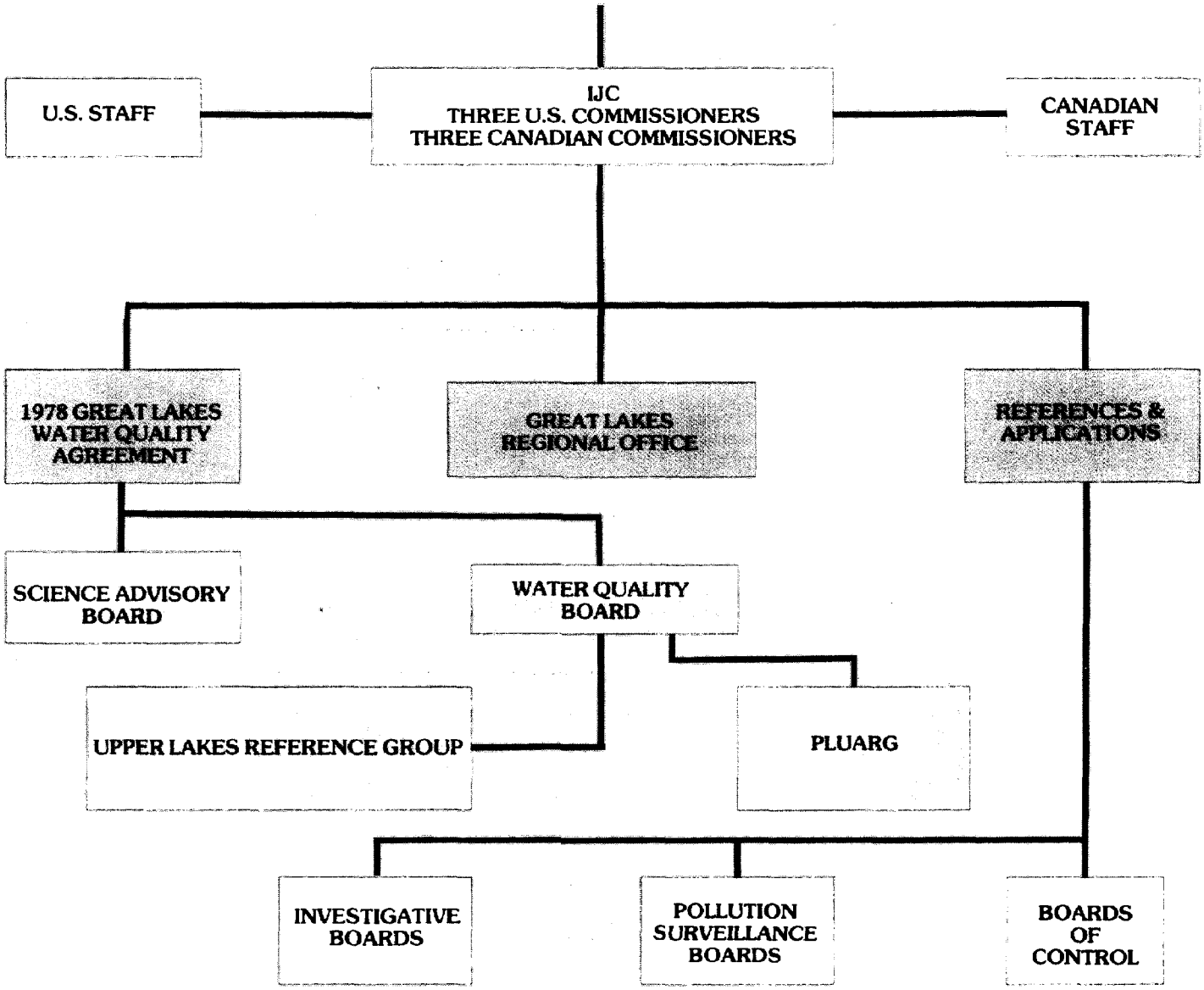
Appendices

IJC ORGANIZATIONAL CHART



APPENDIX 2

IJC List of International Projects 1912-1979

Under the Boundary Waters Treaty and other international arrangements, the IJC generally receives its projects

(1) by *applications* to it for approval of certain activities on boundary or trans-boundary waters, or (2) by referral to it by the U.S. and/or Canadian Govenment to make investigations (*references*).

— A or R on the chart indicates *application* or *reference*.....

— The year refers to the date the application of reference was submitted to the IJC.

— The IJC *Document number* is the official identification number for the purpose of keeping track of the projects.

INTERNATIONAL AND CANADIAN PROJECTS

	Docket No.	Title	Action
1912	1 A	Rainy River Improvement Co. Kettle Falls Dam	Dismissed as covered by a "special agreement."
	2 A	Watrous Island Boom Co. Boom in Rainy River	Approved.No Board.
	3 R	Lake of the Woods Levels	Completed.Resulted in the 1925 Convention.Active Board.
	4 R	Pollution of Boundary Waters	Completed.Recommendations not implemented.
	5 R	Livingstone Channel Detroit River	Completed.Recommendations implemented.
1913	6 A	Michigan Northern Power Co. St. Mary's River Dam (with No. 8)	Approved.First Board of Control. Active board.
	7 A	Greater Winnipeg Water District 100 mgd from Shoal Lake for Winnipeg water supply	Approved. No board
	8 A	Algoma Steel Corporation St. Mary's River Dam (with No. 6)	Approved. Active board.
1914	9 R	St. Mary and Milk Rivers Article VI of B.W. Treaty	Issued Order in 1921 on method of water measurement and apportionment.
	10 A	The St. Croix Water & Power Co. Grand Falls Dam (with no. 11)	Same structure. Approved in 1915. Amended in 1931 - Docket 28. Active Board.
1915	11 A	Sprague's Falls Mfg Co. Grand Falls Dam (with No. 10)	
1916	12 A	International Lumber Co. Boom in Rainy River	Approved. No board.
	13 A	St. Clair River Channel	Approved dredging. No board. Compensating works not constructed.

	Docket No.	Title	Action
1918	14 A	New York and Ontario Power Co. Waddington Weir.	Decision postponed. Now inundated by St. Lawrence Power.
	15 A	St. Lawrence River & Power Co. Massena Weir	Approved board was established. Works removed prior to St. Lawrence Power Project.
	16 A	Canadian Cottons Ltd. Milltown Dam on St. Croix River	Withdrawn in 1919.
1920	17 R	St. Lawrence River Navigation and Power	Completed. Treaty drafted in 1932. U.S. Senate did not ratify it. Revived in Docket 68.
1923	18 A	State of Maine Fishways Fishway in St. Croix River	Approved. No board.
1925	19 A	New Brunswick Electric Power Commission Grand Falls Dam on St. John River	Approved without passing on the issue of downstream benefits. No board.
	20 R	Rainy Lake Levels	Completed Led to Convention of 1928. Active Board. See Docket 50.
	21 A	Buffalo and Fort Erie Public Bridge Co. Bridge over Niagara River	Approved. No board.
1926	22 A	St. John River & Power Co. Grand Falls Dam on St. John River	Approved transfer of approval granted under Docket 19.
1927	23 A	Creston Reclamation Co. Ltd. Dyking on Kootenay River in Canada and above the Lake	Approved. No board.
1928	24 A	St. Lawrence River & Power Co. Raise Massena Weir	No action. Hearing adjourned "sine die". Now inundated by St. Lawrence Power Project.
	25 R	Trail Smelter Fumes	Completed. Report not accepted by U.S. The tribunal award similar to IJC.
1929	26 R	Roseau River Drainage	Completed. Governments to respond
	27 A	West Kootenay Power & Light Co., Ltd. Kootenay Lake Storage	Withdrawn in 1934.
1931	28 A	St. Croix Water Power Co., and Sprague Falls Mfg. Co. Grand Falls Dam on St. Croix River	Approved raising forebay 1.5 feet. Active board. Initial approval in Dockets 10 & 11.
1932	29 A	Kootenay Valley Power and Development Co. Dyking on Kootenay River in Canada near Creston	Approved. No board.
1932	30	Docket number assigned in error - same as above	
	31 A	Madawaska Company Grand falls Dam on St. John River	Denied. Related to claims pursuant to operation under Dockets 10 & 22
1934	32 A	Canadian Cottons Ltd. Milltown Dam on St. Croix River	Approved. Active Board.
1935	33 A	Jean Lariviere Private small dam on Little St. John Lake	Approved. No board.

	Docket No.	Title	Action
	34 A	Bruner, P.C. Dyking on Kootenay River in Canada	Approved. No board.
1936	35 A	Montana Conservation Board Dam on East Fork of Poplar River	Approved. Dam not built. No board.
	36 A	Myrum Geo. B. Repair of Prairie Portage Dam	Approved. Repair work on existing timber dam not implemented.
	37 R	Champlain Waterway Deep waterway from St. Lawrence to Hudson River	Completed. Recommended new Study after St. Lawrence Seaway built.
1937	38 A	Richelieu River Remedial Works	Approved. Only control gates installed. Dykes and excavation not implemented. Active board.
1938	39 A	West Kootenay Power & Light Co., Ltd. Corra Linn Dam for Kootenay Lake Storage	Approved. Active board.
1939	40 A	United States Forest Service Prairie Portage Dam	Approval granted to reconstruct dam. Only cofferdam built. Active board.
	41 R	Souris River Water apportionment	Governments approved interim measures recommended by IJC. Active Board of Control.
1940	42 A	Creston Reclamation Co., Ltd. Dykes along Kootenay River in Canada	Approval settled outstanding differences. No board. Initial approval under Docket 23.
1941	43 A	West Kootenay Power & Light Co. Ltd. Additional two feet of storage on Kootenay Lake	Approved for one year.Active board.
1940	44 A	Grand Coulee Dam & Reservoir Backwater raised water level in Canada	Approved. Active board.
1941	45 A	West Kootenay Power & Light Co., Ltd. Additional two feet of storage on Kootenay Lake	Informal request considered to be unnecessary application.
	46 A	City of Seattle Ross Dam, Skagit River	Approved. Board established when Seattle & B.C. reached agreement in 1967.
1942	47 A	West Kootenay Power & Light Co., Ltd. Additional two feet of storage on Kootenay Lake	Approved until end of the war. Board active.
	48 A	Creston Reclamation Co., Ltd. Reclamation of flooded lands in Duck Lake	Approved. No board.
	49 A	State of Washington Zosel Dam at outlet of Osoyoos Lake	Approved.Active board.
	50 R	Rainy Lake Watershed - Emergency conditions in Rainy and Namakan Lakes. Special jurisdiction under Convention of 1928.	Completed. Issued and subsequently modified Orders specifying rule curves. Active board. See Docket 20.

	Docket No.	Title	Action
1944	51 R	Columbia River	Completed. Led to Columbia River Treaty.
	52 A	Ontario & Minnesota Pulp & Paper Co. Ash Rapids Dam in Lake of the Woods	Approved but not built. Lake of the Woods Board of Control to supervise.
1946	53 R	Sage Creek Appropriation of waters	Completed. No action by Governments.
	54 R	Pollution of St. Clair River, Lake St. Clair and Detroit River and St. Mary's River	Completed. Surveillance over water quality until Great Lakes Water Quality Agreement signed in 1972.
1948	55 R	Pollution of Niagara River	Completed. Surveillance until Great Lakes Water Quality Agreement signed in 1972.
	56 R	Northern States Power Co. Number assigned in error	Was dealt with under Docket 41.
	57 R	Waterton & Belly Rivers Further uses and apportionment of waters	Studies completed. IJC divided on national lines. Only Canadians reported.
	58 R	Souris & Red Rivers Further uses and apportionment of waters.	Completed. Board still reports on its umbrella activities.
	59 A	West Kootenay Power Co., Ltd. Additional two feet of storage on Kootenay Lake	Approved for four years.Board active.
	60 R	Passamaquoddy Tidal Power	Completed. Government accepted Apportionment of costs of further studies.
1949	61 R	Air Pollution in Windsor-Detroit area from vessels	Completed. Surveillance activities terminated in 1966.
1950	62 A	Creston Reclamation Co., Ltd. Levels of Duck Lake	Approved. Board active.
	63 R	St. John River Water resources of the basin above Grand Falls	Completed.
	64 R	Niagara Falls - Preservation and enhancement of their beauty	Completed and accepted by Governments. Active Board.
1951	65 A	Libby Dam and Reservoir	Withdrawn.
	66 A	Consolidated Mining & Smelting Co. Waneta Dam on Pend'Oreille River	Approved. No board.
1952	67 R	Lake ontaro Levels	Completed. Studies concurrent with Application under Docket 68.
	68 A	St. Lawrence Power	Approved. Very active board.
1954	69 A	Libby Dam and Reservoir	No decision. Problem solved by Columbia River Treaty.
	70 A	Creston Reclamation Co., ltd. Modification of 1950 Order on Duck Lake	Approved. Board active.
1955	71 R	St. Croix River Use, conservation and regulation	Completed. Pollution aspect still under active surveillance.

	Docket No.	Title	Action
1956	72 R	Passamaquoddy Tidal Power	Completed.
1959	73 R	Rainy River and Lake of the Woods Pollution	Completed. Rainy River still under active surveillance.
1961	74 R	Additional Remedial Works above Niagara Falls	Completed. Studies led to application under Docket 75.
	75 A	Hepco and Pasny Remedial Works above Niagara Falls	Approved. Active board.
1962	76 R	Pembina River Cooperative development of water resources	Completed. Recommendations not acted upon.
	77 R	Champlain Waterway Commercial navigation	Completed. Negative report.
1963	78 A	Power Authority State of New York Shoal Removal. Niagara Falls	Approved. Active board.
1964	79 A	Lake Erie - Niagara River Ice Boom	Approved. Active board.
	80 A	Vanceboro Dam	Approved. Active board.
	81 R	Red River Pollution	Completed. Active surveillance.
	82 R	Great Lakes Levels	Completed. Governments acted on recommendations.
	83 R	Pollution of Lower Great Lakes	Completed. Led to signing of Great Lakes Water Quality Agreement in 1972.
1966	84 A	Cominco Two feet additional storage on Kootenay Lake	Approved for one season. Board active.
	85 R	Air Pollution In Detroit-St. Clair River areas	Completed. General Central observation along rest of boundary by the International Air Pollution Advisory Board.
1967	86 R	American Falls, Niagara River	Completed. Governments yet to Act.
	87 A	Forest City Dam On St. Croix River	Approved. Order void because applicant did not agree to conditions.
1968	88 A	Raisin River Diversion from St. Lawrence River	Approved. Board active.
1969	89 A	Metropolitan Corporation of Greater Winnipeg Diversion from Shoal Lake of water for domestic purposes	IJC Action deferred at applicant's request.
	90 A	Creston Valley Wildlife Management Area Duck Lake Levels	Approved. Active board.
1971	91 R	Skagit River Environmental consequences of flooding	Completed.
	92 R	Point Roberts Social problems of residents	IJC work under the Reference officially terminated in 1977.
	93 A	Cominco Kootenay lake Storage	Withdrawn.

	Docket No.	Title	Action
1972	94 R	Pollution of Upper Great Lakes	Studies completed. Commission reported to Governments.
	95 R	Pollution of Great Lakes from Land Use Activities	Studies completed. Commission reported to Governments.
	96 R	St. John River Water Quality A CCMS Project	Completed. Commission reported to Governments in 1977.
1973	97 A	U.S. Dept. of State Emergency Regulation of Lake Superior	Application in suspense. Dealt with on interim emergency basis pending Governments' confirmation
	98 R	Richelieu-Champlain Regulation	Board studies completed. Commission preparing to report to Governments.
1975	99 R	Air Quality	Commission reports annually to Governments on Michigan-Ontario Air Pollution.
	100 A	Toussaint-Causeway	Application approved.
	101 R	Garrison Diversion Project	Board studies completed. Commission reported to Governments.
1976	102 A	Flood Control Works Richelieu River	Consideration deferred. Awaiting action under Docket 98.
1977	103 R	Lake Erie Regulation	Studies underway.
	104 R	Great Lakes Diversions and Consumptive Uses	Studies underway.
	105 R	Great Lakes Technical Information Network	Board established.
	106 R	Great Lakes Levels Advisory Board	Studies underway.
	107 R	Poplar River Water Quality	Board studies completed. Commission preparing report to Governments.

APPENDIX 3

FISCAL SUPPORT DATA

Fiscal Year	U.S. Secretariat WASHINGTON Expenditures[2]	Man Years	Great Lakes Regional Office WINDSOR Expenditures[2]	Man Years
1971	128,500	4		
1972	166,000	5		
1973	256,500	8	22,000	.4
1974	314,000	9	152,000	2
1975	369,000	9	400,000	4.2
1976	476,000	9	674,200	11
1977	429,000	9	711,000	10
1978	518,000	10	746,000	10
1979*	746,000	15	883,000	10
1980**	1,399,000	15	884,000	10

Fiscal Year	Canadian Secretariat OTTAWA Expenditures[2]	Man Years	Great Lakes Regional Office WINDSOR Expenditures[2]	Man Years
1971-72	536,000	11		
1972-73	451,000	12		4
1973-74	504,000	14	206,000	8
1974-75	873,500	20	598,500	20
1975-76	1,230,000	21	742,000	23
1976-77[1]	1,183,000	23	924,000	23
1977-78[1]	1,022,000	24	1,070,000	23
1978-79	738,000	24	1,191,000	23
1979-80**	916,000	23	1,162,000	22
1980-81	954,000	23	1,247,000	22

* Estimated
** Anticipated

[1] This includes payments to the Government of Ontaro for one-half the costs of the work carried out by Ontario in direct support of the Commission's Land Use Activities Reference and the Upper Lakes Pollution Reference. United States costs for these studies are borne by the Environmental Protection Agency.

[2] The costs of the Regional Office at Windsor, staffed by Canadian and United States Public Servants, are shared equally between Canada and the United States except for capital items (furniture and furnishings) which are paid for and retained by Canada. Each Country pays and recruits its own officials. The figures above represent salaries of Canadian professional and support staff and the total operating costs which are initially paid from Canadian appropriations and then are shared by the United States equally.

Differences indicated by Regional Office totals are caused by differing fiscal years between Canada and the United States.

Fiscal Year 1976 was a 15-month Fiscal year covering the period July 1, 1975 to September 30, 1976. FY 77 begins the new US fiscal year which now begins October 1 and ends September 30.

Canadian expenditures expressed in Canadian dollars; U.S. expenditures in U.S. dollars.

APPENDIX 4

IJC DOCUMENTS 1978 - 1979

IJC Reports to Governments

IJC Annual Report 1977
Fifth Annual Report on Great Lakes Water Quality 1978
Sixth Annual Report on Great Lakes Water Quality 1979
Water Quality of the Upper Great Lakes 1979
Second Annual Report on Michigan-Ontario Air Pollution 1978
Third Annual Report on Michigan-Ontario Air Pollution 1979
Water Apportionment in the Poplar River Basin 1978
Interim Report on Poplar River Water Quality Reference 1979

Board Reports to IJC

Poplar River Water Quality Study and Appendices 1979
Chambly Canal Flow Diversion Test 1979
Regulation of Lake Champlain and the Upper Richelieu River
Supplemental Report on Regulation of Lake Champlain and Appendices 1978

Great Lakes Water Quality Reports

Environmental Management Strategy for the Great Lakes System (PLUARG) and appendices 1978
Great Lakes Water Quality Board Sixth and Seventh Annual Reports 1978-1979
Great Lakes Research Advisory Board Annual Report 1978
Great Lakes Science Advisory Board Annual Report 1979

* A list of additional reports on the Great Lakes is available from the IJC Regional Office in Windsor, Ontario

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K1P 5M1

United States Section

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Suite 203,
Washington, D.C.
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Regional Office

100 Ouellette Avenue,
8th Floor,
Windsor, Ontario.
N9A 6T3

All IJC reports are available at the Commission offices in Ottawa and Washington. Great lakes water quality reports are also available at the Great Lakes Regional Office in Windsor, Ontario.

APPENDIX 5

IJC INTERNATIONAL BOARDS

	Board Appearance at IJC Executive Meetings	Reports	
		Frequency	When
Boards of Control			
St. Lawrence River (4)z*	Yes	Semi-	Apr-Oct
Niagara River (2)	Yes	Semi-	Apr-Oct
Lake Superior (1)**	Yes	Annual	Apr
St. Croix River (1)	No	Annual	Apr
Prairie Portage (1)	No	Annual	Apr
Rainy Lake (1)*	As Rq	Annual	Apr
Lake of the Woods (1)*(x)	No	Annual	Apr
Souris River (1)	No	Annual	Apr
St. Mary-Milk Rivers (1)	No	Annual	Apr
Kootenay Lake (2)*	No	Annual	Apr
Columbia River (1)	No	Annual	Apr
Osoyoos River (2)	No	Annual	Apr
Skagit River (1)	No	Annual	Apr
Champlain (1) yy	No	Annual	Apr
Pollution Advisory Boards			
St. Croix River Pollution (3)	As Rq	Semi-	Apr-Oct
Rainy River Pollution (2)	As Rq	Semi-	Apr-Oct
Red River Pollution (2)	As Rq	Semi-	Apr-Oct
Air Pollution-Boundary (3)	Yes	Semi-	Apr-Oct
Great Lakes Water Quality Agreement			
Great Lakes Water Quality (9)	Yes	Semi-	Apr-Oct
Great Lakes Research Adv (8)	Yes	Semi-	Apr-Oct
Upper Lakes Pollution (8)	Yes	Semi-	Apr-Oct
Land Use Activities (9)	Yes	Annual	Apr
Working Group on Dredging (7) yyy	Yes		
Investigative-Engineering Boards			
Champlain-Richelieu (5)	Yes	Monthly	
Souris and Red Rivers (3)	No	Annual	Oct.
Michigan/Ontario Air Pollution (3)	Yes	Semi-	Apr-Oct.
Lake Erie Regulation (4)	Yes	Semi-	Apr-Oct
Great Lakes Diversions and Consumptive Uses (5)	Yes	Semi-	Apr-Oct
Poplar Water Quality (4)	Yes	Semi-	Apr-Oct
Tech. Info. Network	Yes	Semi-	Apr-Oct
Great Lakes Levels Advisory Board	Yes	Semi-	Apr-Oct

NOTES: * Regulation Data Submitted weekly. ** Regulation Data Submitted monthly. yy Inactive. yyy Not reporting directly. (x) Strictly not an IJC Board since created by Convention and appointed by Governments. (xx) Created by both Governments but reporting to IJC. (z) Indicates number of Canadian and American Board members. (As Rq) as required.

APPENDIX 6

DIRECTORY OF COMMISSIONERS AND STAFF PRINCIPALS 1978-79

Canadian Section

100 Metcalfe Street, 18th Floor,
Ottawa, Ontario K1P 5M1

Telephone: (613) 992-0204

COMMISSIONERS

Stuart M. Hodgson, Chairman
Bernard Beaupré
Jean R. Roy
Maxwell Cohen, Q.C.*
Keith Henry**

STAFF

Richard H. Millest, Assistant to the Chairman
David G. Chance, Secretary to the Canadian Section
Samuel Wex, Legal Advisor
Murray W. Thompson, Chief Engineer
Walter A. Sargent, Information Officer
Andrew L. Hamilton, Senior Environmental Advisor
Geoffrey Thornburn, Economist
Murray Clamen, Assistant Chief Engineer
Rudy Koop, Research Officer
Craig T. Ferguson, Assistant Secretary

United States Section

1717 "H" Street, N.W., Suite 203,
Washington, D.C. 20440

Telephone: (202) 296-2142

COMMISSIONERS

Robert J. Sugarman, Chairman
Charles R. Ross
Jean L. Hennessey
Kenneth A. Curtis***
Henry Smith III****
Victor Smith*****

* Left April 1979
** Left September, 1978
*** Named U.S. Ambassador to Canada in September 1979
**** Left April 1978
***** Left May, 1978

STAFF

David A. LaRoche, Secretary to the United States Section
James G. Chandler, Legal Advisor
Stewart H. Fonda, Engineer Advisor
Michael Scanlon, Public Information Officer
Walter Rast, Jr., Environmental Advisor
Julie E. Benezet, Legal Assistant
Louise L. Cox, Administrative Officer

REGIONAL OFFICE
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Windsor, Ontario N9A 6T3

Telephone: (313) 963-9041

STAFF

Kenneth A. Oakley, Director
Kenneth H. Walker, Deputy Director
Patricia A. Bonner, Information Officer

For additional information write:

International Joint Commission
U.S. Section
1717 "H" Street, N.W.
Washington, D.C. 20440
STOP 86

International Joint Commission
Canadian Section
100 Metcalfe Street, 18th Floor
Ottawa, Ontario K1P 5M1

INTERNATIONAL JOINT COMMISSION REFERENCES AND APPLICATIONS

SCALE IN MILES

50 0 50 100 150 200

SCALE IN KILOMETRES

50 0 50 100 150 200 250 300

SEPTEMBER 1973

CANADIAN SECRETARIAT I.J.C. OTTAWA

ACTIVE DOCKETS

Boards of Control ○

Pollution Surveillance ○

Investigative Boards ○

KOOTENAY RIVER

27,28,43 West Kootenay Power and Light Co. Ltd. Applications
46,47,59
65,89 Libby Dam Applications
23,42,48 Canron Reclamation Co. Ltd. Applications
62,70
29,30 Kootenay Valley Power and Development Co. Applications
34 P.C. Bruner Application
84 Cominco Ltd. Application
(93) Duck Lake Application
83 Cominco Ltd.

RAINY RIVER-LAKE OF THE WOODS

1 Rainy River Improvement Co. Application
2 Nornous Island Boom Co. Application
(3) Lake of the Woods Levels
7 Greater Winnipeg Water District Application
12 International Lumber Co. Application
20 Rainy Lake Levels
26 Rainy River Drainage
36 E.B. Eyrum Application
(50) United States Forest Service Application
(50) Rainy Lake Watersheds-Emergency Conditions
62 Ontario and Minnesota Pulpwood Paper Co. App.
89 Metropolitan Winnipeg Application

POLLUTION REFERENCES

4 Boundary Waters
25 Trail Smelter Fumes
54,55 Connecting Channels of the Great Lakes
61 Air Pollution of Windsor-Detroit Area
(71) St. Croix River
(73) Rainy River and Lake of the Woods
(80) Red River
83 International Section, St. Lawrence River and Lakes Ontario, Erie
(85) Air Pollution Windsor/Detroit, Sarnia/Port Huron
(94) Upper Great Lakes
(95) Land use activities in Great Lakes System
(96) Saint John River
(98) Air Quality Detroit/Windsor, Port Huron/Sarnia
(107) Poplar River Water Quality
(200) Great Lakes Water Quality Agreement

COLUMBIA AND SKAGIT RIVERS

(44) Grand Coulee Dam and Reservoir Application
(46) City of Seattle Application
(48) State of Washington Application
51 Columbia River
66 Consolidated Mining and Smelting Co. Application
91 Skagit Environment

92 Point Roberts

MID-WESTERN

(9) St. Mary and Milk Rivers
(16) Montana Conservation Board Application
(19) Souris River
(52) Tongue Creek
55 Northern States Power Co. Application
57 Waterton and Belly Rivers
(58) Souris and Red Rivers
76 Pembina River
101 Garrison Diversion Unit

GREAT LAKES BASIN

5 Livingston Channel Detroit River
(6) Michigan Northern Power Co. Application
(15) Algoma Steel Corporation Ltd. Application
13 St. Clair River Channel Application
97 U.S. Government Application-Emergency Regulation of Lake Superior

21 Buffalo and Fort Erie Public Bridge Co. Application
64 Preservation and Enhancement of Niagara Falls
74 Niagara Additional Remedial Works
(75) Niagara Remedial Works — NEPCO
76 Shoal Removal Niagara River — B. PASNY
(79) Niagara Ice Boom — Applications
(80) Preservation and Enhancement of Niagara Falls
(104) Great Lakes Diversions and Consumptive Uses
(106) Great Lakes Technical Information Network
(106) Great Lakes Levels Advisory Board

14 New York and Ontario Power Co. Application
15,24 St. Lawrence River Power Co. Applications
17 St. Lawrence River Navigation and Power
67 Lake Ontario Levels
(68) St. Lawrence Power Application
(82) Water Levels of the Great Lakes
(88) Raisin River Application
(100) Toussaint Causeway
(105) Lake Erie Regulation

RICHELIEU RIVER

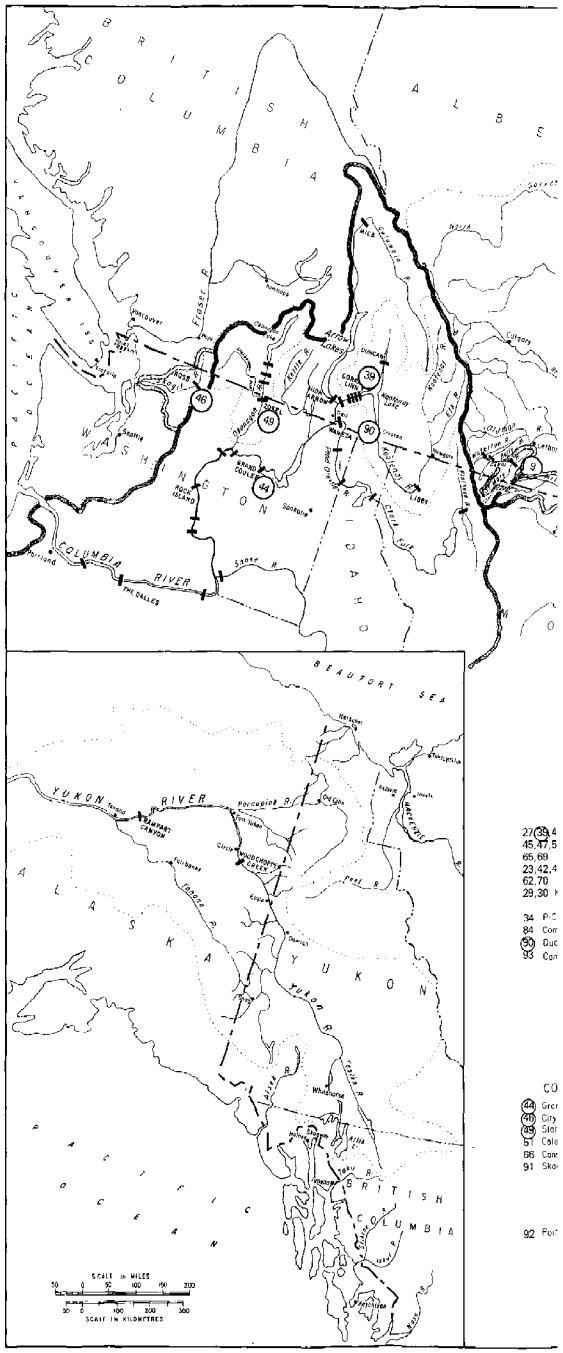
37,77 Champlain Waterway
(38) Richelieu River Remedial Works Application
(88) Richelieu-Champlain Regulation
(102) Flood Control Works Richelieu River

ST. CROIX RIVER

10,11,(28) St. Croix Water Power Co. and Saroque Gas Manufacturing Co. Applications
18,(32) Canadian Cottons Ltd. Applications
18 State of Maine Application
71 St. Croix River Water Resources
(89) St. Croix Paper Co. Application
87 Forest City Application

SAINT JOHN RIVER

19 New Brunswick Electric Power Commission Application
22 Saint John River Power Co. Application
31 Magaguadavic Co. Application
33 Jean Larrivee Application
60,72 Passamaquoddy Tidal Power
63 Saint John River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ALBE
WASHINGTON
IDAHO
COLUMBIA RIVER
Vancouver
Portland
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Dry Coulee
Duncan
Kootenay Lake
Nelson
Trail
Cranbrook
Kimberley
Fernie
Calgary
Lethbridge
Libby
Kalispell
Missoula
Fraser R.
Kootenay R.
Columbia R.
Snake R.
Pend Oreille R.
Flathead R.
Clark Fork R.
Bitterroot R.
Kootenay Lake
Pend Oreille Lake
Flathead Lake
Dry Falls Dam
Grand Coulee Dam
Chief Joseph Dam
Libby Dam
Kootenay Canal
Okanogan Canal
Columbia Canal
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