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The Canada Water Act

Annual Report

1978–1979

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Minister
Environment Canada

Ministre
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Ottawa, Canada
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His Excellency
The Right Honourable Edward Schreyer
Governor General and Commander-in-Chief of Canada

May it Please Your Excellency:

I have the honour herewith, for the information of Your Excellency and the Parliament of Canada, to present the Annual Report on the Canada Water Act for the fiscal year ended March 31, 1979.

Respectfully submitted

John Fraser

Deputy Minister
Environment Canada

Sous-ministre
Environnement Canada

Ottawa, Canada
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The Honourable John Fraser
Minister of the Environment
Ottawa, Canada

Sir:

I have the honour to submit the Annual Report on the Canada Water Act for the fiscal year ended March 31, 1979.

Respectfully submitted,

J.B. Seaborn

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INTRODUCTION

The Canada Water Act, proclaimed on September 30, 1970, provides the framework for joint federal-provincial management of Canada's Water resources. Section 36 of the Act requires that a report on operations under the Act be laid before Parliament as soon as possible after the end of each fiscal year. This, the seventh annual report, covers operations to March 31, 1979.

The report first highlights the provisions of the Canada Water Act and then briefly discusses the individual programs which have been or are expected to be undertaken to meet those provisions.

The Flood Damage Reduction Program is outlined in more detail, with Tables 2 and 3 showing federal-provincial agreements and public information activities respectively. A "special events" section completes a description of the recent drought in western Canada, the early aspects of which were discussed in the 1977-1978 report.

PROVISIONS OF THE CANADA WATER ACT

Part I of the Act provides for the establishment of federal-provincial consultative arrangements for water resource matters (Section 3); and for cooperative agreements with the provinces for the development and implementation of plans for the management of water resources (Sections 4 - 7). This part also enables the Minister, directly, or in cooperation with any provincial government, institution, or person, to conduct research, collect data, and establish inventories associated with the water resources.

Part II envisages federal-provincial agreements where water quality has become a matter of urgent national concern. This part permits the establishment of joint federal-provincial incorporated agencies (although existing federal and provincial corporations might alternatively be used) to plan and implement approved water quality management programs.

Part III of the Act provides for the passing of regulations banning the manufacture or import for use or sale in Canada of any cleaning agent or water conditioner that contains a prescribed nutrient in a greater concentration than that prescribed by regulations. By providing for regulations to control phosphates in detergents, the Act provides one of the principal means of reducing the rate of eutrophication of water bodies.

Under Part IV are provisions for the general administration of the Act. In addition, it provides for inspection and enforcement, and permits the Minister, either directly or in cooperation with any government, institution, or person, to undertake public information programs.

ACTIVITIES UNDER THE CANADA WATER ACT

PART I: Comprehensive Water Resource Management

Federal-Provincial Consultative Committees

To overcome the difficulties created by shared jurisdictional responsibilities for water resource planning and management in Canada, the Canada Water Act provides for the establishment of formal federal-provincial consultative arrangements on water resource matters. Specifically, these arrangements are met through federal-provincial consultative committees which are to maintain continuing consultation on water resource matters and to provide advice on priorities for research, planning, conservation, development, and utilization; and to both advise on the formulation of, and facilitate the coordination and implementation of, water policies and programs.

On April 28, 1978, implementation of the Souris River Board's study recommendations was considered at a joint meeting of the Canada-Manitoba and Canada-Saskatchewan committees; on March 6, 1979, the Canada-Saskatchewan committee met for follow up discussions on Souris River implementation and to consider the Lower Saskatchewan Basin Task Force report and proposed studies in the Cumberland Delta.

Interdepartmental Committee on Water

The Interdepartmental Committee on Water (ICW) was established before the Canada Water Act was passed to allow for interdepartmental consideration and approval of all federal water programs. Since then, ICW has actively pursued its mandate.

A total of 18 departments and agencies with an interest in water matters, are represented on this 25-man committee. Subcommittees and Working Groups are set up as required. During the year under review, there were three such groups:

1) Subcommittee on the Great Lakes Water Quality Agreement
2) Subcommittee on Water Quality
3) Subcommittee on Floods

Topics considered over the past year included: the Canada-United States Great Lakes Water Quality Agreement; implementation of the recommendations arising out of the Saint John River Basin Study; transferral of ownership of the compensatory works at Sault Ste. Marie; DREE's Subsidiary Agreements on Water for Manitoba and Saskatchewan; proposed specific water quality objectives for the Souris, Red and Roseau rivers at the International Boundary; a Canada-Quebec Agreement for the North Shore (St. Lawrence) Ecological Inventories Program; a Waterford River Basin Urban Hydrology Study Plan; wild rivers; a Yukon River basin pre-planning study; a Thompson River basin pre-planning study; a Canada-Manitoba Subsidiary Agreement on Value Added Crop Production; the Richelieu-Chambly Canal; containerized export of water; and St. Lawrence River Water Quality Study recommendations.

Federal-Provincial Agreements

Agreement for specific water programs provide for the participating governments to contribute funding, information, and expertise in agreed ratios. It is

usual for the federal government to meet half the costs for study and planning agreements and the provincial government(s) the other half. Cost sharing for implementation is in proportion to federal and provincial responsibilities.

Progress in Water Planning and Management Programs

Table 1 shows a breakdown of current cost-shared agreements and other cooperative arrangements under the Canada Water Act and indicates the stage each has reached. Each of the programs is referred to briefly in the following and described in greater detail later in this report.

Implementation Programs: The five programs continuing from 1977-1978 represented the principal implementation activities during 1978-1979.

Construction programs designed to reduce damages due to floods in the lower Fraser Valley of British Columbia and in southwestern Ontario were continued. In the Fraser Valley dyking program, $66 million of a total joint commitment of $120 million has been spent by Canada and British Columbia up to the end of March 1979. The Southwestern Ontario Dyking Program was scheduled to expire in March 1977 but it received an extension in terms of both funds and time to March 1978, and was granted a further one year extension to March 31, 1979 to complete essential work.

The Qu'Appelle and Okanagan Implementation Programs were ongoing during the year to implement recommendations arising from comprehensive basin studies. For the Canada-Saskatchewan Qu'Appelle Implementation Program, scheduled to run from 1975 until March 1984, projects essentially completed include flood control works for Regina, Lumsden, Tantallon and Moose Jaw and Phase I of the Regina tertiary sewage treatment plant. For the Canada-British Columbia Okanagan Implementation Program, emphasis has been directed towards improvements to the Okanagan Flood Control Channel, continuation of the water quality monitoring program initiated in 1976-1977, and implementation of a number of water-based recreation projects.

The Canada-Ontario Agreement on Great Lakes Water Quality, as revised in January 1976, was continued in support of the Canada-United States Agreement on Great Lakes Water Quality. Provision for completion of research efforts initiated under the prior agreement were continued under this latest agreement, cost-sharing of surveillance activities was augmented and the scope of surveillance was extended to include the upper Great Lakes. This Agreement provides for commitments by Ontario and the federal government to carry out the programs needed to meet the terms of the international agreement. However, during the past year, additional commitments were undertaken by Canada in a new Canada-United States Agreement on Great Lakes Water Quality and negotiations were initiated with Ontario on a revision of the 1976 Canada-Ontario Agreement to reflect these additional commitments.

Table 1 Status of Principal Implementation Agreements, Planning Studies, Flood Damage Reduction Programs and Other Cooperative Arrangements Under the Canada Water Act

IMPLEMENTATION AGREEMENTS

Under Negotiation	New during 1978-79	Ongoing during 1978-79	Completed
Souris basin Lake Winnipeg, Churchill and Nelson Rivers	Saint John basin (being implemented under regular programs)	Lower Fraser Valley Flood Control Program Southwestern Ontario Dyking Okanagan basin Qu'Appelle basin Canada-Ontario Agreement on Great Lakes Water Quality	Peace-Athabasca delta (1976) Metropolitan Toronto(CWCAA)*(1978) Upper Thames (CWCAA)*(1979)

PLANNING STUDIES

Under Negotiation	New during 1978-79	Ongoing during 1978-79	Completed
Fraser Estuary	Lake Winnipeg Water Quality** Mackenzie River basin English-Wabigoon Mercury Contamination	Planning Committee on Ottawa River Regulation Shubenacadie - Stewiacke basin	Peace-Athabasca delta (1972) Qu'Appelle basin (1972) Saskatchewan-Nelson basin (1973) Okanagan basin (1974) Saint John basin (1975) Lake Winnipeg, Churchill, and Nelson Rivers (1975) Fraser River Upstream Storage (1976) Flow Regulation-Montreal Region (1976) Churchill River (Sask.-Man. 1976) Northern Ontario Water Resources (1978) St. Lawrence River Water Quality (1978) Souris basin (1978)

FLOOD DAMAGE REDUCTION PROGRAMS

Under Negotiation	New during 1978-79	Ongoing during 1978-79	Completed
Programs with Alberta, British Columbia, Yukon Territory and Northwest Territories, and Newfoundland	Program with Nova Scotia Southeastern New Brunswick Dyking	Programs with New Brunswick, Quebec, Manitoba, Saskatchewan and Ontario Memorandum of Understanding on Flood Risk Mapping, NWT Flood Management - Marsh Creek, N.B. Dykes and Flow Regulation Works, Montreal Region New Brunswick Flood Forecasting	Southeastern New Brunswick Dyking (1978)

OTHER COOPERATIVE ARRANGEMENTS

Under Negotiation	New during 1978-79	Ongoing during 1978-79	Completed
Thompson River basin (pre-planning)	Yukon River basin (pre-planning) North Shore (St. Lawrence) Ecological Inventories Program Technical Working Group on Water Quality in the Ottawa River	Prairie Provinces Master Agreement on Apportionment Water Quantity Survey Agreements Follow-up Programs, Canada-Ontario Great Lakes Shore Damage Survey Winter River basin (pre-planning) Water Quality Monitoring, Garrison Diversion Project	Canada-Ontario Great Lakes Shore Damage Survey (1975) Lower Saskatchewan Basin Task Force (pre-planning) 1979

* negotiated under the Canada Water Conservation Assistance Act

** deferred for the present

Implementation arrangements for the Saint John River basin have been under consideration for some time. A federal-provincial task force has reviewed the recommendations of the Saint John River Basin Board and has reported that the planning recommendations can be met through regular programs and that no formal implementation agreement will be required.

Implementation of portions of the Souris River basin study recommendations were being negotiated under the DREE Subsidiary Agreements on Water, and under the Canada-Manitoba Flood Damage Reduction Agreement.

Canada, Manitoba, Manitoba Hydro and the Northern Subcommittee signed an agreement in 1977-1978 that commits Canada and Manitoba to joint action for a Canada-Manitoba Lake Winnipeg, Churchill and Nelson Rivers Implementation Program and calls for annual reporting to northern communities on progress made. Discussions continued with Manitoba to develop a joint monitoring program.

Planning Studies: There were several important planning events during 1978-1979 including the release of final reports for both the Souris River Basin Study and the St. Lawrence River Water Quality Study and the commencement of the Mackenzie River Basin Study.

A Memorandum of Understanding, which formalizes intergovernmental cooperation in the Mackenzie River basin was signed in September 1977 by seven ministers representing Canada, Alberta, British Columbia and Saskatchewan. A three-year Study Agreement Respecting Federal-Provincial Studies and Investigations of the Water Resources of the Mackenzie Basin was signed by May 1978 and this $1,600,000 study program was active for much of the year.

Planning studies designed to develop framework plans for the management of the water and water-related resources in the Souris River basin and in the Shubenacadie-Stewiacke River basin have been ongoing since 1974 and 1977 respectively. The Souris River basin study was brought to a close and the final report was released jointly by Canada, Saskatchewan and Manitoba on August 25, 1978. All background studies for the Canada-Nova Scotia Shubenacadie-Stewiacke Agreement were completed and the final report was under preparation. The Shubenacadie study was originally scheduled for completion by January 1979 but an extension to June 1979 became necessary.

A study to prepare a comprehensive water quality plan for the St. Lawrence River from the end of the international section near Cornwall down to the Gulf of St. Lawrence was completed in March 1978 and the main report was published in June 1978.

In northwestern Ontario, preliminary field surveys were begun to evaluate methods to reduce high mercury levels in the English-Wabigoon rivers system. This program is focusing on ways in which mercury travels, or is deposited and retained within the river system, as well as methods to reduce the absorption of mercury by fish and other water life.

An arrangement between Canada and Manitoba to carry out a water quality study of the Lake Winnipeg basin was signed on September 15, 1977. However, this study has been

deferred by mutual agreement due to financial constraints and Manitoba's wish to re-evaluate the study program.

Negotiations were nearing completion for a joint Canada-British Columbia comprehensive planning study of the Fraser Estuary, including the definition of appropriate shoreline development, and water quality management.

A Canada-Ontario-Quebec Ottawa River Regulation Planning Committee first met in February 1977 to recommend criteria for regulating the Ottawa River, taking into account hydro production, flood protection, navigation, low water problems, water quality needs and recreation. This ad hoc committee continued its work on flow forecasting and regulation and is expected to release its recommendations in 1979.

Flood Damage Reduction Program: During 1978-1979, this program was actively supported throughout most of Canada.

OBJECTIVE: The Flood Damage Reduction Program follows the cooperative federal-provincial approach of the Canada Water Act. Its first aim is to reduce flood damages by identifying flood risk areas and discouraging further flood vulnerable developments in those areas. A General Agreement with each province outlines the basic approach to reducing potential flood damage and a Flood Risk Mapping Agreement identifies areas to be mapped and permits joint funding of the mapping program. Subsequent agreements with provinces can provide flood protection at existing developments in floodplains, flood forecasting, etc.

Under the General Agreements, the respective governments commit themselves to carry out a flood risk mapping program whereby lands subject to flooding would be clearly defined and to restrict government undertakings and programs on lands subject to flooding. The governments agree not to engage in or provide assistance to undertakings in areas designated as flood risk areas. Federal disaster assistance will also be restricted in designated flood risk areas. Only existing structures and, under certain circumstances, new structures which are flood-proofed, would be eligible for disaster assistance. Information linked with designated flood risk areas will be made available to governments, agencies, zoning authorities and the public. Zoning on the basis of flood risk will be encouraged.

Existing developments in designated areas will still require protection against flood damages and, for this reason, further agreements to study such problems can also be negotiated with the provinces. Where benefits exceed costs and where there is a national interest, federal-provincial agreements may subsequently be reached on implementation action. This action could include flood forecasting and warning, flood proofing, works to control flows and levels, acquisition of property, easements or land use planning. It should be noted that in examining alternatives the best choice will be made on the basis of effectiveness, cost, associated benefits and environmental impact. This could mean allowing some flooding to occur.

DURATION: 10 years (starting dates vary from province to province; earliest date is 1976).

PARTICIPANTS AND FUNDING: Canada and the provinces share the costs of reducing flood damages. (See Table 2).

RELATED AGREEMENTS: Several studies and implementation agreements dealing with flood prone areas in Canada were in force when the Flood Damage Reduction Program was launched. These include several agreements described elsewhere in this report under the titles: Lower Fraser Valley Flood Control Program; Southwestern Ontario Dyking; Canada Water Conservation Assistance Act; Qu'Appelle Storage Study; Canada-Ontario Great Lakes Shore Damage Survey.

REPORT ON PROGRESS

Headquarters: National public information activities for the Flood Damage Reduction Program are well underway. Television public service announcements, in French and English, have been prepared and distributed to stations across the country. In addition a national brochure, slide show, display, and briefing sessions by Department of the Environment (DOE) staff are being used to further promote the program.

A report on the use of flood-proofing to reduce flood damages has been completed under contract. A summary of the report, which is a state-of-the-art review of flood-proofing, has been published in the National Research Council's Building Digest series.

Nova Scotia: Nova Scotia became the sixth province to join the Flood Damage Reduction Program by signing general, mapping and studies agreements on June 22, 1978. A total of $600,000, to be shared equally by the federal and provincial governments, has been provided for the mapping of 12 areas. Studies will be carried out for two or more of these areas that have special flooding problems. Another $300,000 shared equally by the two governments has been provided for these studies. The communities of Truro and Bedford-Sackville are receiving top priority within the mapping program due to their severe flooding problems. In addition, work has been initiated on a regional frequency analysis for the province. Steering and Technical Committees have been appointed to implement the agreements.

New Brunswick: Work on flood risk mapping has been continuing in New Brunswick during 1978-79. Hydrotechnical work needed to establish the flood lines for the Fredericton and Perth-Andover series of maps has been completed. These maps will be finished in the near future and public relations maps will also be published. Work is underway on Maugerville-Sheffield-Lincoln, Sussex and Walker Brook flood risk maps.

Implementation of the flood forecasting agreement is proceeding. The Technical Committee for Flood Forecasting is directing the planning of activity required to improve the flood forecasts.

By the year end, under a federal-provincial-municipal flood management program for Marsh Creek, all retardation dams in the project were operational and channelization had been carried out where required. The purchase and conversion of foreshore areas to storage were the only major parts of the plan yet to be completed.

Table 2 Federal-Provincial Flood Damage Reduction Agreements

	Duration (years)		Total Cost* (dollars)	Number of Locations
New Brunswick				
General Agreement	10		-	-
Flood Risk Mapping Agreement	5		1 000 000	24
Studies Agreement	5		200 000	3
Flood Forecasting Agreement - Saint John River basin	5		600 000	-
Flood Damage Reduction - Marsh Creek	2.5		2 010 000(a)	-
Nova Scotia				
General Agreement	10		-	-
Flood Risk Mapping Agreement	5		600 000	12
Studies Agreement	5		300 000	2
Quebec				
Combined General and Flood Risk Mapping Agreement	10 (mapping 5)		5 000 000	183
Dykes and Flow Regulation Works - Montreal Region	3.5		10 000 000(b)	-
Ontario				
All Inclusive Flood Damage Reduction Agreement	11 (mapping 6)		1 200 000 8 000 000	**
Manitoba				
General Agreement	10		-	-
Flood Risk Mapping Agreement	5		700 000	45
Studies Agreement	5		310 000	14
Saskatchewan				
General Agreement	10		-	-
Flood Hazard Mapping and Studies Agreement	5	mapping	1 300 000	30
		studies	480 000	14
Northwest Territories				
Memorandum of Understanding	2		225 000(c)	Hay River

* These costs are to be shared equally by the federal and provincial goverments except for
(a) 33-1/3% federal, 66-2/3% provincial/local
(b) 45% federal, 55% provincial/local
(c) costs shared equally by Environment Canada and the Department of Indian and Northern Affairs

** This agreement applies to flood vulnerable sections of
streams and rivers under the jurisdiction of 38 Conservation Authorities,
10 rivers, 4 lake shorelines

As a result of storm damage in January 1978, dyke repairs were required in the Tantramar Marsh-Memramcook area of southeastern New Brunswick. Canada and New Brunswick completed these repairs on a cost-shared basis during the year. Total cost of the project was $160,000.

Quebec: Canada and Quebec entered into an Agreement Respecting Dykes and Flow Regulation Works in the Montreal Region, on October 4, 1976. In October 1977, both parties agreed to increase the funding required from $5 million to $10 million, and to extend the expiry date by two years to March 1980. By March 31, 1979, construction of dykes at Roxboro, Pierrefonds and Pointe-Calumet had been completed while dyking at Ste-Marthe-sur-le-lac was initiated. Studies were under way to add to the storage at Quinze reservoir and to provide a control structure on the Rivière des Mille Iles.

Flood risk mapping is well underway in Quebec. Twenty-two Montreal flood risk maps have been completed and released with an accompanying brochure as the basis for the first flood area designation under the FDR Program on May 11, 1978. Eight flood risk maps for the Chaudière River basin were officially designated on March 30, 1979. A brochure under preparation for the Gatineau and Ottawa rivers should be completed by summer 1979. The Richelieu and du Gouffre basins are scheduled to be mapped in the 1979-80 fiscal year.

Ontario: A Steering Committee and a Technical Subcommittee have been established to administer and implement the program in Ontario. Procedures for financial and technical review and for setting project priorities were finalized and approved. Pilot projects were identified to test and document difficulties in technical review of projects already done by the province. The four projects are Kam River, Little River, 20 Mile Creek, and Humber River. Also, a priority list of areas for mapping outside of the jurisdiction of Ontario's Conservation Authorities is being established.

Manitoba: The Manitoba flood risk mapping agreement has been officially amended to include Winnipeg as one of the localities to be mapped. Interim designation is planned for the area and the City of Winnipeg is considering a by-law which will complement the Flood Damage Reduction Program's approach. Work is continuing on the Elie, Melita, Souris and Wawanesa series of flood risk maps and designations are expected for some of these communities in the coming year. A public information brochure has been completed and is being distributed to describe the program in Manitoba. Plans to launch a comprehensive public information plan for the coming year have been completed. This will include the use of briefings, a display, a slide show, press releases and so on. Local councils, the public, developers and realtors in areas being mapped will be briefed before and after designations to ensure they are informed.

Saskatchewan: Work on flood risk mapping is continuing for Moose Jaw, Swift Current, Melfort, Weyburn, Eastend, Estevan, Roche Percee, Oxbow and Regina. Moose Jaw mapping is the most advanced to date and should be the first area to be designated in the province.

Table 3 Flood Damage Reduction Program Information

	Available from:
National	
National Brochure - Cutting Our Flood Losses Flood-Proofing: A Component of Flood Damage Reduction Appendix - A Portfolio of Canadian Case Studies (A state-of-the-art review of flood-proofing)	Inland Waters Directorate Environment Canada Ottawa, Ont., K1A 0E7
New Brunswick	
Fredericton (N.B.) Pilot Flood Risk Mapping Project - Flood hazard map - Northwest Sheet - Flood hazard map - Southeast Sheet	Inland Waters Directorate Environment Canada P.O. Box 365 Halifax, N.S., B3J 2P8
brochure - Flood Damage in Fredericton	Water Resources Branch Environment New Brunswick P.O. Box 6000 Fredericton, N.B., E3B 5H1
Quebec	
Montreal Brochure - Flood Damage Reduction Program (includes index map and information on how to obtain 22 Montreal Flood Risk Maps) Chaudière Basin - Eight flood risk maps, with brochure	Inland Waters Directorate Environment Canada 2700 Laurier Blvd. P.O. Box 10,000 Ste. Foy, Que., G1V 4H5
	Service de la Cartographie Ministère des Terres et Forêts 1995 Charest Blvd. West Quebec City, Que., G1N 4H9
Manitoba	
Manitoba Brochure - The Canada-Manitoba Flood Damage Reduction Program--a summary - Carman, Manitoba - Flood risk map - Carman Brochure	Inland Waters Directorate Environment Canada 1901 Victoria Ave. Regina, Sask., S4P 3R4
	Water Resources Division Manitoba Dept. of Mines, Resources and Environmental Management 1577 Dublin Ave. Winnipeg, Man., R3E 3J5
Saskatchewan	
Saskatchewan Brochure - The Canada-Saskatchewan Flood Damage Reduction Program Flooding in Moose Jaw, Saskatchewan (Flood risk map and text)	Inland Waters Directorate Environment Canada 1901 Victoria Ave. Regina, Sask., S4P 3R4
	Saskatchewan Dept. of Environment 1855 Victoria Ave. Regina, Sask., S4P 3V5

A Saskatchewan public information brochure has been completed and is being distributed. A comprehensive public information plan similar to Manitoba's is being contemplated for Saskatchewan for the coming year.

Alberta: Alberta has not joined the Flood Damage Reduction Program to date, but negotiations are taking place towards an agreement. At the end of the year Alberta officials were reviewing a draft agreement prepared by DOE staff.

British Columbia: Negotiations are continuing between provincial and federal officials towards a Flood Damage Reduction Program agreement. The province presently has a flood plain management program and the two governments are working to coordinate provincial policies with federal policies so they will complement each other.

Northwest Territories: Large scale flood risk mapping has been completed for Hay River under a Memorandum of Understanding between DOE and the Department of Indian and Northern Affairs (DINA). However, public information maps and designation will not occur until an agreement for the Northwest Territories has been signed and Steering and Technical Committees have been established to administer it. At present, formal Flood Damage Reduction agreements for the Northwest Territories have received Treasury Board and Privy Council approval and are awaiting the signatures of the Ministers and the Territorial Commissioner.

Yukon: Negotiations are underway to provide the Yukon with a Flood Damage Reduction agreement somewhat similar to NWT's. A two-man ad hoc Technical Committee, with representation from DOE and DINA, has been appointed to prepare schedules of areas requiring flood risk mapping.

Indian Lands: Negotiations between officials of DOE and DINA have resulted in a draft agreement for Indian Lands. The draft is presently under review. A small flood risk mapping project was completed in 1978-1979 on the Hay Lake Indian Reserve in north-western Alberta under a working arrangement between regional officials of DOE and DINA.

Other Cooperative Arrangements: This category includes programs, often of a long-term nature, which cannot be characterized entirely as implementation programs or planning studies. There were several new programs undertaken during 1978-1979 in this category.

Several pre-planning studies were either under negotiation or in various stages of completion across Canada to assess the need, and to prepare a study plan if appropriate, for subsequent cost-shared federal-provincial study agreements. One of these, a pre-planning study to identify water management concerns needing further study in the lower Saskatchewan River basin was completed by Canada, Saskatchewan and the Lower Saskatchewan Basin Association and the final report was released in January 1979; a pre-planning study for the Winter River (Prince Edward Island) also was completed and the findings of that study were under review; in Yukon Territory, a pre-planning study of the Yukon River basin in Canada was initiated while a similar study for the Thompson River basin in British Columbia was under negotiation.

Also initiated during the year was the Canada-Quebec ecological inventories program dealing with rivers flowing into the St. Lawrence River from its north shore. This

program, which covers rivers located to the east of the Manicouagan River basin up to and including the Brador River, is intended to facilitate future assessments of ecological impacts from major developments and is complemented by DREE supported studies of the Labrador portion of the river systems.

In the Ottawa River basin, a Canada-Ontario-Quebec Technical Working Group on Water Quality in the Ottawa River was set up to report on water quality of the Ottawa River, with emphasis on toxic materials, nutrients, and bacteriology.

The Prairie Provinces Water Board, a federal-provincial agency which administers the Prairie Provinces Master Agreement on Apportionment, continued to provide recommendations to Canada, Alberta, Saskatchewan, and Manitoba concerning the equitable apportionment of interprovincial prairie rivers flowing eastward. During the year, the Board's Committees had under consideration natural flow and streamflow forecasting, and were studying apportionment implications of westward flowing rivers, water quality objectives at the provincial boundaries and had begun a major study of historical and present water demands in the Saskatchewan basin.

The shared-cost Water Quantity Survey Agreements, implemented with all provinces and the Department of Indian and Northern Affairs for the territories, is an ongoing program subject to 18 months' written notice of termination by either party. Federal-Provincial Coordinating Committees established in each province and territory plan the hydrometric survey networks and determine the cost-sharing. A national meeting of all Coordinating Committees is convened each year to review annual progress reports and to discuss problems arising under the agreement.

On the Great Lakes, a Canada-Ontario Task Force continued to implement recommendations arising from the Canada-Ontario Great Lakes Shore Damage Survey. Programs for shoreline monitoring and public awareness over a five-year period were continued for the third year. Field work for a shoreline management study has been completed and all reports should be ready by March 1980 to provide guidelines and methodologies for evaluating the feasibility, costs and benefits of various shoreline management strategies for reducing future flooding and erosion damage.

Water quality monitoring related to the Garrison Diversion Project continued to provide baseline water quality conditions for the Souris River where it crosses the International Boundary in both Saskatchewan and Manitoba.

Activities Related to the Canada Water Act

Not to be overlooked in the review of operations under the Canada Water Act are various activities which provide indispensable background information for effective water planning and management.

Socio-Economic Studies: Within the philosophy of the Canada Water Act, there lies the responsibility to develop the socio-economic techniques necessary to carry out studies and to provide technical advice in support of water management in Canada. During the year, programs to collect essential background data on water uses in Canada were continued. Research continued on the use of non-structural techniques for the National

Flood Damage Reduction Program, for example, Flood Risk Mapping, and Flood-Proofing. The industrial water use database originally obtained by direct survey of establishments in 1972, was again updated by carrying out a national survey in 1978. The data collected provided essential information for two ongoing major projects: 1) the IJC study of Great Lakes Diversions and Consumptive Water Uses and 2) the Prairie Provinces Water Demand Study of the Prairie Provinces Water Board.

Water Research: Water quality research programs supported under the Canada Water Act address scientific problems of chemical and biological contaminants found in the aquatic environment by tracing sources, pathways, fates and impacts in such a way that the effects of these contaminants in different types of aquatic systems - lakes, reservoirs, rivers and coastal regimes - can be determined and understood. Research on snow and ice as well as surface and ground water hydrology was also conducted and sponsored. The identified Inland Waters Directorate priorities for research in the past year have included: dynamics of ground water flow with particular reference to distribution and migration of pollutants such as toxic chemicals and radioactive materials; control of aquatic weeds; the disposal of radioactive wastes and waste heat; problems related to drought in western Canada; the impact on water systems of long-range transport of air pollutants; and water management aspects of climatic variability. The university subvention program, conceived of as being an extension of the department's own research program, supports a small but effective research community at universities across Canada. In 1978-1979, fifty-five grants were made to twenty-four universities from the $1 million subventions program. In mid-year, the government announced general reductions in the budgets of its departments and agencies resulting in a reduction of the university subventions program funding to $250,000 in 1979-1980.

Water Data: Programs for the systematic collection and compilation of data on streamflow, water levels, sediment transport, ground water, water quality, and related information on glaciers, snow and ice predated the Canada Water Act but have continued to operate in support of water management basin studies and implementation programs. A relatively new innovation is the collection of background data on water use in Canada.

Data Management Systems: Numerous data and reference systems have been developed in support of water resource activities. WATDOC, the water resource document reference centre, gives direct access nationwide by computer terminal to a variety of water-related information bases through a publicly available on-line interactive storage and retrieval system. NAQUADAT, the national water quality monitoring program's data bank, was designed to store and retrieve chemical, physical, bacteriological, biological and hydrometric data relevant to water quality for surface waters, ground waters, wastewaters and sediments. STAR, a data storage and retrieval system, was developed to handle limnological data from Great Lakes monitoring cruises. WATENIS, the water effluent national information system, provides an inventory of industrial and municipal water pollution sources including data on physical, chemical, and toxicological characteristics

of effluents and information on water effluent regulations and guidelines. MUNDAT, a database covering municipal waterworks and wastewater systems from coast to coast, including data on federal facilities, was developed in close cooperation with the provincial governments and the Federation of Associations on the Canadian Environment (FACE). A Surface Water Data System has been developed to store and retrieve streamflow, water levels, and sediment transport information, and a Glacier Data and Information System has been designed to contain a compilation of physical dimensions of Canadian glaciers and a bibliography of Canadian glacier documents.

PART II: Water Quality Management

No water quality management areas, as defined under Part II of the Canada Water Act, have been set up. However, there are a number of implementation programs by federal-provincial agreements under the Act, where water quality management programs are being implemented. These include programs in the Great Lakes basin and in the Okanagan and Qu'Appelle basins. While these agreements do not provide for the establishment of water quality management agencies under Part II of the Act, they nevertheless have the same objectives of maintaining and improving water quality and are managed by joint federal-provincial Boards. The federal government, in concert with provincial governments, has recently completed the development of water quality management strategies, for the St. Lawrence River (Quebec), and the Souris River (Manitoba-Saskatchewan) and is in the process of preparing similar plans for the Shubenacadie-Stewiacke rivers (Nova Scotia). Also, an ad hoc Canada-Ontario-Quebec Technical Working Group was formed to report on the quality of the water in the Ottawa River, with emphasis on toxic materials, nutrients and bacteriology.

PART III: Regulating Nutrient Inputs

In the late 1960s, when phosphates from laundry detergents were identified as significant contributors to the over-enrichment of some Canadian water resources, the federal government launched its phosphorus concentration control program.

By 1970, regulations to control the amount of phosphorus in laundry detergents were written under the nutrient control provisions of the Canada Water Act. The initial regulations limited the maximum phosphorus content for laundry detergents to 8.7% elemental phosphorus by weight, or 20% as phosphorus pentoxide (P_2O_5) and an inspection program began under which product samples were collected from manufacturers and importers for government analysis. It is estimated that these first regulations resulted in a 22% reduction in the amount of phosphate discharged from all detergent sources (from 57,200,000 pounds to 44,000,000 pounds) per annum.

On January 1, 1973 the maximum permissible phosphorus content for laundry detergents was reduced to a maximum of 2.2% elemental phosphorus by weight, also expressed as 5% P_2O_5. This further limitation is estimated to have reduced the pre-regulation levels of detergent phosphates discharged by 80% (from 57,200,000 pounds to 11,000,000 pounds) per annum.

In 1973 a national network of regionally based Inspectors was formed to more efficiently ensure compliance with the regulations. This network has carried out a complete national round of sampling and analysis of imported and Canadian manufactured laundry detergents annually since then.

Over the years the number of detected violations has declined. Those occurring have generally been "technical" violations, resulting from a misunderstanding of some aspects of the regulations or improper mixing, formulation or clean-up procedures which result in the production of small batches of product which exceed the 2.2% limit by fractional amounts. To date, all such problems have been rectified without recourse to formal prosecution and it must be noted here that the largest manufacturers and importers of the nationally advertised laundry detergents which account for the bulk of the retail Canadian sales, have not been involved in these incidents.

As in past years, the 1978 round of sampling and analysis has been completed without major problems. Associated compliance, monitoring, liaison and information activities are continuing.

PART IV: Public Information Programs

While the number of announcements pertaining to water management programs increased during the year, the Flood Damage Reduction Program continued to be an important focus of information activities. The latter program has been designed to increase public awareness of the potential hazards of flood plain development and of the ways in which both the public and governments can deal with flood problems.

On August 25, the report of the Canada-Manitoba-Saskatchewan Souris River Study Board was made public. A brochure "Souris River Basin Study: Summary and Recommendations" prepared for distribution with the report, invited response with respect to the recommendations.

The release of the final report of the Canada-Quebec St. Lawrence River Water Quality Study was announced October 26.

A press kit was prepared and a press briefing conducted prior to the signing by Canada and the United States of the revised Great Lakes Water Quality Agreement on November 22.

Another Great Lakes study relates to shoreline flooding and erosion problems. A joint federal-provincial program was being conducted to make the public more aware of the problem. In this regard, a brochure "Shore Property Hazards" was prepared for distribution to the public. Also, the nature of the program, its aims and objectives, were widely publicized at the Toronto International Boat show in January 1979.

By March 1979, the third edition of the Canada Water Year Book on freshwater resources in Canada was released in both official languages. This edition, on the theme "water data", deals with the field, office and laboratory programs producing water data, and indicates why the information must be kept constantly up to date, relevant to current needs, and readily available.

At year's end, information staff and scientists alike were producing displays and related materials in preparation for an "open house" at the Canada Centre for Inland Waters at Burlington in April 1979.

A press release was issued June 22, 1978, announcing the signing of flood damage agreements by Nova Scotia and the federal government. Nova Scotia is the sixth province to participate in the federal-provincial flood damage reduction (FDR) program. The other provinces are New Brunswick, Quebec, Manitoba, Saskatchewan and Ontario.

Public service announcements describing the FDR program were provided to over 100 television stations across the country. A third of the stations responded to a questionnaire that examined projected use of the announcements. All of the stations agreed to concentrate use in the March to June period and about half intended to air the announcements at least once a day, probably in the morning or afternoon. A survey examining actual use will be conducted next year.

Requests for the booklet "Cutting our Flood Losses" referred to at the end of the announcements, exceeded 18,000 for the English version and 7,000 for the French version. The brochure contains histories of floods in Canada, questions and answers on the program, and a mail-in card for further information. About 150 cards were received, and the names of these respondents were forwarded to the appropriate regional offices for further response.

A display unit and slide show on the flood damage reduction program were completed. Speakers have used the slide show at meetings such as the Conference of Mayors and Municipal Officials to help them explain the program. The display units, available both at headquarters and in the regions, have been set up at a number of locations, including the Boat Show in Toronto and the National Museum of Science and Technology in Ottawa.

SPECIAL EVENTS

Drought in Western Canada

The 1977-1978 report contained a summary of weather conditions beginning in September 1976 that led to an eight month dry spell and drove streams, lakes, reservoirs and wells to dangerously low levels across all of the western provinces and extending into northwestern Ontario. In a turnaround in mid-1977, the agricultural drought was broken in most areas by abundant summer rains, but the problems of water supply shortages remained. As the spring runoff of 1978 began, dugouts and small reservoirs were generally replenished but there was no significant recovery of ground water and a continued water shortage was expected in many areas which experienced problems in 1977. As the year 1978 wore on, however, intense late summer and fall rains relieved virtually all the symptoms of the 1977 drought across the prairies. This ample precipitation, and ensuing snowfall during winter 1978-1979, led to good soil moisture conditions throughout most of the prairies. Some areas have even experienced serious flood problems, as witnessed by the need to evacuate communities along the Red River upstream of Winnipeg, Manitoba in April 1979.

Although the drought appears to have run its course, there is a decided need to determine practical and economic ways to ameliorate effects of water shortage on the prairies. Federal contributions to any cost-sharing arrangement will be mainly through the Minister of Regional Economic Expansion, although some contributions are being made through existing Canada Water Act agreements. During 1978-1979, Environment Canada carried out a limited program of research on droughts and the program is to be increased in 1979-1980. The research program includes studies of the likelihood, severity and persistence of future droughts; the extent of water quality degradations and possible remedial actions; and the extent to which water conservation practices can be improved. Also, efforts will be made to develop a better understanding of the potential effect of conservation practices on water demands and to increase knowledge of the impact of drought and drought alleviation measures on the environment and on future demands.

Table 4 Current and Projected Release Dates of Final Reports Arising from Canada Water Act Studies

Study	1978-79	1979-80
Souris Basin	August 1978	
St. Lawrence River Water Quality	October 1978	
Shubenacadie-Stewiacke		June 1979

Available upon request from: Director
Water Planning and Management Branch
Inland Waters Directorate
Department of the Environment
Ottawa, K1A 0E7

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PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE
ARRANGEMENTS UNDER THE CANADA WATER ACT

IMPLEMENTATION AGREEMENTS

1. SAINT JOHN BASIN (proposed)

Objective: To implement recommendations arising from the 1970-74 Saint John River Basin Study.

Participants: CANADA
NEW BRUNSWICK

Status: A Federal-Provincial Task Force has reviewed the recommendations of the Saint John River Basin Board and has reported that the recommendations can be met through regular programs and that no formal implementation agreement will be required.

2. LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS (proposed)

Objective: To implement recommendations arising from the Lake Winnipeg, Churchill and Nelson Rivers Study.

Participants: CANADA
MANITOBA

Prior Action: The Lake Winnipeg, Churchill and Nelson Rivers Study Board concluded the three-year, $2,000,000 joint study with the release of the Summary Report (and eight Technical Appendices) on June 2, 1975. Thirteen of the 47 recommendations are of direct federal interest, ranging from water, fisheries, and wildlife to Indian affairs and navigable waters.

Status: Manitoba Hydro and various Manitoba departments are implementing some of the Study Board's recommendations which are provincial responsibilities. The Freshwater Institute, in the federal department of Fisheries and Oceans, is continuing its major research project on the fisheries of South Indian Lake. Environment Canada is continuing its monitoring of water quality and quantity (including sediment).

Proposals for a DOE monitoring program are under preparation and preliminary discussions have been held with Manitoba.

3. LOWER FRASER VALLEY FLOOD CONTROL PROGRAM

Objective: To provide protection from flooding of land in the lower reaches of the Fraser River Valley and other areas upstream by rehabilitating existing dykes, constructing new dykes, increasing river bank protection, and improving internal drainage facilities.

Duration of Agreement: 1968 to 1984 (extended)

Participants and Funding: CANADA.....50%
BRITISH COLUMBIA.....50%
(Local authorities are responsible for providing construction and access right-of-way.)

In 1974, the federal government increased its contribution to the Flood Control Program and Storage Studies from $18,000,000 to $30,500,000 and British Columbia agreed to increase its share by the same amount. In fiscal year 1976-77, both parties agreed to a further increase in funding

and to extend the expiry date. The new funding level is $60,000,000 for each party, and the agreement has been extended to March 31, 1984.

Status: Construction of dykes and floodboxes was completed in New Westminster and continued in Delta, Richmond, Chilliwhack, Pitt Meadows, Coquitlam and Abbotsford. Design for the construction of dykes in Surrey was completed. Acquisition of lands for the floodway and for flood control structures, preparatory to the construction of the Vedder River setback dykes, was also completed.

4. SOUTHWESTERN ONTARIO DYKING

Objective: To provide for the construction and reconstruction of dykes and associated control works for protection of agricultural lands in the southwestern Ontario Counties of Essex and Kent, and the Regional Municipality of Niagara.

Duration of Agreement: March 1974 to March 1979 (extended)

Participants and Funding:

CANADA	Department of the Environment Department of Agriculture	45%
ONTARIO		45%
Municipalities and/or Conservation Authorities		10%

(Federal expenditures to March 1979 totalled $7.2 million. In 1976-77, Treasury Board approved a one-year extension to March 1978 and a total expenditure of $7.6 million in federal funds. A further one-year extension in time to March 1979 was also approved to complete essential works. All construction is to be completed by that date, and all expenses are to be paid by September 1979.)

Prior Commitment: For purposes of this agreement, the program shall include the cost of completing the work in excess of $2,700,000 undertaken pursuant to the agreement made on 30 May 1973 between Canada (Minister of Regional Economic Expansion) and Ontario for the repair and construction of dykes protecting agricultural land in the Townships of Harwich, Pelee and Mersea.

Status: Work was completed in Pelee, Mersea, East Tilbury, Raleigh and Harwich Townships and in the Regional Municipality of Niagara. Work was substantially completed in Dover Township.

5. OKANAGAN BASIN

Objective: To implement recommendations arising from the 1969-74 Okanagan Basin Study.

Duration of Agreement: February 1976 to 1981

Participants and Funding:

CANADA	$2,500,000
BRITISH COLUMBIA	$2,500,000

(Central Mortgage and Housing Corporation loans and grants of $17 million, and funding under the provincial Sewerage Facilities Assistance Act will also be made available for construction of waste treatment facilities.)

Status: All contract work for improvements to three dams is essentially complete. Inlet culverts have been installed on the Janssen and Shippett Oxbows as part of the Pilot Intake Program. Draft plans, specifications and contract documents for modifications to the Kelowna Floating Bridge, the water quality monitoring program, and the economic update using 1976 data have been completed. The framework plan is under review.

Non cost-shared programs and information programs were expanded. Significant fisheries and water-based recreation programs have been initiated.

The agreement also provides for construction of waste treatment facilities to achieve a minimum of 80% phosphorus removal from major urban and municipal outfalls. A plan has been prepared for orderly development of waste treatment facilities. However, recent policy announcements by the province may require the complete removal of all waste bearing outfalls from waters in the basin.

6. QU'APPELLE BASIN

Objective: To implement recommendations from the 1970-72 Qu'Appelle Basin Study.

Duration of Agreement: April 1974 to March 31, 1984

Participants and Funding:

CANADA	$18,000,000
SASKATCHEWAN	$15,700,000

An additional $2,000,000 is available on a loan basis from Saskatchewan. CMHC funding infrastructure changes have decreased the loan of $8,400,000 anticipated in the agreement to about $2,700,000.

Status: The Department of Regional Economic Expansion is acting as the project coordinator.

The Qu'Appelle Valley Management Board established by the agreement continues to oversee work on the implementation programs within the Environmental Improvement and Management, Tourism and Recreation Development, and Implementation sectors.

Projects essentially completed include flood control works for Regina, Lumsden, Tantallon and Moose Jaw, and Phase I of the Regina tertiary sewage treatment plant.

The Moose Jaw Flood Protection and the Livestock Pollution Control programs are in the implementation stage.

Some upstream works to increase the conveyance capacity of the Qu'Appelle River have been completed. Several downstream projects are nearing completion.

Tourism and Recreation Development Strategies have been prepared for the Qu'Appelle Valley. Construction has begun on various Fisheries and Wildlife Developments. A number of commercial developments have received funding under the incentives and loans programs. The public involvement program is well under way.

7. CANADA-ONTARIO AGREEMENT ON GREAT LAKES WATER QUALITY

Objective: To provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality in the Great Lakes basin by reaching agreement on water quality objectives, by accelerating investment in sewage treatment and by conducting research into treatment technology.

Duration of Agreement: January 1976 to March 31, 1980

Participants and Funding: CANADA
ONTARIO

The participants will each pay half the costs associated with the research and surveillance programs; the federal share of research over the two fiscal years 1976-77 and 1977-78 was not to exceed $500,000; the federal share of surveillance was $762,500 for fiscal year 1976-77. For each fiscal year, the total amount payable by Canada shall not exceed an amount to be agreed upon between Canada and Ontario, taking into account:

(a) the recommendations made by the International Joint Commission respecting surveillance of the whole of the boundary waters;
(b) the decisions taken, as a result of such recommendations, by the parties to the Canada-U.S. Agreement with respect to such surveillance;
(c) the recommendations of the Board of Review.

Prior Action: An initial agreement from August 1971 to December 1975 authorized $3 million for feasibility studies and joint sewage treatment technology research. Loans totalling $250 million for sewage treatment facilities from CMHC and the Ontario Government were also called for in the initial agreement. (Funding for municipal sewage treatment is now the subject of a separate agreement with CMHC under the National Housing Act.)

Status: Increased attention has been focused on the importance of water quality trend information in warning of developing problems and assessing the effectiveness of ongoing abatement program. To this end, surveillance design and data analysis under the agreement have been strengthened.

"With the signing of the new Canada-U.S. Agreement on November 22, 1978 the current Canada-Ontario Agreement dated March 12, 1976 is under review and is to be revised to reflect the new Canadian commitments under the 1978 Canada-U.S. Agreement."

Because, as already noted, the Canada-Ontario Agreement is being undertaken to provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality, a brief outline of activities under the latter agreement is also provided.

CANADA-U.S. AGREEMENT ON GREAT LAKES WATER QUALITY

Objective: To improve the quality of the water in the areas of the Great Lakes now suffering from pollution; to ensure that Great Lakes water quality will be protected in the future; and to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem.

Duration of Agreement: continuous since April 1972, revised agreement signed November 22, 1978

Participants: CANADA
UNITED STATES

Commitment: Approximately 99 per cent of the sewered population on the Canadian side of the basin is now served by adequate municipal wastewater treatment facilities. The concept of the Great Lakes basin and its human resources as an ecosystem is explicitly recognized in the new Agreement. Numerical water quality objectives for some 40 compounds have been specified as well as calls for programs to control and prevent pollution from industrial sources entering the Great Lakes System. A commitment has been made directed to eliminating the discharge of toxic substances into the Great Lakes. New interim phosphorous loading targets, defined for each lake, are designed to achieve desirable levels of water quality.

Arrangement: The International Joint Commission was given primary responsibility for overseeing implementation of this international water quality agreement. The Commission has established a number of Boards, Committees and Reference Groups to carry out the various provisions of the agreement. Activities are carried out under four programs: Pollution From Land Use Activities Study, Water Quality Objectives, Regulatory Activities, and Surveillance.

Status: Under the surveillance program, 9 surveillance cruises of Lake Ontario were conducted and two automatic water quality sampling sites were maintained at Wolfe Island on the St. Lawrence River and at Niagara-on-the-Lake on the Niagara River. Progress continued towards developing new and revising existing water quality objectives to ensure the protection of the most sensitive and beneficial uses of the boundary waters of the Great Lakes.

The Pollution from Land Use Activities Reference Group (PLUARG) presented its final report to the International Joint Commission at the Commission's meetings in July, 1978. A total of 11 public hearings on the results and recommendations of the PLUARG report have been held in the Great Lakes basin, with 5 of them being held in Canada.

8. SOURIS RIVER BASIN

Objective: To implement the framework plan for the management of the water and related resources of the basin arising from the 1974-1978 Souris Basin Study.

Participants: CANADA
SASKATCHEWAN
MANITOBA

Status: The Souris River Basin Study Board report, containing a main report and nine supplements, was jointly released by Canada, Saskatchewan and Manitoba on Aug. 25, 1978. An Advisory Committee on Implementation of the joint Canada-Manitoba - Saskatchewan Consultative Committees, and a Souris River Study Implementation Working Group were established.

The Advisory Committee on Implementation has suggested that the majority of the recommendations can be undertaken under existing federal programs, provincial programs, federal-provincial agreements and proposed federal-provincial agreements. In particular a number of the recommendations concerned with water supply and flood damage reduction are included in the proposed Canada-Saskatchewan and Canada-Manitoba Subsidiary Agreements on Water under the DREE General Development Agreements and under the Canada-Manitoba Flood Damage Reduction Agreement.

PLANNING STUDIES

1. LAKE WINNIPEG WATER QUALITY

Objective: A study of the Lake Winnipeg basin for the purpose of identifying beneficial uses of Lake Winnipeg, water quality criteria needed for such uses, and the need for more data on tributary inflows; identifying present and future contaminants and methods of controlling contaminant inflows; developing a predictive model; and determining alternative approaches to managing the water's quality.

Duration of Agreement: approximately five years.

Participants and Funding:
CANADA.....$1,450,000
MANITOBA.....$1,450,000

Status: This study is in abeyance by mutual agreement, due to financial constraints and Manitoba's wish to re-evaluate the study program. Discussions have yet to be held regarding future activities under this agreement.

2. MACKENZIE RIVER BASIN COMMITTEE

Objective: To exchange information on potential water-related developments in the basin and to formulate a program of studies to gather data on the basin's water and related resources.

Duration of Agreement: Continuous since 1973

Participants:
CANADA.....Department of the Environment, Ministry of Transport, Department of Indian Affairs and Northern Development, Yukon Territory, and Northwest Territories.
ALBERTA
BRITISH COLUMBIA
SASKATCHEWAN

Prior Action: Following detailed examination of interjurisdictional water resource issues, the Committee, then known as the Mackenzie Basin Intergovernmental Liaison Committee, submitted a formal agreement to the Ministers of the participating governments, in May 1977, and received endorsation of a study program.

Status: A Memorandum of Understanding and an Agreement Respecting Federal-Provincial Studies and Investigations of the Water Resources in the Mackenzie basin were signed, and a $1,600,000 study program begun.

The first year of studies was completed and progress reports received. The annual work plan and budget for 1979-80 were submitted for ministerial approval.

3. PLANNING COMMITTEE ON OTTAWA RIVER REGULATION

Objective: To plan and recommend criteria for regulating the Ottawa River, taking into account hydro-power production, flood protection, navigation, low water problems, water quality needs and recreation. Associated with this objective is the development of a flow forecasting model, a flood warning system and effective liaison with St. Lawrence River regulation.

Duration: February 1977 to December 1979

Participants: CANADA (3 members)
ONTARIO (2 members)
QUEBEC (2 members)

Prior Action: The Committee on Flow Regulation - Montreal Region, established in May, 1974 by agreement between Canada and Quebec, was empowered to study the means by which damages, due to flood and low water, might be reduced in the Montreal Region. That Committee made recommendations to achieve specific objectives. In order that these recommendations might be acted upon, the then Minister of Fisheries and the Environment wrote to the ministers of interested federal and provincial departments and heads of agencies, inviting them to participate in a new committee. This Ad-Hoc Planning Committee is the result of that invitation.

Status: Forecasts on a real-time basis are being provided for 10-day periods for the principal reservoirs in the Ottawa River basin and at selected points where flooding takes place.

The regulation planning mathematical model is ready for testing of alternative storage operations. Additional storage sites will also be analyzed.

Progress is being made towards the development of a permanent Canada-Ontario-Quebec body with responsibilities for coordinated operation of principal reservoirs in the Ottawa River basin.

4. SHUBENACADIE-STEWIACKE BASIN

Objective: To examine critical problems affecting the water resources and the interrelationships of these problems; to develop proposals for interim measures to control critical problems and to maintain options for future action; and to develop a comprehensive framework plan focusing on water quality and quantity objectives and complementary development and resource-use strategies.

Duration of Agreement: August 1977 to June 1979 (extended)

Participants and Funding: CANADA.....$365,000
NOVA SCOTIA.....$365,000

Status: All background studies have been completed and the final report was under preparation.

5. ST. LAWRENCE RIVER WATER QUALITY

Objective: To prepare a comprehensive water quality plan of the St. Lawrence River from the end of the international section near Cornwall, down to the Gulf of St. Lawrence.

Duration of Agreement: May 1972 to March 1979 (extended)

Participants and Funding: CANADA.....50%
QUEBEC.....50%

(The Statement of Intent called for a total expenditure of $400,000 in 1972-73, while a further $3,500,000 was originally authorized under the formal agreement. In October 1977, a further $550,000 was authorized under the formal agreement.)

Status: The study was completed in March 1978 and the main report of the St. Lawrence River Study Board was presented in June 1978 to the respective federal and provincial Ministers of the Environment.

6. FRASER RIVER ESTUARY

Objective: To develop a management plan and recommend implementation measures for the estuary that would ensure a balance between economic and environmental interests.

Participants: CANADA
BRITISH COLUMBIA

Arrangement: In February 1977, the federal and British Columbia Environment Ministers authorized a preliminary assessment of the need for this study. In August 1978, a Federal-Provincial Steering Committee issued several reports describing the characteristics and prospects of the area and laying out existing policies and practices governing utilization of the estuary. A summary report contained several proposals for the development of a management plan for the estuary.

Status: A draft agreement proposing that Canada and British Columbia enter into a new phase of the Fraser River estuary study was under preparation.

7. MERCURY CONTAMINATION IN THE ENGLISH-WABIGOON RIVERS

Objective: To evaluate methods to reduce high mercury levels in the English-Wabigoon rivers system in northeastern Ontario. (Work under the agreement will focus on ways in which mercury travels, or is deposited and retained within the river system, as well as methods to reduce the absorption of mercury by fish and other water life.)

Duration of Agreement: June 1978 to June 1979
An extension in both time and funding is expected to be requested during 1979-1980 to complete this evaluation.

Participants and Funding: CANADA.....$50,000
ONTARIO.....$50,000

Both governments have also agreed to undertake related studies outside the agreement, including engineering and economic evaluation of measures selected to reduce mercury contamination, a shoreline study to determine potential sources of clay and a cost estimate for the construction of a dam to raise the level of Clay Lake.

Status: Preliminary field studies have been carried out to determine the dynamics of transport, deposition, and retention of mercury in the Wabigoon-English system.

FLOOD DAMAGE REDUCTION PROGRAMS

1. SOUTHEASTERN NEW BRUNSWICK DYKING

Objective: To enable essential repairs to be carried out along dykes damaged during a major storm in January, 1978.

Participants and Funding: CANADA..... 50%
NEW BRUNSWICK..... 50%
TOTAL FUNDING..... $160,000

Status: All work has been completed.

2. FLOOD MANAGEMENT - MARSH CREEK, N.B.

Objective: To reduce the damage from floods in the Marsh Creek Watershed through acquisition of lands, construction of flood control reservoirs, channel improvements, excavations and changes in structures.

Duration of Agreement: September 1977 to March 1980

Participants and Funding:
CANADA.....$670,000
NEW BRUNSWICK.....$670,000
CITY OF SAINT JOHN...$670,000

Prior Action: Studies conducted under the Canada-New Brunswick General Agreement Respecting Flood Damage Reduction contained recommendations for appropriate measures to reduce flood damages in the watershed.

Status: Work is proceeding as scheduled under the agreement. All reservoir and channelization work has been completed while storage acquisition is proceeding.

3. DYKES AND FLOW REGULATION WORKS - MONTREAL REGION

Objective: To plan and construct dykes to prevent flood damage in the municipalities of Pointe-Calumet, Ste-Marthe-sur-le-lac, Roxboro and Pierrefonds; and to determine the feasibility of enlarging the storage capacity of the Quinze Reservoir, and of reducing the maximum flow of Rivière des Mille Iles to approximately 700 cubic metres per second by means of a control structure.

Duration of Agreement: October 1976 to March 1980 (extended)

Participants and Funding:
CANADA.....45%
QUEBEC.....45%
MUNICIPALITIES.....10%
(Total funding was doubled from $5 million to $10 million in October 1977.)

Prior Action: Between June 1974 and October 1976, a study was conducted to determine the means of reducing the frequency of both flooding and extreme low water levels in the Montreal Region water bodies. The Committee on Water Regulation, Montreal Region, which conducted the study, submitted an interim report in 1975 and its final report in October 1976. This new implementation agreement was signed in October 1976 on the basis of the recommendations in the interim report, because the extensive damage caused by floods in 1974 and 1976 in the Montreal Region made it important that these recommendations be implemented immediately. A Flood Risk Mapping Agreement signed at the same time as this Flow Regulation Agreement is discussed in the section headed Flood Damage Reduction Programs on page 7.

Status: Construction of dykes at Roxboro, Pierrefonds and Pointe-Calumet was completed while similar work at Ste-Marthe-sur-le-lac has been initiated. Studies are under way to add to the storage at Quinze Reservoir and to provide a control structure on the Rivière des Mille Iles.

OTHER COOPERATIVE ARRANGEMENTS

1. THOMPSON RIVER BASIN (pre-planning)

Objective: To carry out a pre-planning study of the Thompson River basin in order to prepare a plan, if appropriate, for a subsequent cost-shared planning study.

Duration of Agreement: Six-eight months, 1979

Participants: CANADA
BRITISH COLUMBIA

Status: On 16 February 1979 the federal and provincial Ministers of the Environment agreed to a six to eight month pre-planning study of the Thompson River basin at a shared cost of up to $60,000.

A draft Treasury Board submission was prepared to request authority to enter into an agreement and to share the cost of the Thompson River pre-planning study with British Columbia.

2. YUKON RIVER BASIN (pre-planning)

Objective: To prepare a rationale and plan, if appropriate, for a subsequent cost-shared intergovernmental study agreement.

Duration of Agreement: 1978-1979

Participants: CANADA.....Dept. of the Environment
Dept. of Indian and Northern Affairs
BRITISH COLUMBIA
YUKON TERRITORY

Status: Water officials in the basin have become concerned with water conflicts which are developing among mining, hydro, parks, energy and transportation. The departments of the Environment and Indian and Northern Affairs have set up an informal pre-planning task force to deal with water and related resources in the basin. British Columbia and Yukon Territory officials have been invited and have accepted a role on the task force. A pre-planning report is expected in August 1979 and should identify if a cost-shared intergovernmental study under the Canada Water Act is needed.

3. NORTH SHORE RIVERS ECOLOGICAL INVENTORIES PROGRAM

Objective: To conduct joint ecological studies of rivers flowing into the St. Lawrence River from its north shore in order to facilitate future assessments of ecological impacts from major developments.

Duration of Agreement: April 1978 to September 1982

Participants and Funding: CANADA.....$1,220,000
QUEBEC.....$1,220,000

Status: Studies and Geophysical inventories, dealing mainly with the Romaine River basin, were undertaken during the year under review.

4. TECHNICAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER

Objective: To report on gaps in current water quality information for the Ottawa River and to present a progress report on Ottawa River water quality, with emphasis on toxic materials, nutrients and bacteriology.

Duration: Approximately one year (1979-1980).

Participants: CANADA (3 members)
ONTARIO (2 members)
QUEBEC (2 members)

Status: The first meeting of the Ad-hoc Working Group was held on March 12, 1979. At this meeting, the need for a trend assessment, based on available data for the period 1972 to the present, was discussed. The establishment of a Task Force to provide information required by the Working Group was considered but postponed until listings of all available data were provided to the Working Group.

5. PRAIRIE PROVINCES MASTER AGREEMENT ON APPORTIONMENT

Objective: The equitable apportionment of interprovincial prairie waters flowing eastward. The agreement and subsidiary agreements ensure one half the natural eastward flow of waters arising in or flowing through Alberta for Saskatchewan, and one half the eastward flow arising in or flowing through Saskatchewan for Manitoba.

Duration of Agreement: Continuous since October 30, 1969.

Participants and Funding: CANADA
ALBERTA
MANITOBA
SASKATCHEWAN

(Funding to be borne one half by Canada and one sixth by each of the provinces.)

Arrangment: Schedule C provides for the reconstitution of the Prairie Provinces Water Board, whose responsibility is to oversee and report on apportionment of waters flowing from one province into another province; to take under consideration comprehensive planning, water quality management and other management problems referred to it by the entities concerned; to recommend appropriate action to investigate such matters; and to submit recommendations for resolution of the problems.

STATUS: This agreement is administered through the Prairie Provinces Water Board. The Board's Committee on Hydrology has recommended procedures for the determination of natural flow and streamflow forecasting for five major basins in the area. Natural flows are now being calculated on an annual basis for these five drainage basins. The Committee on Hydrology is also preparing a report for the Board describing the mechanisms required to administer the 1969 Apportionment Agreement and is studying the apportionment implications of westward flowing streams and westward flowing tributaries of eastward flowing streams.

The Board's Committee on Water Quality is now making a thorough review of the existing Prairie Provinces Water Board's water quality objectives. It is planned to update these objectives on a site specific basis when the review is completed. The Board has undertaken a water demand study to determine the historic and present water demand uses in the three prairie provinces. This study will be completed in 1982. The Board's Committee on Interjurisdictional Agreements Administration is now studying the implications of interprovincial apportionment of water on Battle and Lodge Creeks, two streams that flow from Canada into the United States.

6. WATER QUANTITY SURVEY AGREEMENTS

Objective: To maintain a viable and efficient national water quantity survey network and to give recognition to joint federal and provincial responsibilities in this activity.

Duration of Agreements: Agreements between Canada and each province were signed in 1975 and letters were exchanged between the Department of Environment (DOE) and the Department of Indian and Northern Affairs (DINA) agreeing to joint survey operations in the territories. The programs are continuous but there is a provision in each agreement that provides for termination on 18 months written notice.

Participants:
CANADA.....Department of the Environment, and the Department of Indian and Northern Affairs representing the Yukon and Northwest Territories.
ALL PROVINCES

Arrangements: This is a shared-cost program, with the federal government carrying out field and office procedures and invoicing the provinces quarterly. An exception is Quebec which operates its own program and invoices the federal government quarterly except for international and navigable waters, and waters crossing federal land in Quebec, which are surveyed by the federal government. DINA transfers funds annually to DOE for the territories' share of costs.

Funding:

1978-1979	Canada's Cost	$11,421,000 (estimated)
	Payment to Quebec by Canada	717,000 (estimated)
	Provinces' Share	2,292,000 (estimated)
	Total Program Cost	$14,430,000 (estimated)

The Total Program Cost reflects the survey and overhead costs to the federal government (including the National Capital Region Component) and to all provinces except Quebec. Incorporated in the Total Program Cost is a federal payment of $717,000 to Quebec, but not Quebec's own costs.

Status: Coordinating Committees, established for each province, convene annually to review the water quantity survey networks and to determine annual cost sharing.

7. CANADA-ONTARIO GREAT LAKES SHORE DAMAGE SURVEY FOLLOW-UP PROGRAMS

Objective: To implement recommendations arising from the Canada-Ontario Great Lakes Shore Damage Survey.

Duration of Agreement: 1976-1981

Participants and Funding:
CANADA.....50%
ONTARIO.....50%

Programs are carried out by the province and DFE on work-shared and cost-shared bases with $50,000 provided annually under Canada Water Act funding.

Status: Implementation began in 1976 with the establishment of a Canada-Ontario Task Force. The major programs currently being implemented are:

- shoreline monitoring
- public awareness
- shoreline management

Programs for shoreline monitoring and public awareness over a five-year period were continued for the third year.

In 1977, a shoreline management study was initiated to provide guidelines and methodologies for evaluating the feasibility, costs, and benefits of various shoreline management strategies for reducing future flooding and erosion damage. These methodologies are being developed and tested on an 18-mile study site at the western end of Lake Erie. All field work has been completed and all reports will be completed by March 1980. The reports will include a shore management summary and detailed guidelines for shore land use planning, the design of coastal structures, benefit-cost analysis and environmental evaluation. Also, a report will be prepared with specific recommendations for the study site.

8. WINTER RIVER BASIN (pre-planning)

Objective: To carry out preliminary data acquisition and assessment on the aquifer hydraulics of the basin. This work will form the basis of subsequent studies to determine the reliability of the existing water supply system for Charlottetown.

Duration of Agreement: March 1977 to July 1978

Participants: CANADA
PRINCE EDWARD ISLAND

Status: All work under this project has now been completed. The final report is currently under review by both governments in order to assess the feasibility of funding further work under the Canada Water Act.

9. WATER QUALITY MONITORING RELATED TO THE GARRISON DIVERSION PROJECT

Objective: To establish baseline water quality conditions on the Souris River at the International Boundary in both Saskatchewan and Manitoba by means of continuous, automatic monitoring equipment.

Duration of Agreement: Continuous since 1977

Participants: CANADA

Status: Two monitors have been installed and are operating. Major physical modifications have been made to ensure satisfactory cold weather operation. Preliminary studies have been undertaken to determine natural variability in selected parameters to permit assessment of the effects of the Garrison Diversion Project on the quality of the Red River.

10. LOWER SASKATCHEWAN BASIN TASK FORCE (pre-planning)

Objective: To prepare an overview report on the Lower Saskatchewan River basin which would identify water management concerns needing further study.

Duration of Agreement: September 1974 to 1979 (extended)

Participants: CANADA
SASKATCHEWAN
LOWER SASKATCHEWAN BASIN ASSOCIATION

Status: The final report was completed in January 1979 and presented to the Canada-Saskatchewan Consultative Committee for discussion at its March meeting. The Committee is arranging for a limited distribution of the report and an evaluation of the recommendations.