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SHORE-ZONE REPORT

Shore-Zone Report No. 1
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Environmental Conservation Service
Environment Canada
Ottawa, Ontario

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SHORE-ZONE REPORT

1. INTRODUCTION

This publication marks the first of a series of Shore-Zone Reports which will provide a regular source of information on shore zone activities. It has become apparent recently that a need exists for a publication which deals with shore-zone initiatives and concerns.

The Report series has been designed to:

- i) provide an update on the status of shore-zone activities;
- ii) present information on new methodologies;
- iii) help speed technology transfer.

The Report is also intended to increase awareness of Environment Canada's activities and responsibilities as they relate to shore-zone management. It is also directed to federal, provincial and municipal departments concerned with shore-zone management. The information presented will also be of interest to private groups and individuals who are concerned with management activities in the Canadian shore zone.

Any questions regarding specific regional activities described, should be addressed to the co-ordinator(s) listed below:

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Should you require additional copies of the Shore-Zone Report, please contact Mr. Micheal Parkes at the above address.

2. SELECTED HIGHLIGHTS

- . The Proceedings of the Canadian Council of Resource and Environment Ministers Shore Management Symposium which was held in Victoria were published by CCREM in April.

- . An Interdepartmental Shore Zone Working Group (ISZWG) has been established as a liaison and coordination point for shore-zone planning matters. A total of ten departments and agencies are represented.

- . The Fraser River Estuary Agreement was signed October 1, 1979. A Planning Committee has been established to develop a program plan and budget.

- . The first issue of the Coastal Zone Newsletter (November 1979) was prepared and distributed by the Pacific and Yukon Regional Office. The Newsletter presents information on the Pacific and Western Arctic coasts of Canada.

- . Proceedings of the Water and Environmental Law Conference held at Dalhousie University in September are scheduled to be published in October 1980.

- . The Canadian Council of Resource and Environment Ministers has approved a set of Shore Management Principles. The principles are presented in this report (Item 6).

3. HEADQUARTERS ACTIVITIES

A. CCREM Shore Management Symposium Proceedings

The Proceedings of the Canadian Council of Resource and Environment Ministers Shore Management Symposium were published by CCREM in April 1980. The Symposium represents a benchmark in the field of Canadian Shore Management. The object of the Symposium was to draw attention to the problems of shore management and to recommend possible solutions to these problems.

The publication contains background papers presented at the Symposium as well as the results of Working Groups and the Steering Committee. The Proceedings which are unique in Canada are available in both official languages, copies may be obtained by writing to the Canadian Council of Resource and Environment Ministers, 60 Bloor street W., Suite 701, Toronto, Ontario, M4J 3B8. Price \$10.00.

B. Approval of DOE Shore Zone Programs

The DOE Shore Zone Program was approved in August, 1979. Its objective is to develop, in cooperation with the Provinces, a coordinated approach to the planning, development and protection of the shore-zone which will allow the application of sound environmental practices at every stage of the process.

The ADM/ECS coordinates DOE shore-zone activities on a lead agency basis and leads interdepartmental coordination through the Interdepartmental Shore Zone Working Group (see page 5). Regional Directors-General were given the responsibility to negotiate federal-provincial shore-zone management plans where they are needed and desired. This approach is to be followed in areas of intense shore-zone use and where conflicting development practices occur or are planned (eg. Fraser estuary); or where massive developments will have substantial impact on the shorescape.

In addition, it was decided to submit the CCREM Shore Management Principles to review the Justice Department before any formal endorsement.

C. Justice Department Review of Shore Management Principles

As noted above, the Justice Department was asked to review the CCREM Shore Management Principles. Essentially, the Department does not see anything in them that would necessarily give rise to legal problems. They noted, however, that various federal interests will have to be taken into account in the implementation of these principles. Briefly outlined below are some relevant points.

- i) First, it was noted that it is of primary importance that the various proprietary interests of the federal Crown be taken into account in the management of shore areas. Section 91(1A) of the B.N.A. Act gives Parliament exclusive legislative power over federal public property. Thus, no provincial legislature can enact laws in relation to that property or laws which would interfere with its management. Among federal assets of interest here, special mention must be made of public harbours and shore therein, the property of which was acquired by purchase or otherwise, or was transferred to Canada under the British North America Act. Other federal assets coming under exclusive federal control includes national wildlife preserves, migratory birds preserves and national parks.
- ii) Also relevant is section 91(10) of the B.N.A. Act, the "Navigation and Shipping" power, which authorizes Parliament to regulate navigation and shipping in a very broad way. Insofar as navigation itself is concerned, Parliament can legislate, inter alia, to protect navigable waters and to prevent any interference with navigation, as it has done under the Navigable Waters Protection Act, even, for example, so as to prevent the operation of a work such as a mill whose waste

products impede navigation. Even in absence of federal legislation, the provinces are incompetent to authorize interference with navigation. The "Navigation and Shipping" power also confers on Parliament legislative jurisdiction over the subject-matter of harbours since they are essential to effective jurisdiction over maritime navigation. In exercising his power, Parliament clearly can regulate the use of privately-owned lands in a harbour for purposes related to navigation and shipping. Moreover, under section 91(10), Parliament can control inter alia all pollution practices by ships, such as the discharge of garbage, bunker oil and bilge-water into the water, and smoke into the air. It may also regulate the movement by water-borne carriers of dangerous goods and cargo, particularly in relation to the dangers occasioned by spills and discharges into water.

iii) Another important federal power that will have to be taken into account is that given to Parliament by section 91(12) of the B.N.A. Act to exclusively legislate respecting "Sea Coast and Inland Fisheries". This power can support extensive federal legislation requiring the maintenance of a high standard of water quality or concerning habitat protection as long as these measures are directed to protection of fisheries. For example, subsection 33(2) of the Fisheries Act prohibits persons from depositing deleterious substances of any type in water frequented by fish or in any place where such substances may enter any such water. Other provisions of the Act prohibit persons from throwing overboard prejudicial or deleterious substances in rivers, harbours, roadsteads or in any beaches or banks or between high and low water mark, remains of offal of fish, or of marine animals, etc. Recent amendments to the Act provide penalties for the alteration or destruction of fish habitat or in the deposit of deleterious substances in water frequented by fish or in any place where such substances may enter any such water.

iv) Finally, mention must be made that the federal authority over works, undertakings and businesses that fall exclusively under Parliament's jurisdiction, such as inter-provincial railways or pipelines, is broad and that it is likely that federal laws governing environmental matters could be applied to all of the activities of such enterprises to the extent that the scheme of regulation may be characterized as in relation to such works or undertakings. It is worth noting that provincial laws of general application on environmental control may apply to such works and undertakings only as long as they do not affect their construction, repair, operation or other vital activities.

The foregoing merely indicates some federal interests that emerge from the principles adopted by the CCREM. Others, such as Indian Lands or Empire Treaties, might also be relevant.

D. Formation of the Interdepartmental Shore Zone Working Group (ISZWG)

Prior to the CCREM Shore Management Symposium, a series of interdepartmental meetings were held chaired by the ADM/ECS for the Deputy Minister. These meetings were so successful, that it was decided to continue the group as a vehicle for interdepartmental liaison and coordination on shore-zone related matters.

Accordingly, the Interdepartmental Shore Zone Working Group (ISZWG) was agreed to with the following terms of reference:

- i) to coordinate the federal input to the CCREM relating to shore zone questions;
- ii) to coordinate, as needed, other federal policies developed in relation to the principles of shore management; and
- iii) to act as a federal forum for information exchange on shore-related policies and programs.

Some ten departments and agencies are represented: DOE, F&O, DPW, MOT, DINA, FPRO, DREE and IT&C. Meetings are at the call of the Chairman, the ADM/ECS.

E. ACROSES Meeting

The National Research Council Associate Committee for Research on Shoreline Erosion and Sedimentation (ACROSES), was formed in 1978. It is chaired by Dr. Milne Dick, Chief of Hydraulics, CCIW, and meets semi-annually.

ACROSES is presently undertaking a number of important shore-related projects. The first is the compilation of a list of shoreline erosion and sedimentation terms in both official languages. This list will eventually be published by the Committee. The second project is the preparation of a manual defining shore-zone terms. ACROSES also sponsored and organised a conference on nearshore processes entitled "The Canadian Coastal Conference 1980", which was held in Burlington in April, 1980. The results of this conference can be obtained from the National Research Council, Associate Research Committee on Shoreline Erosion and Sedimentation, National Research Council, Ottawa, Ontario. K1A OR6.

F. Shore Processes Research

Hydraulics Division
National Water Research Institute

Shore processes research is grouped into three main areas: surface waves, shore resources and shore dynamics. In addition, coastal engineering work is undertaken.

Studies of surface waves concentrate on air/water interaction such as the generation and propagation of waves. This work has centered around the research tower located one kilometre offshore from Van Wagner's Beach, Hamilton, on Lake Ontario. Hundreds of hours of simultaneous surface elevation measurements from 14 wave stations have been obtained from which accurate determinations of the directional spectrum have been made. The data also include continuous measurements of the vertical transfer of momentum, heat and moisture. Complimentary measurements of direction spectrum and the transfer of momentum and heat have been conducted in the Hydraulics Division wind-wave flume.

A miniature drag sphere current meter was developed to undertake velocity measurements beneath the water surface. A new numerical method of wave prediction has been developed as an outcome of the investigation of momentum transfer from the wind to the waves.

The shore resources work is concentrated on nearshore sedimentology - a program of mapping of the surficial geology and morphology of the nearshore zone of the Great Lakes as a data base - and the application of results to the identification of areas of coastal erosion and sedimentation and the development of coastal sediment budgets. Mapping has been completed on a scale of 1:50,000 for Lakes Ontario, Erie, Huron and for Georgian Bay and data are accessible as summary papers, data reports and computer files.

Shore dynamics are being investigated using a number of approaches. The mechanisms which breaking waves on a beach move sediments have been studied at a field site, Van Wagner's Beach, since 1977. Concurrent measurements of littoral sand transport rates, wave height and direction and nearshore currents have been made during periods of intense wave activity. Offshore from the surf zone nearby, a time-lapse camera system has been used to monitor suspensions events of the bottom sediments. An array of fixed transducers is being used to monitor changes in the bottom morphology across the surf zone. Large portions of the Great Lakes shoreline are made up of bluffs, often of complex stratigraphy. A rapidly eroding bluff near Port Burwell on Lake Erie has been instrumented with piezometers and slope indicators so that geotechnical processes can be monitored during progressive failure of this bluff. Reconnaissance geotechnical data was provided on a thirty-two kilometre reach of shoreline of western Lake Erie for a Canada-Ontario pilot project on shore planning.

Applied coastal engineering studies done by the Division include physical models of harbours used to select remedial structures to eliminate wave agitation problems undertaken for the Department of Public Works. Various armour blocks and rip-rap types have been tested at the request of clients to determine their stability under wave attack. A manual for the design and construction of floating tire breakwaters has been prepared and is now available for distribution.

Finally, the Division hosted two workshops in 1976 and 1978, entitled: "Great Lakes Coastal Erosion and Sedimentation"; the proceedings can be obtained by writing the Hydraulics Division, National Water Research Institute, Burlington, Ontario (N.A. Rukavina, Editor).

4. REGIONAL ACTIVITIES

A) Atlantic Region

The following is a brief annotated description of some of the latest shore zone activities developing in the Atlantic Region. They were provided by the Atlantic Regional Coordinator, Lands Directorate.

- i) The Annapolis River Tidal Power Project is to proceed based on Federal/Provincial cost-sharing.
- ii) A Workshop was held at Acadia University on December 20, 1979 to review the environmental implications of the Annapolis River Tidal Power Project.
- iii) The Nova Scotia government held an offshore oil and gas conference on January 27-29, 1980; attendance was by invitation only. A summary will appear in the next Shore Zone Report.
- iv) Petro-Canada is supporting a detailed classification of the coastline of Labrador for oil spill contingency planning purposes; efforts are being made to have Regional elements of DOE cooperate with Petro Canada in this venture.
- v) During the past six to nine months the media has given more attention to the plight of people living in coastal areas which are being subjected to severe erosion, most severe erosion occurring in the Bay of Fundy and on the Northumberland Strait shoreline of Prince Edward Island, Nova Scotia and New Brunswick.

B) Quebec Region

The federal interest in the St. Lawrence shore-zone is very strong either through direct property ownership, or through management responsibilities that affect it. This is confirmed by a recent report of the study committee established under the Canada-Quebec Agreement in 1973. The Quebec Region organized a meeting of federal departments and agencies with a particular interest in planning and managing the St. Lawrence River shoreline. The meeting was held in Quebec City, February 27-28, 1980.

Common interests were revealed in managing the shoreline and promote information exchange. Information on the results of this meeting can be obtained by writing to the Regional Coordinator, Lands Directorate, Quebec City.

C) Ontario Region

i) Canada-Ontario Great Lakes Coastal Task Force

The Departments of Environment and Fisheries & Oceans are involved with the Ontario Ministry of Natural Resources in a number of activities related to the shore zone.

Basic Guidelines for Great Lakes Shore Management - Multi-disciplinary guidelines covering the topics of land-use planning, economic analysis, structural protection, and environmental evaluation have been prepared for the use of agencies involved in managing and planning for coastal areas. It is expected that the use of the guide by agencies such as municipalities will lead to more effective coastal zone management, thereby mitigating erosion and inundation damages. The draft of the guide has been completed, and it is now being prepared for publication.

Site-Specific Study - To assist in the development of the guidelines and to test their utility, a trial application has been made to thirty kilometres of shoreline on western Lake Erie. The draft report was distributed to the local municipalities.

Public Awareness Program - It is the aim of the public awareness program to increase awareness of the dangers inherent in locating in the coastal zone. A folder of information brochures on Great Lakes flooding and erosion hazards has been prepared and distributed, and two slide-tape shows that describe the hazards of shoreline erosion and how to identify the high-risk shoreline areas have been completed for general use around the Great Lakes. An article on the subject was recently prepared for "Focus", which is a periodical published by the IJC. In the past, workshops have also been used to heighten public awareness of shore erosion.

Shore Monitoring Program - In 1977 a five-year federal-provincial agreement was signed to facilitate the monitoring of erosion rates along the Canadian Great Lakes' shore. Profiles have been measured each year at 162 stations between Georgian Bay and Gananoque. An interim report on the program was prepared in March, 1980, and a final report is scheduled for Spring, 1981, at the completion of the current agreement.

ii) International Lake Erie Regulation Study

Coastal Zone - Subcommittee - In cooperation with Provincial and United States agencies, the potential effect of Lake Erie regulation on erosion and inundation damages along the Great Lakes and the St. Lawrence River have been evaluated. Ten years of wave hindcasting using hourly wind and water level data were used to determine water level-wave energy relationships for sections of the shore. This was combined with recorded erosion rates and shore property values to calibrate erosion stage-damage curves. Inundation stage-damage curves for the Great Lakes were based on recorded flood damages and elevations of shore properties. For the St. Lawrence River, stage-

damage curves were based on recorded damages and an estimated point of zero damage. Preliminary results of the study have been released, and publication of the Final Report is scheduled for Spring, 1981.

Environmental Effects Subcommittee - The Subcommittee is charged with the responsibility of assessing the effects of the proposed Lake Erie regulation plans in five disciplinary areas: i) fisheries, ii) wildlife, iii) water quality, iv) beach recreation, and v) boating. A draft final report and appendix have been prepared on the effects of the proposed regulation plans on fisheries, wildlife, and water quality for Lakes Erie and Ontario. With respect to beach recreation, final evaluation of the impacts has been completed. U.S. representatives on the Subcommittee have completed the evaluation of the boating component.

D) Pacific and Yukon Region

i) Fraser River Estuary Agreement

A two-year federal/provincial agreement was signed October 1, 1979 to develop a Management Plan for the Fraser Estuary. A planning committee co-chaired by Environment Canada and the Ministry of Environment, British Columbia, has been established and a coordinator hired. The Committee is currently in the process of developing the program plan and budget for the fiscal year 1981-82.

ii) Squamish Estuary

A federal/provincial committee has been established co-chaired by Fisheries and Oceans and the Ministry of Environment, B.C. to develop a management plan for the Squamish Estuary. The estuary at the end of Howe Sound is under increasing development pressure which is threatening the biological and recreational viability of the area.

iii) Coastal Resource Folio

Work on the Coastal Resource Folio was initiated in September, 1979. While the long term goal is to provide a coast-wide folio, the first study area will be the east coast of Vancouver Island.

The folio will include maps and companion reports on the following topics:

- | | |
|----------------------|--------------------------------------------------------------------------------------------------------|
| Physical base - | Terrain, substrate process, oceanographic, hydrologic and climatic data and interpretations. |
| Biological factors - | Upland vegetation, marine vegetation birds and mammals, fisheries and habitat data and interpretation. |
| Human Use - | Land Use, zoning, ownership and potential and forecasted uses and developments. |

Meetings have been held with federal, provincial and municipal agencies to obtain baseline data and assistance as to what critical factors and key information should be presented in the folio.

The majority of the relevant baseline data has now been collected and work is underway on the preparation of maps and report manuscripts.

During February and March 1980, meetings with federal and provincial representatives were held to verify the accuracy of presented baseline data and to consider and develop composite and derivative interpretive maps.

iv) Coastal Zone Newsletter

In November 1979, the first issue of an informal Newsletter of the resources of the Pacific and Western Arctic coast of Canada was prepared and distributed to federal, provincial, regional and municipal agencies, as well as to universities and public and private organizations and groups.

The main purpose of the newsletter is to provide an impartial forum for the free exchange of information and ideas pertaining to the Pacific and Western Arctic coasts of Canada, including the adjacent marine areas.

v) Lower Mainland Port Development Study

The Department is participating in the port development study undertaken by DPW, both at the policy level and at the technical level.

vi) Offshore Oil and Gas Exploration

Regional staff participated in a two-day workshop reviewing the environmental concerns related to off-shore oil and gas exploration and production and the department's role and responsibilities related to these activities. The topic is timely in that there is currently a move underway to seek the lifting of the current moratorium on off-shore exploration on the West Coast.

vii) Environmental Assessment in the Coastal Zone

Two major projects have recently been reviewed through the Environmental Assessment Review process: Roberts Bank and Boundary Bay Airport. The Department played a substantial part in reviewing both Environmental Impact Statements and is now in the process of following up on the Panel's recommendations. A major project in the active Panel stage is the Fraser River Training Works Project, for which it is anticipated an EIS will be submitted within the year.

The above material was supplied by Dr. John D. Wiebe, Office of the Director General, Pacific and Yukon Region, Vancouver, B.C., V6E 2M7.

5. CONFERENCES AND MEETINGS

A) National

The Water and Environmental Law Conference was held in Halifax at Dalhousie University, from September 14 to 16, 1979. Its sponsors included the Faculty of Law and Institute for Resource and Environmental Studies of Dalhousie University, the Nova Scotia Department of Environment and Environment Canada. About 200 people attended.

The objective of the Conference was to familiarize lawyers with environmental problems and educate scientists and governmental personnel about some of the legal aspects of environmental protection. Two plenary sessions were held entitled "Ecology Economics and Water Law" and "The Legal Process and Environmental Problem Solving". In addition, there were some 10 workshops on various related topics.

One of the workshops dealt with coastal zone management. It was chaired by Dr. Gordon Beanlands, formerly Atlantic Regional Director, Lands Directorate and included Mr. Terry Hennigar, Chief of Water Planning and Management, IWD Halifax, Dr. Robert Bailey, Executive Secretary Coastal Zone Management, Nova Scotia Department of Environment, and Mr. Hal Mills, formerly of the PEI Department of Tourism and Recreation, as well as Mr. Michael Parkes, National Coordinator, Shore-Zone Program.

A publication of the proceedings is scheduled to be released in September 1980.

First Plenary Session

This session featured some ecology/economic arguments that have been debated since 1969 or so. Professor Ogden of the Biology Department, Dalhousie University spoke on the value of water quality and its role in ecosystem maintenance. He particularly underlined the problem of acid rain in Nova Scotia. Since 1952 the general ph level in provincial lakes has been lowered from 5.1 to about 4.1. He estimates that about 25% of Nova Scotia lakes are sterile. What was increasingly worrisome to him was the fact that soils are vulnerable to increasing acidification.

Peter Pearse of the Department of Economics, University of British Columbia defended the economist's viewpoint. He noted that paradox of greater public concern over higher taxation levels and government spending, while insisting on greater pollution control. To Pearse, pollution simply signifies a market failure--a failure to measure properly the costs and benefits of a particular action involving air, water or land resources. He contends that the polluter-pay principle is naive; any competitive industry will shift the costs of abatement forward to consumers or backward upon the suppliers and work force in order to maximize profit, no matter what constraints are placed on their production processes. Pearse noted that if environmental

quality can be regarded as a marketable good (there was considerable debate about this assumption) then certain criteria exist that can be employed to judge the efficiency of regulating arrangements. These include:

- All potential users must have access in an unbiased way;
- The system will have to respond to marginal adjustments in regulations;
- Uncertainty must be minimized;
- Rules must be flexible over time;
- Rules must be economical in terms of costs of enforcement.

Pearse then proceeded to review five different methods of water pollution control: i) collective abatement, ii) subsidies for abatement, iii) prescribed equipment standards, iv) standards of discharge use of fiscal devices (discharge fees) and v) property rights. His own preference was for property rights, (ie. endowing users with transferable rights to pollute). This provides a security of access to users to the market (the receiving water body); and would permit changes in water quality objectives and the allocation of rights on a more objective basis and would allow market forces to distribute benefits and costs more efficiently. This last suggestion was the centre of considerable debate, not the least from Environment Canada, Environmental Protection Service representatives in attendance.

The evening session featured a discussion entitled "Water Problems in the 1980's and Whether the Law Can Cope". Speakers gave American and Canadian viewpoints. The American perspective was put forward by Mr. J. Olsen, a practising lawyer in Michigan. It was his opinion that the current problems experienced by U.S. courts involving the administration of the National Environmental Protection Act (NEPA) will continue through the 1980's. Briefly, these include: i) the question of standing, (ie. whether the matter in question qualified in the eyes of the Court as allowable as a right under law); ii) the time and the cost associated with class actions involving environmental law--in general lawyers are not attracted to such cases because of the poor return on time invested; and iii) increasing pressure from industry and the administration to "bend" environmental regulations for energy producers in light of the current energy crisis.

The Canadian perspective was given by Paul Emond of the Osgoode Hall Law School in Toronto. He noted the lack of anything comparable to NEPA in Canada and a far greater reliance on common law remedies. These remedies include riparian and, presumptive rights as well as environmental actions in Canada which are notoriously weak. Common law actions are after the fact; there is often difficulty in identifying the person responsible. In addition, one must prove the right that the court recognizes has been impinged. There are no actions in Canada equivalent to class actions that are instituted in American law, but the potential does exist for their pursuit.

Workshops

Regarding the workshops, the titles of some of the background material that was distributed to provide a basis for discussion have been attached. Should you wish any of these papers, please contact Mr. M. Parkes, National Coordinator, Shore-Zone Program, in Ottawa.

<u>Title</u>	<u>Author/Chairman</u>
Environmental Change in Marine Ecosystems	Dr. J.A. Hansen, Director, Institute for Resource and Environmental Studies, Dalhousie University
Upstream Activities and Downstream Consequences	Dr. J.G. Ogden, Biology Department, Dalhousie University
A Historical Review of Water and Environmental Law in Nova Scotia	Dr. J. Nedelsky, Institute for Resource and Environmental Studies, Dalhousie University
Protecting Public Health	Mr. P. Casey, Nova Scotia Department of Health
Acid Rain	Ms. Susan Guppy, Institute for Resource and Environmental Studies, Dalhousie University
The Economics of Environmental Control	Dr. P. Pearse, Department of Economics, University of British Columbia
The Fisheries Act: A Tool for Environmental Protection	Mr. J. MacLatchy, Water Pollution Control Directorate, EPS.
Coastal Zone Management	Dr. G.E. Beanlands, Director, Lands Directorate, Atlantic Region, ECS.

Second Plenary Session

The second plenary session was entitled "The Legal Process and Environmental Problem Solving". It featured addresses by Mr. M.J. Kirby, Director, Institute for Research on Public Policy and Paul Pross, Professor of Political Science and Public Administration, Dalhousie University. Comments on the second speaker were provided by Peter Higgins of EPS and Doug Carter, Deputy Minister of Environment, Province of Nova Scotia.

Kirby's talk centered on constraints to environmental problem-solving within the parliamentary system. It is his opinion that the normal political system is not effective in dealing with environmental topics due to the complexity of the subject. He noted the difficulty

for Ministers and ordinary members to grasp the technicalities of environmental problems as well as absorb information quickly when faced with the normal myriad demands of Parliament. Kirby felt that a better informed public could help considerably in clarifying environmental issues for politicians. This of course implies a greater ease of access to information than at present. Yet at the same time, the legislature must not be denied its constitutional role. Kirby stressed that public servants and scientists must work on giving Ministers a clearer indication of the implications of choices in environmental decision-making. Too many "straw men" are put up as alternative actions for consideration by Cabinet.

Paul Pross spoke on constraints to environmental problem-solving in the bureaucracy. He contends that the philosophy of our political system has been to encourage a distributive approach to resources through their piecemeal allocation to whomever has the most muscle (political or economic). He noted the lack of assessment of what constitutes an environmental resource, and the problems it causes. With better knowledge, resources could be better distributed. Pross used the example of the coastal zone to illustrate his point, citing conflicts between uses, the questions of intangible values, the common property nature of many coastal resources. These factors must force us to re-evaluate our current attitudes to resource distribution.

Conclusions

The conference was a worthwhile experience in terms of learning the many problems faced by the courts in applying both statutory and common law principles to environmental situations. One was left with the impression that considerable gaps both within disciplines and among professionals respecting environmental problems still remain. The translation of environmental parameters in terms of workable laws remains as one of the largest challenges. Hopefully, Dalhousie University and the government departments involved will see their way to repeat the exercise, perhaps on an annual basis.

B) International

Background

The Committee on the Challenges of Modern Society was established in 1969 as an extension of NATO. It has previously commissioned national pilot projects on the physical and social environment with a view to stimulating national or international action regarding certain resource management problems. For example, Canada figured prominently in a previous CCMS pilot program on river basin planning. The Canadian pilot project was the Saint John River Basin and a publication concerning this exercise was produced in 1971.

Attention of the CCMS is now focussed upon estuaries, since these areas are of such great value for world food production. Their increasing pollution from a variety of toxic chemicals and the other demands made upon them by man make their management of vital

importance. Accordingly, it was decided to cooperate jointly on a study of common problems and to develop protection for the resources of important estuaries. A Work Group was formed in 1979 to evaluate comprehensive management strategies in estuaries that have been applied by member countries in preventing environmental degradation. Known as the CCMS Pilot Study on Estuarine Management, the Work Group is chaired by the United States, with representatives from Belgium, the United Kingdom, Greece, Italy, the Netherlands and Canada (as of September, 1980).

The first meeting was held in Brussels, Belgium. At that time, potential areas of cooperation were discussed and specific estuaries for study identified. A request for Canadian participation was made by delegates from the US and UK. In June 1980, a second meeting was held in London, England to produce a work plan for a report and identify a schedule. The US representative agreed to prepare a draft document representing a synthesis of the approaches. It was felt that Canada should at the least have an observer at this meeting. Accordingly, the Scientific Liaison Officer from the Canadian High Commission in London acted in this capacity. Realising the potential benefit from this exercise for the Fraser estuary agreement, the decision was made to appoint a Canadian representative in September and to use the Fraser as our case study example. Contact was made with provincial officials on this matter as the Fraser is currently being planned under a federal-provincial agreement. The provincial ADM responsible (Mr. Art Benson) agreed to full provincial cooperation. The National Coordinator, DOE Shore Zone Program, was appointed as Canadian representative.

The third meeting of the CCMS Work Group was held October 27 - November 1, in Annapolis, Maryland.

Summary of the Meeting

The Fraser estuary was presented as the Canadian case study at the third meeting, and a copy of the federal-provincial task force report on the estuary completed in 1977 was tabled for background information. Both the report and presentation were well received. Representatives from Belgium, the Netherlands, Italy and Greece were particularly interested in the Canadian approach of using a federal-provincial agreement to produce an estuary management plan that included a regional government representative on the steering committee.

Reviews were also presented of the other case study estuaries: the Thames estuary in England, the Scheldt estuary in Belgium, the Tiber estuary in Italy, Amvrokikos Bay in Greece, Lake Grevelingen in the Netherlands and the Potoemac estuary in the United States. Although each estuary is quite different physiographically, there were many common areas of concern regarding their management. These include: (a) the question of how to divide institutional jurisdiction for estuary management among responsible land-based and water-based

agencies; (b) whether a centralized or de-centralized approach should be taken to resource management administration; (c) the need for greater refinement of current mathematical modelling capability for estuaries; (d) the need for greater clarity in describing resource trade-offs; (e) developing better mechanisms for public involvement in the decision-making process.

A draft report on a summary of national programs on estuarine management completed by the US representative was put forward for comment. After considerable discussion, the draft report was radically revised, and a new framework agreed upon (see attached). It was also agreed that representatives would modify or expand their own summaries as needed and add a section dealing with decision-making and conflict resolution by January 1, 1981. It was noted that due to our recent inclusion the Canadian case study was still being written and as a result the deadline would be more flexible. In addition to report revisions, representatives were asked to submit observations on discussions at the Annapolis meeting for study conclusions.

Future Action

The Canadian report is now being drafted in cooperation with the RDG Pacific and Yukon and provincial Ministry of Environment officials. A meeting has been tentatively scheduled for the week of January 19 - 23 in Vancouver to make revisions and obtain a progress report on the Fraser agreement.

Copies of the 1977 federal-provincial Fraser River Estuary Report were obtained from the provincial government and were sent to the CCMS Working Group Chairman on November 28, 1980. These will then be distributed to representatives of the member countries.

The Working Group Chairman has agreed to circulate a second draft report to member countries based on comments and revisions received, including the Canadian report by March 1, 1981.

6. NEW POLICIES

The following principles of shore management were approved by the Canadian Council of Resource and Environment Ministers (CCREM) at their last annual meeting. They will hopefully form the basis of future shore management policies to be adopted by members of CCREM, and will act as guidelines for future program implementation.

PRINCIPLES FOR SHORE MANAGEMENT

Each shore management policy should be based on, but need not be limited to, the following principles:

I. The recognition of the importance of shore areas:

All levels of government recognize the critical environmental, economic and social importance of shores and actively promote the sensitive and orderly management of shores and shore resources in the long-term.

- II. A cooperative approach to management:
Where interests of government and/or agencies coincide, a cooperative approach to the management of shores should be undertaken. A lead agency should be identified within each jurisdiction to provide the leadership to develop and integrate intra- and interjurisdictional policy. This does not preclude direct cooperation between and among individual agencies in relation to specific issues.
- III. Policy and program coordination:
All levels and agencies of government must strive to coordinate their policies and programs so that integrated management of shores and shore resources can be achieved. To achieve this, interjurisdictional coordinative mechanisms could be adopted to embrace the numerous and diverse interests to shore management.
- IV. The recognition of the role of local governments:
The key role of local governments in shore management planning and implementation must be recognized. Senior governments could support these efforts by providing technical and financial assistance.
- V. The contribution of industry:
The potential contribution and cooperation of industry in the development and implementation of shore management practices must be actively encouraged.
- VI. The interrelationship of shore activities:
All shore users must take into account the consequences of their actions on shore systems and on other activities. Development siting criteria sensitive to the physical, biological and social characteristics of shores must be included within each policy.
- VII. The protection of sensitive, unique and significant areas:
Sensitive, unique and significant shore areas, including biotic habitats, should be identified and protected. Government could provide incentives to private individuals and groups who manage, protect and restore sensitive shore areas.
- VIII. The right of public access:
Adequate rights of public access to shore areas must be ensured. In those areas where shore access is in short supply, efforts should be made to restore public rights-of-way.
- IX. Information systems:
Cooperative information systems must be structured so that information obtained is readily applicable to shore management decision-making and planning. Interjurisdictional information centres to coordinate the collection, collation and dissemination of shore management information could be established for this purpose.

X. Public awareness:

All levels of government must undertake programs designed to increase public awareness and appreciation of the dynamic and sensitive nature of shores. Public concerns should be incorporated into the objectives of shore management policies.

7. Selected Shore-Zone Statistics

TABLE 1: Population, Area and Density for Drainage Basins and Primary Watersheds, 1971

Watershed	Population	Area ¹ (square miles)	Population Density (person/sq.mile)
Atlantic Basin	15,481,700	510,991	30.3
Atlantic Ocean	716,275	131,627	5.4
Gulf of St. Lawrence	1,089,635	124,671	8.7
St. Lawrence River	5,276,660	82,909	63.6
Ottawa River	1,178,150	57,977	20.3
Lake Ontario	3,981,490	12,273	324.4
Lake Erie and Lake St. Clair	1,472,295	9,394	156.7
Lake Huron	966,330	36,549	26.4
Lake Superior	150,340	30,972	4.9
St. Lawrence River and Great Lakes ² ..	13,025,265	230,074	56.6
Hudson Bay and Ungava Basin	3,669,060	1,335,650	2.7
Nelson River	30,315	34,435	0.9
Lake Winnipeg	3,336,175	328,067	10.2
Arctic Basin
Mackenzie River	240,945	650,458	0.4
Pacific Basin	2,153,125	381,714	5.6
Columbia River	252,030	39,685	6.4
Fraser River	1,261,595	89,693	14.1
Gulf of Mexico Basin	13,825	9,905	1.4

1. The areas are approximate and should only be used as relative indicators of size.

2. These are figures for the Canadian portion of the Great Lakes Basin only. The following are population figures for the American portions of those basins in 1970: Lake Ontario, 2,898,485; Lake Erie, 10,111,571; Lake Huron, 1,390,880; Lake Superior, 429,033; and Lake Michigan, 10,566,266.

Source: Special tabulation by the Census Field, Statistics Canada; Population Estimates for the Great Lakes Basins and their Major Tributaries, Canada Centre for Inland Waters, Environment Canada, Burlington, Ontario 1973; Human Activity and the Environment, Statistics Canada.

TABLE 2: Populations of Selected Watersheds Which Contain Census Metropolitan Areas (CMA's) and Other Large Cities, 1971

Watershed	Total population	Area square miles	Population density persons per square mile	City, CA or CMA	
				City, CA or CMA	City, CA or CMA population
Saint John River	337,080	14,542	23.2	Saint John, CMA	106,744
St. Lawrence River	5,276,660	82,909	63.6	Québec, CMA	480,502
				Trois Rivières, CA	97,930
				Montréal, CMA	2,743,208
				Valleyfield, CA	37,430
				Cornwall	47,116
				Kingston, CA	85,877
Saguenay River	267,400	34,022	7.9	Chicoutimi-Jonquière, CMA	133,703
St. Maurice River	183,510	17,536	10.5	Shawinigan, CA	57,246
Ottawa River	1,178,150	57,977	20.3	Ottawa-Hull, CMA	602,510
Lake Ontario	3,981,490	12,273	324.4	Oshawa, CA	120,318
				Toronto, CMA	2,628,043
				Hamilton, CMA	498,523
Trent System	193,760	5,198	37.3	Peterborough, CA	63,531
Niagara Peninsula	389,775	1,268	307.4	St. Catharines-Niagara, CMA	303,429
Lake Erie and Lake St. Clair	1,472,295	9,394	156.7	Windsor, CMA	258,643
Grand River	489,875	2,999	163.3	Kitchener-Waterloo, CMA	226,846
				Brantford, CA	80,284
Thames River	426,045	2,318	183.8	London, CMA	286,011
Lake Huron	966,330	36,549	26.4	Sarnia, CA	78,444
Lake Winnipeg	625,845	108,453	6.0		
Red River and Assiniboine River	1,247,085	72,267	17.0	Winnipeg, CMA	540,262
				Regina, CMA	140,734
Saskatchewan River	1,870,510	157,344	11.9	Edmonton, CMA	495,702
South Saskatchewan River	952,275	68,769	13.8	Saskatoon, CMA	126,449
				Lethbridge	41,217
				Calgary, CMA	403,319
				Red Deer	27,674
Columbia River	252,030	39,685	6.4		
Okanagan River	113,160	3,262	34.7		
Fraser River	1,261,595	89,693	14.1	Prince George, CA	49,100
				Vancouver, CMA	1,082,352
Thompson River	100,820	21,685	4.6	Kamloops, CA	43,790

Source: Same as in Table 1.

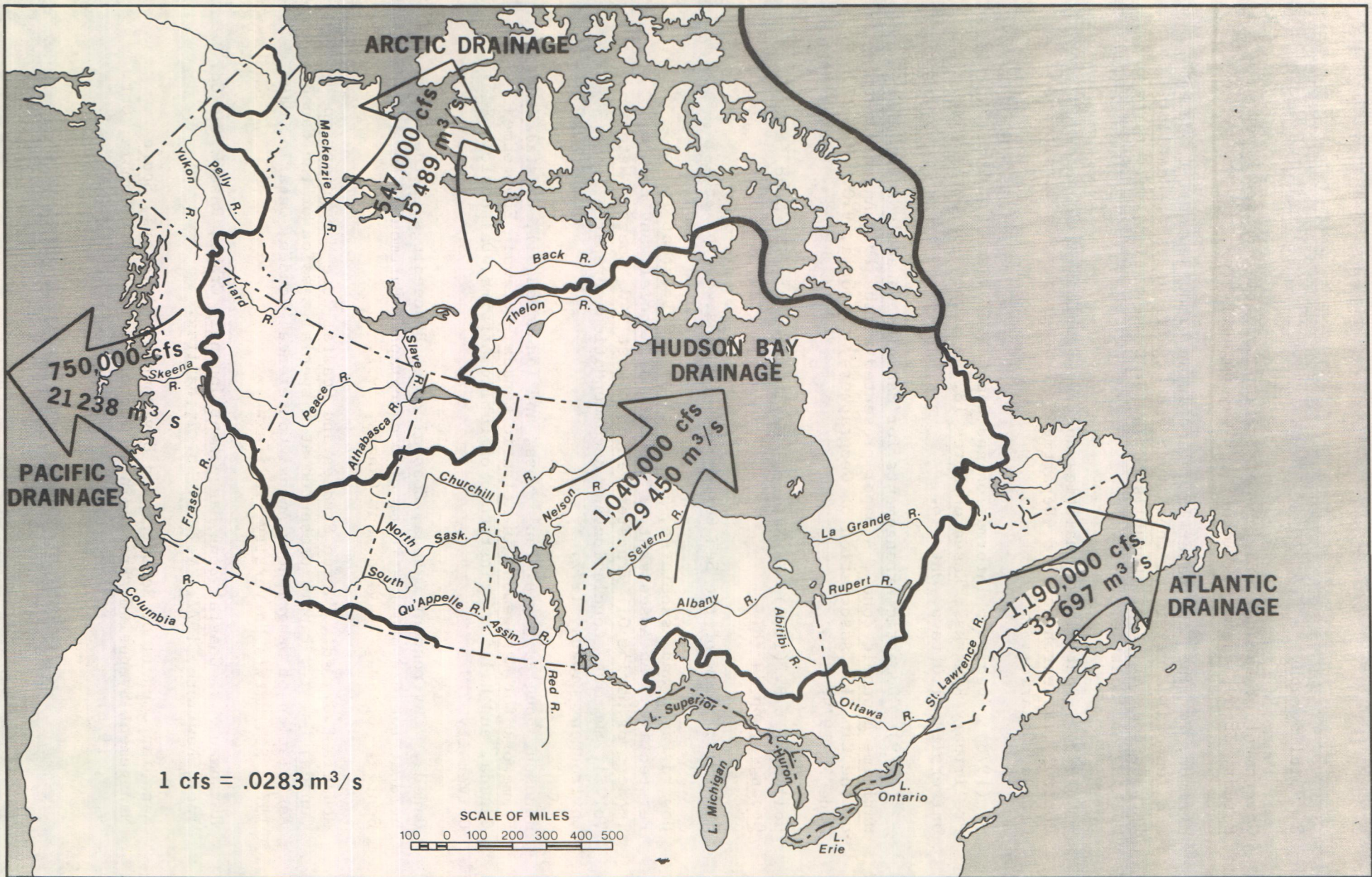
TABLE 3: Watersheds with High Population Densities, 1971

Watershed	Population	Area square miles	Population density persons per square mile
Toronto ¹	2,434,505	1,203	2,023.7
Montréal ¹	2,667,375	1,926	1,384.9
Hamilton ¹	630,530	996	633.1
Lower Fraser River	1,007,420	2,389	421.7
Niagara Peninsula	389,775	1,268	307.4
Thames River	426,045	2,318	183.8
Grand River	489,875	2,999	163.3
West St. Lawrence (Quebec part)	64,010	395	162.1
Lower Ottawa (Ontario part)	479,175	3,700	129.5

¹ These sheds are constructed to enclose an urban area and may contain a number of small river basins.

Source: Same as in Table 1.

DRAINAGE TO CANADIAN SHORE ZONES



Source: Canada Water Year Book 1975, Environment Canada; Human Activity and the Environment, Statistics Canada, 1978.

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CALL FOR SUBMISSIONS: COASTAL ZONE MANAGEMENT JOURNAL: SPECIAL ISSUE

The Coastal Zone Management Journal (CZMJ) (published by Crane Russak) is, as you know, the major journal specialising in questions of coastal zone management. As part of its policy of preparing special issues on important topics, CZMJ has decided to publish a special issue on the Canadian situation. This will be the first such issue to deal with a specific country, and there is a good deal of interest in it.

Professor Peter Harrison, Department of Geography, University of Ottawa is a member of the editorial board of CZMJ. He will be editing the special issue on Canada and will be joined by Michael Parkes (National Coordinator, Shore Zone Program, Environment Canada) and Walter Gray (Coastal Resources Centre Division of Marine Resources, University of Rhode Island). Together they will make up a special editorial selection and review committee.

Those who have an interest in CZM in Canada, are invited to submit abstracts of papers dealing with management aspects of coastal development in Canada which would be publishable in the special issue. The abstract should be approximately 150 words long, and should be received before April 15, 1981. The editorial selection committee will then choose between the abstracts and will make a formal request to those chosen to prepare the paper they proposed. The final version of these papers should reach Professor Harrison by July 30, 1981.

In choosing papers the committee will try to strike a balance between East coast, West coast, and Arctic coast examples and between different types of issues ranging from multiple use and access problems to emerging questions as energy facility siting. Since we are restricted to one issue of the journal, a total of 4 or 5 papers (25-30 pp each) will be chosen. Should the response to the request for abstracts be overwhelming, consideration will be given to the possibility of publishing separately those papers not chosen for the special issue.