SHORE-ZONE REPORT

Shore-Zone Report No. 1
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Environmental Conservation Service
Environment Canada
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SHORE ZONE REPORT

1. INTRODUCTION

This publication marks the third of a series of Shore-Zone Reports which will provide a regular source of information on shore-zone activities in Canada.

The report series has been designed to:
i) provide an update on the status of shore-zone initiatives and concerns;
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 may 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:

I resigned as coordinator at last 6 mos. ago

Headquarters
Dr. Michael Parkes
National Coordinator
Shore-Zone Program
Policy and Program Development
Directorate
Environment Canada
Ottawa, Ontario
K1A 0E7

Ontario Region
Mr. Doug Cuthbert
Head, Engineering Division
Water Planning and Management Br.
Inland Waters Directorate
Environment Canada
P.O. Box 5050
Burlington, Ontario
L7R 4A6

Quebec Region
Mr. Jean-Louis Belair
Director
Lands Directorate
P.O. Box 10100
2700 Laurier Blvd.
5th Floor, Champlain Tower
Ste. Foy, Quebec
G1V 4H5

Western and Northern Region
Mr. W. Brakel
Office of Departmental Director-General
Environment Canada
9942-108th Street
Edmonton, Alberta
T5J 1S6

Atlantic Region
Mr. R. Beardmore
Atlantic Regional Director
Lands Directorate
Environment Canada
45 Alderney Drive
Dartmouth, Nova Scotia
B2Y 2N6

Pacific and Yukon Region
Dr. J. Wiebe
Office of Departmental Director-General
Environment Canada
1001 West Pender Street
Vancouver, British Columbia
V6E 2M7

Should you require additional copies of the Shore-Zone Report, please contact Dr. Michael Parkes or Mr. Chris Hanlon at the above address.

2. HIGHLIGHTS

- The Canada Oil and Gas Act has established a new management regime for oil and gas development in the Yukon and Northwest Territories as well as Canada's offshore seabeds, known as "Canada Lands".

- An agreement to govern offshore oil and gas resource management and revenue sharing between the Governments of Canada and Nova Scotia was signed on March 2, 1982.

- The joint Federal-Provincial program known as "Wetland Protection Mapping and Designation" is nearing completion in Nova Scotia and is over half-way along in Prince Edward Island.

- To anticipate the variety of shore environments found along the Arctic coasts (and elsewhere), to facilitate a timely air photo interpretation schedule, and to permit the use of previous, detailed studies where they exist, an open-ended classification is being developed based on landform associations which occur at the land/sea interface.

- The publication of The Coastal Resources Folio (1:50,000 and 1:15,840 scale thematic maps) is being scheduled over the next year in Vancouver.

- An environmental/sensitivity mapping workshop was held in Halifax Nova Scotia on March 10, 1982.

- The Executive Committee of the Canadian Association of Geographers (CAG) announced the formation of a special interest group, the Marine Studies and Coastal Zone Management Group.

- A major Canadian conference on Coastal Engeneering will be held at the Four Seasons Hotel in Vancouver, British Columbia on May 12 and 13, 1983.

- World Conservation Strategy Report.

3. HEADQUARTERS ACTIVITIES

A) Canada Oil and Gas Act

One of the most important pieces of legislation to affect the future development of the Canadian shore zone was proclaimed in Ottawa on March 5, 1982. The Canada Oil and Gas Act established a new management regime for oil and gas development in the Yukon and Northwest Territories as well as Canada's offshore seabeds, known as "Canada Lands".

The new Act contains several interesting provisions. The federal government will retain a 25 per cent interest in any oil and gas rights on the Canada Lands, excepting fields already in production. A minimum level of 50 per cent Canadian ownership is established in new oil and gas production on Canada Lands. Basic royalties are set at 10 per cent of gross oil and gas revenues, with an additional royalty of up to 40 per cent of net profits above a 25 per cent rate of return on the investment of the exploration company. In addition, Canadian manufacturers, consultants, contractors and service companies will have a full and fair opportunity to participate competitively in the supply of goods and services in exploration, development and production activities in the Canada Lands.

Proposals for exploration have been received from 11 companies in response to a call for Submission of Proposals by the Department of Energy, Mines and Resources for seven parcels of seabed off the east coast of Canada. Action on these submissions has, however, been postponed to give the Government of Newfoundland and Labrador time to consider the Canada - Nova Scotia Offshore Oil and Gas Agreement.

Canada - Nova Scotia Offshore Oil and Gas Agreement

An agreement to govern offshore oil and gas resource management and revenue sharing between the Governments of Canada and Nova Scotia was signed on March 2, 1982. The revenue sharing system agreed to give the Nova Scotia government potential access to revenues equal to, and somewhat above the national average for provincial governments.

The following is a brief summary of the provisions of the Agreement:

(i) The Resource Management Regime

Offshore Objectives

The cooperative regime for offshore resource management is intended to achieve a number of objectives:

- Increased energy security and economic prosperity.
- A pricing and fiscal regime which will encourage increased offshore exploration and development on an economic basis.

- Rigorous protection of the environment and fishing industry.

- Government control over the pace of offshore development.

- Canadian jobs and industry participation on a fair and competitive basis, with first consideration for Nova Scotians.

- Improved safety of offshore work.

Canada Nova Scotia Offshore Oil and Gas Board

Under the authority of the federal Minister of Energy, Mines and Resources, the Board makes decisions on the management of offshore oil and gas resources and advises the Minister.

The Board is comprised of three members appointed by the Government of Canada and two members appointed by the Government of Nova Scotia. The Chairperson of the Board is the Administrator of the Canada Oil and Gas Lands Administration (COGLA), one of the federally-appointed members.

As part of its responsibilities, the Board will:

- Direct COGLA in its management of offshore exploration and development.

- Advise the Minister on offshore legislation and regulations.

- Collect and administer the Basic Royalty and the Progressive Incremental Royalty (PIR).

Provincial Right of Delay on Key Decisions

- the Nova Scotia members of the Board have the right to delay the execution of decisions covering a Canada benefits plan, call for proposals, exploration agreement, provisional lease or authorization of an oil or gas production system for specified periods ranging from three months to one year;

- if this delay right is used, the Minister and the Nova Scotia Board members will make every effort to reach agreement and, if successful, the suspension will be lifted immediately.

Ministerial Authority

- the federal Minister may make decisions in the absence of a decision by the Board and substitute his decision for a Board decision, with a one-month delay in execution.

(ii) Canada Oil and Gas Lands Administration (COGLA)

- COGLA will administer offshore oil and gas activities.
- A COGLA office will be established in Nova Scotia (CNSO) to administer offshore activity locally.
- COGLA staff may be augmented by seconded employees of the Nova Scotia public service.

(iii) Public Review Process

- a public review will be held in Nova Scotia before any choice of a production system for offshore oil and gas.

(iv) Environmental Protection

- a cooperative environmental assessment process meeting the environmental review requirements of both governments will be established.

(v) Fishing Industry

- a joint Canada - Nova Scotia fisheries advisory committee will be established including representatives of fishermen, the fishing industry and both levels of government to advise on offshore oil and gas activity as it may affect the fishery.

(vi) Revenue Sharing

Nova Scotia is initially to receive all provincial-type resource revenues and additional revenues, including revenues equivalent to:

- The basic 10 per cent royalty on gross production revenue.
- The progressive incremental royalty of up to 40 per cent of net revenue.
- A provincial corporate tax applied in the offshore region.
- A provincial retail sales tax applied in the offshore.
- Bonus payments.
- Rentals and license fees above administrative costs.

- The Federal Petroleum and Gas Revenue Tax (PGRT) at an effective 12 per cent rate.

The province will continue to receive these revenues until it reaches a level of fiscal economic capacity above the national average. Thereafter, revenues will be shared with the federal government, but on a gradual basis to ensure that the fiscal and economic benefits for Nova Scotia are lasting.

Revenue sharing between governments will be reviewed at five year intervals following the commencement of production.

(vii) Canada - Nova Scotia Development Fund

- $200 million fund advanced to the government of Nova Scotia by the federal government over the period 1984 to 1987 will enable the province to develop new infrastructure to meet the demands of development at Venture and elsewhere in the offshore region near Nova Scotia. Nova Scotia will propose expenditures from the fund and both governments will approve expenditure. These advance funds will subsequently be reimbursed to the federal government from offshore production revenues.

(viii) Crown Share

- The Nova Scotia government will have the right to acquire, at a price based on the federal government's costs, a 50 per cent portion of the Crown Share of offshore gas fields and a 25 per cent portion of the Crown Share of offshore oil fields.

(ix) Pricing

- The wellhead price of offshore oil and gas will be set by the federal government after consultation with the government of Nova Scotia.

(x) Venture Natural Gas

- Exploration to prove up threshold reserves to proceed without delay.

- Both governments will facilitate development on an economic basis.

- The operator should submit a development plan as soon as possible.

(xi) Transportation

- The Nova Scotia Government will have the opportunity to acquire, on a commercial basis, an interest of up to 50 per cent in any oil or natural gas trunkline from the offshore, including an extension within Nova Scotia.

(xii) Sable Island

- Authority over Sable Island to the low water mark will be exercised by the Nova Scotia Minister of Mines and Energy.

- Nova Scotia will receive all provincial-type resource revenues from Sable Island, for the duration of the agreement.

(xiii) First Access to Offshore Oil and Gas Supply

- The needs of oil and gas consumers in Nova Scotia will be met by offshore oil and gas before sales are made to purchasers outside the province.

(xiv) Canada - Nova Scotia Executive Commitee on Economic and Social Benefits

- The Committee will advise on objectives and methods for promoting economic and social benefits from offshore activity, in close cooperation with the Board.

(xv) Implementation

- Implementing legislation will be passed by the Parliament of Canada and the legislature of Nova Scotia.

- The agreement will stand even in the case of any subsequent court decision with respect to ownership of the offshore.

(xvi) Term

- the agreement commences on March 1, 1982 and is intended to last for a term of at least forty-two years.

B) Canadian Coastal Sediment Study

Background

In 1977, the National Research Council of Canada (NRC) established an Associate Committee for Research on Shoreline Erosion and Sedimentation (ACROSES) to provide a national forum for the discussion of shoreline-related sediment problems, with the aim of defining national research requirements. It is expected that the results of this research would help to overcome the major deficiencies in the present understanding of very complex shoreline processes. The on-going efforts of various universities and government organizations in this area of research have not been sufficient, evidently, to provide answers to the questions which are presently being asked by individual shore-property owners, as well as municipal, provincial and federal governments with a responsibility for the management of the nearshore zone.

A Shore Management Symposium, held in October 1978 by the Canadian Council of Resource and Environment Ministers in Victoria, B.C., focussed attention on the need for a better understanding of the interaction of the oceans or lakes within the Canadian land mass. Alberta and Ontario have either plans for or drafts of "Shore Management Guides", but the contents of the Ontario draft makes it clear that nearshore research has as yet not provided the required basic information.

A Workshop on Instrumentation for Currents and Sediments in the Nearshore Zone, organized by ACROSES at NRC in October, 1979, made, amongst others, the following three recommendations:

(1) A comparative study of different fast-response flowmeters, in steady and unsteady flow conditions should receive high priority.

(2) The use of fast-response sediment monitors should be encouraged in Canada, together with further development of such instruments to increase their reliability.

(3) More collaboration between different institutes, in particular between government institutions and universities, and between engineers and geologists, should be encouraged by ACROSES and other organizations.

The Proposal

In response to these recommendations, ACROSES suggested that a comprehensive coastal sediment research study be carried out, with NRC as the lead-agency and co-ordinator. A subcommittee was set up to act as the steering committee for the proposed study. The following departments are represented on the subcommittee: Public Works (DPW), Transport (MOT), Environment (DOE), Fisheries and Oceans (DFO), Energy, Mines and Resources (EMR) and NRC.

The proposed study would consist, mainly of monitoring closely a shore length of coastline, with a maximum of installed instrumentation to measure currents, waves, tides and sediment transport. Most of the work would be carried out under contract by consulting engineers, universities and provincial research organizations. NRC would provide personnel for overall management of the study and some research support. ACROSES would provide advice and overall direction through a steering committee to be appointed once approval of the study is obtained.

A site for the study has not been selected; however, three alternatives have been identified. One site is located in Prince Edward Island, a second in New Brunswick and a third in the Magdellan Islands. One of the first tasks of the Steering Committee will be to select the most suitable site, based on a site study which NRC will fund during 1981/82. It is expected that, once a site has been chosen, the appropriate Provincial Government would support the study by providing local headquarters facilities and an on-site project office.

The study would provide (i) an urgently needed comparison and evaluation of instrumentation and (ii) an equally urgently required collection of field data to develop new or calibrate existing models of shoreline processes, and (iii) an excellent opportunity for collaboration between the different institutions and disciplines, presently active in nearshore zone studies in Canada.

C) Shore Zone Siting Facilities Methodology

Environment Canada, in cooperation with the Department of Indian and Northern Affairs has undertaken a contract study to develop a model siting process that can be used in identifying environmentally appropriate facility sites in the arctic Canada Shore Zone. The siting model process will be supported by specific siting criteria that are applicable to facility development in the north. Although no data collection is proposed, a third aspect of the study will be a report on the types of data that would be required to make efficacious siting decisions.

The final product of this study will be a report that includes (1)a detailed method to use in identifying environmentally acceptable sites for facilities in the Beaufort Sea coastal area, and northern Canada generally, (2) a list of specific environmental criteria tha must be considered when siting a facility, and (3) a review of data needs to effectively plan and site facilities in the north.

The model developed will be generic, rather than specific to one area or political entity, although it will be developed with special emphasis on the Canadian Beaufort Sea. It is designed to provide the Government and the petroleum industry with a clear means of assuring the adequacy of development plans as they relate to environmental concerns. It will provide guidance for judging how

effectively development programs appear to be addressing the public's concerns as well as industry's facility development needs. The major benefit of a stated siting process is that industry and government planners have a basis for guiding their decisions, and both groups will be using similar approaches and will be aware of each other's concerns and interests.

Two audiences are seen for the model. One is industry, which can shape the generic model to specific development needs. Public officials form the second audience. Government agency staff will benefit from the approaches and information provided by a well thought out model facility siting process because it will provide a structure upon which to base analysis and decisions, and it will ensure that relevant criteria are not overlooked.

The process will accommodate energy facilities generally, although the principles are sound and apply to any development. The types of facilities for which criteria may be developed include the following:

- refineries;
- natural gas processing plants and pipeline transmission systems;
- crude oil facilities (tank farms) and pipeline transmission corridors;
- marine terminal facilities and ports;
- pipeline landfalls;
- service, supply, and support facilities for oil and gas operations.

The first task will be the development of a general siting process outline. The process will be based on the principle of screening environmentally unacceptable areas from further consideration as potential sites. The screening processes will be outlined and submitted for comments. Next, environmental criteria, the decision points in the process, and the actors involved will be identified. The final planning document will necessarily have to be largely in outline and list form, but will be complete enough in itself to be immediately of use in guiding siting decisions. The following site screening and decision aspects will be covered:

- the steps of the entire planning process;
- the linkages required;
- the factors likely to be of concern to the industry and the public;
- the environmental criteria the industry needs to consider when siting a facility; and
- the role of officials involved in various decision points.

This contract is being supervised by the Federal Activities Branch, Environmental Protection Service, Environment Canada.

D) Classification of Arctic Marine Shores for Regional Land Management and Environmental Evaluation

Since 1971 the Lands Directorate of Environment Canada has been compiling resource information, at a scale of 1:250,000, in the Northwest and Yukon Territories. This information is produced as the Northern Land Use Information Series of maps, a project co-sponsored by Environment Canada and Indian and Northern Affairs Canada, and carried out with the aid of a number of sub-contracts issued to specialists in Fisheries and Oceans Canada, the Government of the Northwest Territories Wildlife Service, and other agencies involving government and consultants. In 1980 the Series focussed for the first time on part of the Arctic archipelago. To anticipate requirements in regional planning, land management and environmental evaluation, a marine shore classification was added to the information gathered on landforms, soils, vegetation, wildlife, fisheries, present land use, marine mammals, sea ice and climate, etc.

While a number of detailed Arctic marine shore classification studies have been conducted in certain locales, no overall marine shore classification appears to have been done except at the most general of scales. To anticipate the variety of shore environments found along the Arctic coasts (and elsewhere), to facilitate a timely air photo interpretation schedule, and to permit the use of previous, detailed studies where they exist, an open-ended classification is being developed based on landform associations which occur at the land/sea interface. Each section of shoreline is assigned to one class; each class is defined in terms of a typical range of morphology and materials.

In 1980 the study area was centred around Lancaster Sound and included Devon Island, Cornwallis Island, the Boothia Peninsula and Northern Baffin Island, for a total of 29 map sheets. Fifteen classes were used to describe marine shores in that area; the Northern Land Use Information Series maps for that area will be published during 1981-82. In 1981 the study areas included Bathurst, Melville, Northern Victoria, Prince of Wales and numerous smaller, offlying islands, again for a total of 29 map sheets at 1:250,000. Two more classes were added to account for the shore types not encountered in the Lancaster Sound area; conversely, not all of the original classes were seen during the 1981 field program.

Mapping and classification is achieved through air photo interpretation following reconnaissance overflights and some landings to provide ground truth. An innovative aspect of this marine shore classification is the use of air photo microfilm as the basic tool, rather than 9" by 9" stereopairs. While some reliability is undoubtedly lost, only through the single frame microfilm format, with its advantages of rapid access, scanning and re-shelving, could this extensive shore classification be done within the limited resources available. Based on the 1980 study, ground truth at 187 sites showed that major classes are 92% correct overall and sub-classes 80% correct overall.

Coupled with the other data on the Northern Land Use Information Series maps, such as on geology, surficial materials, vegetation, marine mammals and sea ice conditions, this shore information can be applied to a number of interpretations. Examples are: oil spill sensitivity; suitability for and sensitivity to engineering works, including aggregate removal; accessibility by fixed-wing aircraft, helicopters or small boats; and shore habitats for birds or amphibious mammals.

4. REGIONAL ACTIVITIES

A) Atlantic Region

EPS proposes, as part of the 1982-83 Baseline Studies Program, to complete their coastal sensitivity mapping of Atlantic Canada. The western and southwestern coasts of Newfoundland are the subject of this proposal. Over the past several years atlases have been prepared for the Bay of Fundy (1977), Coastal Labrador (1978), Gulf of St. Lawrence (1979), Eastern Nova Scotia (1980) and Southeastern Newfoundland (1981).

Information on the contents and availability of these atlases was provided in Shore-Zone Report No. 2.

Lands' Newfoundland Coastal Mapping Project is ongoing. A report on the Avalon-Burin Peninsula will be completed this fiscal year. Field work for the northeast coast of Newfoundland was completed this summer and maps and a report will be completed during 1982-83.

Three 1:50,000 sheets covering part of the Avalon Peninsula have been entered into the Canada Land Data System. This data set is meant to demonstrate the usefulness of the CLDS to handle and display this kind of information. Consideration is also being given to including offshore information from the EPS coastal sensitivity maps with the data base.

The Caraquet Bay coastal zone management proposal is still being discussed. A meeting between the various agencies concerned and the University of Moncton is scheduled for January, 1982. After that funding for the project will be requested from appropriate sources.

Cooperative Wetlands Inventory in the Maritimes

Wetlands in the Maritime Provinces are being surveyed through a joint Federal-Provincial program known as "Wetland Protection Mapping and Designation". The work is nearing completion in Nova Scotia and over half way along in Prince Edward Island. It is hoped that the New Brunswick portion of the inventory can be initiated in late 1982 and the entire project completed by 1984.

Wetlands in southern Canada had been classified during the mid-1960's under the Canada Land Inventory program of capability mapping for waterfowl. However, that system provided only a capability rating for waterfowl production and did not provide a measure of the overall value to wildlife of a particular wetland. Additionally coastal wetlands were all lumped into one category and were not delineated according to type. Thus, initial efforts to establish a more comprehensive wetland inventory in the Region began in Nova Soctia in 1977 when the provincial government examined the use of a fresh-water wetland classification and evaluation scheme that had been developed in Massachusetts by

Francis C. Golet (1972). In 1978, the Canadian Wildlife Service began pilot studies towards a marine wetlands classification and inventory system in two coastal sections of Nova Scotia. The two programs developed independently until August 1980 when funding became available through a new Federal-Provincial initiative known as "Wetland Protection Mapping and Designation Program". A full scale inventory was then implemented whereby the marine and fresh-water programs were combined. The result will be a complete inventory of all wetlands over 0.25 ha in size.

The program is being coordinated by the Canadian Wildlife Service of Environment Canada, but is a joint Federal-Provincial venture with sharing of both work tasks and costs by the Wildlife Division of the Nova Scotia Department of Lands and Forests, and on Prince Edward Island by the provincial Fish and Wildlife Division with assistance from Ducks Unlimited (Canada). The overall objective of the program is to provide information on the classification, size, distribution, and wildlife value of wetlands in the Maritimes.

The inventory relies heavily on air photo interpretation from vertical color air photographs (mostly 1:10,000 scale) plus follow-up field checks where necessary. The fresh-water component uses a slightly modified "Golet" classification and evaluation system. The major features of the "Golet" classification system for fresh-water wetlands include the identification of wetland classes and sub-classes based on dominant vegetative types, water depth and permanence, wetland size and hydrologic location, types of surrounding habitat, vegetative interspersion, and water to cover ratio. Once the classification is completed and field checks carried out, the wetlands are scored by combining the classification component with wetland juxtaposition and water chemistry and through the application of certain specifications and ranks a numeric score is derived which reflects the wildlife value of the wetland. The field data sheets used for the fresh-water component of the inventory are coded for entry into a computerized data base.

The marine wetlands classification system used for the program incorporates portions of a system developed by Cowardin et al (1979). Salt marshes are classified according to the ratio of high to low marsh and the number of ponds per hectare. Additionally, all inter and sub-tidal marine and estuarine wetlands are classified along with their substrate or flat type, including the presence of eel grass beds. Surrounding associated habitat such as beaches, sand dunes and spits, and nearshore islands are also classified due to their associated role in determining the intensity of use of marine wetlands by wildlife. No evaluation scoring similar to the fresh-water component is possible, however, the coast line is divided into discrete units and coastal unit score are calculated. That unit score is calculated from the total of the scores from six component types (salt marshes, coastal saline ponds, estuarine flats, beaches, dunes, and islands) along with five conditional factors (tidal influence, vegetation presence, size, exposure factor, and juxtaposition factor), and

added to that is a value for the disturbance status of the unit. The total coastal unit score is an indication of the productivity of each unit and is designed to provide a relative measure of the importance to wildlife of individual coastal bays, lagoons, estuaries, etc.

The end products of the inventory will be a computer data base and map atlases for each county within a Province.

Data for all fresh-water wetlands, salt marshes, and tidal ponds are being stored in computer data banks located at provincial resource centres. Researchers and planners will have access to the data bank and retrieval will be on a provincial, county, water-shed, or sub-shed basis. Numerous tabular summaries illustrating the location, distribution, size, and importance of wetlands are to be compiled and made available.

Once both the fresh-water and marine components of the system have been completed, map atlases on the 1:50,000 scale using the National Topographic Series Base Maps will be prepared for each county within a province. Those maps will show all marine wetlands, their classification, sizes, and coastal unit scores, along with all fresh-water wetlands that have a relatively high wildlife value (Gotlet score of 60+) and will show their size, wetland classification, and score.

A copy of each county atlas will be distributed to appropriate municipal planning offices. It will contain details of the classification and scoring system along with recommendations for use of the maps. Other agencies involved with land management of coastal resources will receive copies of either the county atlases or an overall provincial atlas.

It is expected that the Wetlands Inventory when completed will be widely used to assist federal, provincial, municipal, and town planning agencies in making decisions in the developments of provincial wetlands policy and will additionally provide a data base for a wide variety of wetland research and management programs.

Associated with this program is provision for the negotiation of Federal-Provincial Agreements for wetland habitat protection. Under such agreements, important wetlands would be designated and highlighted on the wetlands maps. That designation would mean that both senior levels of government would agree not to finance activities in those wetlands which would alter the natural character of the habitat. Thus government assistance for agricultural drainage, industrial installations, sewage treatment plants, etc., would not be approved for such designated wetlands. It is hoped that such Federal-Provincial agreements can be developed soon after completion of the inventory.

B) Quebec Region

1. Offshore Drilling in the Estuary and the Gulf of St. Lawrence

This project, initiated by SOQUIP (Société québecoise d'initiatives pétrolières), will be carried out with the participation of the following oil companies: Western Star, Petrofina and Imperial Oil. The project is still in the exploration stage and only seismic surveys have been conducted to date. The results of these studies will make it possible to identify favourable exploration drilling areas.

2. Arctic-Pilot Project

This project comprises the transportation of gas from the Arctic to a liquefied natural gas (LNG) terminal. Two possible sites are under consideration for this terminal: Gros Cacouna in Quebec and Melford Point in Nova Scotia. Public hearings concerning the Gros Cacouna site were held in February 1981, at which time DOE filed a report that aroused a great deal of interest and gave rise to several exchanges with the proponent. DOE feels that there is no major direct impact on the environment; however, extremely strict safety measures must be taken to ensure that the population would not be affected by an accidental spill.

Public hearings were also held on the Melford Point site in June 1981.

Concerning navigation lanes, the Coast Guard's TERMPOL process will apply. The Atlantic Region is currently revising the corridor from the 60th parallel to Melford Point. The revision of the section from the Strait of Belle Isle to Gros Cacouna will be carried out when the National Energy Board has made its decision.

3. Port of Chicoutimi Relocation

Since the current port of Chicoutimi no longer meets the new maritime transportation requirements, a new location has been decided upon for this port. The chosen site is still on the Saguenay, downstream from the present port, at Grande-Anse. This site will enable year-round navigation and will be open to larger ships with no need to dredge the river. An environmental impact assessment study is currently underway.

4. Quebec Port Extension

The Quebec port authorities having shown that they intend to submit to the Environmental Assessment Panel an environmental impact statement on the Quebec port expansion project, the Panel will resume its work this fall. The Panel's work began in 1978 and the directives for preparing an environmental impact statement were issued in January 1979. Public hearings

will therefore be held later. This panel will be chaired by Dr. Marcel Lortie, Professor of Forest Science at Laval University.

5. Mille-Iles River Control Work

The growing amount of flooding in the Montreal area's floodplain entails astronomical costs in terms of damage suffered since the start of the 1970's. Given this state of affairs, certain corrective measures have been undertaken by the federal and provincial governments. Included in these measures is the construction of a control work at the Mille-Iles River entrace to limit flow during the flood season to 725 m^3/s, since most of the damage occurs when this level is exceeded. This limitation on the Mille-Iles River, however, must be offset by an equivalent flow reduction on the Ottawa River, otherwise the other rivers around Laval and Montreal Islands would have their flows increased accordingly.

The Quebec government has held public hearings on the subject and the panel report should be available in the next few months.

Inland Waters Directorate Activities

In order to make up for a lack of knowledge and to ensure some continuity, however minimal, to the work on the St. Lawrence undertaken by the St. Lawrence River Committee, IWD-Quebec decided to initiate, in 1978, a sectoral study of the St. Lawrence River's Middle Estuary.

1. Physical and Chemical Studies

The significant shore zones (in terms of area) in this part of the St. Lawrence first formed the subject of research on their role in shortcircuiting suspended materials. "L'étude de la sédimentation intertidale de l'estuaire moyen du St-Laurent" (Study of intertidal sedimentation in the St. Lawrence middle estuary) (Serodes, 1980), made it possible to assess the ability of the wetlands in the upper middle estuary of the St. Lawrence to accumulate fine sediments.

The study concluded that nearly one third of the St. Lawrence's annual sediment load was "shortcircuited" during the summer and that the new availability of nutrients accompanied this phenomenon.

In 1980, a study of the dynamic physical processes responsible for such sedimentation was undertaken. In March 1981, a document entitled "Etude des mécanismes sédimentologiques des zones intertidales de l'Estuaire Moyen du St-Laurent -- cas de la batture du Cap Tourmente" (Study of intertidal zone silting mechanisms in the Middle Estuary of the St. Lawrence -- Case of the Cap Tourmente wetlands) (Troude, Sérodes and Elouard, 1981), presented the results of this research.

This study made it possible to characterize the spatial evolution of sedimentation on the Cap Tourmente wetlands. It was also learned that the temporal evolution of sedimentation follows a cycle that is influenced strongly by the seasons. Similarly, the role of certain factors influencing intertidal sedimentation was made evident:
- erosive role of half-tide currents;
- contributing role of suspended solids;
- protective and erosive role of the ice cover;
- role of vegetation in the accumulation of sediment.

In 1982, we are continuing to study the silting processes and to examine the power of intertidal zones in the middle estuary of the St. Lawrence to "transform" nutrients, trace metals, pollutants and so forth.

2. Biological Studies

At the same time as the studies on sedimentation in 1980, a study was launched on the diversity of the macrobenthic community in the intertidal marshes of Isle Verte, Rivière du Loup County, Quebec. This exploratory work led to a final (preliminary) report (Ward and Fitzgerald, 1981), that was designed to serve as a point of departure for more exhaustive study.

A pilot project of the same type (therefore just as exploratory) was also conducted at Cap Tourmente and Isle Verte in order to assess the comparative diversity of the organisms at various shoreline levels. A brief report has appeared on the subject: "Etude de la diversité de la communauté endobenthique à différents étages des marécages intertidaux de l'Isle Verte et de Cap Tourmente" (Study of the diversity of the endobenthic community at various levels of the Isle Verte and Cap Tourmente intertidal marshes), (Leclerc, 1981).

The aspect of these studies which aroused our interest referred to the energy transfer (in terms of biomass) from the littoral zone to the pelagic zone. The 1980-81 results showed that much greater efforts will have to be made if we hope to make progress in this direction, particularly owing to the many variables associated with intertidal marshlands.

Although our present resources have not enabled us to pursue work in this direction in 1981, we are nevertheless planning the description of required studies and the evaluation of associated resources.

Canadian Wildlife Service Activities

1. Shore Zone Inventories

The activities of CWS over the past three years, including waterfowl inventories along shore zones in the Quebec Region, are listed below:

- As part of a long-term snow goose population monitoring program, visual and photographic inventories in the spring and fall along the migratory stopping points on the St. Lawrence are conducted each season so as to monitor the fluctuation levels, distribution and use of land by this species.

- A ten-year study to monitor Great Blue Heron population fluctuations was started in 1977 and uses a certain number of volunteer workers each year to inventory nests in a certain number of heronries, many of which are located in the islands of the St. Lawrence.

- In 1980 and 1981, a series of inventories covering all shore zones of the St. Lawrence River and its estuary enables us to determine the important sites and the abundance of the various shorebird species frequenting the shores of the St. Lawrence, particularly during their migratory passage in late summer and early fall.

- An inventory of the seabirds breeding along the shores of the Gaspé Peninsula and on the Bonaventure Island allowed us, for the first time, to determine the distribution and abundance of each species using this vast area during the nesting season.

- The eider duck stocks breeding at Ungava bay were surveyed in cooperation with the local Inuit in order to determine the abundance of this species, the types of habitats frequented and the areas most used for nesting purposes.

- Surveys via various sampling methods and observations of the activity of puffins according to various environmental parameters were carried out in the Baie des Loups sanctuary on the Lower North Shore. The purpose of this project was to establish an accurate inventory method for counting breeding pairs in the rocky habitats used by this species.

- A study in cooperation with various international agencies on the abundance of the slant-eyed phase among common murres in the North Atlantic, started in 1940 and repeated every 10 years, was carried out this year. Enumerations were conducted in the sanctuary colonies of the Ste-Marie Islands along the Lower North Shore and on Bonaventure Island in the Gaspé; these counts will enable the monitoring of changes in the proportion of the various phases in relation to the population levels of the various colonies in the different parts on the North Atlantic.

2. Mapping of Favourable Migratory Bird Habitats

Habitats favourable to migratory birds along the St. Lawrence River, the estuary and the Gulf were mapped in 1980 at a scale of 1:20,000. The results of this study show that the lentic

freshwater portion of the river system contains vast areas of marshland (33,000 ha), that the lotic freshwater and saltwater portion of the St. Lawrence contains only 3,884 ha of grassland area dominated by American bulrushes, that the spartina marshes of the estuary (4,400) are mainly located on the South Shore, that the North Shore of the Gulf of St. Lawrence and the Gaspé Peninsula contribute but little (2,500 ha) to the total marshland area, and that the 2,200 ha of marshland associated with the Magdalen Islands may be considered significant because of the small area of these islands.

3. Analysis of Riparian Vegetation Losses Along the St. Lawrence Between Cornwall and Matane (1945-1960, 1960-1976)

An analysis of aerial photographs shows that the area of study has suffered a total loss of over 3,600 hectares of riparian habitats since 1949. Over 75 percent of the habitats suffered changes during the first analysis period (1945-1969). The sector between Cornwall and Grondines, comprising the Montreal archipelago, suffered the greatest amount of change (2,500 hectaries). Losses related to farming activity were the most significant (1,230 ha), followed by embankment work (969 ha), residential developments (431 ha), excavations (346 ha), service facilities (337 ha), and industries (285 ha).

Fisheries and Oceans Activities

1. Study of a St. Lawrence Intertidal Marsh -- Kamouaska

The purpose of this research is to describe the fish community of an intertidal march in the St. Lawrence estuary.

The area of study is two kilometers east of Kamouraska. It is characterized by the presence of clearly defined vegetation strata. Fishing is restricted to the zone characterized by the presence of Spartina alterniflora and to the adjacent Fucus and mud zone. Sampling was carried out from mid-June to the end of October in 1980, and from mid-April to the end of June in 1981. The fishing gear and their use varied.

In all, fourteen fish species were inventoried, six of which may be termed abundant (aside from the migrating eels): smelt, tomcod, smooth flounder and three species of stickleback. The sand shrimp (Cangon septemspinosa), which is quite abundant from time to time, should also be mentioned. Most species are present for a short time only, while others remain all summer. Sometimes, only young fish are found; on other occasions, only adults are present. The examination of the stomach contents of the principal species showed no case of predation between the species.

2. Establishment of Models Characterizing the Dynamic Balance of the Strands Along the South Shore of the Middle Estuary of the St. Lawrence

The proposed study consists in determining the dynamic balance characterizing the morphonogy, geochemistry and plant biology of the strands along the South Shore of the St. Lawrence River's middle estuary, and in identifying the probable impacts on this balance of facilities construction. The purpose of the study is to develop models of the evolution of strands in relation to the series of components prevailing under natural conditions, and to predict anticipated changes in dynamics resulting from tampering with one or more components. The development of such models must be based on a thorough knowledge of the texture and relief of the strands, or geochemical profiles coupled with stratigraphic analyses, of vegetation and of the morphological evolution of the littoral fringe.

C) Ontario Region

1. International Lake Erie Regulation Study

The final reports of the Coastal Zone and Environmental Effects Subcommittees of the International Lake Erie Regulation Study have been completed and forwarded to the International Joint Commission.

2. Great Lakes Shore Management

A publication entitled "Great Lakes Shore Management Guide" has been prepared by the Ontario Ministry of Natural Resources and the Departments of Environment and Fisheries and Oceans and is available for distribution. The publication provides multidisciplinary guidelines for the development of shore management plans, and includes the topics of land-use planning, economic analysis, shore protection and environmental assessment.

A draft report has been prepared by the Department of Fisheries and Oceans on the results of a Great Lakes shore erosion monitoring program funded by the three agencies mentioned above over the period 1975 to 1980. Following the withdrawal of DOE from the program at the end of 1980, DFO and OMNR agreed to fund the program for 1981. However, DFO has found it necessary to withdraw from the program at the end of the fiscal year.

D) Pacific and Yukon Region

Coastal Resources Folio

In April 1978, the Intergovernmental Coastal Zone Resource Subcommitee completed a study on the state of the art of coastal resource management in British Columbia. This report made a series of recommendations to deal with current and potential problems facing the B.C. coastal zone. One of the initial requirements identified was the preparation of a Coastal Resource Folio, the purpose of which would be to provide an overall perspective of the coastal zone with respect to its physiographic, biotic, oceanographic, and climatic regions, as well as the associated processes and natural resource uses and values.

In the fall of 1978, Environment Canada undertook a review of current departmental efforts devoted to environmental programs and problems. The review found that within the department's Pacific and Yukon Region, the majority of personnel time, funds and studies devoted to environmental impact assessment reviews, task force studies and project refunds were being expended within the B.C. coastal zone. Further, an analysis of forecasted demands on the department for information and advice indicated that this trend would continue and indeed increase over the next 5-10 year period.

In recognition of the above findings, the department initiated the Coastal Resources Folio Project in fall of 1979.

The overall purpose of the Coastal Resources Folio Project is to provide an inventory and synthesis of existing biophysical and land/water use information in a format that is useful in environmental assessments, integrated and single purpose planning and management programs, coast-wide and regional resource allocation studies, and the identification of baseline study needs.

For the purposes of this Coastal Resources Folio for the east coast of Vancouver Island, the following geographic limits were chosen.

> The study area extends from Race Point north of Campbell River to Hatch Point south of Duncan. The seaward boundary extends to the mid-point of the Strait of Georgia and includes the Gulf Islands and islets lying within these waters. Landward the boundary includes the Nanaimo lowlands to approximately the 150 metre elevation.

The following steps were used to develop the Coastal Resources Folio:

(i) Overall purpose, approach, and content of folio developed.

(ii) Meetings were held with selected federal, provincial, and local agencies to seek advice on priority areas and topics, as well as the location of sources of baseline information.

(iii) Initial selection of key criteria for each theme was made and the collection of baseline information begun.

(iv) Contacts with agency personnel made to obtain baseline data and further advice on the type of information that should be presented in the folio.

(v) Systems for classifying, tabulating and standardizing data.

(vi) Resulting information transferred and recorded on working maps, or in tabular and report form.

(vii) A second round of meetings were held with representatives of federal, provincial and local agencies to provide an update on the project and to make mid-course corrections to the folio project.

(viii) Limited field work supported by air photo interpretation was undertaken to fill some of the identified data gaps, particularly with respect to shore process information, presence of marine vegetation and land/water uses.

The Coastal Resources Folio consists of two types of documents:

Volume I is an atlas containing Section 1.0 Introduction, Section 2.0 Coastal Resources Map Series (1:50,000), Section 3.0 Land/Water Use and Status Tables and Section 4.0 Estuary Map Series (1:15,840). In view of the total number of maps generated for the study area, Volume I is divided into eight separate folios. Volume I - 1 and 2, contains information relevant to areas covered by base maps 1 and 2. The remaining seven folios, that is Volume I - 3 through to Volume I - 9, relate to the respective areas covered by the seven base maps numbers 3-9.

Volume II is a report containing Section 1.0 Introduction, Section 5.0 Companion Report and Section 6.0 Sources. Volume II is a single document whose coverage applies to the entire study area.

Availability

The Coastal Resources Folio is available from:

Lands Directorate
Environment Canada
904-1001 West Pender Street
Vancouver, B.C.
V6E 2M7

The publication of the Coastal Resources Folio (1:50,000 and 1:15,840 scale) thematic maps is being scheduled over the next year. As a consequence, coverage for all base maps and themes may not be immediately available at the time of your order.

Requests should be placed by mail, and the Folio can be ordered in whole or in part, that is, by base map, by resource theme, by table topic or by section. Further, Sections 2.0 Coastal Resources Map Series (1:50,000) and 4.0 Estuary Map Series (1:15,840) map manuscripts can be ordered as either ozalids (paper prints) or as films (diazo, or autopositive) or coloured mylars. The films can be either black line or colour-keyed by map theme.

The cost of your order will be in direct relation to the nature of your request, and in accordance with the following arrangement:

	Request		Cost
	Number of Copies	Type of Product	
Volume I Atlas	Limited number of single copy theme maps or tables	Ozalid (paper print)	No charge
		films (diazo or autopositives	At current commercial rates established by local printing firms. Direct billing to apply.
		film (colour-eyed mylars by map theme)	At cost by special arrangement through Lands Directorate.
	Multiple (duplicate) copies of theme maps or tables	Ozalids (paper prints) films (diazo, autopositives or colour-keyed mylars by map theme.	At current commercial rates established by local printing firms. Direct billing to apply.
Volume II Report	Limited number of copies available free of charge.		

5. CONFERENCES AND MEETINGS

A) Canadian Association of Geographers - Marine Studies and Coastal Zone Management Group

The Executive Committee of the Canadian Association of Geographers (CAG) announced the formation of a special interest group, the Marine Studies and Coastal Zone Management Group. The group was formed to ensure that work in the field of marine studies and coastal management is given a strong and prominent place in the activities of the CAG.

It was also announced that papers presented at the CAG annual meeting in Cornerbrook in the Marine Studies and Coastal Zone Management session will be published by St. Mary's University.

The next annual meeting of the CAG is scheduled for Ottawa, June 9-12.

B) Environmental/Sensitivity Mapping Workshop

An environmental/sensitivity mapping workshop was held in Halifax Nova Scotia on March 10, 1982. The workshop was sponsored by the Environmental Protection Service (EPS), Environment Canada, Atlantic Region.

The workshop was attended by twenty-five persons representing federal and provincial resources and environment departments as well as representatives from private industry. Mr. Alan McIver (EPS/DOE) chaired the meeting which addressed itself to some of the more important and pressing issues relating to mapping activities; including mapping formats, technology and equipment as well as current and expected priority areas. The workshop provided the participants with an excellent opportunity to exchange information and views on various aspects and concerns relating to mapping.

Much of the proceedings were directed specifically to issues which are particular to coastal/shore-zone regions. Participants discussed various facets of shore/coastal region processes including erosion and sediment transport along the Nova Scotia coast; coastal and near-shore resource mapping as well as the problems and prospects associated with sensitivity priorizing and mapping. The workshop also examined the role and applications of computers vis-à-vis their ability to handle, store and manipulate geo-spatial data etc.

It was agreed by those who attended the workshop that meetings of this nature are essential. It was also felt that additional steps must be taken to maintain and improve upon existing communication channels. A consenus felt that future workshops should investigate the feasibility of developing a common language for resource identification and that additional efforts should be directed towards establishing a focal point which will undertake map co-ordinating and clearing functions.

For additional information concerning the environmental/sensitivity mapping workshop contact Mr. Alan McIver (EPS/DOE) - Dartmouth Nova Scotia, Telephone: 426-8301.

C) N.R.C. Associate Commitee for Research on Coastal Erosion and Sedimentation (ACROSES)

A Canadian Conference on Coastal Engineering will be held at the Four Seasons Hotel in Vancouver, British Columbia, on May 12 and 13, 1983. The Conference will be sponsored by the National Research Council's ACROSES Commitee. The purpose of the Conference is to provide a forum for the discussion of Canadian scientific research and engineering practise in the shore zone environment. Conference details and the call for papers may be obtained through:

Mr. Duncan Hay, P.Eng.
President
Western Canada Hydraulic Laboratories Ltd.
1186 Pipeline Road
Port Coquitlam, B.C.
V3B 4S1

6. NEW POLICIES AND PUBLICATIONS

A) The World Conservation Strategy

In his press release dated October 7, 1981, the Honourable John Roberts, Minister of State for Science and Technology, and Minister of the Environment, announced that he had endorsed the World Conservation Strategy* on behalf of the federal government. Mr. Roberts commented "I am very happy to adopt this important document as a model for the development of federal government conservation strategies. It is an important step towards ensuring environmental quality and continuing growth and prosperity of our resource-based economy."

The World Conservation Strategy was developed for governments, conservationists and developers to help advance the achievement of sustainable or continuing development through the conservation of living resources. It was written to respond to current resource destruction and forecasts that see serious resource shortages and environmental degradation reducing the capacity of ecosystems to sustain development and support life.

The Strategy provides guidelines to integrate conservation and development so that the species and ecosystems upon which economies depend will go on renewing themselves, for all practical purposes, indefinitely. To achieve this, the Strategy identifies three objectives:

1) maintenance of essential ecological processes and life-support systems;
2) preservation of genetic diversity;
3) sustainable utilization of species and ecosystems.

The shore zone is an important identifiable feature in the World Conservation Strategy. One of the main species groups and ecosystems with which the Strategy is concerned is the fisheries and their support systems including habitats essential for spawning or as nurseries.

Despite the essential role of coastal ecosystems in the maintenance of fisheries, many coastal wetlands are being modified or transformed so drastically that the fish industry and related industries in certain areas are threatened. Extensive regulations to prevent overfishing and incidental take in the open sea must be

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* The World Conservation Strategy was commissioned by the United Nations Environment Programme (UNEP) and written by the International Union for Conservation of Nature and Natural Resources (IUCN). Over a three-year period, 450 government agencies and conservation organizations in over 100 countries contributed to the Strategy. As well, more than 700 scientists from around the world were involved in its preparation. The Strategy was released throughout the world in March 1980.

integrated with measures to maintain essential habitat in the shore zone if depleted fish stocks are to recover to their full potential and to continue to meet demand on a systained bases.

In Canada, sea food exports bring in earnings of more than $600 million a year.* While figures are not available for the cost to the fish industry of habitat degradation and removal in this country, the loss is already significant in the USA (approximately $86 million a year).** As the commercially valuable fisheries for fish, crustaceans and molluscs become more fully exploited throughout the world, the importance of the relationship between the maintenance of fish habitat and the viability of the fish industry will become more evident.

Fisheries habitat degradation in the shore zone is seen by the World Conservation Strategy as one of the priority problem areas requiring action to ensure that conservation objectives be achieved. On the face of it, the maintenance of the support systems of fisheries appears straightforward. However, the implementation of such a priority is difficult. Competition among different uses of land and water is so acute that governments are often reluctant to take the actions needed. Conservationists may push for extreme courses of action without recognizing the difficult trade-offs involved in the decisions of governments and their regulatory agencies. Involved departments of different governments and regulatory agencies are often so numerous in the shore zone and jurisdiction and responsibilities so fragmented that it is difficult to build conservation into the decision-making process early enough to be a positive influence on development rather than a constraint to it.

The World Conservation Strategy concentrates on providing guidance on how to overcome the obstacles to integrating conservation and development in the priority areas such as fisheries support systems.

In 1981, the Environmental Conservation Service, Environment Canada undertook an inter- and intradepartmental Review of the priority problem areas and the recommended national actions to determine whether the federal government could endorse the Strategy. This federal review led to the endorsement of the Strategy by the Minister of the Environment on behalf of the federal government.

The Federal Review also provided the basis for a presentation prepared for Mr. Roberts to discuss the implementation of the

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* How to Save the World: Strategy for World Conservation, Robert Allen, Barnes and Noble Books, Totawa, N.J., 1980, p. 73.

** World Conservation Strategy, 2.11.

Strategy with his provincial counterparts at the 1981 annual meeting of the Canadian Council of Resource and Environment Ministers (CCREM). Further to the CCREM meeting, provincial governments are reporting to the federal government their positions with regard to the Strategy and the measures they are taking to implement it. Canada will make the synthesis of this information available for the report that will be made to the Executive Director of UNEP at its meeting this spring in Nairobi.

For further information on the World Conservation Strategy or the Federal Review, contact Jane Teeple, Policy and Economics Branch, Policy and Program Development Directorate, Environmental Conservation Service, Environment Canada.

B) ACROSES has announced the publication of the results of a Workshop held in Rimouski, Quebec, May, 1981. Papers focus on drift ice as an agent of shore erosion. The book is entitled: Workshop on Ice Action on Shores (NRC, Ottawa: 1982). This workshop marks one of the first times that this phenomenon has come under such scrutiny, despite its importance in terms of arctic and sub-arctic development. Included in the publication are papers on shoreline ice defences for artificial islands in The Beaufort Sea, erosion and protection of permafrost and the ice rich shore near Tuktoyaktuk and the interaction of sea ice and storm waves on Bylot Island NWT. Copies may be obtained from the National Research Council Associate Commitee for Research on Shoreline Erosion and Sedimentation in Ottawa for $17.00.

7. SELECTED SHORE ZONE STATISTICS