

Appendix A

Proposal for Development of a
Marine Affairs Diploma Program
with ICOD Assistance

Dalhousie University, Halifax, NS
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SUMMARY

This document has been prepared in response to a request for proposal from the International Centre for Ocean Development (ICOD) which seeks to assist a Canadian university (or consortium of institutions) in the establishment of a one year graduate Diploma Program in Marine Affairs commencing in 1987. If established at Dalhousie University the Diploma Program will draw upon existing strengths within several faculties, institutes and centres on campus. Links are proposed with other universities in the Halifax-Dartmouth area. Inputs from the Technical University of Nova Scotia and Saint Mary's University are incorporated in this proposal. This region has the largest assemblage of marine scientific and technical personnel within Canada.

Dalhousie University is a natural location for the proposed program since over the past 4 decades many campus units have adopted marine themes in their teaching and research. The Diploma Program will have access to expertise in the well-established marine programs of biology and oceanography, marine and environmental law, ocean studies, plus individuals from fields such as economics and business. It will be administered by the Faculty of Law and housed in Law Faculty space.

The Program cycle will start in mid-June, with three major periods: a preparatory period to September; two academic terms, September to April; and a practicum extending to the end of May. A 2-term core course in Marine Affairs would be initiated as a key component. Participants could enter one of three streams. They should be exceptionally qualified since the intent is to train small numbers who will be leaders in this field within their home countries. The Program will be limited to 10-20 students per year and will be open to individuals from all countries, with 10 fellowship participants from ICOD. The first participants could begin studies in June 1987.

Program funding must come from external sources, with Dalhousie in-kind contributions. Two co-ordinators will be appointed, each on a half-time basis, to represent policy/management and scientific areas. There will be a senior academic steering committee and linkages with other ocean-oriented centres within and outside the region. The proposal is contingent on ICOD funding and will be subject to the normal review and approval process for new programs within the University.

Given the priority assigned to marine studies and international development, Dalhousie University feels it has a major role to play in the field of marine affairs, especially training programs designed for the benefit of government officials, educators, private sector marine specialists and others in developing countries. The year-long Diploma Program proposed in this document is seen by DOSC as the next logical step towards that end. Ultimately it may be desirable to offer such a program in cooperation with institutions located in developing countries. However, over the time period covered under the present proposal (1986-1990 minimum) this option will not be considered. Also, since the process of establishing a new diploma program requires passage through various channels within and outside the University, there can be no guarantee of a diploma program in place by a fixed date. Thus the Program will be initiated and run as a certificate program until such time as full diploma status can be granted.

The ICOD request for proposal (Appendix D) is timely in stimulating and helping to focus interests of individual contributory units within and outside the University. It is important to recognize that the Program ultimately must be self-supporting, whether from ICOD or other external sources of funds. If the desired international recognition is established, it may be assumed that a number of funding sources can be found to support participant fellowships and core costs of operation. For the University to make a full commitment of staff and supporting infrastructure it is necessary to have a somewhat longer time frame than is called for in the request for proposals. Program development at the graduate level generally occurs over a five to eight year period, with initial review after five years of operation. In the present proposal we have developed a detailed budget outline for the four year initial period, which includes three outputs of participants. As well, we have provided an outline for an additional two years of Program continuation which we would like to discuss in any follow-up negotiations between Dalhousie and ICOD concerning this proposal.

The proposed Marine Affairs Program will draw upon a wide array of ocean expertise within Dalhousie and other cooperating institutions. There will be an opportunity for summer preparatory work, including elective participation in the annual Dalhousie-IOI course offered on campus or certain Summer School courses. In the latter part of the Program emphasis will be placed on one-to-one practical training drawing on the pool of expertise in government, university and private sector organizations active in various aspects of ocean and coastal zone management. While this pool is very large within Atlantic Canada, there is no reason to limit exposure of students to this region. In other Dalhousie training programs there has been considerable success in linking trainees with outstanding administrative, scientific and management activities wherever these are located in the country. During the period September to April the core academic program will be offered on campus, with appropriate field trips in the region. During this period the core course on Marine Affairs plus other compulsory and elective courses will be offered. There is sufficient diversity of courses available to permit "streaming" of participants according to their interest in one of three major areas: marine law, policy and administration; marine technology and business development; or marine science and management.

While there may be considerable flexibility in entrance requirements, it is assumed that candidates will be of outstanding calibre, in some cases already in possession of a master's, doctorate or professional degree. They will have in common a desire to develop professional qualifications in the field of marine affairs. Many will already be in positions of responsibility concerning ocean or coastal zone management. They will meet reasonable standards of English proficiency and any other requirements which from time-to-time may be set by the Graduate Council of the University. Canadian students will also be granted entry to the Program, for it is important to provide opportunities for more of our own

citizens to understand ocean management issues in the broadest international context.

It is hoped that the Program proposed below will become a "flagship" effort for both ICOD and Dalhousie. There will have to be considerable cooperation in materials development and in selection of participants. To ensure close and continuous liaison between ICOD and Dalhousie, it is proposed that two co-coordinators (one science-oriented, one policy-oriented) be available and that a steering committee be established within the University, with ICOD representation, to guide the development, implementation, and operation of the Program.

DESIGN OF MARINE AFFAIRS PROGRAM

Introduction

The Marine Affairs Program will provide for integration of participants into regular Dalhousie courses in addition to work specially tailored to their needs. As in other interdisciplinary work on campus, extra effort in student monitoring and supervision will be provided to ensure that academic and personal problems are recognized and dealt with at an early stage. Since students will be streamed into Program options specific to their needs, they will have to be on campus for a long enough period for the program co-coordinators and other staff to adequately determine these needs as well to evaluate their previous level of experience and academic preparation. The summer period is ideal for a preparatory time and is also the period for the Dalhousie-IOI Ocean Management course, which some participants will wish to take as an introduction to the subject matter. Hence the Program will run from 15 June to 30 May of the following year.

In the sections below, design of the entire Program and criteria for successful completion are discussed. This design should be considered a starting point rather than immutable. New programs require some leeway for experimentation based on actual experience with the first three or four groups of participants. Furthermore, before a diploma program is approved by the Graduate Council and University Senate, there is provision for faculty input and changes at each stage of the decision-process.

Outline of Structure and Elements

There will be four distinct periods or terms in the Program. All must be satisfactorily finished in the given time in order to receive certification of successful completion. These periods are shown below with approximate dates and activities:

15 June - 31 August	Preparatory Period
1 September - 31 December	Fall Academic Term
1 January - 30 April	Spring Academic Term
1 May - 31 May	Practicum Period

The objective within each period is fairly straightforward. The **Preparatory Period** is intended to provide each participant with adequate counseling for the overall Program; to permit enrollment in a summer school course if required to address any major deficiency, especially in a fall-spring course prerequisite; to enroll in the Dalhousie-IOI course if required for a first introduction to ocean management; to participate in field visits arranged by the Program staff; and, if required, English language training. The options for participation in Summer School and the Dalhousie-IOI course are one or the other—not both. In some cases it may be possible to arrange directed readings, independent study, and affiliations with professors rather than a standard summer school course.

The **Academic Terms** will provide for advanced-level work including the two-term Marine Affairs core course, at least three other courses each term and a Marine Affairs weekly seminar. For some participants there will be a need for an Introduction to Marine Science course. At present there is not a course available

which is suitable; a new or modified one-term course will be developed. Those individuals taking Introduction to Marine Science will enroll in only two rather than three elective courses in the Fall term. In addition to the elements already noted, there will be several field trips during the Fall and Spring terms, and access to further English language tutorials for those who require such help.

The core Marine Affairs course, field trips and seminars will be discussed in a separate section. Other Academic course offerings will be drawn from an agreed-upon list utilizing faculties at Dalhousie, Technical University of Nova Scotia, Saint Mary's University and possibly Mount Saint Vincent and other institutions. A tentative list of elective courses is provided in Appendix E. The major streaming of students will be into three groups as noted below. The clusters of related topics are exemplary. In reality we expect students may desire some cross-over among these categories, or may define their interests in categories not represented in this simplification. It is also important to note that certain options may require an advanced level of existing skills. It is not uncommon for Marine Affairs students in the U.S.A. to already hold an MSc or PhD in Oceanography, or a law degree, etc. It will not be in the best interests of participants or teaching staff to place students in courses without suitable prerequisite experience or academic training.

The student streams are noted below along with selected areas of interest:

Marine Law, Policy and Administration

- development of marine law and regulations
- coastal community development
- national development planning
- security and surveillance

Marine Technology and Business

- marine transportation and port development
- marine environmental protection techniques
- ocean business development
- fisheries technology
- offshore technology
- marine insurance

Marine Science and Management

- utilization of marine bioresources including fisheries and aquaculture
- marine geology exploration and management
- marine science research management
- regional ocean management
- marine and coastal zone habitat protection
- coastal zone management
- marine pollution control and environmental assessment

Some example participant curricula are shown in a later section. It should be noted that for some applicants to this program other alternative diploma or degree program options available within Dalhousie or other universities may be more desirable/useful. For example, there is the Dalhousie one-year diploma in Aquaculture, the Master of Development Economics, the Master of Environmental Studies, the Masters degree in Fisheries Technology at TUNS, community development programs at St. Francis Xavier, etc. The Marine Affairs Program will not overlap such activities and will direct applicants to other programs where appropriate. It will be desirable to have close cooperation with ICOD to ensure that well-qualified candidates to alternative programs can be separately funded.

The Practicum is intended to bring participants into a one-to-one relationship with an experienced teacher, researcher, manager, administrator, businessman or policy-maker in their field. This experience will take place within the institution of the person providing the training, wherever it is located within Canada. Likely at least half of the participants will be located within Atlantic Canada. The terms of reference for the practicum must be developed on an individual basis, with a satisfactory reporting or assignment produced by the participant at the conclusion of the Practicum. While the Practicum is nominally listed as a one-month term, it may in practice be 6 or 7 weeks, depending on the end of the Spring academic term and the nature of arrangements. A list of possible Practicum sites has been prepared but not included with this proposal since it is premature to approach individuals and institutions prior to acceptance of the proposal.

Academic Credits

Participants will enroll in the Graduate Faculty as non-degree students. The program will require completion of academic course credits totalling 24 hours, plus the preparatory period and practicum. The breakdown of academic credits is:

Marine Affairs Course (2 terms)	6
Introduction to Marine Science (or one-term elective)	3
Additional Fall Term Elective Courses	6
Additional Spring Term Elective Courses	9
Practicum	6
Total	30 hours

In exceptional cases, candidates may wish to add one more course per term.

Core Course In Marine Affairs

The two-term Marine Affairs course will provide a comprehensive overview of not only the practical side of the various ocean uses but also the more theoretical issues of ocean policy and management. Practical experience will be fostered by field trips introducing students to various sectors. For example, to provide a broad understanding of fisheries issues, students would follow fishing from harvesting to marketing through a visit aboard a fishing trawler, a tour of a fish processing plant, and a visit with corporate policy makers (for example, at a leading fisheries business). To gain a practical experience with the actual trials and tribulations of a fisheries manager, students may attend a panel discussion of fisheries administrators from both the federal and provincial levels. For each resource use--oil/gas development, seabed mining, fishing, aquaculture, marine transportation, and ocean energy--students will be provided with a broad introduction to international and national policy issues and management approaches.

Each segment of the course will include lectures by scientists on issues and approaches towards each resource use. For example, for the oil and gas segment, a geologist will explain the basics of hydrocarbon deposit development and exploratory technologies. Another scientist will provide an overview as to our knowledge of the environmental impacts of hydrocarbons and drilling effluents on the marine environment. A technical specialist will explain the basic drilling process and the essential pieces of equipment, for example, the workings of a blow-out preventer.

Each functional segment of the course will also offer lectures by specialists in economics and business administration so that students may be introduced to the market realities of ocean industries.

The overall course will be divided into two major divisions. A broad, general overview of ocean development and management issues will be provided for the period from September - February (approximately 21 weeks). Classes during March and April (approximately 6 weeks) will offer overviews of marine affairs issues in particular regions such as the Caribbean, S.E. Asia or West Africa. During this period students will complete papers relevant to their home countries and region.

Table 1 provides an outline of the proposed course.

Table 1. Outline of Proposed Two-Term Course in Marine Affairs

- I. **Marine Affairs: A Multidisciplinary Perspective on Ocean Development and Management (2 weeks)**
 - A. Resource Economics - Common Property Resource Management
 - B. Socio-Anthropology - Coastal Communities
 - C. Political Science/Public Administration - Decision-Making Theory
 - D. Ethics/Philosophy - Conflict of Values and Value Resolution
 - E. The Role of Law - Balancing of Interests
- II. **An Overview of the Law of the Sea/Historical and Political Developments (2 weeks)**
- III. **Ocean Resource Uses and Management (17 weeks)**
 - A. Non-Living Resources
 1. Oil/Gas and Hard Minerals (3 weeks)
 - a. The Industry and Operational Approaches
 - b. Environmental Effects of Offshore Hydrocarbon Exploration/Exploitation
 - c. Economic Impacts and Financing of Oil/Gas Development
 - d. International Law and the Oil/Gas Industry
 - e. Domestic Law - Licensing, Regulation and Administration (Exploration, Production, Transportation)
 - f. Jurisdictional Issues
 - g. Admiralty Issues/Other Legal Issues
 2. Deep Seabed Mining (1 week)
 - a. Resource Potentials
 - b. Extraction Technologies
 - c. Environmental/Economic Impacts
 - d. International Legal Regime

B. Living Resources

1. Fisheries (3 weeks)
 - a. Overview of the Industry and Fisheries Resources
 - b. Surveillance and Enforcement
 - c. International Legal Issues and Management Institutions
 - d. National Law Approaches
2. Aquaculture (2 weeks)
 - a. Overview of the Industry and Technology
 - b. Economic Development Programs
 - c. National Management Issues and Approaches
3. Marine Mammals (1 week)
 - a. Overview of the Resources
 - b. International Management Framework
 - c. National Management Approaches

C. Marine Transportation (3 weeks)

1. Overview of the Shipping Industry
2. Environmental/Economic Impacts
3. International Law/Shipping Conventions
4. National Legal Approaches
5. Port Development and Management

D. State Interests: Military, Customs, Piracy (1 week)

1. Summary of National and International Security Interests in the Oceans
2. International Legal Framework
3. National Law Approaches

E. Ocean Energy Development (1 week)

1. Offshore Energy Technologies and Potentials
2. The Legal Framework

F. Environmental Protection (2 weeks)

1. Uses and Abuses of the Sea
2. Land-Based Pollution - Problems and Management Framework
3. Vessel-Source Pollution - Problems and Management Framework
4. Seabed Exploitation - Problems and Management Framework
5. Atmospheric Pollution - Problems and Management Framework

IV Regional Studies of Ocean Development and Management (6 weeks)

- A. The Caribbean
- B. S. E. Asia and Indian Ocean
- C. The North Atlantic
- D. The Mediterranean
- E. East and West Africa
- F. South and East Pacific

Field Visits and Seminar

It is essential that a high level of group interaction be maintained over the entire period of the Program and that good opportunities exist for academic and practical exchanges. Hence field visits and a weekly seminar will be included. The field visits will be within the Atlantic Provinces and will be timed to coincide with weather conditions, level of activity and curriculum content. They will be conducted during the summer period and in conjunction with the fall-spring term Marine Affairs Course.

The weekly seminar (during both academic terms) will be organized by the Program coordinators, with input from participants. They will include both outside speakers and presentations by individual participants. The series will be organized in cooperation with other units on and off campus in order to minimize costs of inviting speakers. During the summer all participants will be invited to some sessions of the Dalhousie-IOI Course when there are leading speakers in the field of ocean management on campus. It is hoped that ICOD personnel and Program faculty will participate in seminars and that seminars will serve an integrative function, especially between scientific and policy aspects of the subject matter.

Sample Curricula

Participants will select courses during August. This selection will be made in consultation with the Program coordinators and with a supervisor individually assigned to the participant. The right to accept a student into a particular course remains with the course instructor. Hence there will be a need for considerable liaison, especially in cases where there may be uncertainties regarding prerequisites.

Several sample curricula are noted in Table 2. These are based in part on elective courses identified in Appendix E. The excellent range of available courses should meet most needs. If there is a specific need which cannot be met by an existing course, it may be possible for a participant to enroll in a directed readings course, or other type of independent study, if a professor with the appropriate interest is available and willing.

TABLE 2. SAMPLE CURRICULA FOR MARINE AFFAIRS STUDY STREAMS

I. Marine Law, Policy and Administration

Fall:	Marine Affairs Core Course	3
	Introduction to Marine Science	3
	International Business and Ocean Resources	3
	Resource Economics	3
		12 hours
Spring:	Marine Affairs Core Course	3
	Coastal Communities	3
	Natural Resources Policy and Administration (or The Politics of the Sea)	3
	Fisheries Law (or Oil and Gas Law)	3
		12 hours
Practicum		6 hours

II. Marine Technology and Business Development

Fall:	Marine Affairs Core Course	3
	Introduction to Marine Science	3
	International Business and Ocean Resources	3
	Economic Geography (SMU)	3
		12 hours
Spring:	Marine Affairs Core Course	3
	Seminar in Ocean Transportation	3
	Fisheries Economics (SMU)	3
	Offshore Drilling and Production (TUNS)	3
	(or Seafood Process Technology (TUNS))	12 hours
	Practicum	6 hours

III. Marine Science and Management

Fall:	Marine Affairs Core Course	3
	Introductory Biological Oceanography	
	(or Introductory Chemical or Physical Oceanography)	3
	Introduction to Fisheries Population Biology	3
	(or Aquaculture)	
	Resource Economics	3
		12 hours
Spring:	Marine Affairs Core Course	3
	Fisheries Management	3
	Environment Assessment	3
	Marine Management	3
		12 hours
	Practicum	6 hours

Participant Grading and Criteria for Successful Completion

The standard graduate grading system will apply for participants. They must maintain an average of at least B-, and grades for any course below B- will be treated as a failure. This system provides little margin for poor performance at any time during the Program. It emphasizes the need for careful selection of participants and considerable attention to ensure there is no inappropriate course selection. Inevitably there will be individual problems, either through factors such as illness, or of poor performance in one course despite an overall satisfactory record. Such situations will be dealt with by the Graduate Dean and Program coordinators.

Certification of program completion will take place only at the end of the practicum period. If a participant does not complete all components of the Program, those items entered on the academic record will stand, but the participant will not be permitted to re-enroll unless there are special circumstances.

Francophone Students

It will not be possible to provide spaces in the Program for participants not fluent in English. Since a significant number of potential applicants will be fluent in French, but possibly not in English, it would be desirable to have either a parallel program at a Francophone university or develop some linkage between Dalhousie and one or more institutions where participants might be sent. Dalhousie would be prepared to cooperate with ICOD and Francophone institutions to achieve an overall program which would provide access for participants in either official language.

CERTIFICATE PROGRAM AND DIPLOMA APPROVAL PROCESS

Application for a Diploma Program in Marine Affairs has already been forwarded by the Dean of Graduate Studies to the Graduate Council, where it will be reviewed by a sub-committee. After approval by Graduate Council the proposed Diploma would be reviewed by the Academic Planning Committee of Senate, and finally by the Senate. When approved, the Program document would be forwarded by the President's Office to the Maritime Provinces Higher Education Commission (MPHEC). Approval by MPHEC is the final stage in the process. Diplomas can be issued by the President at a regular graduation ceremony after all requirements are met by individual participants and after Senate has approved awarding of their diploma.

A letter of certification can be granted on completion of a specified work program. The certificate is granted by the unit operating the program, although it may be signed by the President of the University. The participants will also receive a Dalhousie transcript which records academic performance. The certificate approach almost certainly will be the most feasible at least for the first or second groups, as it is unusual for a diploma program to be approved in less than eighteen months. As stated earlier, there can be no absolute guarantee that a diploma program can be successfully put in place since the decision ultimately rests with the University Senate and MPHEC. In the event that approval was not granted, the certificate program could be operated over the period covered by the proposal, but an extension beyond this initial period likely would not be warranted.

COORDINATION, PARTICIPANT SUPERVISION AND STAFFING

Program Co-coordinators

Since the Program will attract participants with technical and science backgrounds as well as individuals with management and social science experience, two people will share the coordination responsibilities. One will be drawn from marine sciences, the other from a policy background. Each will devote half-time to the Program. This approach will maximize coverage of subject areas yet minimize the possibility of gaps in coordination where one person is absent.

The co-coordinators will be responsible for liaison with ICOD, and for overall communication with faculty members and University administrators. They will be responsible for detailed program development including material preparation, for preparatory work necessary for participant selection, correspondence with prospective participants, and arrangements for participants while on campus or in travelling to and from Canada. The co-coordinators will establish liaison with other Faculty at Dalhousie and elsewhere to make them aware of any special needs of participants and to assist students where necessary in gaining entry to specific courses. The Marine Affairs core course and seminar program will be coordinated by them and field trips will be arranged under their supervision. The co-coordinators will arrange for the preparatory period and practicum of each participant, with assistance from other supervisory faculty. Over the year the co-coordinators will monitor progress and deal with academic and other problems of participants.

It is anticipated that both co-coordinators will be current Dalhousie faculty members associated with existing departments and/or institutes. They will require release from other activities to take on this assignment.

Individual Participant Supervision

Each participant will be assigned to a faculty member prepared to provide advice and supervision of activities on a regular basis. The faculty member should be reasonably close to the participant's area of interest and, if possible, have knowledge of the geographic region where the participant works. At the time academic coursework is selected and when the Practicum location is decided, advice from the faculty supervisor will be particularly critical. Dalhousie considers this individual attention to be essential for all graduate-level students.

Program Staffing

There will not be a need for new staff recruitment to the University for the Program. Individual course instructors will be accepting participants in the same way as for students from other programs. Dalhousie has a good tradition of accepting students from one academic unit into courses of another. There are well-established procedures in place which permit students from one university to take courses at other institutions in Halifax.

In order to properly run the Marine Affairs core course there must be a commitment by an interdisciplinary team which will assist in the lectures. It will

not be difficult to obtain this commitment since there is strong interest on the part of at least six staff in various units of the University. There is a very considerable number of marine specialists who can be drawn from local universities, government offices and businesses to cover specific topics in the core course.

A modest level of support staffing is required for the Program. It is not anticipated that new administrators, librarians, etc. will have to be hired. It will be necessary, however, to fund a full-time secretarial position since there will be a considerable volume of correspondence, and logistical details that will require administrative support while participants are in Canada.

Academic Steering Committee

To ensure firm direction and coordination among contributing units to the Program, an Academic Steering Committee will be appointed for a three-year term by the Dean responsible for the Program. This Committee will include at least four Dalhousie senior faculty members with interest and expertise in Marine Affairs and Science plus at least two members drawn from other cooperating institutions. ICOD will be invited to participate with one of their staff members. The role of the Steering Committee will be to set periodically general directions of curriculum development, and to provide recommendations to the Dean regarding various aspects of the Program including staff recruitment and appointment, selection process for participants, standards, requirements for on-going funding and management, and major changes in the status of the Program and its relationship to ICOD or other development agencies.

Reporting Arrangements

For administrative purposes, the Program will be situated within the Faculty of Law's Marine and Environmental Law Programme. It will be operated in the same way as other graduate activities, with academic decisions shared by the Dean of Law and the Graduate Dean and Graduate Faculty. The Program must maintain the interdisciplinary contact and goodwill of many units inside and outside the University. Hence there will be a definite effort not to "internalize" Program activities within the Law Faculty. There will be periodic reporting of activities to the Dalhousie Ocean Studies Council. As already noted, there will be participation from relevant specialists, wherever they are located within the University.

FACILITIES AND SPECIAL SERVICES

The University will make available all facilities required for satisfactory completion of work by participants. These facilities will include classroom and seminar space, communal and individual work spaces either within offices or as library carrels, access to library services, audio-visual and computer facilities, access to student health and other campus student services on terms similar to other foreign students.

Dalhousie maintains extensive library holdings relevant to the Program. These holdings are located within the collections of the Law, Killam and MacDonald Science Libraries as well as smaller more specialized collections. The Law collection is especially noteworthy since it is considered as one of the most complete marine affairs collections in North America. International scientific literature (e.g. U.N. documents) are available within the Bedford Institute of Oceanography library, and other marine technical literature is accessible in other university, naval and government libraries in Halifax-Dartmouth.

It will be highly desirable for students to have a meeting area and, if possible, work space in one location. The most likely location of this space will be in the main Law Faculty building, which is currently being renovated to provide additional office and work space as the first stage of reconstruction following last year's fire.

Dalhousie cannot be fully responsible for finding living accommodation satisfactory to the participants. They will be housed in student dormitories at their expense during the first two months of their stay. This time period will be sufficient for individuals either to find an apartment/room outside the University, or to apply for student housing for the academic year. The University maintains an effective International Student Coordinator office which assists foreign students in matters pertaining to housing and other practical problems of adjustment. It is expected that the Program co-ordinators also will assist in this process.

Various services are required for this type of program. Those items which require cost-recovery are: office materials, mail and courier, photocopy and printing services, long-distance telephone, telegraph and telex facilities, extensive use of inter-library loan services, commercial computer searches or use of central computer facilities beyond the level normal for graduate students, secretarial services, translating services, local and other transportation.

INSTITUTIONAL COOPERATION

Linkages with Area Universities and Other Training Units

This proposal has been developed with inputs from other Halifax-area universities (Technical University of Nova Scotia and Saint Mary's University). These institutions have special skills not available at Dalhousie. TUNS has a very active research and training group in fisheries technology and specialists in other aspects of marine technology. SMU has a geography department oriented to marine geography and coastal zone management. As well there is expertise in fisheries bioeconomics, coastal community problems and fisheries trade issues. Specific course offerings relevant to the Program are noted in Appendix F.. Discussions will be held with other degree-granting institutions in Halifax-Dartmouth concerning their possible participation in the Program.

In addition to academic units located in Halifax there are several other Nova Scotian organizations which offer programs that may be directly or indirectly valuable to the proposed Diploma Program. Some participants will return to design very practical training activities. Hence they may have a strong interest in extension training methods such as those of the Coady Institute and the Nova Scotian Fisheries Training Centre located in Pictou. The Seaman Training Centre, which is being relocated to Canso, and the Estuarine Research Centre at Acadia University are other examples of institutions concerned with marine topics. If Dalhousie is awarded the Program, contact will be made with these and other institutions in order to determine how their faculty and staff may participate and contribute.

Cooperation with Marine Science and Management Specialists

The presence of the Bedford Institute of Oceanography, the large number of marine specialists in Environment Canada and the Department of Fisheries and Oceans management units makes the Halifax-Dartmouth area extremely attractive as a training location. The marine science community is considered to be the second or third largest in North America, and certainly the largest within Canada (see Appendix G). There are existing good relations of Dalhousie with staff in these organizations and many formal arrangements already in place (e.g. academic and research appointments). It will not be difficult to involve first-rate scientists and managers as guest lecturers, in field visits, for seminars and, on an individual basis, for the Practicum assignments.

Ocean Business Linkages

Over 100 organizations with ocean business interests are found in the Halifax-Dartmouth area, and there are interesting corporations in other parts of the Province and other Atlantic Provinces. These include consulting firms, shipping and port businesses, ocean technology, fisheries, offshore oil and gas and marine supply firms. They represent a tremendous and dynamic resource which will be tapped as noted above in the case of marine science and management specialists. There are several focal points for organizing such inputs: the Centre for International Business at Dalhousie, the federal government Ocean Business Office, and the Canadian Marine Transportation Centre at Dalhousie are examples.

Fisheries and Marine Surveillance

Costs of maintaining a 200 mile zone certainly include fisheries and marine surveillance. Through the Fisheries Observer Program and patrol boat activities, the Vessel Traffic Management System in place for Eastern Canadian waters, oil spill contingency planning, air/sea rescue and various naval surveillance activities there will be excellent case examples to which participants can be exposed during their stay. This side of Marine Affairs will be covered by a combination of field trips and invited lectures. There should be many opportunities for practical affiliations with organizations, such as the Coast Guard, Department of Fisheries and Oceans and Environment Canada.

Linkages with Institutions outside the Region

Various ocean-oriented research business, management and training centres are scattered among the coastal provinces and in Ottawa. There already exist many linkages with these offices of Dalhousie faculty in departments such as Oceanography and Political Science and centres such as the Dalhousie Ocean Studies Programme and the Institute for Resource and Environmental Studies. Where appropriate, individuals will be invited to Dalhousie for lectures in the Program. There are many such visits each year; hence this aspect of Program enrichment can be accomplished at little additional direct cost.

It is also anticipated that individuals from institutions outside the region will be prepared to accept Program participants for the Practicum. There are cost implications for assignment of individuals outside of the region. However for specialized needs it may be essential. Thus in budgeting for participants it will be assumed that three per year will undertake their Practicum outside of the Maritime provinces. It is also worth considering the potential value of a cross-Canada organized field study period to gain insight into different marine management problems and approaches to solutions. This has not been included in program design for budget reasons. We would, however, be prepared to discuss such a concept in negotiations.

Dalhousie enjoys long-standing relationships with a very substantial number of marine-oriented programs in universities, research and management units around the world, including the major programs in the U.S.A., Europe, Australia and many parts of the developing world. Our physical proximity to Woods Hole, Boston area universities (e.g. Harvard, M.I.T.), the University of Rhode Island and United Nations headquarters in New York is an advantage since many leaders in the field enroute to the U.S.A. stop by at very little cost to visit colleagues here and, upon invitation, to lecture. Dalhousie also has many joint ventures in research and training with the institutions named above plus others.

Linkages with developing country organizations are of special relevance since it ensures faculty members are in tune with their needs and also opens good opportunities for selection of strong candidates for participation in the Program. Some of the relevant activities by Dalhousie units are noted below and in Appendix C:

Dalhousie Ocean Studies Programme (DOSP)

- linkages with organization of Eastern Caribbean Islands for ocean development in national planning

- SEAPOL (Southeast Asia Policy on Law of the Sea) research project with Chulalongkorn University, Thailand
- West Africa regional seas research and development needs

Oceanography

- ASEAN Marine Science Project
- Jamaica marine and coastal studies
- Peru El Nino project

Faculty of Law

- graduate education of marine law specialists from China and other developing countries
- graduate education of environmental law faculty members from Indonesia

Institute for Resource and Environmental Studies

- Indonesia Ministry of Population and Environment and Universities
- coastal zone management workshops and other environmental training and research
- training course in environmental assessment for the Caribbean with University of West Indies and Caribbean Conservation Association

Biology

- Jamaica marine studies
- Southeast Asia mariculture
- Mariculture training

Centre for Development Projects

- Study tours for senior Caribbean fishery planners

Political Science

- IOI Course on Marine Affairs - 20 or more participants each year

Centre for Marine Geology

- research on ocean crust and training courses involving participants from many developing countries

In the course of this work Dalhousie has developed linkages with a substantial number of the international development agencies. These contacts will be helpful in seeking support for additional participants beyond those funded by ICOD and for identifying qualified candidates, etc. In addition there are many linkages through international scientific and professional organizations such as UNESCO, WMO, IMO, FAO, UNEP Regional Seas Programme, ICLARM, IABO, IUCN, Law of the Sea Institute, WMU, and the Commonwealth Secretariat. These contacts will lead to Program enrichment, and also will be helpful over the longer term in creating networks that will help graduates of the Program once they return home.

PARTICIPANT SELECTION AND ENROLLMENT

Selection Process

Participants will apply to Dalhousie University in the normal fashion for non-degree graduate-level students. Their applications will have to be complete well before the normal 31 May deadline in order for selection to be made for 15 June entry. In fact, the process should be complete by the end of December to allow approximately six months for processing of Canadian visas and other practical details.

The major concern will be to identify a sufficient pool of extremely well-qualified participants. This will not be a Program for poorly-prepared candidates. It should be restricted to those who have advanced skills in language and educational preparation. Some candidates will already possess a master's or doctorate degree. They will have a TOEFL score of 500 to 525 (or equivalent) as an absolute minimum for entry. It is assumed that they can achieve a level of 550 by the time academic work is started in September. The Program should avoid those who make degree or diploma acquisition a profession and those whose main skill may be adequate mastery of the English language. Thus a great deal of effort by the co-coordinators will be directed to seeking outstanding candidates likely to make a major contribution once they return to their home country. Selection will be based on personal interviews where possible; trusted opinions; and letters of reference; involvement in projects, training or research where competence and leadership has been demonstrated; as well as academic grades. Special attention will be given to recruitment of female participants and to recruitment of individuals from coastal communities of developing countries who are likely to play a significant role in local-level development of marine resources.

Canadian participants will be selected following advertisement of the Program within Canada. The maximum number of Canadian participants is anticipated to be 4 or 5 per year.

Enrollment Schedule and Fees

Student programs will begin between 15 June and 1 July. They will be registered immediately after their arrival on campus for the summer term. During August each student will complete an academic course form (Appendix H) which covers the coursework to be fulfilled under the Program. This form becomes binding when it is signed by a Program Coordinator, the Dean of Graduate Studies and the student, but it may be modified by mutual agreement over the period of the student's studies. The students will register for individual courses in September and January following normal procedures.

The fees to be charged for the Program will be those appropriate for a one-year, full-time graduate program. For foreign students there will be a differential fee calculated according to standards set by the Province of Nova Scotia. The one-year fee will include summer school or other preparatory work, with the exception of the I.O.I. Course on Marine Affairs which has a special fee. Any possible reduction in this fee can only be arranged via direct negotiations with the I.O.I. course organizers. It is assumed that fees will not be charged by cooperating organizations for the Practicum. If this assumption turns out to be incorrect, there will be a need to draw upon contingency funds which have been included in the proposed budget.

The current level of fees (1985-86 Academic Year) for a foreign graduate student at Dalhousie is \$ 3,389. However this level is only indicative rather than guaranteed. Actual fees charged will be those currently applicable at registration time.

Class Size Determinants

An interdisciplinary graduate program such as proposed for Marine Affairs requires a minimum of 8 to 10 participants to function successfully. Below these numbers it will be difficult to generate the necessary group interaction and spirit. Furthermore the Program would become very expensive to administer in relation to its training contribution. At the upper end of the scale, it is unlikely that more than 15 to 20 participants should be admitted per year, at least over the first five years of the Program's existence. Larger numbers likely would lead to compromises in quality of participants selected and difficulties in supervision plus limitations on available space.

We anticipate the following schedule of entries:

Academic Year	87-87	87-88	88-89	89-90	90-91	91-92
No. of participants	-	13	15	17	20	20
Sources of Support						
ICOD		10	10	10	?	?
Int'l Agencies/Govt's		2	3	4	5	5
Sources for Canadians		1	2	3	5	5

If ICOD support cannot be maintained past the third year, intensive efforts would be required to develop alternative sources such as international bank and other donor support, especially for poorer countries which do not have the means to directly fund their candidates.

MATERIALS DEVELOPMENT

As already noted, the rich and complex literature base which is evolving through the many sub-fields relevant to Marine Affairs is well-represented within Dalhousie University libraries, especially in the Marine and Environmental Law collection of the Law library and in the MacDonald Science Library. The former collection is considered one of the finest in North America and is used as the basis of the award-winning periodical "Marine Affairs Bibliography". The marine science collection is very broadly-based and is complemented by important collections of United Nations and other international materials not only within the Dalhousie Collections but also at the Bedford Institute of Oceanography library, which is accessible to Dalhousie faculty and students. Thus the base of substance for materials development is both large and current.

We support the concept of creating a background workbook which could serve as a text not only for the Marine Affairs core course but also possibly for courses that might be later offered within particular countries by participants or others. It is very important that preparation of the workbook involve the Program coordinators and others involved in Program teaching. We would prefer to have the workbook prepared by the Dalhousie staff associated with the Core course. However we recognize that ICOD may wish to contract separately for this particular workbook. It will only become a genuinely useful product if it is developed with the full participation of those involved in teaching. Furthermore, it is generally true that a minimum of three cycles of experience in use of such materials may be required before they are fully satisfactory.

The need to go beyond the printed page is also evident. It will be highly desirable to use videotape, slide shows and other audio-visual techniques to cover some concepts. Increasingly, low cost micro-computer simulation and information systems are finding their way into the classroom. We view the establishment of a new program as an opportunity to make use of advanced teaching and group-interactive techniques and would like to see a budget line specifically available for materials development pertaining to the use of micro-computers and audio-visual materials. It is interesting to note that some Asian, and possibly also Latin American countries place great emphasis on such techniques in their own programs.

Over time it will be desirable to produce materials for courses other than the core course in Marine Affairs. No budget is incorporated for such materials in this proposal. This is a point which should be reviewed in negotiations.

The proposed schedule for the core course materials development is noted below based on the assumption of an independent contractor for the workbook:

July-August 86	Meeting of Coordinators and ICOD to determine draft content of workbook
September-October 86	ICOD sets Terms of Reference and arranges contracting
November 86-May 87	Work by contractor in consultation with Dalhousie Faculty
June-August 87	Review and printing of draft workbook
May-August 88	Review and printing of second edition workbook
May-August 89	Review and printing of third edition workbook

ICOD ROLE AND PARTICIPATION

The Marine Affairs Diploma Program, if approved by Senate and MPHEC, would be an integral activity of Dalhousie University to which ICOD would be a key contributor and participant in the operation. It is assumed that both Dalhousie and ICOD have a long-term interest in the Program and that a partnership satisfactory to both parties will be established. Bases for this partnership should include the following:

	ICOD	Dalhousie
Funding	Core Funding Fellowships	In-kind contributions; Additional fellowship support arranged via other outside channels
Facilities	Participant access and use of ICOD information system once it is established	Ready access to all facilities including lab, libraries, study space, ocean information systems
Expertise	Program management staff	Administration, supervisory and teaching staff
Linkages	Identification of potential outreach and qualified institutions/candidates	Many academic and project contact linkages via individual faculty contacts
Participant Selection	Assistance in advertising and identifying qualified candidates	Recruitment and final selection
Curriculum Development	Advisory	Decisions
Materials Development	Contracts	Advisory and direct participation
Participant Supervision	Supporting role	Main role
Course Development	Advisory	Main role
Overall Program Direction	Steering Committee Member	Steering Committee establishment and functioning
Evaluation	May make independent evaluation	Academic evaluation after five years operation

EVALUATION AND REPORTING ARRANGEMENTS

The partnership of ICOD and Dalhousie on the development of a new program will demand extensive exchange of information in order to satisfy evaluation needs of both institutions. In brief the evaluation and reporting arrangements proposed are:

(1) An annual evaluation conducted just prior to graduation by Faculty and participants. The output will be a summarized written report prepared by the Co-coordinators for distribution to the Academic Steering Committee, deans and to ICOD. This report will be available to the Graduate Dean and other academic administrators upon request.

(2) Annual financial report and narrative report prepared by the Co-coordinators and submitted each July to ICOD via the Office of the Academic and Research Vice-President of the University.

(3) A mid-period and Five-Year Review to be conducted by ICOD and Dalhousie, respectively. The first review will be undertaken in the summer after the initial class has completed its work. This review will be intended primarily to examine management performance and the need for any mid-period corrections in the conceptualization and implementation of the Program. It will be conducted by ICOD based on a terms of reference and reviewers mutually agreed-upon by Dalhousie and ICOD. Funds for this review would need to be allocated by ICOD and have not been incorporated into the proposal budget. Also, Dalhousie is prepared to appoint a faculty member to this mid-period evaluation team, if so desired by ICOD.

The Five-Year Review would be an internal review which would follow standard procedures laid out by the Graduate Faculty for the review of its program. If ICOD wished to appoint a member to the evaluation team it would have to be arranged via the Dean of Graduate Studies. In general the University prefers to have one external reviewer as well as an internal review team chosen from Dalhousie faculty members.

If the proposed evaluation arrangements require further refinement to be agreeable to ICOD, this matter could be discussed during negotiations. In our opinion it is an important matter that both the style and approximate timing of evaluations be incorporated within any final agreement. Also, the total estimated cost and source of funds should be clearly spelled out. Dalhousie will absorb costs for any internal review team but is not in a financial position to pay for external reviewers of newly initiated programs.

BUDGET

The cost of mounting a new program can be broken down into direct additional budget needs, and in-kind or indirect costs, especially where the program can take advantage of existing courses, available library resources, space, etc. In addition, it is necessary to consider both immediate and long-term costs of program implementation. Ideally, it is desirable to start new programs with 5 to 8 years assured funding support for staff and students. This time span permits the program to become integrated into the overall budgetary framework of the University and assures that the activity (and participants) will not be abandoned suddenly as a consequence of a lack of funds. We recommend that serious consideration be given by ICOD to extending the period of support beyond the relatively short 4 year term proposed.

The overall cost of the program over the first 4 years (exclusive of fellowships and some other expenses as noted) is \$945,033 (see Table 3). The proposed ICOD contribution is \$461,033. These figures are based on categories noted in the budget breakdown and include both proposed ICOD contributions and Dalhousie in-kind support. Under current conditions of fiscal restraint it is highly unlikely that any new program such as the Marine Affairs diploma could receive an independent budget allocation from within-University sources. Over the longer run it may be anticipated that the base of support will be broadened from various international and Canadian sources. Also, there are internal Dalhousie redistribution and development mechanisms newly in place which might be tapped at some future point, although demands on them are very substantial from existing program activities.

In Table 4 details are provided of the proposed ICOD contribution. The budget does not include the following items: ICOD Fellowships for the program; materials preparation for the Marine Affairs core course; travel by individual participants to other parts of Canada for the Practicum or other purposes; costs of external evaluation. Also, there is no provision in the budget for payments to other universities and institutions. Any such need will have to be clearly identified at the time of negotiations. It is not anticipated that such costs would be a substantial additional burden.

Table 3 Total Four-Year Budget for Marine Affairs Diploma

Budget Category	Proposed Contribution	
	OOD	Dalhousie In-Kind
1. Personnel (salary & benefits)		
- Co-coordinators	167,448	
- Admin Secretary	66,979	
- Faculty Release	42,865	
- Faculty Supervisory Time	-	125,000
- Faculty Teaching	-	<u>150,000</u>
Sub-total	<u>277,292</u>	<u>275,000</u>
2. Communications and Materials		
- Telex, Telegram & Telephone	15,600	2,000
- Computer Use	3,000	15,000
- Materials	6,600	-
- Photocopy & Printing	5,000	-
- Mail and Courier	<u>4,400</u>	-
Sub-total	<u>34,600</u>	<u>17,000</u>
3. Travel		
- Annual Recruitment trip	13,000	-
- Travel within Region (staff and students)	<u>14,500</u>	-
Sub-total	27,500	-
4. Materials Preparation		
- Rental fees/purchase A.V. materials	1,500	1,000
- Other course material dev.	<u>7,000</u>	<u>3,000</u>
Sub-total	<u>8,500</u>	<u>4,000</u>
5. Facilities		
- Furniture and Equipment	8,000	8,000
- Library Facilities	-	140,000
- Office and Student Space	-	<u>40,000</u>
Sub-total	<u>8,000</u>	<u>188,000</u>
6. Overhead	83,187	-
7. Contingency (5%)	<u>21,954</u>	-
Total	<u>461,033</u>	<u>484,000</u>

Table 4 **Proposed ICOD Budget Contribution**

	Year				
1. Personnel	1	2	3	4	Total
Co-coordinators	38,850	40,792	42,832	44,974	167,448
(salary & benefits)					
Secretary	15,540	16,317	17,133	17,989	66,979
Faculty Release Time (1/3 F.T.E.)	-	13,597	14,377	14,991	42,865
Supervisory Time for participants	-	-	-	-	-
Faculty Teaching	-	-	-	-	-
Sub-total	54,390	70,706	74,242	77,954	277,292
2. Communications and Materials					
Telex, Telegram and Telephone	3,500	3,800	4,000	4,300	15,600
Computer Use	700	700	800	800	3,000
Materials	1,500	1,600	1,700	1,800	6,600
Photocopy and Printing	900	1,200	1,400	1,500	5,000
Mail and Courier	<u>800</u>	<u>1,000</u>	<u>1,200</u>	<u>1,400</u>	<u>4,400</u>
Sub-total	7,400	8,300	9,100	9,800	34,600

Table 4 (continued)

3. Travel

Annual recruitment trip	4,000	4,500	4,500	-	13,000
Travel within region	<u>1,000</u>	<u>4,000</u>	<u>4,500</u>	<u>5,000</u>	<u>14,500</u>
Subtotal	5,000	8,500	9,000	5,000	27,500

4. Materials Preparation

Rental, fees etc,	-	500	500	500	1,500
Other course material development	<u>1,000</u>	<u>2,000</u>	<u>2,000</u>	<u>2,000</u>	<u>7,000</u>
Sub-total	1,000	2,500	2,500	2,500	8,500

5. Facilities

Furniture and Office Equipment	3,000	4,000	500	500	8,000
Office Space	-	-	-	-	-
Library Facilities	-	-	-	-	-
Student Facilities and space	-	-	-	-	-
Sub-total	3,000	4,000	4,000	500	8,000

6. Overhead

(30% of Personnel Costs)	<u>16,317</u>	<u>21,211</u>	<u>22,273</u>	<u>23,386</u>	<u>83,187</u>
Sub-total	16,317	21,211	22,273	23,386	83,187

7. Annual Cost	96,546	129,288	132,039	133,936	439,079
5% Contingency					<u>21,954</u>

TOTAL 461,033