

Report of the Academic Review  
Committee for the  
Proposed Diploma in Marine Affairs

June 1986

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*Table of Contents of Marine Affairs Bibliography*

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## I. The Committee and its Task

The Committee was struck in April 1986 to make recommendations to Faculty Council regarding the Proposal for Development of a Marine Affairs Diploma Program at Dalhousie University with ICOD Assistance, May 1986, in accordance with the relevant sections of the document "Academic Review of Graduate Degree Programs".

The proposed Diploma in Marine Affairs is the University's 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. The Proposal including a summary is attached as Appendix A.

The members of the Committee were: Dr. M. Paul Brown, School of Public Administration, Dr. Ian A. McLaren, Department of Biology, and Dr. Donald J. Patton, School of Business Administration, who acted as Chairman.

During May and June 1986 the Committee held seven meetings and interviewed a number of individuals including the proponents of the Program and the President of the funding agency, ICOD. (A list of the meetings held and the persons interviewed can be found in Appendix B and a fact sheet on ICOD is included as Appendix C).

## II. Recommendation and Justification

### **THE COMMITTEE RECOMMENDS THAT FACULTY COUNCIL APPROVE THE PROPOSED MARINE AFFAIRS DIPLOMA PROGRAM WITH ICOD ASSISTANCE.**

We make this recommendation for the following reasons:

1. **A Marine Affairs Program, requiring no additional internal funding, would make a valued addition to the Academic program of Dalhousie University.**

In support of this view we cite the conclusion of a 1984 university committee<sup>on</sup> Ocean studies at Dalhousie.

In view of the current state and requirements of the University, the region and the nation as a whole, Dalhousie University must fully develop its natural advantages as a "college by the sea". With its recognized strengths in the sciences, the University is uniquely positioned to become a world leader in research and training in marine affairs. The region will clearly benefit as will the nation as a whole. (Report of the Review Committee for the Dalhousie Ocean Studies Program, June 28th, 1984, page 8).

2. Qualified faculty are already on staff and with the exception of the core course in Marine Affairs, no new classes need be added.

While the field of Marine Affairs is broad (see Appendix D for a listing of the components of Marine Affairs) the Proposal has identified sufficient faculty and courses at Dalhousie and TUNS as well as St. Mary's and Mount Saint Vincent Universities to amply support such a program.

3. ICOD is Fully Aware of University, sensibilities in matters of admissions, control of course content, and certification.

From our meeting with ICOD personnel, we established the following:

Although they will offer scholarships to potential students prior to admissions, ICOD has taken pains to enquire into requirements for admission as represented by Dalhousie, and recognizes that admissions are entirely a university prerogative.

While ICOD staff are anxious to have input into the proposed Marine Affairs class, especially on study materials, it is clear that their views have already been established by academics (including some from Dalhousie) and they recognize that the professoriate controls structure and content. It appears that they are seeking nominal involvement to give visibility to their mandate.

There is considerable flexibility in ICOD's part regarding the kind of certification to be offered. Oddly, it seems that a "certificate" (non-degree, non-diploma in our system) may carry more weight in some third world countries than a "diploma" (which can mark graduate-level achievement in our system). There was also recognition of the desirability of developing the Diploma program to the masters level, in due course.

4. There appears to be demand for such a program.

Marine Affairs is offered at a number of Universities in the United States (see Appendix E for a brief description of selected programs). One of the most visible and highly regarded of these is the Graduate Program in Marine Affairs at the University of Rhode Island, (Appendix F). As no university in Canada offers a Marine Affairs program, Dalhousie is uniquely positioned to take advantage of this opportunity.

5. **There is room on Campus.**

The Central Services Building, 5th floor has an available classroom for the new course in Marine Affairs, as well as sufficient space for informal meetings and research by course participants. The Dean of Law advises that present plans for the new Law Building, scheduled for completion in 1989, include space which could be used to support teaching and research in Marine Affairs.

6. **Marine Affairs library holdings in Halifax-Dartmouth are among the best in Canada.**

While increased funding for the Dalhousie library system is needed, the work of an additional thirteen to twenty graduate students in Marine Affairs would not appear to over tax the system.

However, there is some concern that in the general areas of applied marine science and technology, Dalhousie holdings are not adequate. (See Section III below).

7. **If Dalhousie is selected by ICOD, external funding for the program will be available for at least four years.**

The budget for the Marine Affairs Diploma appears realistic (see pages 27 - 29 of the Proposal) and while it would be desirable to negotiate additional monies from ICOD (e.g. for additional library materials) the program could proceed in its present form.

8. **The proposed Diploma is in conformity with the university's strategic plan; 1986 and Beyond: A Report of the First Cycle of Academic Planning at Dalhousie University 21 April 1986.**

In a number of areas the concept of a Marine Affairs Diploma is directly supported by the plan. For example, after observing that one of the purposes of the University is to serve the public and community the plan recognizes the benefits that accrue from such interaction -- an integral part of the proposed Marine Affairs Diploma. We quote:

The University also recognizes that its basic functions of teaching and research are enormously enriched by its interactions with the community. (Pg. 9, emphasis added).

More specifically, three of the five environmental factors affecting the University's future are directly addressed by the Marine Affairs Diploma, namely, reduced funding; demographics; and regional needs and opportunities.

As regards reduced funding, the Diploma is to be fully underwritten by ICOD for at least four years. Demographic changes will be marginally offset by the enrollment in the program of twelve to fifteen mature students from abroad. Specific regional needs and opportunities will be met in at least two ways: First through the education in the Halifax-Dartmouth area of foreign marine specialists who will return to positions of authority in their home countries; and secondly, because Canadians (one to five each year) will receive training in Marine Affairs to the later benefit of the Province and the Region.

In a related vein, the University's plan recognizes that a network of research institutes in the area provides opportunities for co-operative activity, another important aspect of the proposed Marine Affairs program.

Interdisciplinary studies are also supported by the plan. Specifically it states that:

the development of new interdisciplinary teaching and research activities, the breadth of Dalhousie expertise and the existence of many cognate departments within and between faculties is a strength which warrants further exploitation (Pg. 32, emphasis added).

The Marine Affairs Diploma Program is fully interdisciplinary.

Finally, Objective 7-11-1 gives priority to increasing co-operation among academic units, on campus and off. This objective reads as follows:

To increase substantially the level of co-operation among academic units at Dalhousie both internally and with respect to other post-secondary institutions on the Atlantic Region and to make such increased co-operation a priority at the University (Pg. 84, emphasis added).

9. The Proposal for the Development of a Marine Affairs Diploma Program with ICOD Assistance is a well conceived document that has the enthusiastic support of many of the faculty at the University who will be directly involved in the Program.

The Proposal is a thorough, consistent and accurate document that appears to have addressed the key issues and requirements for success with a Marine Affairs Diploma. While additional suggestions for improvement are made below, the overall concept, the proposed course of study, the organizational structure on campus and vis-a-vis ICOD, as well as the sources of funding are desirable and workable in the eyes of the Committee members as well as those Dalhousie faculty and administrators charged with its implementation.

### III. Suggestions for Improvement and Clarification.

1. The **Practicum**, an important and desirable part of the Marine Affairs curriculum, appears to be for too short a period (See Proposal, pg. 8). Requirements in other Schools on campus (eg. Public Administration) are for significantly longer periods of internship or work experience. In its final structure and implementation, ~~the~~ Practicum must demand work from the candidate sufficient to justify the academic credit given.
2. As the program develops, careful observation may suggest a need to enlarge the core course requirements. In the Dalhousie Marine Affairs Diploma as little as 20 percent of the class load may be required, while at the University of Rhode Island for example, 60 percent of course credits are compulsory.
3. In the early stages it may be particularly important to ensure that the "weekly seminar" (Proposal, pg. 11) is an integrating device that draws the participants together and is taken seriously by them.
4. The criteria to apply when determining if diploma students have successfully completed their full course of study must be clear to all parties. For example, the relevant section of the Proposal (Pg. 12) may not be completely in accord with paragraph 2.11 of the Calendar, Faculty of Graduate Studies, 1986-87, p. 27.

In the pursuit of excellence for the Program, the coordinators, in consultation with the Academic Steering Committee and the Deans of Law and Graduate Studies, may choose to recommend even higher standards for Marine Affairs graduates.

5. As regards the content of the core class in Marine Affairs curriculum, committees and individual faculty members <sup>will</sup> control what is taught in the classroom. While ICOD appears to understand this important principle, Dalhousie representatives should ensure that no misunderstandings arise over this potentially sensitive question.

6. We recommend that the university library system undertake a major study of its holdings and deficiencies in applied marine science and technology, given their initially increasing importance even without the proposed program.

Although we have been unable to secure formal statements from senior librarians on library holdings, conversations with some of them and certain elements in the Proposal <sup>NET</sup> suggest that we cannot assume complete adequacy. Particularly in the areas of applied marine science and technology and in cognate "gray literature", the university holdings may be deficient. Our students do <sup>not</sup> have easy access to holdings in other government libraries in the area; some are decidedly closed. To suggest such alternate sources is to admit to Dalhousie's deficiencies.

7. In later years effort should be made to increase the proportion of Canadian students in the Diploma program, provided they are funded by corporations, government departments or other outside agencies.
8. As it may be desirable to admit to the Marine Affairs Program a limited number of candidates from abroad who do not possess undergraduate degrees from a recognized university, <sup>NET</sup> at the appropriate time, Dalhousie representatives should carefully review with the funding agency university policies <sup>NET</sup> for such cases.
9. As ICOD funding for the Diploma in Marine Affairs is not expected to continue beyond a set period the University should, from the outset, ensure that individuals associated with the Marine Affairs Diploma aggressively seek replacement funding. A full statement of progress in this vital area should be included in the Annual Report submitted by the co-ordinators.





## Appendix C

### International Centre for Ocean Development (ICOD) Fact Sheet

On the basis of a commitment made by Prime Minister Trudeau in 1981 at the Commonwealth Conference in Melbourne, Australia, ICOD was formed, first as a non-governmental organization (May 1984) and later in February 1985 as a crown corporation. Headquartered in Halifax, ICOD assists Third World coastal nations with the comprehensive management and development of their ocean resources.

With a budget of \$4.2 million in 1986 (\$10 million by 1991), ICOD will provide on an equal basis technical assistance, information and training for all ocean activities—from fisheries through tourism.

Technical assistance by ICOD includes: a common fisheries policy for the countries of the Eastern Caribbean (\$500,000 per annum over 4 years) fisheries surveillance in the South Pacific, and in specified countries helping "the man in the boat".

Under the heading of information, ICOD is working with the governments of Sri Lanka and the South Pacific nations, among others. In Canada, ICOD is preparing a directory of ocean-related training programs.

Funding a **Marine Affairs Diploma** at a Canadian university is central to ICOD's training program. Other initiatives include two courses at Sweden's World Maritime University, as well as planned offerings in offshore mineral exploration and surveillance.

ICOD will use an independent review board to select for funding one of the two Anglophone proposals received. Their decision should be known by September 1986.

Training Scholarships will be offered as follows:

20 "open" scholarships for two years (\$18,000 - \$20,000 per annum); 20 scholarships for Marine Affairs Diplomas in Canada (10 for the English language program and 10 for the French); 4 to the International Ocean Institute (Malta and Halifax); 2 to the World Maritime University; and 3 each to universities in the West Indies, South Pacific, West Africa, South-West Indian Ocean, and other areas. Additional ICOD funding will be made available for specialized study and faculty exchange.

Appendix E

Brief Description of Marine Affairs Courses  
and Programs at Selected U.S. Universities

University of California, Santa Barbara  
Santa Barbara, CA

Marine activities at the University of California, Santa Barbara are carried out through the Marine Science Institute and a number of departments, covering more than ten academic disciplines.

Areas of research and instruction include Marine Science, Ocean Engineering and Marine Policy.

University of San Diego  
San Diego, CA

USD has established a new undergraduate Marine Studies Program. Marine Studies students have a choice of two interdisciplinary options: Marine Sciences or Ocean Studies. Each involves a double major in order to assure the broadest experience in the liberal arts and sciences and to enlarge the career opportunities of the programs graduates. A student choosing the Marine Sciences option will have a second major in a non-science field; for example, Anthropology, Economics, History, International Relations, Political Science, or any other appropriate discipline.

University of Southern California, Institute for Marine and  
Coastal Studies (IMCS)  
Los Angeles

The Marine Policy Program involves multi-disciplinary studies of local, national and world policy issues that involve the uses of ocean resources.

Courses offered in departments of Biological Sciences, Geology, School of Engineering, Law School, Department of Political Science, School of Public Administration, and School of International Relations as well as in the IMCS.

University of Delaware  
Newark and Lewes, DE

The College of Marine Studies offers graduate programs leading to the Master of Science, Master of Marine Policy and Doctor of Philosophy degrees with areas of specialization in applied ocean science, oceanography, marine biology, and biochemistry, and marine policy.

University of Miami  
Coral Gables, FL

University law school offers an interdisciplinary ocean and coastal law program.

Degrees offered: LL.M. in Ocean and Coast Law; J.D. with specialization in ocean and coastal law.

Northeastern University  
Boston, MA

An interdisciplinary undergraduate minor option in Marine Studies is offered.

Woods Hole Oceanographic Institution  
Woods Hole, MA

Postdoctoral fellowships are available to individuals in the social science fields interested in advanced studies in marine policy and ocean management.

Mississippi-Alabama Sea Grant Consortium  
Ocean Springs, MS

The Consortium conducts projects dealing with living marine resources, marine technology research and development, marine environmental research, socio-economic and legal studies, seafood processing, marine education, and advisory services.

University of Rhode Island  
Kingston, RI

The Graduate Program in Marine Affairs offers two master's degrees in Marine Affairs: a two-year Masters of Arts in Marine Affairs (MAMA) for recent graduates who intend to enter a marine profession, and a one-year terminal Master's of Marine Affairs (MMA) intended for people in mid-career who have had prior academic, professional or practical experience in marine affairs. The Marine Affairs Program focuses on marine policy and management of the coastal zone, fisheries, ports and shipping, and international marine affairs.

University of Virginia  
Charlottesville, VA

The Graduate School of Arts and Sciences also offers the Master of Arts in Marine Affairs. This is an interdisciplinary degree drawing on coursework in the College of Arts and Sciences, the Law School (Center for Oceans Law and Policy), the School of Architecture (Planning); and the School of Engineering.

University of Washington  
Seattle, WA

The Institute of Marine Studies supports work in maritime policy and management.

Source: Sea Technology Buyers Guide/Directory, 1985-86.  
Section F.

Appendix A

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

Dalhousie University, Halifax, NS  
May 1986

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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.



PROPOSAL FOR DEVELOPMENT OF A  
MARINE AFFAIRS DIPLOMA PROGRAM

AT  
DALHOUSIE UNIVERSITY

WITH  
ICOD ASSISTANCE

INTRODUCTION

Since 1945, Dalhousie University has been developing teaching and research programs in the field of marine affairs. Initially, this effort focused exclusively on the marine sciences, and by the 1960's Dalhousie had achieved international prominence as one of the leading oceanographic centres in North America, greatly reinforced by the wealth of expertise available at the Bedford Institute of Oceanography and other research and teaching institutions in the Atlantic region. In the early 1970's, the University began to develop teaching and research capabilities in the marine-related areas of law and the social sciences. By the late 1970's no less than seven institutes and centres with ocean-related interests had been established at Dalhousie University, and a proliferation of both graduate and undergraduate courses in marine affairs had taken place in various faculties on the campus. Because of this emergence of marine affairs as a priority area at Dalhousie, the President of the University established a coordinating mechanism, the Dalhousie Ocean Studies Council (DOSC, see Appendix A), to help develop integrated teaching, training and research activities throughout the University community, often in conjunction with the Bedford Institute and other marine-related institutions in the region. This Council meets as required. The present proposal was developed by a committee of DOSC coordinated through the office of the Assistant Vice-President for Research. The Technical University of Nova Scotia and Saint Mary's University have indicated their interest to become associated with the proposed Diploma Program and other Universities in the region will be approached if the proposal is successful.

In recent years, DOSC members have begun to consider the need for developing a master's degree program in marine affairs, as United States universities have done. Within the last five years, Dalhousie has undertaken short (ten week) training programs in marine affairs in cooperation with the International Ocean Institute (IOI), based in Malta (Appendix B). These successful courses have attracted government officials from over thirty countries to the Dalhousie campus. Moreover, the research and teaching activities of several institutes and departments in both the physical and social sciences have taken Dalhousie ocean-related scholars out into several developing regions, especially the Caribbean, Africa and South-East Asia (Appendix C). Dalhousie's long-term involvement with development studies was reinforced by the recent establishment of the Pearson Institute for International Development, reflecting the University's commitment to international development assistance both within and beyond the field of marine affairs. At present students from more than 70 countries are enrolled in 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 facilities 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 practise 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 (or Aquaculture)	3
	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	
	KOD	Dalhousie In-Kind
<b>1. Personnel (salary &amp; benefits)</b>		
- Co-coordinators	167,448	
- Admin Secretary	66,979	
- Faculty Release	42,865	
- Faculty Supervisory Time	-	125,000
- Faculty Teaching	-	150,000
Sub-total	277,292	275,000
<b>2. Communications and Materials</b>		
- Telex, Telegram & Telephone	15,600	2,000
- Computer Use	3,000	15,000
- Materials	6,600	-
- Photocopy & Printing	5,000	-
- Mail and Courier	4,400	-
Sub-total	34,600	17,000
<b>3. Travel</b>		
- Annual Recruitment trip	13,000	-
- Travel within Region (staff and students)	14,500	-
Sub-total	27,500	-
<b>4. Materials Preparation</b>		
- Rental fees/purchase A.V. materials	1,500	1,000
- Other course material dev.	7,000	3,000
Sub-total	8,500	4,000
<b>5. Facilities</b>		
- Furniture and Equipment	8,000	8,000
- Library Facilities	-	140,000
- Office and Student Space	-	40,000
Sub-total	8,000	188,000
<b>6. Overhead</b>	83,187	-
<b>7. Contingency (5%)</b>	21,954	-
Total	461,033	484,000

**Table 4** Proposed ICOD Budget Contribution

	Year				Total
	1	2	3	4	
<b>1. Personnel</b>					
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
<b>2. Communications and Materials</b>					
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

MASTER OF MARINE MANAGEMENT:  
REPORT OF THE REVIEW COMMITTEE (FSS).

February 1990

MASTER OF MARINE MANAGEMENT:  
REPORT OF THE REVIEW COMMITTEE

The Marine Affairs Programme was established in October 1986 after a proposal had been submitted by Dalhousie to the International Centre for Ocean Development. ICOD had requested a proposal to develop a one year course of study offering a graduate Diploma in Marine Affairs, which is the degree now conferred on those who complete this programme. As a result, the Marine Affairs Programme has been financed by ICOD since its inception. ICOD has budgeted \$850,000 for the development and operation of this programme over a six year period that will end in 1992. Another \$237,500 has been committed to the development of teaching materials, and ICOD will also offer 50 scholarships of one year each over a five year period that ends in 1992. Dalhousie has the only Anglophone programme in marine affairs in Canada; there is a Francophone programme at the University of Quebec at Rimouski, which is also supported by ICOD. A change from a Diploma to a Master's Degree is also being considered for the programme at Rimouski.

Though the Marine Affairs Programme has attracted some Canadians, it draws a very large part of its clientele from developing nations. It has been developed with the interests in mind of government officials, educators, and private sector managers from the developing world who must deal with marine affairs. Furthermore, ICOD's fifty scholarships go to students from developing countries. The first eleven students who enrolled in the programme began their studies in June 1987. Two subsequently withdrew, and nine graduated one year later. Another nine students graduated in 1989. Eighteen students were admitted to the programme for

the 1989-90 academic period. The Coordinators estimate that they have had over 130 enquiries about the programme since it began. Eighty-five applications to enter the programme were made during its first three years. Interest in the programme is strong and continues to increase.<sup>1</sup>

The Coordinators of this programme submitted in late April 1989 a proposal to offer a Master of Marine Management Degree and to drop the Diploma. They argue that their programme has developed to the point where its content is equivalent to a Master's programme and that the Diploma is therefore inappropriate. In fact, the Coordinators believe that the standards required of applicants, the content of the programme and standards expected of graduates make it equivalent to a Master's programme. They also argue that standards in effect for admission to the Diploma programme are equivalent to those applied for entry to a Master's programme. They do not see this as a proposal for a new programme.

A committee was formed in late May to review this proposal. It interviewed a number of people from June through October of 1989.<sup>2</sup> ICOD had commissioned Coastal Associates and Consultants Ltd. of St. John's, Newfoundland to conduct an independent review of the Marine Affairs Programme during this same period, and the Review Committee consulted with representatives of this company and ICOD. These reviewers have indicated they are very favourably impressed with the speed at which the programme has been implemented and developed, its quality, the quality of its graduates and the people running the programme, and the efficiency of the

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<sup>1</sup>A status report for enquiries and applications for admission to the programme is attached as Appendix I.

<sup>2</sup>A list of people interviewed is attached as Appendix II.

programme. Coastal Associates and Consultants will, at the same time, be bringing forth their own recommendations. Both they and ICOD support the proposal for a Master's degree. Nearly everyone else interviewed by the Committee offered enthusiastic support for the change to a Master's Degree and commented on the excellence of the programme.

The Review Committee focussed on the academic merits of this proposal. It supports the proposal for a Master's degree on academic grounds, but this support does include several recommendations about the programme. Furthermore, any examination of the Marine Affairs Programme raises the difficult issue of funding the programme once ICOD has completed its commitment to the developmental phase. This issue is primarily a financial one, but the Committee felt that it could not proceed without acknowledging it. Additional comments are made on this later in the report.

#### The Proposed Curriculum

The Marine Affairs Programme is interdisciplinary, but it is based in the School of Law, and its curriculum is built around Dalhousie's expertise in Marine Law, Environmental Management and Oceans Policy. The curriculum proposed for the MMM is given in Table 1.

The classes in Table 1 would be offered over three terms beginning in September and ending in August. The first two classes, MAP 5001A and 5011B (Contemporary Issues in Ocean Development and Management) are conducted and evaluated by the Coordinators of the Marine Affairs

TABLE 1  
 PROPOSED CURRICULUM FOR A MASTER OF  
 MARINE MANAGEMENT DEGREE

<u>Required Classes</u>	<u>Credits</u>
MAP 5001A, 5011B (Contemporary Issues in Ocean Development and Management)	1.0
MAP 5002R (Independent Graduate Project)	1.0
Two electives each term (fall, winter) <sup>a</sup>	2.0
<u>Optional Classes</u>	
Map 5000R/Pol Sc 5537R (Management and Conservation of Marine Resources) <sup>b</sup>	<u>1.0</u>
Total credits	5.0

<sup>a</sup>MAP 5003R will be required of students who have little or no background in science.

<sup>b</sup>Currently required in the Diploma Programme, this class would become optional in the Master's Programme.

Programme. They are taught in a modular format by the Coordinators and a variety of guest seminar leaders who treat individual topics. MAP 5002R, the Graduate Project, is primarily a review of literature, though it may also involve field activities, interviews of experts, attendance at conferences and the like. The project would normally be carried out during the spring and summer over a period of three to four months and is expected to produce a manuscript of at least fifty pages. Management and Conservation of Marine Resources, MAP 5000R/Political Science 5537R, is taught over a period of ten weeks during the summer term in conjunction with the International Ocean Institute. It would be an optional class in



the Master's Programme, and those students who do take it would be given a full credit. A class in Marine Science and Technology (MAP 5003/Oceanography 2850) was developed by combining a series of guest lectures concerning the application of marine science to management issues and an additional paper with Introductory Oceanography. Only those students registered for MAP 5003 are required to attend the guest lectures. Only students with a relatively limited background in science are expected to take this class.

This curriculum incorporates two changes to the Diploma programme. First, though it remains compulsory for the Diploma, MAP 5000R/Political Science 5537R would become optional upon implementation of the Master's Degree. Second, MAP 5001R (Contemporary Issues in Ocean Management and Development) has been changed from a full credit class taught in one term to two half credit classes (MAP 5001A, MAP 5011B), which are taught in the fall and winter terms, respectively. These two classes have also been organized into a modular format. Specialists in relevant fields teach different components of the class within this framework. In fact, several instructors who hold cross or adjunct appointments are making significant contributions here. This arrangement allows a better definition of the essential material a marine manager is expected to have.<sup>3</sup> It has been incorporated into the Diploma Programme, and is in effect for the 1989-90 academic year.

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<sup>3</sup>An outline of MAP 5001R for 1988-1989 is included as Appendix III.

### Why Offer a Master's Degree?

A number of reasons have been advanced for offering a Master's degree in place of a Diploma. The academic case turns on an argument that the programme now meets standards comparable to other similar courses of study at Dalhousie and to programmes of study in marine affairs at other universities. In addition, Dalhousie's expertise in Marine Law and Environmental Policy gives it a niche within the broader field of marine affairs. As already noted, the academic case was the one of primary concern to the committee, but two related issues also arose.

The first of these related issues concerns the appropriateness of a Master's Degree as the qualification for those who complete the Programme. This concern was raised by officials of ICOD, ICOD's external reviewers, and the Programme's Coordinators. The Diploma is apparently viewed by much of the Programme's potential clientele either as an undergraduate qualification or as a watered down compromise between a Bachelor's and a Master's Degree. It thus does not recognize the qualifications of its recipients. This in turn makes the programme less competitive in attracting qualified applicants. This problem is compounded because many scholarships available to Master's students cannot be used to support Diplomas. Students who have outside support can therefore be expected to apply for admission to programmes at other institutions that offer Master's Degrees in marine affairs, or to select alternative fields of study. The great majority of students enrolled in the Diploma programme are therefore from the third world and supported by ICOD scholarships. A more varied mix of students is desired.

The second issue was raised by many of the people interviewed by the Committee. It concerns the role Dalhousie is defining for itself. The Statement of the Institutional Role and Planned Capacity of Dalhousie University states intentions to expand graduate enrolment, improve interdisciplinary interactions, use interdisciplinary programmes to build graduate enrolment, increase the level of interuniversity cooperation (particularly in the Metro area), develop ocean studies as an area of special emphasis, and to increase efforts in the field of international development. The Marine Affairs Programme incorporates elements that foster all of these objectives. It would therefore be appropriate to develop this Programme along the lines recommended by those who have invested their efforts in its development and operation. Furthermore, the Statement of Role and Capacity indicates that efforts to increase the University's involvement in international development will include attempts to attract funds from CIDA and IDRC. It would be impolitic, says this line of argument, to make such efforts without being able to show a strong follow-through on a programme developed with a major commitment of funds by ICOD. This follow-through includes the change from a Diploma to a Master's degree.

#### The Academic Case

These two lines of argument aside, the Review Committee was most interested in the academic case for a Master's degree. Comparisons can be made between the proposed MMM and other programmes. There are five Master's programmes at Dalhousie that offer a residency requirement of one

year, provided the student enters with the appropriate background.<sup>4</sup> Other programmes where a residency of two years appears to be the norm offer either a one year residency or consideration for advanced standing if the appropriate qualifications are in place when the student enters graduate studies.<sup>5</sup> In comparison with these requirements, the proposed programme for the MMM, including a one year residency, appears to be appropriate provided a student enters this with qualifications comparable to those required for other Master's degrees.

Comparisons of the programme proposed for the MMM were also made with similar programmes as outlined in the graduate calendars of the London School of Economics, the University of Washington, and the University of Rhode Island.<sup>6</sup> These comparisons also supported the case for the proposed programme.

The programme at LSE requires one calendar year of full time study to complete. It is aimed at civil servants, naval officers, shipping managers or others interested in a career where marine studies would be useful. The programme offers an MSc. Specializations in Sea Use Law, Economics and Policy are available. A student must write one examination in marine science, resources and technology. Two additional examinations

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<sup>4</sup>These programmes are: MA, MSc, MEd, MAT, LLM.

<sup>5</sup>The programmes that normally require two years but for which a one year residency is available for those with appropriate qualifications are: MDE, MES, MLIS. The following programmes have a two year residency, but in the right circumstances will consider a student for advanced standing: MHSA, MBA, MPA.

<sup>6</sup>Information was obtained from the most recent graduate calendar available in the local area for each of the three universities. The dates of the calendars were 1988, 1988-90, and 1984-85 for LSE, UW, and URI, respectively.

must be written in fields selected from international law of the sea, national and international problems in making policy with respect to the sea, economics, or financial reporting and management of the sea. An essay of up to 10,000 words is also required. The requirements for admission were not stated in LSE's calendar.

The UW offers a Master of Marine Affairs degree. The programme requires two academic years for a student with a new bachelor's degree to complete, though well qualified students (for example someone in midcareer with appropriate experience) may be able to complete the programme in one calendar year. Students in the two year programme spend their first year developing an understanding of marine affairs and analytical skills. They develop a specialty in the second year from fields such as coastal zone management, the management of ports and marine transportation, marine policy, and management of marine resources. Each student writes a manuscript on a topic he or she has researched. The School of Law also offers a Master of Law degree with a specialization in Marine Affairs.

URI offers specializations in coastal zone management, marine transportation and port planning, fisheries law and management, and international marine policy and law. Both an MA and an MMA are offered. The MA requires the equivalent of 7.5 credits plus a thesis, and the MMA requires five credits and a written comprehensive examination. Three of the five credits in the MMA programme are required core classes and two are electives. An entering student must have a previous graduate degree or five years of equivalent work in a relevant field. The MA programme requires an entering student to have a bachelor's degree.

### Recommendations

The comparisons with graduate programmes in marine affairs at these three universities, comparisons with other programmes at Dalhousie, and almost all the evidence obtained by the Committee through interviews support the case for offering the MMM at Dalhousie as proposed. The Review Committee therefore recommends:

- (1) that the Master of Marine Management Degree be implemented as proposed.

Additional recommendations are included with this. First, the entry for Marine Affairs in the Graduate Calendar states: "Students applying for admission to the Marine Affairs Programme must have a Bachelor's degree with second class standing, preferably with some relevant work experience." The Committee advises that immediately upon implementation of the MMM this be changed to remove any ambiguity about the consistency of entry requirements for the MMM with regulation 2.2.2 of Dalhousie's Graduate Calendar. This regulation states that only candidates with honours standing or the equivalent may complete a Master's Degree in twelve months of full-time study. The Committee accordingly recommends:

- (2) that (i) an applicant be required to have a Bachelor's Degree in the natural or social sciences from a recognized university with honours or the equivalent of honours standing as conferred by Dalhousie University in order to enter the MMM; (ii) when an applicant who cannot meet this requirement is admitted, it must be to a qualifying year; (iii) an explicit statement indicating these two requirements replace the statement quoted above from the calendar entry for Marine Affairs.

As a result of (iii) described in the following: Any applicant who wants to enter the MMM programme, but who first requires a qualifying year must make a new application to enter the MMM Programme upon completion of the

qualifying year. This procedure is now followed by the Faculty of Graduate Studies for other Master's programmes.

Revisions to the programme in Marine Affairs offer a better indication of the material every marine manager should have, particularly when the outline for the newly implemented MAP 5001A and 5011B is examined. Appendix IV augments this information by indicating that any successful applicant who does not have an educational background in science will be required to take MAP 5003R. This class offers an introduction to oceanography for students with limited backgrounds in science, and it is cross-listed with Oceanography 2850R (Introduction to Oceanography). The University Calendar indicates that Oceanography 2850R deals with descriptive science. The Committee recommends:

- (3) that the Coordinators of the Marine Affairs Programme compare the background in science required by their proposed programme, including the minimum represented by MAP 5003R, with similar requirements elsewhere and report the evidence so produced to Faculty Council together with either: (i) an argument that supports this requirement, or (ii) a proposal for changes.

Faculty Council has recommended to the Faculty of Graduate Studies ". . .that only 3000- or 4000-level undergraduate classes may be cross-listed as graduate classes." Council has also recommended that in such cases ". . .classes must incorporate work requirements for graduate students which are consistent with other graduate classes in that Department."<sup>7</sup> The Committee noted that MAP 5003R, with its separate

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<sup>7</sup>Graduate Faculty Council Minutes, June 14, 1988. Council has also endorsed proposals from the Registrar to the Committee on Academic Administration that a standardized system of listing classes be developed. Such a system would reveal all graduate classes that are simultaneously taught at the undergraduate level. (Graduate Faculty Council Minutes, May 9, 1989.)

programme of lectures and additional paper for graduate students, only complies with the second part of Council's recommendation. It accordingly recommends:

- (4) that MAP 5003R be brought into compliance with both parts of this recommendation as soon as possible.

Oceanography 4120A (Introduction to Physical Oceanography) and 4150A (Introduction to Biological Oceanography) could possibly be candidates for cross-listing with MAP 5003R, but the Coordinators may wish to consider other arrangements, too.

The independent review commissioned by ICOD will apparently produce some recommendations to increase the amount of practical experience students receive in the process of obtaining the MMM. These recommendations will perhaps involve ways of increasing the amount of contact students have with managers and practitioners outside of academe and of increasing the amount of material concerning the problems of small ocean states. Recommendations concerning the introduction of case studies may also be forthcoming. If such recommendations are made and accepted, it may be necessary to modify further the core of required material. The Committee therefore recommends:

- (5) that once ICOD's independent review has been received and considered, a brief report to Faculty Council be made as to whether any modifications to the core of the programme are deemed necessary, and if so, how they will be carried out.

Some effort has been made to develop interdisciplinary contacts for the Faculty Affairs programme on the Dalhousie campus, particularly with respect to library resources. However, further effort in this direction is warranted with respect to human resources. Contact with appropriate faculty members could be used both to increase the level of



interdisciplinary contact on campus for students of marine affairs and to offer a springboard for contacts outside Dalhousie from the local to the international level. The Committee accordingly recommends:

- (6) that when orientation of new students occurs, human resources as well as library resources be emphasized; at minimum, a list of faculty members who could serve as contacts in various disciplines should be made available.

The Coordinators of the Marine Affairs Programme may also wish to explore further the use of adjunct and cross appointments to give these faculty members and contacts outside of Dalhousie an explicit connection to their programme.

#### Funding Problems

The Marine Affairs Programme faces two problems whether or not the Diploma is replaced by a Master's Degree. Both are directly related to funding the programme once its developmental phase ends in 1992. Financial and academic matters can be separated, but in this case the Committee believes the financial questions are fundamental and must be acknowledged.

The first of these problems concerns whether or not the Marine Affairs Programme will continue beyond 1992. It is certainly the more difficult of the two problems. A change from the Diploma to a Master's Degree will not have any immediate financial implications because regardless of the degree offered, money from ICOD will continue to support the programme through its developmental period, which ends in 1992. However, no plans are in place to fund the programme beyond this point. Furthermore, when Senate approved this programme, it was with the explicit recommendation to the Board of Governors that approval be withdrawn should

external funding become unavailable.<sup>8</sup> However, when we met with representatives of ICOD, they carefully emphasized that Dalhousie knew that external support would end in 1992, and that they believed the University had assumed some responsibility to continue the programme. In their view, this included a willingness to assume some of the financial burden. The original proposal for the programme refers to efforts in the longer run to broaden the base of support to ". . . various international and Canadian sources."<sup>9</sup>

The implications of Senate's recommendation will be faced in 1992 regardless of whether or not a Master's Degree is offered. Furthermore, the proposal to offer the MMM says nothing about financial implications to the university of this programme beyond 1992--it may well be that the financial implications will be the same whether a Diploma or Master's Degree is offered. The proposal simply does not address this issue. Indeed, the importance of the funding issue both deserves and requires a separate process.

The second problem concerns Library holdings and is also directly related to funding. This problem also arises regardless of whether or not a change is made to a Master's Degree. The library reports strong holdings of materials concerning ocean law and policy and that holdings in the social sciences are adequate. Important gaps exist with respect to applied science, marine transportation, port development, and foreign policy issues. The cost of books and monographs that would close this gap

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<sup>8</sup>Minutes of Senate, December 8, 1986. Faculty Council made this same recommendation to Faculty (Council minutes, October 26, 1986).

<sup>9</sup>Report of the Academic Review Committee of the Proposed Diploma in Marine Affairs, July 1986, p. 26.

is estimated at approximately \$3000 per year. Several journals would also have to be added at an annual cost of about \$1500. In addition to this, the collection in the Law Library is being supported through an allotment of overhead from ICOD's grant to the Law School in the amount of \$5000 annually. The School for Resource and Environmental Studies has been given \$500 annually from the same source to expand its marine and environmental materials. The total amount needed to support library collections for this programme therefore approaches \$10,000 per year. This presumably is a matter to be addressed as part of an overall package of funding issues that will present themselves in 1992.<sup>10</sup>

#### Conclusions

The Committee recommends that a Master of Marine Management Degree be implemented as proposed. At the same time, five additional recommendations are made about the programme. Furthermore, any consideration of the Marine Affairs Programme raises difficult financial issues because no financial plan exists for the period beyond 1992 when current ICOD funding expires. However, this situation exists irrespective of the degree offered. The Review Committee commends this matter to the attention of Faculty Council and to the attention of appropriate officials of the University. Even though more than two years remain in the

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<sup>10</sup>The Report on Library Holdings is attached as Appendix V. A similar report was not completed when the proposal to implement the Marine Affairs Programme was made in 1986.

programme's developmental phase, there is no time to be lost in planning for events in 1992 and beyond.

Carl M. Boyd  
Melvin L. Cross (Chairperson)  
David Scott

## Appendix I

MARINE AFFAIRS PROGRAM - STATUS OF ADMISSIONS FILES  
(As of December 11, 1989)

The attached is a DRAFT version of the status report for the Marine Affairs Program admissions files. The format of this report is such that each person enquiring/applying to the Program is counted once only.

For example, today's report notes 3 inquiries from Brasil, received this year. If one of these should develop into an application, then the subsequent report would note 2 inquiries from Brasil and 1 application in progress. If that applicant is the accepted into the Program, the subsequent report would note 2 inquiries from Basil and 1 accepted... and so on and so forth.

L. M. McDonald

## Appendix II

## List of People Interviewed

1. C. Amaratunga, Project Officer, ICOD
2. J.F. Brault, student, DMA, Dalhousie University, 1989
3. S. Coffin, student, DMA, Dalhousie University, 1989
4. R. Cote, Coordinator, Marine Affairs Program
5. E. Gold, Professor, School of Law, Chair, Marine Affairs Advisory Committee
6. A. Hansen, Professor, School of Resource and Environmental Studies
7. K.T. Leffek, Dean, Faculty of Graduate Studies
8. M.G. Alton MacKey, Manager, Project Evaluation and Development, Coastal Associates and Consultants Ltd.
9. P. Mushkat, Research Associate, Marine Affairs Program
10. S. Ralston, Research Associate, Marine Affairs Program
11. R. Singh, student, DMA, Dalhousie University, 1989
12. D. Vanderzagg, Coordinator, Marine Affairs Program
13. G. Vernon, President, ICOD

## List of People Contacted by Telephone

1. M. Arthur, Professor, Oceanography, University of Rhode Island
2. I. Christie, Dean, School of Law
3. G. Drapeau, Professor, Marine Geology, University of Quebec at Rimouski
4. R. Fournier, Associate Vice-President, Research
5. J. Hall, Professor, Geology
6. P. Lane, President, Senate
7. A.P. Pross, Director, Public Administration
8. D. Stairs, Vice-President, Academic and Research
9. M. White, Administrator, Marine Affairs Programme

## CONTEMPORARY ISSUES IN OCEAN DEVELOPMENT AND MANAGEMENT

## SCHEDULE OF CLASSES

PART I      WHY ~~MANAGE~~ THE OCEANS?September 14    The Limits of the Oceans

- Course Overview
- Issues and Concepts
- Ecological Limits and Assimilative Capacity
- Conflicts of Values and Uses

Seminar Leaders:    Ray Côté  
                              David VanderZwaag

Readings:            Volume II.A, Sections 1 and 2

## PART II      WHO MANAGES THE OCEANS?

September 16    Managing the Commons:  
In Search of the Ideal Management Blend

- No Management
- Community-based Management
- Government/Expert Management
- Full Market Economics

Seminar Leader:    Cynthia Lamson  
                              - IITOPS

Readings:            Volume II.A, Section 3

September 21    Coastal Communities: Development Issues

- Local and National Perspectives
- Sociological, Economic, Political Perspectives

Seminar Leader:    Scott Wood  
                              - Henson College

Readings:            To be announced

## PART III HOW TO MANAGE THE OCEANS

Intelligent management of ocean resources must be based on knowledge; therefore, collection and organization of the information base is of primary importance. After the necessary information is acquired, resource management usually focuses on specific resources (e.g. shipping, offshore minerals, and fisheries) and is carried out through a variety of legislative and regulatory techniques, such as:

- standards/sanctions
- licenses and permits
- economic incentives and disincentives
- administrative tribunals
- contracts.

September 23 Ocean Law, Policy Making and Conflict Resolution

- International and Domestic Law Making and Techniques
- Dispute Resolution

Seminar Leaders: Ian Townsend Gault  
David VanderZwaag

Readings: Volume II.A, Section 4

September 28 Marine Scientific Research, Monitoring and Information Systems

- International Experiences
- Developing a Research and Monitoring Programme

Seminar Leader: Ray Côté

Readings: Volume II.A, Section 5

September 30 Ocean Business Overview

- Marine Industries
- Potential for Growth

Seminar Leader: D. Patton  
- Business Administration

Readings: To be announced



- October 5      Vessels: Operation, Pollution and Management
- Contingency Planning
  - Receiving States
- Film: The Ghost of the AMOCO CADIZ
- Panel discussion on shipping management, contingency planning, and oil spill liability and compensation.
- Seminar Leaders:    Ian Townsend Gault  
                         Ray Côté  
                         David VanderZwaag
- Readings:            Volume II.A, Section 7
- 
- October 7      National Fisheries Management:  
In Search of an Appropriate Management Framework for  
Developing Countries
- The US Fisheries Framework
  - The Canadian Fisheries Management System
  - Fisheries Management in Developing Countries
- Seminar Leaders:    Douglas Marshall  
                         - N.E.F.M.C.  
                         David VanderZwaag
- Readings:            Volume II.A, Sections 9A-C
- 
- October 12     No Class
- 
- October 14     Offshore Minerals Management
- Joint Ventures/Unitized Fields
  - Licenses/Contracts
- Seminar Leader:     Ian Townsend Gault
- Readings:            Volume II.A, Section 8

## PART IV TOWARD INTEGRATED OCEAN DEVELOPMENT AND MANAGEMENT

October 19 Sea Use Planning and Coastal Zone Management

- History of the Concept
- Focus on the United States, North Sea and SouthEast Asian Experiences

Seminar Leaders: Ray Côté  
David VanderZwaag

Readings: Volume II.B, Section 13

October 21 Special Areas Protection

- Endangered Species
- Wetlands of International Significance
- Marine Parks

Seminar Leaders: Robert Graham  
- University of Waterloo  
David VanderZwaag

Readings: Volume II.A, Section 11

October 26 Shipwrecks and Other Sites and Objects of Historical Significance

- Benefits
- Jurisdiction
- Protection

Seminar Leaders: David VanderZwaag  
Ian Townsend Gault

Readings: To be announced

- October 28      Maritime Boundaries
- Bilateral and Multilateral Approaches
  - Regional Case Studies
- Seminar Leaders:    Ian Townsend Gault  
                         David VanderZwaag
- Readings:            Volume II.B, Section 14A-B
- 
- October 31      International Fisheries Management
- Case Study of NAFO
- Seminar Leaders:    To be announced
- Readings:            Volume II.A, Sections 10A-C
- 
- November 2     Environmental Impact Assessment
- Concept and Components
  - Methods
  - Simulation
- Seminar Leader:     Ray Côté
- Readings:            Volume II.B, Section 12
- 
- November 4     Environmental Impact Assessment
- Simulation (continued)
- Seminar Leader:     Ray Côté
- Readings:            Volume II.B, Section 12

November 9 Regional Approaches to Ocean Development and Management

UNEP Regional Seas Programme

- the South Pacific
- the Mediterranean
- the Caribbean

Seminar Leaders: Edgar Gold  
 - IITOPS  
 Salvano Briceno  
 - UNEP Coordinating Unit, Jamaica

Readings: Volume II.B, Section 15

November 11 Remembrance Day - No classes.

November 16 Conciliation Simulation

Seminar Leaders: Ray Côté  
 Ian Townsend Gault  
 David VanderZwaag

Readings: Handout

November 18 Conciliation Simulation

Seminar Leaders: Ray Côté  
 Ian Townsend Gault  
 David VanderZwaag

Readings: Handout

November 23 International Approaches to Ocean Management Issues

- Land-based Pollution ("Montréal Guidelines")
- Ocean Dumping

Seminar Leader: Ray Côté  
 David VanderZwaag

Readings: Volume II.B, Section 17

November 25    International Approaches to Ocean Management Issues

- Regulation of Whaling
- Endangered Species
- Wetlands of International Significance

Seminar Leaders:    Paul Brodie  
                              David VanderZwaag

Readings:            Volume II.B, Section 18

November 30    Class Presentations

December 2     Class Presentations

December 7     Class Presentations

December 8     DEADLINE FOR SUBMISSION OF TERM PAPERS

Term Papers

Students will be expected to research and write a paper on an ocean development and management topic of interest to them for presentation at the end of the term. Topics must be discussed with advisors, thereby ensuring that students are able to address national, regional and international aspects of the topic. It is very important for students to appreciate these linkages in establishing national ocean policies and management programs.

Each student will have thirty (30) minutes in which to present his/her paper at the end of term. We recommend that students enhance their presentations with slides or overhead transparencies.



# Dalhousie University

Marine Affairs Program  
Weldon Law Building  
6061 University Avenue  
Halifax, Nova Scotia  
Canada B3H 4H9

DATE: January 29, 1990

TO: Dr. Melvin L. Cross  
Chairman  
Master of Marine Management Review Committee

FROM: Ray Cote and David VanderZwaag  
Directors

SUBJECT: Master of Marine Management

Dalhousie University offers a one-year Master's program in Marine Management (n.b. one year is understood to mean one calendar year.) The following are the minimum requirements which are applicable to prospective students seeking entry into the program.

Students with honours or equivalent qualifications at the Bachelor's level in the social or natural sciences, preferably with three to five years' experience in a marine field, will be considered. Completion of additional courses of study following the Bachelor's degree will be considered in determining equivalency to an honours degree.

Students entering with educational backgrounds other than natural sciences will be required to take Marine Science 5003.

MARINE AFFAIRS PROGRAM



Phone: 902-424-3555  
TELEX: 019-21863  
CABLE: DALMAP HALIFAXNS  
FAX: 902-424-1316

## PROGRAM OF STUDY

	Term 0	Term 1	Term 2	Term 3	No. of Credits
MARA 5000/POL SC 5337*	[-----]				(6)
MARA 5001 Core Course		[-----]			6
MARA 5002 Marine Management Paper			[-----]		6
MARA 5003 Marine Science**		[-----]			3
Elective		[-----]			3
Elective		[-----]			3
Elective			[-----]		3
Elective			[-----]		3
Elective			[-----]		3
Elective			[-----]		3

\* Preferably students applying to enter the program should have successfully completed a class similar to Political Science 5337, also known as the Conservation and Protection of Marine Resources organized by the International Ocean Institute.

\*\* Students enrolling without academic backgrounds in the natural sciences are required to take this course.

## Appendix V

Report on Library Holdings  
in Support of the Proposed  
Master of Marine Management

Submitted to  
Dr. Melvin Cross, Chairman  
Faculty of Graduate Studies  
Review Committee

by  
Holly Melanson  
Coordinator of Collections Development  
November 8, 1989



As part of the Faculty of Graduate Studies new programme review, an assessment of Library holdings to support the proposed Master of Marine Management was carried out. The 1989/90 schedule of classes and 1988/89 list of readings for the existing diploma program were used to develop an appropriate checklist of sources the Killam (Science, Social Sciences and Humanities) and Law Libraries should hold. The following report represents the efforts of science, social science and law specialists to objectively assess the collections in marine management.

Marine Management Collections at Dalhousie

Since the establishment of the diploma program in 1986, there has been a noticeable increase in demand for library materials on the scientific and commercial aspects of marine management, particularly in Third World countries. Although the Law Library has an excellent marine studies collection that was established with University funding in 1978 and kept up-to-date with annual donation of \$5,000.00 from ICOD, its collection is centered on law and policy issues. The Killam Library has had difficulty satisfying both specific title and general subject requests in some of the applied areas of marine studies, particularly environmental protection, offshore technology, marine geology exploration and ports and shipping management. The sciences collection has traditionally concentrated on pure rather than applied marine sciences. Although the Bedford Institute of Oceanography provides resources in some of the applied areas, we cannot presume their Library will be fully accessible to Dalhousie students. At the present time, the BIO collection is open to the public weekday afternoons only. The collection at the Library of the Technical University of Nova Scotia is helpful for references to a small number of engineering and environmental technology journals.

The Killam collection contains a number of useful series of marine-related publications from such agencies as FAO and OECD, but many of the students in the programme are looking for material related to their own countries, much of which is unavailable in local collections. The Killam documents collection should be expanded to include marine-related material from international agencies concerned with the Third World. Subscriptions should be established to relevant reports series, such as the United Nations Environment Program Regional Seas Reports and Studies.

The Ocean Studies collection at the School for Resource and Environmental Studies has evidently been enhanced in the past few years. Although the microfiche catalogue of this collection is available in the reference areas of the Killam Library, a problem still exists with both bibliographical and physical access. The limited services and restrictive circulation policies of the SRES Library remain a barrier to the effective use of its resources by the University community. On the other hand, the Asia Collection, also a part of the School for Resource and Environmental Studies, is now being recorded in Novanet, the online catalogue holdings of five metro university libraries. Access to and availability of this strong collection of books, technical reports and journals on environmental issues in Asia has already greatly increased, and potential duplication of future acquisitions will be cut down accordingly. The results of this assessment represent the holdings

of the Asia Collection as listed in Novanet, but not the holdings of the School for Resource and Environmental Studies.

The International Institute for Transportation and Ocean Policy Studies (now Ocean Institute of Canada) contains yet another specialized collection on campus that could help the University Libraries support student and faculty research in marine management. Unique subscriptions to marine policy and maritime transport journals are held by the Institute, but these journals are not listed in Novanet, nor are they available to the larger University community. Duplication of these important journals in the Libraries would be an unfortunate use of acquisitions funds, but may have to be reconsidered if the demand continues to grow.

#### Monograph and Journal Holdings

To measure the adequacy of the Library's holdings in the marine sciences, sections of the 1987 and 1988 Aquatic Sciences and Fisheries Abstracts were checked against Library holdings. Specific areas within the Law, Policy, Economics and Social Sciences section were checked, e.g., "Coastal zone management", "Conservation" and "General papers on resources". The majority of relevant monographs, journals and conference reports were held by the Killam or Law Library. A number of United Nations and U.S. government publication series were not owned and should be acquired, for example, publications of the U.S. Sea Grant Program.

To measure the collection in maritime transportation, port development and foreign affairs, a bibliography was developed from the online database of Public Affairs Information Service International. The bibliography covered the period 1988-1989 in such subject areas as "exclusive economic zones", "coastal zone management", "ports", "shipping" and the ocean. Of 83 monographic items listed, 69 (or 83%) were not owned by a Dalhousie Library. However, of those 69 titles, 13 (or 16% of the total checked) are in areas of the world relevant to the proposed program and should be acquired. Of the periodical articles checked, 54% of the individual journals are available at Dalhousie. The missing and relevant titles are Environmental Forum and Lloyd's Shipping Economist. The latter title is held at the IITOPS collection for the years 1975-1986, but was cancelled when funds were not available. Students have recently placed interlibrary loan requests at the Killam Library for articles in Lloyd's Shipping Economist.

An additional assessment was carried out of the environmental sciences journal collection. A list of relevant journals was compiled on the basis of information contained in the 1987 Science Citation Index: Journal Citation Reports. This annual publication lists citing and cited journals by subject and by title and also ranks journal titles according to their frequency of citation by other journals. The journal, Environmental Science and Technology was chosen as a regularly cited journal in environmental sciences over the past ten years, and the journals it cites frequently were listed. These journals and other relevant indexed journals in environmental sciences were checked against holdings of Dalhousie and other local area libraries. Of the 51 titles checked, Dalhousie has 39, or 76%. Of the six journals not avail-

able locally, two are of interest: Resources and Conservation and Journal of Environmental Education.

### Conclusion

The 1986 Proposal for Development of a Marine Affairs Diploma Program referred to Dalhousie's "extensive library holdings relevant to the Program", particularly within the Law Library. The proposal deemed these holdings and the additional international scientific literature at the Bedford Institute of Oceanography sufficient for the needs of the potential 10-20 diploma students. The Libraries concurred with this view. The current proposal would offer a graduate degree with great potential for attracting North American students in large numbers. The interdisciplinary graduate work required of these students, particularly the "extensive literature review" will require a strong collecting effort on the part of the libraries. With the designation of Ocean Studies as an Area of Emphasis in Dalhousie's Mission Statement (Draft 8A, p. 8), the demand for marine studies literature can only increase in the immediate future.

It is clear from the assessment that the Library's collection is indeed strong in the legal and policy aspects of ocean development and management (Law Library) and in the scientific aspects of marine resources (Killam Library). However, extra support is required for book acquisitions in the applied areas of environmental protection, maritime transportation and ports and shipping management. Government publications relating to marine resource development in the Third World, particularly in the ICOD target areas (Caribbean, South Pacific, West Africa and Western Indian Ocean Basin) should be actively sought and acquired, as well as those of major international organizations such as the United Nations Environment Program. The annual cost of building collection strength in these areas would be approximately \$3,000.00. In addition, the current annual cost of the four journals required for the collection is \$1,450.00.

In addition to the extra funds required by the Killam Library, it must be kept in mind that the ICOD funding for this program is planned to end in two years. The present strong collection in the Law Library has been maintained with an ICOD donation of \$5,000.00 per year. The Law Library cannot continue to support a growing graduate programme without ongoing financial support.

Total funds required: \$9,450.00/year.

STAGE 2 SELF STUDY REPORT  
OF THE MARINE AFFAIRS PROGRAM

submitted to  
the

DEAN OF THE FACULTY OF GRADATE STUDIES

January 30, 1991

The Marine Affairs Program (MAP) was established in 1986 pursuant to a five-year contract between Dalhousie University and the International Centre for Ocean Development (ICOD). The objective of this contract is to offer a one-year, graduate-level, diploma program providing students with the knowledge, concepts, and tools to ensure that they can participate effectively in the sustainable development and management of the oceans.

Since the implementation of the Diploma program, several reviews have been conducted both internal and external to the University. The first review was commissioned by the International Centre for Ocean Development as an independent mid-program review. The remaining reviews have been internal to the University and result from our submission of the proposal to change the Diploma in Marine Affairs to a Master of Marine Management degree. The Oceans Studies Task Force also considered this program during its deliberations. A further review has now been initiated as a result of the request for a self-study by President Clark. This report and its attachments will address issues raised by the President and also by Dean J. Fingard of the Faculty of Graduate Studies.

Section I of this report emphasizes the critical importance of the Marine Affairs Program to interdisciplinary ocean studies at Dalhousie University. Section II summarizes future administrative and financial needs of the Program. Section III addresses academic issues such as the future academic status of the Program and cross/adjunct appointment arrangements for faculty. Section V investigates funding options with regard to the continuation of Program and Section VI highlights the important role of the Marine Affairs Program Advisory Committee.

I. THE MARINE AFFAIRS PROGRAM: A KEY COMPONENT OF OCEAN STUDIES AT DALHOUSIE

In its mission statement, the University identifies Ocean Studies as an area of emphasis, along with a continuing commitment to international development and increasing interest in interdisciplinary programs. The Marine Affairs Program satisfies all three priorities and, therefore, should be given special emphasis as a Program to be supported and strengthened.

The Marine Affairs Program is an "ocean studies" program. As indicated by the letter from the Ocean Studies Task Force to the Academic Planning Committee of Senate (see Appendix 1). The Marine Affairs Program fits within the University's overall strategy for and emphasis on ocean studies. This is also supported by the report of the Faculty of Graduate Studies Review Committee for the Master of Marine Management proposal (see Appendix 2)

The international development facets of the Program are evident in several areas. The Marine Affairs core classes, Introduction to Marine Affairs and Contemporary Issues in Ocean Development and Management, incorporate international development issues and make use of case study material from around the globe. Many students enrolled in the Program are from lesser developed countries. In addition, ICOD's activities are oriented to selected lesser developed countries and regions. This is reflected in the Marine Affairs Program because, although the Program is not restricted to these countries alone, one of ICOD's primary objectives in establishing the Program was to assist these lesser developed nations.

The very nature of the oceans dictates that a program focusing on management and development of its resources must be interdisciplinary. The core classes comprehensively cover all marine-related topics from sectoral management to integrated ocean management. Additionally, students elect classes from many disciplines at Dalhousie, St. Mary's and the Technical University of Nova Scotia. The Program also incorporates a dedicated teaching faculty drawn from eight disciplines as seminar leaders in classes and academic advisors to students. The need for an interdisciplinary class in marine science has been met with the class Marine Science and Technology. Dr. Anthony Bowen of Dalhousie's Oceanography department and Dr. M. G. Satish of the Civil Engineering department of the Technical University of Nova Scotia developed this class, in collaboration with R. Cote of MAP, keeping in mind the interdisciplinary nature of the Marine Affairs Program.

For additional reference, the independent reviewers commissioned by the International Centre for Ocean Development have determined that Dalhousie has established an internationally competitive program and the reviewers support its continuation.

## II. ADMINISTRATIVE AND FINANCIAL MATTERS

A report on the long-term cost and resource implications of the proposed Marine Management Program has been completed by the Senate Financial Planning Committee and has been submitted to the Senate Academic Planning Committee. (See Appendix 3).

Concern has been expressed over the high administrative costs of the Program. As addressed in the Senate Financial Planning Committee's report,

The high administrative overhead is due to the multidisciplinary nature of the program, its international clientele and its (virtually) free-standing position in the University's organizational structure. Administrative workload includes "all financial aspects (except final preparation of financial statements), all admission procedures including final decisions, . . . all general program administration including registration of students, approval of classes, . . . administration of scholarships, . . . advice to students on personal and general academic issues, linkages with alumni, internal and external agencies management of materials and a host of other activities". (Appendix 3, p. 3)

The Committee has also determined that support service units will not be significantly affected by the continuation of the Program or by upgrading the Diploma to a Masters.

While Program Directors and the Administrative Officer must ensure that a quality academic program is offered, they will be looking at all possible ways of reducing costs.

## III. ACADEMIC ISSUES

A number of questions have been raised in discussions on the proposed Master of Marine Management degree.

1. Should MAP be a program, department or school?

At present, the Marine Affairs Program operates much the same as a Department or School within a Faculty, albeit a small one. Traditionally, the Faculty of Law has not had distinct Departments and the Marine Affairs Program is, in fact, the only unit in the Faculty which operates with the independence of a Department. To raise the status of the Program both on campus and abroad, we recommend that the Marine Affairs Program become the School of Marine Affairs within the Faculty of Law. A designation as a professional school will facilitate cross and/or adjunct appointments from other disciplines which are so necessary to the functioning of an interdisciplinary program. To resolve the status question of the Program, discussions should be initiated between the Dean of the Faculty of Law, the Dean of Graduate Studies and, possibly, the Vice-President, Academic and Research.

The Faculty of Law remains an appropriate home for MAP. The Dean has expressed interest in and support for the Program. He has also provided space for the successful operation of the Program over the past four years and this support is expected to continue. The Dean of Law, elect, Professor Tom Cromwell (to take office in July, 1991) has indicated that he is keen to foster and support activities in the marine and environmental fields.

2. Cross/Adjunct Appointments

If interdisciplinary programs are to be fostered at Dalhousie, some arrangements will have to be negotiated on a University wide basis to satisfactorily resolve the cross/adjunct appointment issue. The current arrangement within the Marine Affairs Program is to remunerate six faculty (4 from Dalhousie and 1 each from TUNS and Saint Mary's) for their participation as student advisors and teaching faculty. Given the unclear status of the Program within the University and the current funding arrangements, this seemed the best option. To assist with the management of interdisciplinary programs, and Marine Affairs in particular, perhaps the Academic Planning Committee of the Graduate Studies Council should develop a set of principles on cross/adjunct appointments followed by a review of existing mechanisms and possible new approaches for such appointments. Management and co-ordination of interdisciplinary/multidisciplinary programs is complicated in part due to the different standards applied in University faculties and schools. An



Associate Dean with particular responsibilities for interdisciplinary programs and a special committee of the Academic Planning Committee may be necessary.

### 3. Integration of the Marine Management Specialization

The issue of a marine management specialization within an existing program such as the Master of Environmental Studies and the Master of Business Administration has been raised. Marine specialization within other programs, such as the Master of Environmental Studies, the Master of Business Administration and the Master of Law, should be encouraged as part of Dalhousie's commitment to ocean studies. In fact, these programs make it possible for Dalhousie to offer a graduate program in marine management without having to develop a wide range of new courses at substantial cost. They also ensure that the University has the capacity to provide the necessary supervision for graduate students in a marine management program. However, an interdisciplinary program such as Marine Affairs allows for creative integration of disciplinary perspectives. Government departments and academic institutions are increasingly recognizing the need for comprehensive interdisciplinary programs. The International Centre for Ocean Development recognized this need and established, through initial funding and in co-operation with the respective universities, two interdisciplinary marine management programs in Canada (Dalhousie and Rimouski). Comparable interdisciplinary programs already exist in at least five American universities and at the London School of Economics. An interdisciplinary ocean studies graduate diploma program is also being developed at the University of the South Pacific and a similar program is in place at the University of the West Indies.

## IV. POTENTIAL FUNDING OPTIONS FOR THE MARINE AFFAIRS PROGRAM

### 1. Program Funding

An ideal funding level for the Marine Affairs Program has been assessed and is included in the report of the Senate Financial Planning Committee (See Appendix 3). This report provides an accurate assessment of the full cost of the current program including library support and scholarships for Canadian students.

There are a number of options for funding the Marine Affairs Program, both short and long term, including:

- a.) If Dalhousie chooses to redistribute operating funds to implement the Ocean Studies Task Force's report, consideration should be given to supporting the Marine Management graduate program as the first manifestation of the University's commitment to an interdisciplinary ocean studies initiative.
- b.) The University may target ocean studies funding as part of its external funding campaigns. The Marine Affairs Program should be included in the publicity material developed for such a campaign.
- c.) Dalhousie may wish to consider a multi-university degree program in ocean studies cost-shared with the Technical University of Nova Scotia and Saint Mary's University.
- d.) An executive interchange from a federal agency or international institution could be considered as a means to fill a full-time Director's position. If a suitable cost-sharing agreement were negotiated, some financial flexibility might be achieved.

2. Scholarship Funding

The International Centre for Ocean Development has agreed, in principle, to support the Marine Affairs Program with continued financial scholarship support of approximately \$1 million over the 1992 - 1997 period. The amount is to include funds for administration of the scholarships. This funding is conditional on the resolution of two issues. First, that the proposal for a Master of Marine Management degree be approved and, second, that the Master of Marine Management Program be part of the University's long term planning.

V. PROGRAM ADVISORY COMMITTEE

We expect the Advisory Committee will take on a greater role in the resolution of academic, financial and administrative issues facing the Marine Affairs Program. Some of these issues include external funding sources, scholarship funding for Canadians, practicums and/or internships for students and the relationship of the Marine Affairs Program to the implementation of the Ocean Studies Task Force report. We are also of the opinion that there ought to be more communication between the Advisory Committee and Deans of Law and Graduate Studies and this will be encouraged.

## VI. CONCLUSION

Support has been received at all levels, to date, for the proposed Master of Marine Management degree. Reviews of the Program, both internal and external, have been very positive. The Marine Affairs Program meets three of the primary thrusts outlined in the University's Mission Statement. An interdisciplinary, graduate, marine management degree should be encouraged and supported at Dalhousie University. To this end, the University should capitalize and build on an already existing, and successful, program.

## VII. APPENDICIES

1. letter from the Ocean Studies Task Force to the Academic Planning Committee of Senate
2. report of the Faculty of Graduate Studies Review Committee for the Master of Marine Management proposal
3. report of the Senate Financial Planning Committee
4. summary of the mid-program external review of the Marine Affairs Program commissioned by the International Centre for Ocean Development
5. proposal to convert the Diploma to a Master's degree
6. Marine Affairs Program Advisory Committee membership

**Educational Underpinnings of  
Interdisciplinary Marine Affairs Programs**

by

Raymond P. Côté  
Marine Affairs Program  
Dalhousie University  
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and

Carol Amaratunga, PhD  
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prepared for

Pacific Congress on Marine Science and Technology  
Kona, Hawaii

June 1-5, 1992

EDUCATIONAL UNDERPINNINGS OF  
INTERDISCIPLINARY  
MARINE AFFAIRS PROGRAM

by

R.P. Côté  
Marine Affairs Program  
Dalhousie University,  
Halifax, Nova Scotia

In recent years, a new type of educational program has emerged. These multi-disciplinary and interdisciplinary programs reflect a recognition of problems of increasing complexity facing society, the expanding gulf between disciplines resulting from increasing specialization, the realization of the interconnectedness of environment and development and finally, globalization.

These new programs have been established at the post graduate levels in coastal resources management, coastal zone management, sea-use law and policy, fisheries and aquaculture management, maritime administration, marine affairs and marine management. The objectives of some of these programs reflect their multi-sectoral and interdisciplinary nature.

A UNESCO report on challenges for the year 2000 is marine science education and training, released in 1988 argues that "training and education are essential to the development and application of knowledge on the marine environment and its resources." Clearly if nations are to benefit from the resources of the oceans resulting mainly from the expanded Exclusive Economic Zone, their capabilities must be enhanced. Enhancement will require economic investment, but strengthening human resource capabilities through education and training will play a central role.

Of particular interest in the UNESCO report is a list of occupational fields cataloguing the needs for training and educated personnel in various marine sectors:

- i) managers for coastal zone, marine parks, fisheries, marine information systems, waste disposal, offshore engineering projects
- ii) environmental impact assessment and protection
- iii) mariculture
- iv) fisheries science
- v) marine biology
- vi) tourism, coastal and marine
- vii) marine archaeology
- viii) marine environmental toxicology
- ix) engineering - coastal, submarine, offshore
- x) seabed geology and mining
- xi) meteorology and climatology
- xii) marine veterinary science
- xiii) diving physiology and medicine
- xiv) materials science
- xv) marine law
- xvi) marine geography
- xvii) marine pharmacology and toxicology
- xviii) remote sensing applications and interpretation
- xix) information science and technology
- xx) marine electronics
- xxi) ship design and construction
- xxii) coastal and oceans administration

Universities and colleges, especially those in the more developed and industrialized countries, have responded with new courses and degree programs. This is particularly evident in the United States as a result of the establishment of the Sea Grant College program and the Coastal Zone Management Act of 1972.

With the support of a Canadian international development institution known as the International Centre for Ocean Development (now defunct), Dalhousie University established a program offering a graduate Diploma in Marine Affairs in 1986. In 1989, we began a process to convert the Diploma into a Master's degree in Marine Management. In late 1991, all the necessary approvals were obtained and consequently the University will award the new degree in the fall of 1993.

However, during the deliberations on the proposal to upgrade the degree from a Diploma to a Master. These questions have persisted. Questions were raised about the nature of the degree.

The first question revolves around the nature of the program as training for the particular purpose or education for understanding. A related issue is whether these programs are academic or professional in nature. A third question is whether these programs produce specialists or generalists. The fourth issue which has been raised is whether these programs are disciplinary, multi-disciplinary or in fact interdisciplinary. Finally the fifth issue is the existence and degree of disciplinary bias in the design and conduct of the program.

I would argue that universities and colleges may be too quick to establish new programs in an attempt to establish a niche for themselves in an increasingly competitive world of higher education without thinking through the real nature of the courses of study. Is it more appropriate to market these programs as academic or professional, formal education or skills training, disciplinary or interdisciplinary? This paper is designed to explore some of these issues for further discussion.

### **Education vs training**

As indicated earlier, education is often defined as the imparting of knowledge through formal (classroom) and informal (conferences) processes to foster understanding. The emphasis is usually on theories, concepts and processes. Case studies, exercises and experiments are then used by teachers to highlight explain the theories and concepts.

Training is usually oriented to teach and enhance skills in the conduct of research, information-gathering, routine operation of technology, monitoring, etc... As one example, the 1960 Conference on the Safety of Life at Sea called upon governments to ensure that masters, officers, and seamen were trained in the use of aids of navigation, life-saving equipment and authorized devices for the prevention, detection and extinction of fires.

Training programs are offered by a wide range of academic institutions, national agencies and international agencies. For example, the Food and Agriculture Organization (FAO) cooperates with regional and national agencies in organizing training courses on topics such as stock assessment, harvesting and processing. The UN Conference on Trade and Development (UNCTAD) has established a training program known as TRAINMAR focusing on ports, harbours and shipping.

When reading the literature on marine education and training, the difference between the two blurs considerably. The terms are used interchangeably. Undeniably skills such as conflict resolution, and tools such as geographic information systems are important to the coastal zone, sea-use or marine manager. But the manager needs to understand what needs to be done, why it needs to be done, generally how the objective could be accomplished and who should be involved. The manager must understand what is involved in order to make an intelligent decision. He or she does not necessarily need to know the intricacies of the various tools and procedures which will need to be put into place for an efficient management system. Shouldn't these programs therefore combine education on theories and concepts with some skills training in the selection of appropriate management tools and processes?

#### **Academic vs professional**

The second question which is debated about new programs aimed at integrating science, policy and management in universities is whether they have an academic or professional orientation. The distinction appears to be that an academically designed program offers learning in a field of study for its own sake and secondly to orient people into advanced degrees leading to teaching or pure research appointments in universities or research institutions.

Professional programs, sometimes referred to as 'terminal degrees,' are designed to educate and/or train people for employment in selected fields. These include law, medicine, dentistry, business, among others. In fact, many of the degree programs in universities follow the same road though some graduates pursue doctorates with the intention of teaching while others will become practitioners in their field of study.

Why then would someone suggest that the Master of Marine Management be offered in a professional stream as a one year program and in an academic stream as a two year course of study?



## Specialization vs generalization

In the marine sector, we have seen increasing specialization in disciplines with programs at the undergraduate and post graduate levels in fields such as marine biology, marine geology, marine chemistry, ocean business, maritime transportation, ocean law and ocean engineering. These specialities within disciplines are presumably offered in our universities as a result of demand.

But alongside these specialists, we are seeing an increasing demand for a different type of graduate. This demand arises from the complexity of marine developmental issues and their interconnectedness as highlighted by the United Nations Convention on the Law of the Sea, which cannot be easily addressed by specialists. The management of human activities and the allocation of space in the Exclusive Economic Zone and the coastal zone requires new policies, plans and management strategies. These graduates are considered by some as "generalist" that is someone who has a limited understanding of many disciplines or many components of a problem, for example, the multiple sectors which must be accommodated in a coastal area.

Unfortunately, the term 'generalist' has a negative connotation in some circles. Are we in fact talking about specialists in planning, policy-making and management? How should these graduates be portrayed?

## Disciplinary, multi-disciplinary or interdisciplinary.

The differentiation between disciplinary, multi-disciplinary and interdisciplinary courses of study is somewhat artificial. Traditionally, disciplines have been accepted as subject matter with a more or less defined set of concepts and rules. Some disciplines have been in existence for hundreds and thousands of years. In the past hundred years, certain of these have become increasingly specialized. More recently, since 1970, the need for people who can function in multi-disciplinary fora has been recognized and universities began to respond. In part, these graduates were needed to bridge the increasingly large gaps which existed between disciplines. In addition, government, industry and non-government organizations were realizing that the problems faced by society were very complex. Solution required cooperation among many disciplines sectors and interests. Management processes such as coastal zone management, sea-use planning and environmental impact assessment clearly required a multi-disciplinary perspective.

Most of us in this room will have debated with our colleagues, whether an M.Sc. in Marine Resource Management or an M.A. in Marine Affairs or an M.Sc. in Sea-use, Economics and Policy is a multi-disciplinary or an interdisciplinary program.

The following is a very brief description of five such programs:

1. MSc in Sea-Use, Economics and Policy: To provide government servants, naval officers, international lawyers and others with the necessary background to advise on or administer government policy on marine matters; University of London, London School of Economics.
2. Master in Marine Resource Management: To help provide trained professionals to met the present and future demands for development and management of coastal and marine resources; Oregon State University, College of Oceanography.
3. Master in Marine Management: To provide students with the concepts and tools allowing them to work effectively in various aspects of ocean use management; Dalhousie University, Marine Affairs Program.
4. MSc in Fisheries Economics: To provide the academic and practical foundations for professional planning to pursue careers in fisheries planning and management, fisheries administration and fisheries development; Portsmouth Polytechnic, Centre for Marine Resource Economics.
5. MSc in Maritime Administration: To improve the level of competence in governmental maritime administration emphasizing international organizations and legislation, policies and functions dealings with ships and ports; World Maritime University.

Are coastal zone management or sea-use planning new disciplines or management approaches? If interdisciplinary refers to the adoption of new theories, concepts or rules which borrow from two or more disciplines such as might be found in oceanography or toxicology, are any of these programs really interdisciplinary?

#### **Bias versus objectivity and impartiality**

The final issue which requires further consideration when elaborating these multi or interdisciplinary programs is that of disciplinary bias. In some universities, the initiative for a new program has in fact come from a particular department with the result that there may be a bias in the content of the program and the perspective of the graduates. I can think of one program when a graduate program in marine resource management began as an initiative of a Department of Economics in which fisheries economics was an area of emphasis. As a result, the program is in reality a degree in fisheries resource management with a limited coverage of other resources.

As long as it is recognized and advertised as such, these need not be a problem. Or alternatively if the intent and plan of the faculty and administrators is to increase the balance of sectors and disciplines over a period of time, this need not be a problem. Although, we have tried to provide a balanced program in Marine Management at Dalhousie University, some reviewers have argued that there is a bias in favour of law and environmental studies. This is perhaps not entirely surprising since the Co-Directors of the Marine Affairs Program were from the Faculty of Law and the School for Resource and Environmental Studies. Efforts have been made, however, through an Advisory Committee representing different sectors and disciplines and a teaching faculty from different disciplines to ensure that the students receive a balanced perspective. The teaching faculty, who also act as student advisors, are from Oceanography, Economics, Anthropology, Business Geography, Engineering as well as Law and Environmental Studies. The core course of the degree program "Contemporary Issues in Ocean Development and Management" addresses all the key sectors of ocean use in the first semester and discussions of multisectoral and integrated approaches in the second semester. (see table 1) Shouldn't we look critically at our programs ensuring that any bias is recognized and advertising reflects the bias?

#### Conclusion

As indicated in my paper, most of the programs are still in their infancy, or at best, adolescence. We know that children and teenagers require guidance and counsel. Those of us involved in teaching, administering or coordinating these programs need a forum for exchanging information about the pitfalls encountered, the solutions found, the curriculum, and the materials. There are, of course, journals on coastal zone management, marine policy, etc... Agencies such as the International Centre for Ocean Development, the International Maritime Organization, the Commonwealth of Learning, the United Nations Educational, Scientific and Cultural Organization have all concerned themselves with the need for trained and educated people to ensure that countries are able to manage coastal and ocean uses and sustain marine environments and livelihoods. They have supported the development of tools, for example, distance education and materials. What does not exist is a mechanism or forum for discussing and assessing the educational underpinnings of interdisciplinary programs in marine affairs, marine resource management etc... Should we be calling for such a mechanism?

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Table 1

Outline of the Core Course:  
Contemporary Issues in Ocean Development and Management

1st Semester

1. Why manage the oceans and their uses?
2. Who manages the oceans and their uses?
3. How to manage the oceans and their uses?
  - i) Marine Scientific Research
  - ii) The Shipping Business and Vessel Source Pollution
  - iii) Offshore Minerals Management
  - iv) Fisheries Management
  - v) Marine and Coastal Tourism
  - vi) Defense and Maritime Security

2nd Semester

1. Integrated Ocean Development and Management
  - i) Special Areas Protection
  - ii) Environmental Impact Assessment
  - iii) Sea Use Planning and Coastal Zone Assessment
  - iv) Maritime Boundaries
2. Regional Ocean Development and Management
  - i) Gulf of Maine
  - ii) Caribbean
3. International Approaches
  - i) Management of Land Based Sources
  - ii) Protection and Management of Migratory Species
4. What lessons have we learned from National, Regional and International Approaches?