

White Paper ***on*** ***Public Post-Secondary*** ***Education***

Marine Institute Submission to the Commissioner

October 7, 2004



Memorial
University of Newfoundland



MARINE INSTITUTE

White Paper on Public Post-Secondary Education

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Foreword

This document is provided for the purpose of contributing to the deliberations of the Commissioner by raising issues and suggestions related to potential courses of action for development of the public post-secondary education system. The ideas included in the document are not the position of Memorial University. Our understanding is that official submissions from the University are being prepared by the University Senate and by the President of the University.

Section I

Introduction

1. 0 Introduction

This document is the Marine Institute's submission to the Commissioner for the 2004 White Paper on Public Post-Secondary Education. The document builds on the Marine Institute's consultation with the Commissioner and the Commissioner's staff which was held on August 11th, 2004.

The document is comprised of three sections. The first section deals specifically with the Marine Institute and its place in the post-secondary education system. A detailed overview of the Marine Institute with examples of its recent accomplishments is provided along with a summary of the status of the Institute's Vision 2020 process. Vision 2020 is an intensive process involving significant consultation with stakeholders, environmental scanning, advice and debate. It will challenge the Marine Institute to broaden its scope in terms of the oceans economy, aspire to global leadership in selected areas and enhance its contribution to the development of Newfoundland and Labrador. We believe that the vision for the Marine Institute is compelling and it is a challenge and an opportunity which we are eager to address. Attaining this vision will also require the presence of an enabling environment in which to nurture the development of the Institute. Key elements of this environment which are discussed in this report include:

- Marine Institute being part of Memorial University;
- Continuance of the Marine Institute's marine/oceans mandate across the full spectrum of programming areas together with a focus on applied research and technology transfer;
- Establishment of a Governing Council for the Marine Institute with a similar composition to the Industry Advisory Committee;
- Establishment of a separate Marine Institute funding envelope within Government's annual grant to the University;
- Establishment of a multi-year infrastructure development fund for the Marine Institute;

The second section of the document deals with the questions which the Commissioner posed to guide consultations. This section deals with a wide range of issues related to the public post-secondary education system. Our submission attempts to put forward new and creative ideas related to some of the fundamental issues facing the Commissioner.

The final section of the document outlines the joint position which the Marine Institute and the College of the North Atlantic have developed with respect to two items of mutual interest. The Institute and the College are proposing to collaborate on the development of new integrated technical/applied degree programs. Further, the Institute and the College propose that a major infrastructure development initiative be undertaken at the Marine Institute/Engineering Technology Centre Campus on Ridge Road. These initiatives would position both institutions to better meet the emerging opportunities and challenges for programs, applied research and industrial assistance in support of the economic development of the Province.

Section II

The Marine Institute

2.0 The Marine Institute

2.1 Marine Institute Overview

The Marine Institute is unique among the Centres of Excellence in Oceans Technology that have been developed in Newfoundland and Labrador. It is Canada's Fisheries and Marine Institute and it is the most comprehensive marine institute in North America. There is nothing else like it in this hemisphere. Our capability combines the best of world-class facilities, strong education and training programs and highly qualified and dedicated people.

2004 is the 40th anniversary of the founding of the College of Fisheries. It was established in 1964 in the then recently vacated campus of Memorial University on Parade Street in downtown St. John's.

In 1985, on completion of the Ridge Road campus, the College was relocated and renamed The Newfoundland and Labrador Institute of Fisheries and Marine Technology - "The Marine Institute."

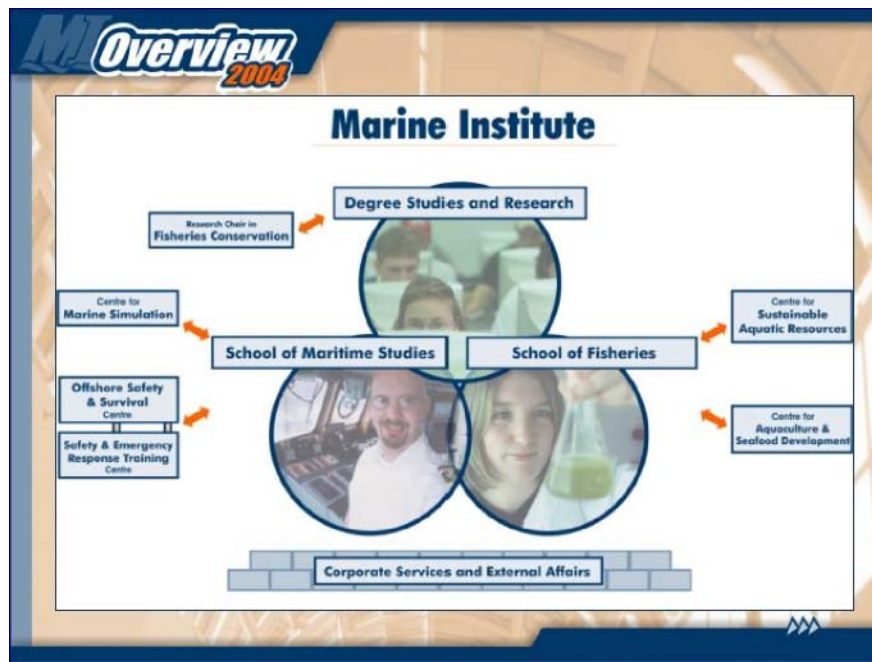
In 1992, reorganization of the post-secondary education system resulted in the Institute joining Memorial University. It is a very unique and successful affiliation.



Today the Marine Institute has about 1200 full-time students and over 7000 industrial trainees each year. We have 300 employees, of whom 165 are faculty.

Marine Institute Structure

The Marine Institute has 3 academic units – the Division of Degree Studies and Research, the School of Maritime Studies and the School of Fisheries.



The School of Fisheries offers programs related to fishing, aquaculture and the marine environment. It has two industrial research units, the Centre for Sustainable Aquatic Resources and the Centre for Aquaculture and Seafood Development.

The School of Maritime Studies offers programs in Nautical Science, Marine Engineering, Naval Architecture and Ship Systems Design. It has two industrial training units, the Centre for Marine Simulation and the Offshore Safety and Survival Centre including our satellite campus, the Safety and Emergency Response Training Centre, in Stephenville.

The Division of Degree Studies and Research oversees our degree programs and is the main interface with the faculties of the University. It also provides design, development and ongoing support for the Institute's e-learning activities. This division includes the Research Chair in Fisheries Conservation.

Finally, the Division of Corporate Services and External Affairs support all of our operations.

We have also been very innovative in embracing outreach organizations with complementary mandates, into our organization.

MI International attends to our international business while the Office of the Industrial Assistance is our conduit for technology transfer in conjunction with the National Research Council (IRAP). Each is a functional unit of the



Institute.

The

Office of Offshore Training Programs, established following the awarding of the White Rose FPSO training program, is pursuing worldwide opportunities to promote MI's offshore training and research expertise and to secure future training contracts.



One Ocean is the liaison organization for the petroleum and fishing industries. Its role is to assist the fishing and petroleum industries in understanding each other's operations and activities. The One Ocean Industry Board consists of members of the FFAW, fish processors and the Canadian Association of Petroleum Producers, which has provided \$800,000 for the initial 4 years of operation.



The Canadian Centre for Fisheries Innovation is mandated to focus the science and technology capability of Memorial University on the challenges of the fishing industry. The Canadian Centre for Marine Communications promotes the development of the Marine Information and Communications Technology sector. These units are separate corporations with their own Boards of Directors.



MI also houses the Bridges program. "Bridges" was established through the Offshore Development Fund with an allocation of \$2.3 million. It is mandated to build public-private sector alliances and promote marketing of the marine technology capability in our Province.

Education Programs



As part of Memorial University, the Marine Institute has developed a program mix focused on the marine sector but ranging from industrial programs, certificates and diplomas (which are the traditional programs of colleges) to bachelor degrees, postgraduate diplomas and master's degrees.



The Marine Institute specializes in customized career solutions. Our Master of Marine Studies (Fisheries Resource Management) will soon be joined by two new options under development - coastal zone management and maritime management.

Our bachelor programs are precedent setting. The maritime studies and technology degrees changed the way Canada trains its maritime personnel and help advance applied science and engineering technology and health science technology graduates into management positions.



The Marine Institute is committed to developing and delivering a range of education and training to the food, fisheries and marine environmental sectors with a range of graduate and diploma programs. Students may specialize in the areas of aquaculture, food safety, and our newest program, water quality.



MI turns education into action with its globally recognized programs in ship operations. With state-of-the-art facilities, industry-driven curriculum and work placements, MI cadets have a competitive edge in the marine transportation industry. Our marine engineering and nautical science cadets and graduates are in demand, as are those trained by MI for entry-level positions such as marine diesel mechanics and bridge watch personnel.



MI is also well known for training the highly-skilled men and women who can design, build and power many of the new vessels and offshore structures. Our graduates from naval architecture, marine engineering systems design and steel plate fitter programs are employed locally, nationally and internationally.

The Canadian Navy has depended on the Marine Institute to deliver high calibre training to their cadets for almost a decade. The Institute offers two training programs to naval cadets - a Marine Engineering Technical Training Plan and a Naval Combat Systems Technical Training Plan, both of which have been accredited by the Canadian Technology Accreditation Board.

One of the most requested training programs at MI is our 24-week firefighting certificate. Provincial fire departments and offshore companies rely on our expertise in emergency response and safety training to prepare them for any challenge. We recently expanded this expertise to include aviation firefighting at our operation in Stephenville. As of January 2005, the firefighting certificate program will also be transferred to Stephenville.

Department of National Defence

The Marine Institute is home to a very special group of students. They are young Canadians pursuing their dreams of a naval career.

For over a decade, diploma programs have been offered in marine engineering and naval combat systems to meet the high technology needs of our modern Navy.

Located at the Marine Institute, Canadian Forces Naval Engineering School (St. John's) is the largest concentration of Canadian armed forces personnel in Newfoundland and Labrador.



Over 200 Navy personnel are enrolled in programs plus there is a full-time military detachment of seven under the command of Lt. Commander Paul Alexander.

For the students, it is the deal of a lifetime. Free tuition, subsidized accommodations, and a salary between \$26,000 and \$32,000 while in school and \$48,000 upon graduation.

For the City of St. John's, it has very quietly reached the status of a successful new industry with a total economic impact in 2002/03 of approximately \$10 million.¹

¹The Institute for Advancement of Public Policy

E-Learning

Advances in computer technology present a huge opportunity for educational institutions to enhance their teaching and learning. In particular, the Internet allows educators to provide flexible learning opportunities at a distance.



The Marine Institute has developed a host of web-based learning products including courses in support of the Bachelor of Technology and Bachelor of Maritime Studies – two degrees that can be completed in full on-line.

Not only does MI offer e-learning to its current students, it also reaches into the high school classroom through Marine Technology 2228, a course developed by MI to acquaint Level II students with ocean technologies.

On campus, we have implemented 12 smart classrooms with computers, projectors and other audio/visual equipment that permit instructors to use educational technologies to enhance their lectures and demonstrations.

This complements our student laptop program, which enables Naval Architecture, and Marine Systems Design students to plug into the MI network to work on their design projects.

Graduate Success

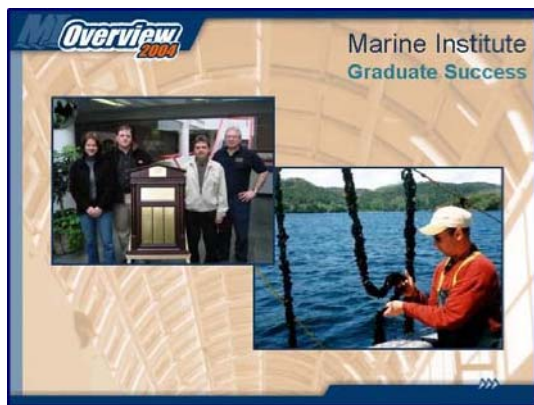


The best indicator of the quality and relevance of our education programs is the success of our graduates.

Each year the Provincial Government undertakes a survey of all post secondary education graduates from the previous year. Marine Institute graduates consistently rate at the top of the rankings in employment, income and satisfaction.

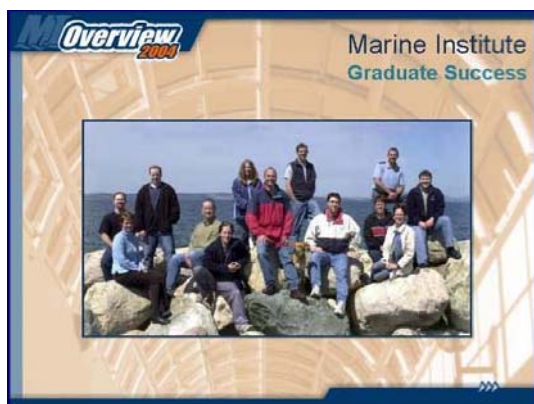
We are justifiably proud of all of our graduates, some of whom are highlighted below.

Damon Woodland



First is Damon Woodland. Pictured here second from the left, Damon graduated in 1996 with his Advanced Diploma in Aquaculture. He is the Seawater Production Manager with Heritage Salmon in Campbell River BC, the largest Canadian production company with operations across North and South America. Damon is currently responsible for west coast growout operations with a staff of over 75 and production value exceeding \$40 million.

Leonard Pecore



As a Naval Architecture graduate, Leonard Pecore is president of Genoa Design International, a Newfoundland company changing the world of marine drafting. Using unique technology, Genoa's team of marine drafters offers detailed design, drafting and 3D modeling online for the marine and offshore industries around the world. Leonard also considers MI as part of his company's foundation and employs MI graduates in Naval Architecture and Marine Engineering Systems Design.

Karen Duff and Joel Harding

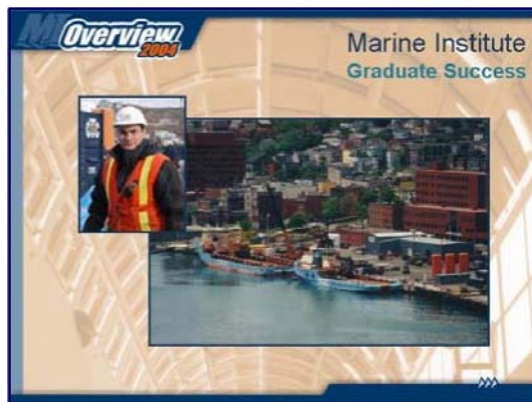
Karen Duff is always aiming higher. In June, she graduated with her Nautical Science Diploma and will shortly receive her Bachelor of Maritime Studies. She is now an officer with Canada Steamship Lines. Karen plans to continue her education to become a Master Mariner.

Three years of hard work has paid off for Naval Architecture graduate, Joel Harding. Originally from Sarnia, Ontario, Joel became interested in naval architecture in high school and decided to come east to MI to launch his career in ship design.



Renee Randell

Renee Randell graduated from MI with her Advanced Diploma in Food Safety in 2000. Renee has been working as a HACCP Coordinator with Labatt Breweries in St. John's. Her work with this company has led to HACCP certification, the first such certification for any of the Labatt locations in the country.



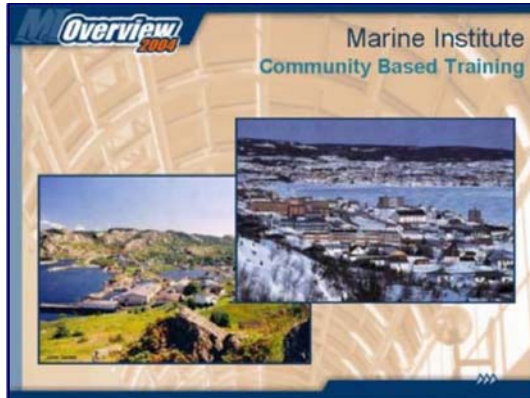
Jeremy Whittle

Jeremy Whittle holds a degree in Maritime Studies and a Diploma in Nautical Science. As a certified ships officer, Jeremy has been involved in various aspects of the marine and offshore industry. Today, he is Operations Coordinator at A. Harvey and Co. Ltd's marine base and is responsible for vessel movements, load planning, and safe rigging practices as well as vessel cargo operations.

Training

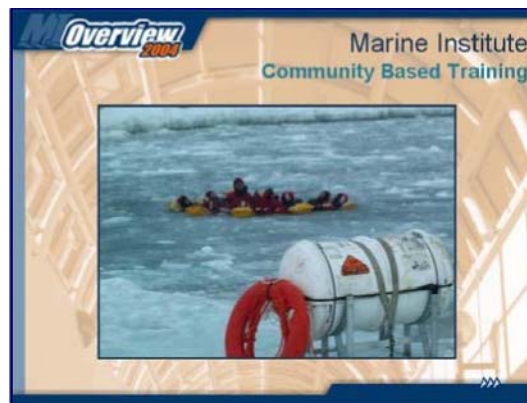
Training to meet the emerging needs of the marine industry has been a major pillar upon which the Marine Institute has been built. We develop and deliver training at the level that our client industry requires and we deliver the training when and where it is needed.

Community -Based Training



In the early days of the College of Fisheries, a travelling school was used to deliver navigation and skills training to fishers and plant workers throughout the Province. Today, the Institute, in cooperation with the College of the North Atlantic and the Professional Fish Harvesters Certification Board, continues to deliver training for the fishing industry by means of a Community Based Delivery Model.

This model is built on the concept that training, where possible, takes place in the participant's home community utilizing local experts, and teaching high-quality programs developed and monitored by the Marine Institute.



Maritime Security

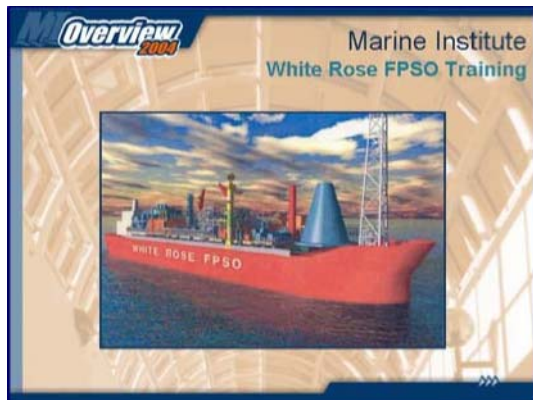
The events surrounding September 11th continue to impact the world we live in. Air travellers are well aware of the security screening measures now in place. This level of security is now moving into the shipping industry. New international regulations require that shipping companies and port facilities carry out a security assessment of their vessels or facilities and have a security plan in place along with their personnel trained as of July 1, 2004.

The Marine Institute has mobilized to develop a training program to allow our industry clients to meet these new regulations. Our course is the first to be launched by a Canadian maritime training institute.

White Rose FPSO

In June 2003, Maersk Contractors Newfoundland Limited recognized the superior training capability which the Marine Institute has built in support of the offshore petroleum industry and

awarded a contract to develop and deliver courses to train operations personnel for the White Rose floating, production, storage and offloading vessel (FPSO).



The exclusive training program is specifically designed for the crew members who will work onboard the FPSO. In total, MI will deliver approximately 4,500 training days at its St. John's, Foxtrap and Southside campuses.

The agreement represents a milestone for the Marine Institute, as it will also be responsible for managing Maersk's training program. MI will lead the administration and logistical coordination of subcontracted training partners, facilities, equipment and other resources that will be used during the

training program.

SERT Centre



In February 2003, ACOA announced over \$1-million in funding for a major new MI training facility in Stephenville. The Safety and Emergency Response Training (SERT) Centre is a joint project between MI and the Stephenville Airport Corporation. It will provide training for the fisheries and marine transportation sectors in western Newfoundland; the industrial and oil and gas sectors in the province; and the aviation sector in Atlantic Canada.

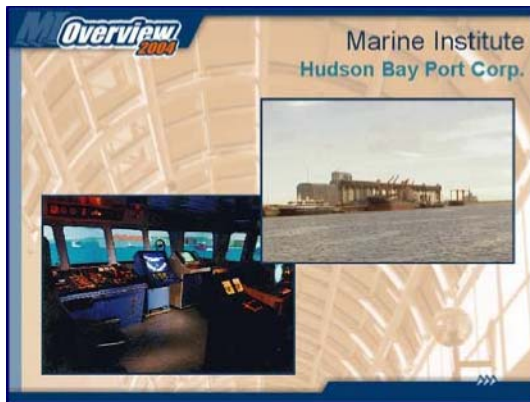
The SERT Centre was officially opened on November 20th. The Stephenville Airport's fire training facility has been reactivated, classrooms have been built, and special programs developed. Training has already been delivered for the international airports in Halifax and St. John's and for the new town of Natuashish. Marine Emergency training and industrial programs are scheduled. MI is poised to become the leading safety and emergency response training centre in Eastern Canada.

The Town of Stephenville also benefits with the Centre expected to contribute up to \$1.6 million annually in economic benefits.

Applied Research

For our students, the MI mission is simple: we turn education into action. The same philosophy applies to our applied research initiatives: we turn ideas into action, solving the problems faced by our industry clients and pioneering the innovations that are revolutionizing the ocean industry worldwide. At MI, applied research is a way of life.

Hudson Bay Corporation



Recently, the Hudson Bay Port Corporation operating in Churchill, Manitoba was faced with a problem. The Corporation had recently conducted a dredging program to increase the capacity of the port. However, the Port Corporation was unsure if it was feasible to bring Panamax vessels into the port under normal weather conditions. MI's Centre for Marine Simulation came to their rescue. Utilizing the full mission bridge, a number of trials were carried out by CMS personnel and the ship's pilots under various weather conditions.

The result is that the Panamax vessels are able to enter, dock and leave the harbour using the techniques developed during the simulation.

Fishery Products International

At our Centre for Sustainable Aquatic Resources, the emphasis for applied fisheries research has changed over the years from how to catch more fish to how to catch the desired species and size of fish without negatively impacting other fish or the general marine ecosystem.

One important client is Newfoundland's largest fishing company, Fishery Products International. Over the past five years, a number of projects have been undertaken with FPI to improve size selectivity, reduce by-catch and to minimize bottom contact with fishing gear. These research projects were very successful and were recognized through a National Fisheries Institute award to FPI for environmental leadership and innovation in sustainable fisheries.

Today, we are working at sea with FPI developing strategies to eliminate the by-catch of yellow tail flounder in the American Plaice Fishery on the Grand Banks.



Mussel Production



A \$2 million Comprehensive Mussel Production and Extension Program was undertaken by MI's Centre of Aquaculture and Seafood Development on behalf of the Newfoundland Aquaculture Industry Association from 1997 to 2002.

Some of the key achievements of this project included improved farm production, adoption of new production practices, improved husbandry practices and reductions in the production costs.

Over the five-year period, mussel production increased more than 400% in volume to 2500 tonnes per year, and over 500% in farmgate value to four million dollars per year. A significant increase in rural employment was realized as a result of increases in mussel production, and provincial economic contributions now exceed \$10 million per year from the mussel sector.

SPAR Rig Testing



In partnership with Oceanic Consulting, the Institute's flume tank is now being used for barge towing studies and for design testing for offshore structures such as the White Rose FPSO and SPAR offshore oil rigs from the Gulf of Mexico.

Harsh Environments

The Marine Institute is poised for a leap forward in applied research. The Centre for Marine Simulation

has been awarded, through the Atlantic Innovation fund, \$3 million towards a \$9 million, five-year project to develop innovative modelling and simulation capabilities.

This project is focused on reducing human error, with its ultimate aim being to improve the safety and efficiency of oil and gas operations in harsh maritime environments.



Fisheries By -Products Centre

Atlantic Canada produces in excess of 300,000 tonnes of waste from the fishing and aquaculture industries each year. The rapidly emerging field of marine bioactives offers tremendous potential for value addition and product diversification, while at the same time enhancing waste management and cost controls. The Marine Institute, in cooperation with the Faculty of Science, is pursuing innovative research and development to address key opportunities and constraints relating to by-product utilization.



The Atlantic Canada Fishery By-Products Research Centre will be located at our food science pilot plant on Mt. Scio Rd with satellite research labs at Dalhousie, St. Francis Xavier, and McGill Universities. This initiative is supported by the Canadian Foundation for Innovation and the Atlantic Canada Opportunities Agency.

Safety and Survival

Our shore Safety and Survival Centre has established a new Applied Research and Development Unit with funding from ACOA's Atlantic Innovation Fund. It will perform applied research into offshore and marine safety with an emphasis on training, evacuation and rescue systems and equipment, and operational procedures.

Our
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Off



Survival Craft Launch Simulator

Initial projects have already begun related to evacuation systems, cold ocean survival and survival craft launch simulation. These projects involve researchers in the School of Human Kinetics, Faculty of Engineering and the Institute for Ocean Technology.

Aquatic Health and Biotechnology Unit



MI has launched plans for a state-of-the-art Aquatic Health and Biotechnology Unit. This unit will work with industry to deliver health screening and applied research services for product testing and development.

In the North

MI is working closely with the Baffin Fisheries Coalition, Nunavut Government and Nunavut Arctic College to develop the fishery in Canada's newest territory.

Nunavut

Seamanship, trawl construction and safety training has been completed in Iqaluit for 24 native fishermen to allow them to participate in the offshore shrimp and turbot fisheries.

MI has also been working with hunter and trapper organizations to develop coastal fisheries for the inshore communities. During the past two years, 10 research and development projects have been conducted in communities such as Pangnirtung and Kugluktuk.

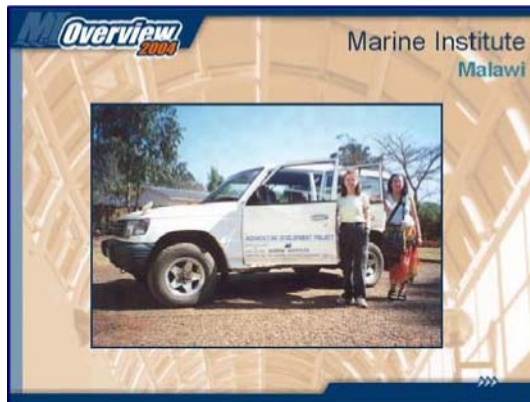


In spring 2003, Philip Walsh of MI spent 21 days inside the Arctic Circle in temperatures as low as -60°C , and successfully developed a new technology for longlining for turbot under the ice. This year the turbot fishery in Cumberland Sound landed 500,000 lbs. of fish.

International Initiatives

In the field of international development, MI has a reputation for excellence as a leader in institutional development of training institutes and a leader in fisheries and marine education and industrial support.

Having completed 70 projects in over 35 countries, the Marine Institute is one of Canada's elite institutions engaged in the international arena. While time is too short to go into detail, here are a few examples of current initiatives.



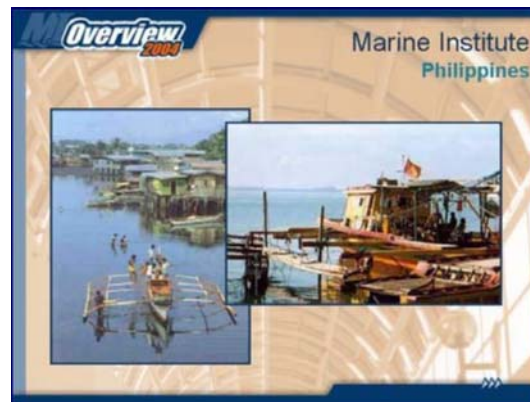
Malawi

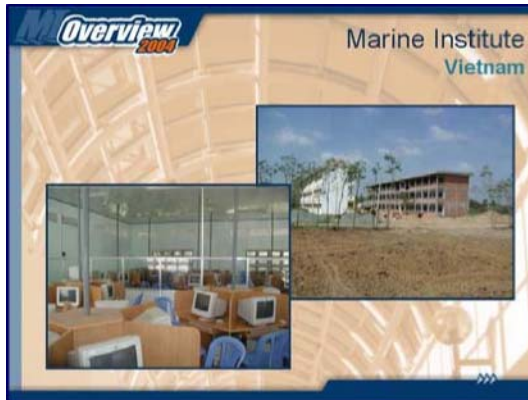
In Malawi, we are participating in a \$1.1 million, 6-year project with the University of Malawi to enhance aquaculture capability in the African country.

MI has also been shortlisted for a new \$10 million project to develop the Malawi fishery. The detailed

Philippines

proposal is now being prepared. The Marine Institute has been very active in Southeast Asia, and in the Philippines in particular, with 7 projects over the past 10 years. Most recently, MI has provided policy and institutional level support to the Government of the Philippines in its efforts to meet the international standards established through the International Maritime Organization. This 4-year project was evaluated by the Chairperson of Higher Education in the Philippines, Dr. Ester Garcia, as the best international support project she has been involved with to date.





Vietnam

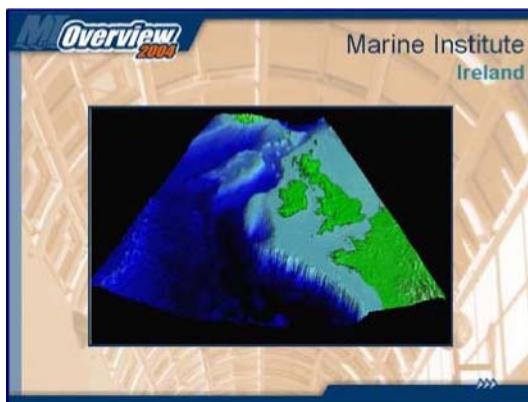
At Tra Vinh in the Mekong Delta region of Vietnam, the Marine Institute is part of a consortium working to establish a Community College. In addition to curriculum development for aquaculture and post harvest programs, the Marine Institute is leading efforts to build the governance and administrative systems required for the College.



Mexico

In Mexico, MI's fishing technologists are working with the Government of Mexico and World Wildlife Fund to eliminate the by-catch of marine mammals, such as the porpoise, from the shrimp industry.

Ireland



In addition to International Development activities, the Marine Institute promotes linkages and commercial projects in a number of developed countries.

In Ireland, for example, the Marine Institute has built a number of collaborations. CCMC was instrumental in putting together the Canadian/Irish team, which was contracted by the Irish government to provide scientific and technical consulting for the seabed survey of its offshore territory. While the contract was relatively modest at \$300,000, the associated sales of Canadian technology were worth over \$1.5 million. Other initiatives in Ireland include contracts with the Irish Sea Fisheries Board for fishing gear technology workshops and with St. Angela's College to implement a Higher Diploma in Food Technology.

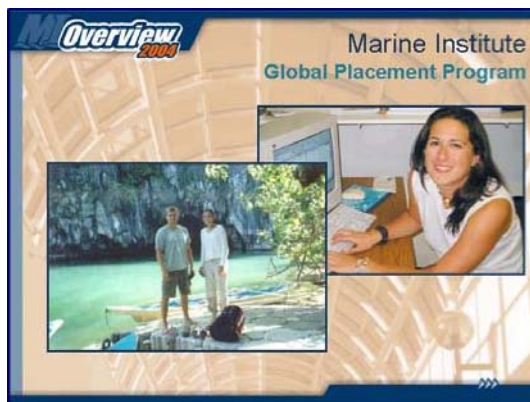
The Institute also has established working relationships with the Cork Institute of Technology, the University of Ireland and the Irish Marine Institute.

China



In response to provincial government and Memorial University's mandate to increase the number of international students in the Province, the Marine Institute has led the development of a relationship with Jilin University, the largest University in China. To date, over 60 Chinese students have enrolled at Memorial with an additional 20 students are expected to begin their studies during 2004 - 05. The Provincial economic benefits are estimated to be \$1 million per year.

Global Placement Program



MI launched its Global Graduate Placement in 1998 with funding support from CIDA. Over the past 5 years MI has become established as a national leader having placed 72 students in 12 countries on 6- to 10-month international work assignments. Our interns have gained a high degree of recognition. Leanda Delaney (Malawi Intern 2001) recently received a very prestigious \$150,000 award to pursue an applied masters program in Malawi.

Student Mobility



There are also international study opportunities for students prior to graduation. The Marine Institute is leading a Canada – EU Student Mobility Project for Nautical Science and Marine Engineering students. These students will be able to participate in exchanges with marine academies in Ireland, Sweden and the Netherlands.

MI has also partnered with Nunavut Artic College to place MI advanced diploma students in Nunavut for work term/study placements. In return, Nunavut

participants will study in advanced diploma programs at MI.

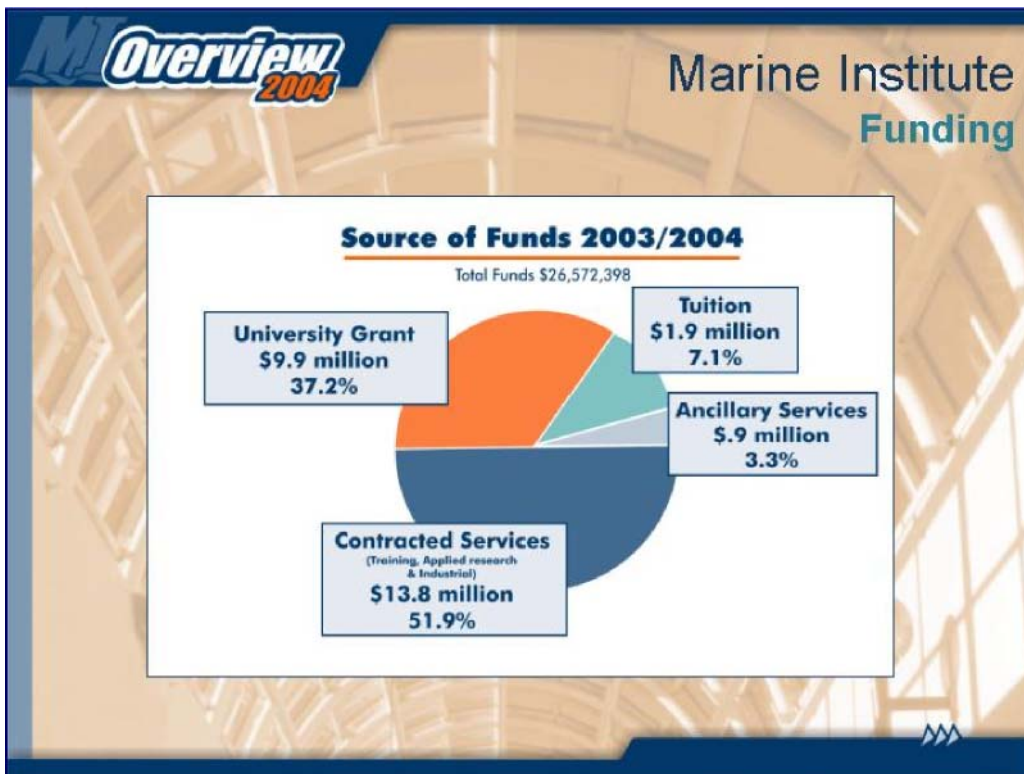
A five-year student mobility project is proposed for Marine Environmental and Coastal Zone Management students with institutions in the United States and Mexico.

Funding

The Marine Institute is an organization that is on the move.

All of this activity requires funding and in the past fiscal year the Marine Institute spent \$26.5 million.

The Marine Institute is unique among public post secondary institutions in that just 37% of those funds were provided directly by the Provincial Government through its grant to Memorial University. Almost 52% of MI funds are generated from externally contracted services, which includes training and applied research.



The Marine Institute is very grateful to its industry clients and the government agencies, which each year show their confidence in our ability to deliver superior education, training, applied research and technology transfer services.

In the Provincial Government, we have strong support from the Department of Education, the Department of Fisheries and Aquaculture and the Department of Industry, Trade and Rural Development. The National Research Council, Human Resources Development Canada, and the Atlantic Canada Opportunities Agency are also strong partners. As well, not all support is financial. For example, the Canadian Coast Guard provides our research and training vessel, the MV Louis M. Lauzier, at the modest least rate of \$1 per annum.

MI is a very progressive organization. Our achievements are made possible by the hard work and dedication of all the people who comprise the Marine Institute. We have an entrepreneurial culture, a focus on our clients, commitment to quality, and we enjoy our work.



With regard to Quality, our recent focus has been to achieve ISO registration. This process has caused us to greatly enhance all of our work processes, our communication and the evaluation of our services and products. It also challenges us each day to continually improve.

Our efforts were rewarded in October 2001 with ISO 9001 registration, the first for any public post-secondary institution in Newfoundland and one of only a few across Canada. In December 2003, MI achieved the new and more demanding ISO 9001: 2000 registration.



2.2 MI's Vision to 2020

Background

The vision which has guided the Marine Institute for the past two decades can be summarized in three phases:

- create a Centre of Excellence in marine and fisheries technology in Newfoundland
- become Canada's foremost fisheries and marine Institute; and
- become the leading and most comprehensive marine institute in North America.

When this vision was developed, its achievement was a very daunting task. It required the:

- massive overhaul of academic programs in terms of scope, level, and academic rigor including the introduction of degree programs;
- conceptualization, funding and building of world-class facilities;
- positioning of the Institute in marine and fisheries education and training across Canada;
- establishment of a strong international presence;
- development of a research capacity;
- attraction of superb faculty and staff; and the building of a culture of success.

This vision has largely been achieved.

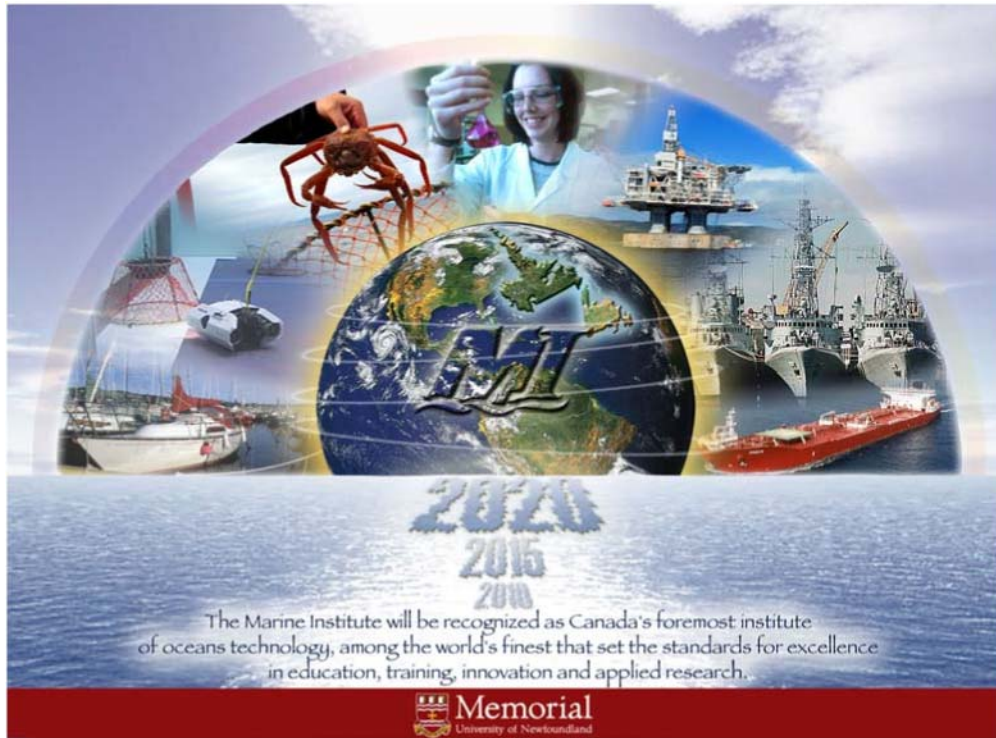
In 2004, the Marine Institute is embarking on a new visioning process entitled *Vision 2020*. It is an intensive process involving significant consultation with stakeholders, environmental scanning, advice and debate. The process is ongoing. However, in terms of direction, the vision will challenge the Marine Institute to

- broaden its scope in terms of the oceans economy,
- aspire to global leadership in selected areas and
- enhance its contribution to the development of Newfoundland and Labrador.

The following section outlines the current state of the new vision for the Marine Institute, the environment which is required in order to achieve this vision and what achieving this vision will mean.

Draft Vision 2020 Statement

The Marine Institute will be recognized as Canada's foremost institute of oceans technology, among the select group of the world's finest that set the standards for excellence in education, training, innovation and research.



- The central focus of the Marine Institute is the oceans.
- Its educational programs and applied research align with sustainable development priorities and the realities and needs of the oceans industry.
- In this context, the term *oceans* refers broadly to aquatic environments including the global oceans and seas and waterways leading to them such as rivers, lakes or ponds.
- The Marine Institute is an integral part of Memorial University collaborating fully with faculties or schools within the university system.

Elements of the Vision

The defining characteristics of the Marine Institute will be:

The Marine Institute will be one of the world's elite oceans institutes. The Institute's programs will reflect its ocean orientation and will be developed to meet labour market forecasts and industry demand.

The goal of Marine Institute activities will be to promote **sustainable development** of renewable resources and **responsible** exploitation of non-renewable resources.

The Marine Institute will be an integral part of the provincial, national and international educational community. The Institute will seek opportunities to advance **education and training** and **applied research and development** related to oceans and coastal economies in communities around the globe. There will be a special **priority on serving Newfoundlanders and Labradorians**, sharing its expertise to contribute to the economic growth and development of the Province.

Research and development programs at the Marine Institute will bridge the gap between fundamental research and commercialization by building upon alliances with educational and research institutions, the private sector, community groups, governments and government agencies. Within a culture of entrepreneurship and collaboration, the Institute **concentrates on** applied research and development program aims to solve challenges from industry and communities.

Teaching and learning will be conducted in a vibrant academic environment, with student academic and career success being the primary goal. To accomplish this, the Institute will promote a **learning culture** among its faculty, staff and management through a professional development program and promotion of lifelong learning.

The Marine Institute will continuously review and improve its activities and consistently provides dedicated professional services and high quality products. The Institute's **reputation of quality and leadership** has led to its programs and services being held as the standard for other institutions.

Strategic Thrusts



Sectors

The Institute is engaged in varying degrees across the entire spectrum of the **oceans economy**, including the sectors of fisheries, aquaculture and biotechnology, marine recreation, energy, science, defence, and marine transportation.

Cross-Cutting Themes Æ Within these sectors there are a number of themes that cut across all of the sectors:

ocean technology, environment and living resources, safety and emergency response, policies and regulations; and management.

The Marine Institute will address these sectors and themes based upon industry demand and developments.

What achieving our Vision will mean:



Programs	Research	Resources
MARINE BIOTECHNOLOGY		
Degree Advanced Diploma	<ul style="list-style-type: none"> • Aquatic Health • Product Development 	Personnel Infrastructure
MARINE INFORMATION AND COMMUNICATION TECHNOLOGY		
Industrial Workshops	<ul style="list-style-type: none"> • Equipment Development • System Integration • Demonstration Projects 	Personnel Infrastructure
MARINE ECOTOURISM		
Advanced Diploma Workshops	<ul style="list-style-type: none"> • Market Studies 	Personnel Infrastructure
OCEAN ENERGY		
Technology Diploma	<ul style="list-style-type: none"> • Wave • Tidal • Offshore Wind Turbines 	Personnel Infrastructure
APPLIED MARINE BIOLOGY		
Degree	<ul style="list-style-type: none"> • Fish Behaviour • Marine/Ecosystem Interaction 	Personnel Infrastructure
MI NORTH		
Industry Training Diploma Degree	<ul style="list-style-type: none"> • Marine resources assessment • Technology for cold climate 	Personnel Infrastructure

What achieving our Vision will mean:



Programs	Research	Resources
BOAT BUILDING INNOVATION		
Apprenticeship Diploma Degree	<ul style="list-style-type: none"> • Vessel Design • Fabrication Processes • Materials 	Personnel Infrastructure
SIMULATOR DEVELOPMENT		
	<ul style="list-style-type: none"> • Design/Construction/Testing of marine simulator 	Personnel Infrastructure
COMMAND AND CONTROL		
High level Industrial	<ul style="list-style-type: none"> • Human Factors • Emergency Response 	Personnel Infrastructure
MARINE GEOMATICS		
Degree Diploma Industrial	<ul style="list-style-type: none"> • Coastal and Seabed Habitat assessment 	Personnel Infrastructure
SHIP OPERATIONS		
Industrial	<ul style="list-style-type: none"> • Safety • Efficiency • Ship Operators 	Personnel Infrastructure
REMOTE / AUTONOMOUS OPERATED VEHICLES		
Industrial	<ul style="list-style-type: none"> • Application 	Personnel Infrastructure

What achieving our Vision will mean:



Programs	Research	Resources
	WATER QUALITY	
Degree Diploma Industrial	<ul style="list-style-type: none"> • Shipboard Waste System • Municipal 	Personnel Infrastructure
	SIMULATION OF HARSH ENVIRONMENT	
Industrial	<ul style="list-style-type: none"> • Ice Navigation • Safety • Wave Interaction 	Personnel Infrastructure
	FPSO SCHOOL	
Industrial Training Worldwide		Personnel Infrastructure
	OIL SPILL RESPONSE	
Industrial	<ul style="list-style-type: none"> • Response Techniques • Equipment • Biodegradation 	Personnel Infrastructure
	M I ONLINE	
E-Learning Programs	<ul style="list-style-type: none"> • Marine Delivery Systems 	Personnel Infrastructure

2.3 *Creating an Enabling Environment*

The Marine Institute is an institution that is unique to the Province. It exists because our culture and our economy are based on our historic relationship with the sea and the exploitation of its resources.

The future of our Province will be largely dictated by our ability to use our skills, our creativity and our intellect to forge a key role in the world oceans economy. The competition is and will continue to be intense both for industrial market share and for choice jobs and careers.

The previous section outlined a vision for the Marine Institute of the future. We believe it is a compelling picture for the future that will bring the Marine Institute to a new level and will offer increased opportunities for our students and our industrial clients.

Attaining this vision will require intense work within the Institute in order to plan and to implement. It is a challenge and an opportunity we are eager to address.

Attaining this vision will also require the presence of an enabling environment in which to nurture the development of this Institute. Key elements in this enabling environment include:

- 1. Memorial University**

When the Marine Institute became part of Memorial University in 1992, it was a unique experiment for which there were high hopes but no models to follow. Over the past decade, the Marine Institute has thrived within Memorial. Being part of Memorial has opened many new opportunities in programming and in research.

Enabling Environment: Marine Institute being part of Memorial University

- 2. Mandate** The mandate of the Marine Institute as outlined in Article 67 of the Memorial University Act is:

The university shall, through the Fisheries and Marine Institute established under this section and in accordance with the direction of the board and the senate,

- a) provide degree, diploma, certificate and other programs in the areas of fisheries and marine science and technology;*
- b) provide for the upgrading and enhancement of the fisheries and marine labour force, in cooperation with the colleges...;*
- c) provide for the sharing of facilities between the Fisheries and Marine Institute, the university and the various colleges...; and*
- d) provide for applied research and technology transfer.*

It is this mandate which provides for the unique character of the Marine Institute as a marine polytechnic offering both a full range of programming linked to labour force demands and engaging in applied research and technology transfer in support of marine industries. This mandate relates directly to the oceans economy and positions the Marine Institute for maximum impact.

Enabling Environment: Continuance of the Marine Institute marine/oceans mandate across the full spectrum of programming areas together with a focus on applied research and technology transfer.

3. Governance

The legislation which made the Marine Institute part of Memorial University provided for establishment of an Industry Advisory Committee is as follows:

- (1) The Board of Regents shall establish an industry based advisory committee to advise the Fisheries and Marine Institute respecting fisheries and marine related programs offered at the Fisheries and Marine Institute.*
- (2) The Board shall appoint to the advisory committee established under subsection (1) not less than 11 nor more than 15 members to consist of:*
 - a) the Deputy Minister of Fisheries or the representative of the deputy minister;*
 - b) a full-time student at the Fisheries and Marine Institute;*

- c) a representative of the administration of the Fisheries and Marine Institute;*
 - d) 8 persons from the fishing and marine industries or related organizations; and*
 - e) those other persons that the board may determine.*
- (3) The Board shall designate 1 of the members appointed under subsection (2) as chairperson of the advisory committee and another member as vicechairperson of the advisory committee.*
- (4) The Board shall establish the terms of appointment of members of the advisory committee so that there is continuity in membership of the advisory committee.*

The experience with the Industry Advisory Committee over the past decade has been mixed. Some members have been very active in devoting their time and energy towards assisting the Institute to position itself to meet the changing needs of stakeholders. Generally, however, the experience, both from the perspective of the Institute and from the perspective of the Committee members, has been unsatisfactory. Much of this dissatisfaction arises from the lack of any connection of the Industry Advisory Committee with the governance of the Institute, which is vested in the Board of Regents of the University.

At this time in the development of the Marine Institute and Memorial University, it is appropriate for the Industry Advisory Committee to evolve into a Governing Council. Given the industrial focus of the Institute, and the need to ensure that both programming and applied research activities remain relevant, it is essential that those providing advice have the authority to engage in a governance role. This would establish a greater degree of accountability for Institute performance and enhance the ownership by industry of Institute activities and successes.

Enabling Environment: Establishment of a Governing Council for the Marine Institute with a similar composition to the Industry Advisory Committee. This Governing Council should be delegated responsibility for operations of the

Marine Institute by the Board of Regents and the Chair of the Governing Council should be a member of the Board of Regents.

4. **Funding** The Marine Institute is not a funding priority of Memorial University.

In the twelve years that the Marine Institute has been part of Memorial University, the University has made no substantive investment in either ongoing operations and programs or in the development of the Institute's infrastructure. This is not to say that Memorial University has treated the Marine Institute harshly from a fiscal perspective. Rather, the University has treated the Institute in an "equitable" manner, passing along general increases and decreases in the annual grant along with any specific funding which government might designate, from time to time, for the Marine Institute.

Memorial University has many demands upon its fiscal resources. It has been the judgement of the University that these demands are of higher priority than the needs of the Marine Institute and/or that the Institute is entrepreneurial enough to find alternative sources of funding. Given this perspective, the funding requirements for the operation and development of the Marine Institute may never be a priority for Memorial University.

It is essential that a mechanism be established to access funding to support the operations, growth and development of the Marine Institute on its own merits.

Enabling Environment: Establishment of a separate Marine Institute funding envelope within Government's annual grant to the University.

5. **Positioning**

Currently the Marine Institute is unable to access funding from the Canada Foundation for Innovation. Even though the Institute is arguably the best small technical institute in Canada with respect to undertaking high impact applied research, it is designated by the Foundation to be a university and its proposals

assessed in the peer review process for universities. The experience of this Institute with the Foundation is detailed in Section 3.2.3 but the implication is that unless a substantive change occurs then the Institute will continue to be blocked from the key source of research and research infrastructure funding in Canada. Discussions with the Foundation have indicated that the establishment of a governing council for the Institute and the implementation of a process for direct funding from government will result in the Marine Institute being viewed as a Technical Institute with its proposals being rated against those from similar institutions.

Enabling Environment: Changes to governance and funding arrangements for the Marine Institute as per 3 and 4 above.

6. Infrastructure

A critical element in positioning the Marine Institute is its world-class infrastructure and state-of-the-art equipment. When the Marine Institute campus was built in the early 1980's, its designers did a superb job of planning, not only for what the Institute was at that time, but for what it could become. Inclusion of the world's largest flume tank, a fish processing plant, and an acoustics tank, together with a suite of new equipment, gave the Institute the credibility to move forward. This infrastructure was further augmented through the Offshore Development Fund which provided funding for the full motion bridge simulator, ballast control simulator and the offshore safety and survival centre.

Today much of the infrastructure and equipment at the Marine Institute is between 15 to 20 years old. This infrastructure and equipment needs to be renewed and new infrastructure built if the Marine Institute is to hold its hard won place among the world's best marine institutions.

In the past ten years the only significant investment in equipment and infrastructure at the Marine Institute has been made by the Federal Government.

This has primarily been through specific projects sponsored by the Atlantic Canada Opportunities Agency.

Enabling Environment: Establishment of a multi-year infrastructure development fund for the Marine Institute. This fund would be used to purchase/build new infrastructure leveraging funding from other programs and industry to the fullest extent possible.

Section III

Questions Posed by the Commissioner

3.0 Questions Posed by the Commissioner

3.1 Existing Post-Secondary Structure

3.1.1. Strengths and Potential Improvements

What do you value about the current public post-secondary systems?

From a practical viewpoint, the existing structure of the public post-secondary system which has one public college and one public university for the 500,000 or so people in Newfoundland and Labrador is very reasonable. It allows both institutions to take advantage of such economics of scale as may be possible. In terms of quality, both the College of the North Atlantic and Memorial University rate very well in comparison with similar institutions in other parts of Canada. They are both effective generators of social and economic growth and provide good career prospects for graduates.

What would you change to make it more effective for the social and economic growth of the province and for the employment prospects of our graduates?

The one college, one university model we have in Newfoundland demands that these institutions view themselves, structure themselves and, furthermore, act as a provincial college system and a provincial university system.

We would argue that both institutions, to varying degrees, lack this system's perspective and that this is an inhibiting factor in their ability to meet the complete needs of the Province.

1. College of the North Atlantic

While the College of the North Atlantic is a full service community college, it has adopted an organizational structure which seems to work against its community service objectives. This complex organizational structure combines features from both the corporate and educational sectors which do not appear to be particularly efficient.

Consideration might be given to re-engineering the College of the North Atlantic model along the lines of the New Brunswick Community College. That is, the

establishment of strong regional campuses with a service-oriented headquarters, which provides centralized accounting, registration services and coordination of major academic programs. This type of model might be more receptive to regional needs, able to react more quickly, promote innovation, etc. – but still be able to take advantage of economies of scale.

2. Memorial University

The Comprehensive University

Memorial University views itself as “Atlantic Canada’s premiere comprehensive university and one of the region’s most important research facilities.” It compares itself with such other outstanding Canadian universities as Guelph University, Simon Fraser University and the University of Waterloo. As comprehensive universities, these institutions have significant research activity and a wide range of programs at the undergraduate and graduate levels, including professional degrees.

Memorial is indeed a very good comprehensive university. That is, the main campus of Memorial in St. John’s is all of these things. It has very good faculties and excellent professional schools. It has a wide range of undergraduate and graduate programs and undertakes research across a wide spectrum of disciplines. However, the fact that Memorial views the world as a traditional comprehensive university, has structured itself as a traditional comprehensive university and functions as a traditional comprehensive university does inhibit it from reaching its full potential as the university system for the Province.

Sir Wilfred Grenfell College and the Marine Institute

The most obvious areas where the University’s current outlook and structure is an inhibitor are the two components of the university which do not fit the traditional mold of a comprehensive university – Sir Wilfred Grenfell College and the Marine Institute.

Sir Wilfred Grenfell College is what would be classified in Canada as a primarily undergraduate, liberal arts and science university. On a stand-alone basis it is comparable to the smaller universities in the Atlantic Provinces, such as Mount St. Vincent's, Acadia, St. Thomas' and St. Francis Xavier.

The Marine Institute is a uniquely Newfoundland invention. It is a marine (or oceans) polytechnic with a full suite of programming ranging from individual response training to master's degree within a narrow band of marine/oceans technologies. The Marine Institute is unique in Canada and a world leader in its areas of endeavour.

Both SWGC and MI benefit greatly by being part of Memorial. However, a new outlook for the university and a new approach to governance and funding would enhance their development.

A New Model for Memorial University

It is time to consider a new organizational model for Memorial University. This new model should consider the reality facing Memorial as the single university system for Newfoundland and Labrador and the need for it to be structured to maximize the development potential of its different components in order to enhance the employment prospects of its graduates and to make it a more effective agent for social and economic growth of the province.

One option for this new systems model would be to restructure the University as follows:

- The University Core

This would consist of the President and central service units responsible for overall University strategic planning, policy and central operations such as budgeting and registration. The Board of Regents and the Senate would be part of the University Core.

- Memorial University – St. John’s Campus

This would be the comprehensive university component of the Memorial University system. It would have a clear mandate to build high quality undergraduate and graduate programming and to advance research and scholarship. This component of the University would have all of the elements necessary for a research-intensive university and could, in time, displace Dalhousie as the leading university in the region.

- Memorial University – Sir Wilfred Grenfell Campus

This would be the undergraduate liberal arts and science university component of the Memorial University system. It would have a clear mandate in undergraduate education and would be the regional university for western Newfoundland. The latter responsibility would direct the focus of research and public service at this campus.

- Memorial University – Marine Institute Campus

This would be the marine/oceans polytechnic within the Memorial University system. It would have a clear mandate in providing a full spectrum of programming in the marine oceans sector along with a focus on applied research and technology transfer.

The primary benefit of this model for organizational structure would be to clarify the role of the three major components of the University while maintaining the advantages incumbent in one university which has an established reputation and effective administrative and academic support systems.

- Other Models

The systems model suggested for consideration is similar to university systems which have been established in other provinces and states. One example is the University of New Brunswick which operates campuses at Fredericton and St. John. The organizational structure for the University of New Brunswick is shown in Attachment 1.

3.1.2 Infrastructure

What are some innovative ways that the existing infrastructure can be improved to contribute to the social and economic development of the community/region?

We believe that the organizational changes described above (Section 3.1.1) with the associated changes in outlook at both the College and the University would result in better utilization of existing infrastructure for the social and economic development of the regions and communities of Newfoundland and Labrador.

3.1.3 Principles

Currently the four broad principles of accessibility, quality, affordability, and sustainability guide the overall approach to delivery of public post-secondary programs and services. Are they still the correct ones? Are there others?

The four broad principles which guide the overall approach to delivery of public post-secondary programs and services should be augmented to reflect better the future needs of the post-secondary system. Consideration should be given to inclusion of such other principles as:

Excellence – While the principle of “quality” infers high standards, the actual definition of quality relates to meeting stated goals. This is reasonable in that there may be different goals for different aspects of the post-secondary system in the province. However, it is also important to recognize in the guiding principles that there is an expectation and a commitment to building excellence in selected parts of the post-secondary system.

Relevance – The public post-secondary education system should be relevant to the needs and expectations of the Province of Newfoundland and Labrador.

Economic Impact – The economic impact of education programs, of research and public service should be a guiding principle for the public post-secondary system.

3.1.4 Distribution of Programs and Services

In light of these principles, how should the programs and services be distributed at the local, regional and provincial level to respond to the changes in demographics and the labor market?

The expectations of the public and the institutions for local, regional and provincial programs and services should be clearly defined.

At the local (community) level there should be the expectation that citizens can access a wide range of higher educational courses through distributed learning technologies. The emphasis for this distributed learning should be personal and career development.

As well, at the local (community) level there should be the on-site capability to deliver basic literacy education as required.

At the regional level, there should be the expectation that a common suite of programs is available at each region. This would include:

- skills programs that are generally required to support economic activity in all areas (eg. carpentry)
- the primary technology year for diploma programs offered by the college and the Marine Institute
- the college transfer year and second year of general arts and science degree programs

The regions should also have industrial support programs and particular expertise in specific areas of endeavour that are critical to the region's development, for example, mining and heavy industrial programs might be a focus in western Labrador.

Programming and services offered by the post-secondary system should be designated "provincial" based on a number of criteria. These criteria would include:

- the cost of the program

- the level of student demand
 - requirement for specialized expertise or faculties -
- the standard of excellence expected

3.2 Funding of Post-Secondary Education

3.2.1 Sources of Funding

Given that our public post-secondary system is funded largely by our tax dollars, which of the following options should government pursue in addressing the financial pressure of our institutions?

- *Operating grants*
- *Tuition fees*
- *Tax incentives*
- *Others*

Operating Grants

Operating grants from government are the primary source of funding for the public college and public university in Newfoundland and Labrador. It is essential that operating grants be maintained at a level that allows the college and the university to carry out their mandates. This is not to say that the institutions should be given a blank cheque. Rather, the level of operating grant should be clearly tied to a suite of mutually agreed goals.

Tuition Fees

Tuition fees at Memorial University and the College of the North Atlantic are among the lowest in Canada. The temptation might be to raise tuition substantially as a means of either increasing funds available to the institutions or to reduce the funding commitment required by government through its operating grants. Right wing think-tanks such as the Atlantic Institute for Market Studies would strongly endorse this viewpoint citing research which shows that students are the primary beneficiaries of post-secondary education.

We would argue that tuition is not the greatest cost which students have to bear to gain a post-secondary education. They must incur substantially higher costs related to living expenses especially those students living away from home and they must forgo 3-5 years of potential earned income while they attend college or university. Further, the recent experience in Newfoundland is that the reduced level of tuition at Memorial University in comparison to other Canadian universities corresponds very closely with both an increased participation rate in

university and a decrease in the rate of Newfoundland students choosing to study in other provinces. This experience indicates that lower tuition fees do influence students' decisions and that the lower tuition fees at Memorial are having the desired impact. A side note would be that there are immediate economic benefits associated with keeping Newfoundland students in the Province equivalent to approximately \$25,000 per student per year of study.

Notwithstanding the above, there is some room to increase the current level of tuition at both the college and the university. One option would be to establish affordable base tuition for programs and implement a differential system for programs based upon the relative expected returns to the students in those programs. Under this system, all students would pay the base tuition per credit hour. Students in some disciplines would pay a differential program fee in recognition of the higher expected return to those from their program of study.

Incentives (Tax Versus Grants)

It is generally recognized that the largest cost of post-secondary education is the living expenses incurred by students who live away from home in order to pursue their education. Low general tuition rates help these students but no more than any other student.

Two options are suggested to assist students who live away from home – tax incentives and grants. Of these two options, the grants to students would appear to be a better mechanism.

Contracted Services

In 2003 – 04, the Marine Institute's total expenditures were \$26,572,398. The Institute received \$9.9 million (37.2%) of these funds from government in the form of the operating grant transferred from the University. It received \$1.9 million (7.1%) in tuition fees from students and \$9 million (3.3%) from ancillary services such as the cafeteria and bookstore. The remainder of the Institute's funding \$13.8 million (51.9%) was generated through provision of contracted

services in the form of training, applied research and industrial support for industry and government agencies.

Contracted services undertaken by the Marine Institute encompass a wide range of activities both in Newfoundland and Labrador, in other parts of Canada and internationally. Much of the activity is small industrial training contracts but there are also some innovative projects including:

- a multi-year contract with the Canadian Navy to train marine engineers and technical staff for its fleet. The contract was worth about \$2.0 million to the Marine Institute in 2003 – 04 and it had an economic impact on this Province estimated at \$9 million
- a \$2.5 million contract to manage and conduct the training for the crew of the White Rose FPSO
- contracts to undertake multiple applied research projects and training courses for fishers in Nunavut
- a contract to help develop a community college in the Mekong Delta region of Vietnam

Contracted services are a way that post-secondary institutions can supplement the funding provided to them by taxpayers and by students. It is also a means to expand the capability and reputation of the institution.

Consideration should be given to providing incentives or support from government to encourage institutions to pursue contracts with private companies and government agencies.

3.2.2 Accountability

How can public post-secondary institutions be more accountable for quality outcomes and effective spending?

We are not aware of any formal accountability measures which government uses to evaluate its investment in post-secondary education. We are aware that other jurisdictions in Canada and the United States have implemented very formalized

performance based budget allocation systems for both their universities and college systems eg. Alberta. Typically these appear to be systems with multiple institutions in each sector and performance measures are used as part of a formula to divide the total funding pot available to each sector among the various institutions.

It is not clear how performance based budget allocations might be used in a one college/one university system. Certainly, the same criteria could not be used to measure the performance of these two very different institutions.

With regard to the Marine Institute, the public is realizing a very good return on its investment. This is evident from a number of different measures. These measures may or may not be applicable to other parts of the post-secondary education system.

- Quality – The Marine Institute is the only academic organization in Newfoundland, and one of only a few in Canada, which has achieved ISO 9001-2000 certification. This means that the Institute is judged by independent auditors against international standards of quality excellence in internal operations and interaction with clients (including students).
- Outcomes – Marine Institute graduates get good jobs, have rewarding careers and contribute to the province and the country. The outcomes for Marine Institute graduates are measured independently by the Department of Education.
- Industrial Relevance – The Marine Institute is the ultimate in industrial relevance to the marine industries that it serves. It has a full service program mix from industrial courses to advanced degrees. It provides technology transfer and coordination services and undertakes applied research on the current and emerging issues facing these industries.
- Economic Impact – A local consultant, The Institute for the Advancement of Public Policy has been contracted to determine the economic impact of the Marine Institute using 2002 – 03 as the base year for analysis. Their draft report looks at short-term and long-term impacts.

The short-term impact has been relatively easy to quantify. It includes all direct expenditures by the Institute for salary, operations and capital, student and visitor spending as well as the indirect and induced impacts generated by these expenditures. In 2002 – 03, the Marine Institute spent \$23.3 million. The Institute grant was \$8.7 million (37%). The total direct Expenditure Impacts for 2002 – 03 were estimated to be \$35.8 million and the indirect or induced impacts an additional \$11.2 million for a total short-term economic impact of \$46.9 million. This is 5.4 times the provincial grant.

To get the net economic impact, the \$46.9 million is reduced by the provincial grant then the overall short-term net economic impact of the Marine Institute in 2002 – 03 is \$38.2 million.

The long-term economic impact is more difficult to quantify – it is also much greater. These economic benefits have to do with the incremental value of higher education to individuals and to the provincial economy. In the case of the Marine Institute, it also includes the ongoing value of applied research, which enhances provincial industry.

With regard to long-term impact on students, the consultant determined, based on various assumptions, that the total impact over 30 years would be \$390 million for the Marine Institute – that’s about \$13 million per year.

With regard to impacts of Marine Institute industrial projects, the consultant has had more difficulty due to the availability of information related to economic impact. We are continuing to work with them on that issue.

3.2.3 Research

Given the investment of research dollars in the Province, what role should the public post-secondary system play to better link research funding to the economic development of the province?

Memorial University is Newfoundland and Labrador’s research agency. It conducts most of the research and development in the province and a much higher

proportion than the university sector in other provinces or the nation as a whole. The university is in this position because of the weakness with regard to research and development elsewhere in the public system and the overall weakness of the private sector in the Province.

Memorial University has done a very good job of linking its research to the economic and social development of the province. It has done this in a fiscal climate where almost all research funding is provided by agencies of the federal government on a competitive basis. The provincial government has provided some direct funding to help the University leverage funding from federal agencies. A more aggressive leveraging policy similar to that in other provinces would certainly be beneficial. If this leveraging funding were tied to provincial priorities for social and economic development, then research in those areas would quickly follow.

Marine Institute research efforts are now, and will continue to be, linked to the economic development of the oceans sector in the province. Within that sector, the Marine Institute focuses on the gap between fundamental research, which is the purview of the traditional faculties of the University, and commercialization, which is the focus of the private sector. Our applied research activities have been responsible for exciting innovations in seafood products, in fishing gear design and in marine communications.

Access to Funding

As noted earlier, the Marine Institute has to face a major barrier in procuring research funding. The national granting councils, and in particular the Canadian Foundation for Innovation, which control the vast majority of research funds in Canada, are not accessible to the Marine Institute. Even though the Marine Institute concentration is on applied research, similar to the technical institutes, university-college and colleges in Canada, Marine Institute proposals for funding are judged not against proposals from these institutions but against proposals from other faculties of Memorial University and from other Universities. The peer

review process for universities is highly weighted towards fundamental research qualifications.

The Marine Institute is arguably the best small technical institute in Canada with respect to undertaking high impact applied research. Our experience with the Canadian Foundation for Innovation would be comical if its implications were not so serious for the Institute and our client industry.

- In 1998, the Marine Institute was considered to be a technical institute/college and a proposal to enhance the technology associated with the Flume Tank was approved
- In 1999 and all subsequent years, the Marine Institute was considered to be a university and all proposals have been rejected
- In 2002, the Marine Institute reworked a proposal which had been rejected twice before and submitted it under a lead researcher from the Department of Biochemistry. The proposal for the Atlantic Centre for Fisheries By-Products was funded
- In 2003, the Marine Institute proposal related to Simulation in Harsh Environments did not even pass the peer review process within Memorial University. A complementary proposal was funded by the Atlantic Innovation Fund

Discussions with the Canada Foundation for Innovation clearly indicate that its policy towards the Marine Institute will change only if the Institute can show it has a governance board and that it receives its base funding directly from government.

3.2.4 Marketing

How can the public post-secondary institutions market their educational systems (programs and services) and their research capability to attract investment and generate economic development?

Newfoundland and Labrador has developed a concentration of world-class marine and cold ocean technology infrastructures, resident primarily in the public post-

secondary environment. Despite this impressive array of world-class facilities in the province and continued growth of the advanced technology sector, it is felt that the centres of excellence facilities have not achieved their full potential. Through the post-secondary budgetary process, these centres of excellence have been allocated limited budgets for marketing their facilities and human resource expertise to clients outside of the province. In addition, the majority of these facilities have been established with a research or teaching mandate as opposed to a commercial focus and they do not have extensive marketing experience in residence. The private sector has traditionally not been very active in pursuing alliances with these centres of excellence. While many of the centres do interact on a regular basis, there remains great potential for collaborations and partnerships.

“Bridges,” or the Marine Technology Alliance Building and Marketing Initiative, has been designed specifically to address these problems. This unique and creative program is promoting cooperation within the post-secondary system as well as public-private partnerships between publicly funded research facilities and the private sector. Through these partnerships, Bridges is facilitating the commercialization of technology. Its focus on the marine technology sector is also directly inline with the Provincial government’s economic development agenda, which has identified this sector as an area of expertise and potential growth.

In order to accomplish these goals, Bridges has been allocated \$2.35 million in funding from the Canada – Newfoundland and Labrador Offshore Development Fund (CNODF). Bridges has a four-year mandate and an Executive Director was hired in August of 2003. The initiative operates within Memorial University’s administrative system, however an outside board or steering committee provides guidance and votes on funding proposals. This seven-person Steering Committee is comprised of industry, academic and government representatives.

The Centres of Excellence identified as the primary focus of the Bridges initiative are:

Memorial University

- Centre for Earth Resources Research (CERR) -
Ocean Sciences Centre (OSC)
- Ocean Engineering Research Centre (OERC)
- Telemedicine and Educational Technology Resources Agency
(TETRA)
- Centre for Offshore and Remote Medicine (MEDICOR) -
C-CORE

Marine Institute

- Centre for Marine Simulation (CMS)
- Offshore Safety and Survival Centre (OSSC)
- Centre for Sustainable Aquatic Resources (CSAR)
- Centre for Aquaculture and Seafood Development (CASD)

College of the North Atlantic

- Engineering Technology Centre (ETC)

National Research Council

- Institute for Ocean Technology (IOT)

An initial call for proposals began in September 2003. This round was intended for funding in the range of \$10,000 to \$15,000. The intent was for proponents to assist in the development of conceptual plans, conduct exploratory market research or begin preliminary discussions with potential partners/customers. This initial call generated twenty-five (25) submissions, of which ten projects were approved.

A second call for proposals ended in May 2004. An advertising campaign in the local and regional media was conducted to advertise this call. This round was designed for larger-scale projects and many successful proponents from the first round submitted follow-up proposals. Thirteen proposals, requesting funding in

the range from \$45,000 to \$380,000 were received. As of September 2004, six proposals have been funded for a total of over \$800,000.

Bridges has also contributed \$100,000 to Oceanic Consulting Corporation to help support Oceanic's ongoing marketing efforts. Oceanic is a unique model within the province's public sector system as they are a private sector, marine performance evaluation consultancy that aggressively markets the testing facilities of the Institute for Ocean Technology, Faculty of Engineering and the Marine Institute to international clients.

Bridges has been given a four-year mandate and the funding from the CNODF is non-renewable, as this fund will soon cease operations. While proponents have been actively encouraged to submit proposals with a post-Bridges sustainability plan, the full component of Bridges funding will not solve all the problems that have been identified in this sector.

The Bridges initiative is a creative approach to address legitimate needs within the marine technology sector as it relates to the public post-secondary and this funding should be perpetuated in some form. Newfoundland and Labrador's centres of excellence in marine technology can compete on the global stage with other international research and development facilities. However, in order to do so, funding for marketing and alliance building activities must be readily available on an ongoing basis. Bridges, which calls for strict performance indicators, postfunding sustainability strategies and public-private partnerships, is a successful model. Consideration should be given to continue to fund Bridges in the range of \$500,000 - \$750,000 annually.

3.3 Impacts of Population Changes 3.3.1

Barriers to Participation

How can the public post-secondary system better respond, today and into the future, to the needs of individuals who experience barriers in participation in the public post-secondary system?

To overcome barriers to participation it is critical to provide access to levels of education and training at the local, regional, and provincial levels. Although, as we outlined in Section 3.1.4, there will be differences in what may be available throughout the province, being able to access the training will depend on the ability to obtain the funding necessary to avail of this training. The ability to transfer credits within the system is key to ensuring that students can move from the local to regional and then provincial level of the post-secondary education system in seeking the education and training they require.

3.3.2 Lifelong Learning

How can public post-secondary institutions help promote a culture of lifelong learning?

One key aspect of lifelong learning is to receive credit recognition for all aspects of learning. This would include detailed prior learning assessment of work experience and other forms of training towards credit in the post-secondary education system. It must however also be a fully integrated system that can take individuals through all stages of their career and corresponding educational needs. A good example of this is the recognition of credits in a diploma program towards a baccalaureate degree and on into a master's degree. Essentially it is a seamless transition through all stages of lifelong learning.

3.3.3. National and International Students

What issues should be considered in developing a recruitment strategy for national and international students?

In looking at a recruitment strategy for national and international students it is important to recognize the different approaches that should be taken with each group.

At the national level, in order to attract students it is important to offer something unique that they cannot get in their home province. This can be developed through our centres of excellence in terms of offering students specialized programs. At the same time it must be affordable.

On the international stage there are other factors to take into account. The most pressing issue is not recruitment but student services. There is a tremendous need to provide a one-stop shop for students at all stages of the process (i.e. prior to application until they become alumni). Certain issues are of a highest priority. These include adequate and affordable accommodation, cultural support (religious, dietary, etc.), and trouble shooting. Poor or inadequate services will have a negative impact on recruitment. In this regard an investment of funds is needed to put these systems in place. It is also important that participation of international students in the post-secondary education system within this province not be a financial burden and that they pay their way. Considerable opportunity exists for the Marine Institute to market its programs internationally. The Institute's quality programming in high demand niche sectors makes a highly marketable commodity. However, the high costs associated with international student recruitment and services make these activities not only cost-prohibitive for the Institute but also a net money loser. Tuition sharing arrangements must be put in place in order to provide the necessary financial incentive to support the Institute's activities associated with recruitment and service provision.

In general, the ability of the post-secondary system to interact flexibly with international partners with different cultural backgrounds is critical to successful international recruitment activities.

3.3.4. Positioning

How can the public post-secondary institutions position themselves nationally and globally?

The Marine Institute's uniquely responsive and entrepreneurial nature has built up a large network of international partners. The reputation of the Institute is very strong internationally. Close ties are maintained with national governments in Europe, Southeast Asia, sub-Saharan Africa and the Middle East. These linkages provide opportunities for the Newfoundland post-secondary system as a whole.

Section IV

Joint Position of the Marine Institute and the College of the North Atlantic

4.0 Joint Position of the Marine Institute and the College of the North Atlantic

4.1 Commitment

The Marine Institute and the College of the North Atlantic are committed to achieving the goals which Government have established for the Provincial Postsecondary Education System. Within our mandate areas, we act independently to ensure accessibility, quality, affordability and sustainability in the delivery of our programs and services. Our institutions have also had a long history of collaborating in areas where our mandates and/or capabilities overlap. Collaboration is necessary to ensure that the postsecondary system, as a whole, maximizes its capability.

Past collaboration between the Marine Institute and the College of the North Atlantic has included:

- development of a common first year curriculum for diploma of technology programs - delivery of community based training in support of the fishing industry - development and delivery of international projects, for example, a multi-year

technology education program with Jilin University in China

While the level of collaboration is positive, there is also the potential for greater collaboration in the future. Recent discussions have highlighted a willingness at both institutions to work closer together, both with respect to specific projects (eg. expansion of the Safety and Emergency Response Centre in Stephenville) and with respect to moving forward on major policy issues.

With regard to the latter, the Marine Institute and the College of the North Atlantic have agreed to submit a joint position to the Commissioner respecting:

- i. Implementation of Applied Degrees, and
- ii. Development of the Marine Institute/Engineering Technology Centre Campuses on Ridge Road

4.2 Applied Degrees

4.2.1 Continuance of the Post Diploma – Baccalaureate Model for Applied Degrees

The White Paper of 1990 saw the Marine Institute affiliated with Memorial University while retaining its distinct identity. By means of this affiliation, it was intended that the Institute would be able to develop its own degree programs. Following affiliation in 1992, the Institute moved to develop its first degree program, the Bachelor of Maritime Studies (BMS), based upon a model that retained the Institute's marine-focused diploma programs and added an articulated group of existing University courses in order to create a four-year program. This program was launched in 1995.

The concept for an articulated Bachelor's degree for applied science and engineering technologists, completing programs that did not readily lead into the BMS, also originated during the late 1980's and early 1990's, with an initial proposal drafted in 1993. A stakeholder survey at that time showed overwhelming interest in the proposal and the Bachelor of Technology program, appropriate to a wide range of both engineering technology and health science technology diploma programs at both the Marine Institute and the College of the North Atlantic, was designed and received Senate approval in 1997.

The Bachelor of Maritime Studies and Bachelor of Technology programs are designed to be completed after graduation from a diploma program. There is a strong demand for the program with a majority of students being employed and wishing to complete the course requirements on a part-time basis. In addition, many live in rural areas or outside the Province. In response to this demographic and with funding support from the Canada-Newfoundland Agreement on Human Resource Development, the programs have been established with no on-campus residency requirement and with all required courses available on-line.

Enrolments in the two programs, particularly in the more broadly based Bachelor of Technology program, have been substantial, with around 260 graduates since their introduction. Most recently, articulation agreements with a number of Canadian colleges have resulted in growth in admissions of out-of-province students. In addition, a number of Chinese students have enrolled in the program, both on-campus and in China, as a result of a partnership with the College of the North Atlantic and others.

The existing Bachelor of Maritime Studies and Bachelor of Technology programs continue to provide the opportunity to earn a degree to both former College of the North Atlantic and Marine Institute graduates, and to graduates from accredited diploma programs offered by partner colleges. It is proposed that these programs would continue while demand exists, and that they be actively marketed within the partner institutions and to professional associations, particularly in provinces where other technical/applied degree programs are not available.

4.2.2 Development of Integrated Applied Degree Programs

Concept

It is proposed that new integrated technical/applied degree programs be developed by the Marine Institute in collaboration with the College of the North Atlantic. This will enable the Institute and the College to respond to new programming opportunities in evolving technical areas and to create appropriately sequenced learning while satisfying the needs of the labor market and the demands of students and parents for technical education at an undergraduate level.

Rationale

The Bachelor of Maritime Studies and Bachelor of Technology programs were an innovative response to evolving national and international trends in technology education and to a growing need for technology credentials appropriate to expanding career advancement opportunities for technologists. These trends are continuing, with rapid technological change having a significant impact in the workplace. A broader range of skills is expected of technical personnel entering

the workforce, while mid-career technologists are increasingly responsible for technology management activities. Frequently, technologists are expected to participate in research teams, undertaking tasks appropriate to Master's level education. During the last decade, these changing workplace demands have begun to be reflected in technical education, and among Canada's economic competitors an undergraduate degree is now seen as an appropriate credential for technologists' career entry.

Such programs are designed to prepare their graduates for professional technical careers in which further advanced study and directed research activities will be required. Applied degree credentials differ from what has become a norm for Canadian undergraduate education and require a number of different types of achievement. Graduates are expected to have:

- a comprehensive knowledge and understanding of the content and method of a particular technical discipline, based upon the requirements necessary for professional entry, and the ability to apply this knowledge in the workplace;
- the ability to critically review and assess materials and to identify, analyze and solve technical problems;
- the ability to manage their own learning and to work independently as well as in a team setting;
- a number of ancillary attributes including significant literacy, numeracy, communication and IT skills

In order to ensure that these requirements are met, well-designed integrated programs are required that provide students with appropriately sequenced learning activities and that provide an undergraduate degree exit point appropriate to technical career entry and advancement. Programs in British Columbia, Alberta and, most recently, Ontario, are evolving in this direction. Background information on standards for Applied Degrees in Ontario is included as Attachment 2. Similar opportunities can and should be made available to students in Newfoundland and Labrador.

Integrated Technical/Applied Degree Program Structure

Each program would lead to an undergraduate technical/applied undergraduate degree and would include selections from a matrix of generic core, common core and program specific courses (including perhaps elective courses). This would enable creation of career-focused programming within a cost-effective, efficient delivery system.

- course-based – 40 courses (120 credit hours) – plus work terms as appropriate
- designed to develop and achieve skills and knowledge expected of applied degree program graduates
- course sequencing and integration designed to achieve, as far as possible:
 - appropriate progression of learning
 - maximum commonality early in programs
- course content appropriate to career entry requirements and meeting national standards to ensure professional mobility
- honours degree option for students seeking graduate school admission;
- course delivery by College of the North Atlantic and possibly Grenfell College
- possibility of advanced technology or technology management streams
- maintain the academic standards of the participating institutions

Graduate Profile

- graduates will possess the skills and knowledge (indicated above) expected of individuals graduating with an undergraduate technical/applied degree

Program Scope

Dependent upon specific student and industrial demand along with resource availability for program development, it is anticipated that existing College and Institute applied science/engineering technology, health science technology, and marine technology programs will evolve into integrated technical applied undergraduate degree programs. As well, a number of new program initiatives

will be developed at this level including those in oceans technology at the Marine Institute and in the areas identified by the College of the North Atlantic.

Opportunities and Challenges/Accessibility

The creation of technical/applied degrees will allow the Institute and the College of the North Atlantic to offer students the means to pursue career opportunities in emerging technical areas. Collaboration with the College of the North Atlantic is key to articulating clear educational pathways emphasizing life long learning while effectively creating a seamless network of technical and academic education within Newfoundland and Labrador. In addition, this will provide the means for the College of the North Atlantic and Memorial University (Marine Institute) to expand existing international relationships and to develop new ones.

The Marine Institute is an organization with a philosophy, focus and a range of activities providing technical education and training in response to ongoing and emerging industry requirements. The Institute now has the intellectual capacity and design infrastructure necessary to develop and deliver technical/applied undergraduate degree programs. The evolution of the academic relationship of the Institute within Memorial University provides the academic basis for the Institute to lead new degree program initiatives in a manner consistent with its educational philosophy.

4.3 Development of the Marine Institute/Engineering Technology Campus-Ridge Road

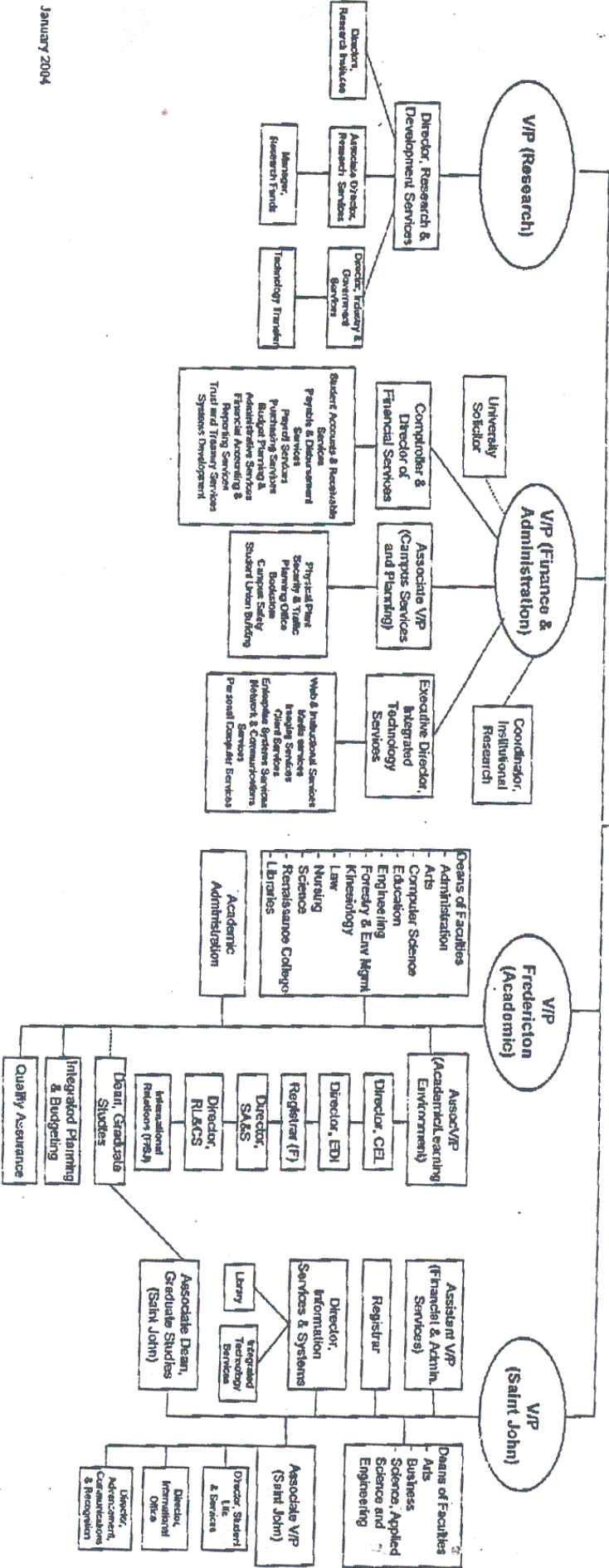
The organizations agree that there needs to be a major infrastructure development initiative to position the Marine Institute and the Engineering Technology Centre to meet the emerging opportunities and challenges for programs, applied research and industrial assistance in support of the economic development of the Province.

The infrastructure development requirements of the Engineering Technology Centre will be presented in the submission by the College of the North Atlantic.

The infrastructure development requirements of the Marine Institute will be identified in the Vision 2020 process described in Section 2.2. Establishment of a multi-year infrastructure development fund to lever funding to the fullest extent from other government programs and from industry to purchase/build world-class infrastructure and state-of-the-art technology will be a critical element in attaining this vision.

Attachment 1

Organizational Structure
University of New Brunswick



Attachment 2

Applied Degree Standards - Ontario

7. Program Review Standards

All Ontario College applicants seeking ministerial consent to offer an baccalaureate degree programs in applied areas of study or any part thereof must undergo a program quality assessment to determine whether the proposed program meets the board's criteria.

The following program quality standards will apply to programs taught by various means, including courses or programs that are designed specially to serve students at a distance.

The board will assess the quality of proposed degree programs in accordance with the following board standards and ministerial requirements. In cases where the applicant seeks ministerial consent to offer a part of a degree program, the board will assess the proposal in the context of the entire degree program.

7.1 Program Structure

The Board expects that degree programs in applied areas of study offered by Ontario colleges will comprise at a minimum:

- eight semesters, or the equivalent, of on-campus studies; and, in addition
- at least one separate, paid, full-time work term (of no less than 14 consecutive weeks) prior to graduation, related to the professional field of study.⁵

All components of the program must be submitted to the Board for review and recommendation to the Minister. If an Applicant wishes the Board to consider the appropriateness of an alternative minimum program structure, it should explain any deviation from the Board's normal expectations for the structure of a Baccalaureate Degree in an applied area of study.

⁵ When a paid work term is not feasible, the board may consider proposals for a full-time unpaid work term of comparable length to meet this requirement.

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7.2 Board Standards

1. Program Degree Level
2. Admissions, Promotion, Graduation
3. Program Content
4. Program Delivery
5. Capacity to Deliver
6. Credential Recognition
7. Regulation and Accreditation
8. Program Evaluation
9. Academic Freedom and Integrity
10. Student Protection

7.3 Minister's Requirements

Applicants must demonstrate conformity with the Minister's "Applicant Acknowledgement and Agreement," the *Directives and Guidelines for Applying for Ministerial Consent Under the Post-secondary Education Choice and Excellence Act, 2000*, any regulations under the act that may be in effect, and the Minister's specific directives regarding Ontario College baccalaureate degree programs in applied areas of study.

All applications will be assessed against all of the board's standards and all of the Minister's requirements to evaluate their acceptability. Members of the Quality Assessment Panel may request additional information from applicants to assist assessors in their obligation to provide their best judgement on the quality of applications.

The board will ask quality assessors to evaluate the extent to which each application meets the board's standards and the Minister's requirements.

7.3.1 Program Degree Level: Baccalaureate Degree in an Applied Area of Study

Baccalaureate degree programs in this category are normally designed to require a level of conceptual sophistication, specialized knowledge, and intellectual autonomy similar to that in an honours or specialist degree program but with the disciplinary content oriented to an occupational field of practice.

Students in applied programs learn by doing, with a focus on preparing for entry into an occupational

field of practice. Such programs incorporate a blend of theory and practice, and normally include a terminal project or other practice-based exercises intended to develop and demonstrate the student's readiness for employment in the occupational field of practice.

In addition to personal and intellectual growth, the programs are primarily designed to prepare students for employment in the field of practice, second-entry professional degree programs, or, depending on the content of the program and the field, entry into either graduate study or bridging studies for an appropriate graduate program.

Degree Standard

BACCALAUREATE DEGREE IN AN APPLIED AREA OF STUDY

This degree is awarded to students who have demonstrated:

Depth and Breadth of Knowledge in the Field

- a. a specialized knowledge and critical understanding of:
 - the principal assumptions, methodologies and applications of the discipline and the field of practice and of the way in which these have developed;
 - the main fields within the discipline, and
 - the discipline's relationship and interaction with other disciplines;primarily but not only as these relate to mastery of the field of occupational practice, at least some of which is informed by developments or needs of the field of practice and/or trends in the discipline.
- b. an ability to interpret and to critically evaluate and apply new material relevant to the field of occupational practice;

Depth and Breadth of Knowledge Outside the Field

a more than introductory knowledge of the distinctive assumptions and modes of analysis of one or more disciplines outside their main field of study and of the society and culture in which they live and work;

Conceptual and Methodological Awareness

a conceptual understanding that enables the student to:

- devise and sustain arguments, and/or to solve practice-related problems, using ideas and techniques, some of which are at the forefront of a discipline or field of practice; and
- describe and comment upon particular aspects of current research or equivalent advanced scholarship in the discipline and/or profession and how these are relevant to the field of occupational practice;

Level of Analytical Skills

an ability to review, present, and critically evaluate qualitative and quantitative data (as appropriate to the area of study), and apply underlying concepts, principles, and techniques of analysis, both within and outside the context in which they were first studied and practiced, particularly within an occupational field of practice.

Level of Application of Knowledge

the ability to

- a. use a range of established techniques and bodies of knowledge to initiate and undertake critical analysis of arguments, assumptions, abstract concepts and data (which may be incomplete);
- b. apply the methods and techniques of the discipline and practice-related experience to extend their occupational competence;
- c. make judgements;
- d. to frame appropriate questions to achieve a solution — or to identify a range of solutions — to a problem in an occupational context;
- e. initiate and carry out occupational projects; and
- f. make critical and practical use of scholarly and professional reviews and primary sources (e.g., refereed research articles and/or original materials appropriate to their discipline and field of practice);

Professional Capacity/ Autonomy

- a. qualities and transferable skills necessary for:
 - employment requiring the exercise of initiative, responsibility and accountability in both personal and group contexts;
 - developing leadership and management skills;
 - decision-making in complex and unpredictable contexts;

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- b. the ability to manage their own learning in changing circumstances, both within and without the discipline and occupation, and to select an appropriate program of further study.

Level of Communications Skills

the ability to communicate information, arguments, and analyses accurately and reliably, orally and in writing, to employers, team members, clients, consumers, and others, using structured and coherent arguments, and where appropriate informed by key concepts and techniques of the discipline and/or field of practice;

Awareness of Limits of Knowledge

an appreciation of the uncertainty, ambiguity and limits of knowledge, and how this might influence analyses and applications based on that knowledge.

Benchmarks for assessing program degree level

1. The program meets or exceeds the learning outcome standards for the baccalaureate in an applied area, and the Applicant demonstrates how the program meets the standard.
2. Assessment of individual student work in the terminal stage of the program, that reflects exemplary, average, and minimally acceptable performance, demonstrates that the degree level standard has been achieved.

7.3.2 Admissions, Promotion, Graduation

The applicant has admissions, promotion and graduation requirements for the proposed program consistent with the postsecondary character of degree-granting organizations and comparable with those of members of the Association of Universities and Colleges of Canada.

Benchmarks for assessing admissions, promotion and graduation

1. Admission requirements are appropriate to the learning outcome goals of the program and the degree-level standard. Admission to a baccalaureate degree in an applied area

of study requires at a minimum an Ontario Secondary School Diploma or equivalent, six university or university/college courses at the Grade 12 level, a *minimum* average of 65 per cent, and additional requirements as programs require.

2. "Mature students" have demonstrated academic abilities equivalent to those of Ontario high school graduates, verified by successful completion of courses at the postsecondary level or an entrance examination. ("Mature students" are applicants who have not achieved the Ontario Secondary School Diploma [OSSD] or its equivalent, who are at least 19 years of age on or before the commencement of the program in which they intend to enrol.)

Transfer Credit/Credential Recognition

3. Applicants who propose to award any type of advanced standing into the proposed program are required to have policies and procedures pertaining to credit/ credential recognition that relate to the type of advanced standing being proposed (including any bridging requirements for certificate/diploma to enter degree programs), and such policies must:
 - a. have as a principal criterion that the credits accepted for admission to a degree program are in proportion to the affinity with and/or applicability to the specialist content of the program and other curricular requirements;
 - b. be fair (award credit where credit is due), reasonable (do not award credit where none is due), and consistent; and
 - c. identify the bases on which such decisions are made, including:
 - i. the minimum acceptable grade or achievement level,
 - ii. any requirements for comparability of program content of earlier studies with that of the proposed program,
 - iii. any limits on the number of credits that will be awarded for credits with and without academic affinity,

A. DESCRIPTIONS OF DEGREE CATEGORIES

The following descriptions are intended to capture the most general aspects of the respective degree levels. It is to be understood, however, that each of these degrees and degree levels applies to an extremely broad spectrum of disciplines and program types.

Some general and honours/specialist baccalaureate degrees are in fields that are very practically oriented (e.g., archaeology, chemistry, geology, microbiology, zoology), while some applied programs are in disciplines that are heavily knowledge and research based (e.g., applied psychology, applied mathematics, applied linguistics, agricultural and applied sciences). The applied/dual-degree distinction at this level is designed to capture the essential features of the differences between these two types of programs while respecting the fact that, whether a program is intended to prepare an individual either for immediate practice/employment in a field of practice or for further study in a discipline, each must meet a substantial and common set of outcomes that have historically been and continue to be critical to and shared by both types of programs within a degree-level educational environment.

At the master's and doctorate levels, the differences in program content and outcome between the "traditional" degrees and those which have a designed applied focus are much subtler. This is usually evidenced by close ties with industry or professional organizations (such as external advisory committees, research tests, formal partnerships, and sponsorship), by the integration into the program of some practical elements (such as management, marketing, or law, information science), and by offering these in a manner that develops and reinforces communication and team skills through working in real or simulated occupational or professional environments. Separate skill and knowledge outcomes for these degree levels are intended to provide increasingly higher levels of knowledge and skills in a discipline and the ability to apply these in any and all relevant occupational, professional and academic environments.

DESCRIPTION	BACCALAUREATE DEGREE: GENERAL	BACCALAUREATE DEGREE: HONOURS/SPECIALIST	BACCALAUREATE DEGREE: PROFESSIONAL AREA OF STUDY	BACCALAUREATE DEGREE: APPLIED AREA OF STUDY	MASTER'S DEGREE	DOCTORAL DEGREE
Overall Program Design and Outcome Expectations	General baccalaureate degree programs are normally designed to require some conceptual understanding of the discipline, but not a deep or specialized knowledge in at least one area of the discipline. Each program typically requires less extensive knowledge than a baccalaureate degree in an applied or professional area of study.	Baccalaureate degree programs in this category are normally designed to require some conceptual understanding of the discipline, and a deeper and broader disciplinary knowledge than a baccalaureate degree in an applied or professional area of study. Students in honours or specialist programs learn by doing, with a focus on exploring their mastery of the discipline through research projects, theses, and other practice-based activities intended to develop and demonstrate the student's readiness for employment in the professional field of practice. Practitioners are often practised within a regulatory framework and programs may require accreditation by a regulatory body or professional association.	Baccalaureate degree programs in this category are normally designed to require a level of conceptual and applied knowledge, specialized knowledge, and professional skills that is an honours or specialist degree program but with an honours or specialist focus on a professional field of practice. Students in professional programs learn by doing, with a focus on preparing for entry into a professional field of practice. Such programs incorporate a blend of theory and practice-based activities intended to develop and demonstrate the student's readiness for employment in the professional field of practice. Practitioners are often practised within a regulatory framework and programs may require accreditation by a regulatory body or professional association.	Baccalaureate degree programs in this category are normally designed to require a level of conceptual and applied knowledge, specialized knowledge, and professional skills similar to that in an honours or specialist degree program but with an honours or specialist focus on an occupational field of practice. Students in applied programs learn by doing, with a focus on preparing for entry into an occupational field of practice. Such programs incorporate a blend of theory and practice-based activities intended to develop and demonstrate the student's readiness for employment in the occupational field of practice.	Professional A professional master's degree program builds on knowledge and competencies acquired during post-secondary education and requires more advanced knowledge and intellectual autonomy than a baccalaureate degree program. Much of the program is designed to be informed by the practice of an academic or professional discipline. Research A master's degree program builds on knowledge and competencies acquired during post-secondary education and requires more advanced knowledge and intellectual autonomy than a baccalaureate degree program. Much of the study undertaken in the master's program is informed by the practice of an academic or professional discipline. Students will have shown originality in the application of knowledge and they will understand how the boundaries of knowledge are being extended. They will be able to deal with complex, systemic, and interdisciplinary issues that will require originality in seeking and solving problems. Professional A doctoral program builds on the knowledge and competencies acquired during post-secondary education and requires more advanced knowledge and intellectual autonomy than a baccalaureate degree program. Much of the program is designed to be informed by the practice of an academic or professional discipline. Holders of the doctoral degree must have demonstrated a high degree of intellectual autonomy, as well as the ability to design and implement projects for the creation and application of new knowledge and to integrate and synthesize knowledge that extends the boundaries of a discipline, usually through original research or creative activity. Research A doctoral program builds on the knowledge and competencies acquired during post-secondary education and requires more advanced knowledge and intellectual autonomy than a baccalaureate degree program. Much of the program is designed to be informed by the practice of an academic or professional discipline. Holders of the doctoral degree must have demonstrated a high degree of intellectual autonomy, as well as the ability to design and implement projects for the creation and application of new knowledge and to integrate and synthesize knowledge that extends the boundaries of a discipline, usually through original research or creative activity.	
Preparation for Employment and Further Study	In addition to personal and intellectual growth, the program may prepare students for more secondary professional degree programs, employment in the field, or employment in a variety of fields. Many of these programs do not prepare students for direct entry into practice and may	In addition to personal and intellectual growth, the honours and specialist programs are normally designed to prepare students for entry into graduate study in the field, secondary professional degree programs, or employment in a variety of fields.	In addition to personal and intellectual growth, the program is normally designed to prepare students for entry into a professional field of practice, or depending on the program, for employment in a regulatory framework or for employment in an appropriate graduate program.	In addition to personal and intellectual growth, the program is normally designed to prepare students for entry into an occupational field of practice, or depending on the program, for employment in an appropriate graduate program.	Graduates will have the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative in complex and unpredictable professional environments. A master's program is typically three to five years in duration (normally 45-60 credits, in the equivalent).	A doctoral program is typically three to five years in length, depending on the field and the report in which a student is publishing (and conceptual depth of research).

UNIVERSITY

