



VISION 2020

The Future of the
Marine Institute

Review of Accomplishments

206



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Please cite as:

Usher, A., Burroughs, R. (2019). *Vision 2020: The Future of the Marine Institute – Review of Accomplishments*. Toronto: Higher Education Strategy Associates.

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This report was commissioned by the Fisheries and Marine Institute of Memorial University of Newfoundland.



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CHAPTER I

The original vision for the future of the Marine Institute

A BACKGROUND TO THE VISION 2020 PROCESS

In 2004, the Marine Institute understood its place within both the oceans industry and the education landscape as a centre of excellence in marine and fisheries technology in Newfoundland and Labrador, and for two decades has striven to become the leading marine institute not just in Canada but in North America. But the Institute was struggling with both enrollment and budgetary problems; it had an idea of where it wanted to be at the end of the next decade, but no guiding document nor a plan to get it there. The purpose of Vision 2020 was to provide the Marine Institute (also referred to as the Institute in this document) with that long-term vision toward which the institution could work. To quote the original document, “This new world, the global oceans economy, is where we are headed.”

At its origins, Vision 2020’s ambitions were simple:

“To be a world-class oceans institute, setting the standard for education, training, innovation, and research.”

Laying a Foundation, 2005.

Vision 2020 was built upon the Institute’s eight values:

- ✿ **Excellence:** that the Institute be recognised as a world-class oceans institution;
- ✿ **Stewardship:** that the Institute promote and lead the environmental stewardship of the oceans;
- ✿ **Service:** that the Institute continue to serve Newfoundland and Labrador’s education and economic development;
- ✿ **Research and development:** that the Institute bridge the fundamental discovery of university research and the commercialisation demands of the industry;

- ✿ **Learning:** that the Institute promote a teaching and learning culture with student academic and career success at its core;
- ✿ **Technology:** that the Institute incorporate technologies into the heart of its teaching, learning, and research so as to remain at the forefront of innovative discoveries and to address the changing needs of the industry; and
- ✿ **Collaboration:** that the Institute nurture its collaborative culture to leverage its partnerships with the broader Memorial, education, industry, and government communities.

Vision 2020 was endorsed by all major stakeholders in 2005, including the Institute’s employees, its Industry Advisory Committee, the Memorial University Board of Regents, and the Provincial Cabinet. New leadership at the Institute, who started shortly after the launch of Vision 2020, determined that the vision would be implemented with the guidance of three 5-year implementation plansⁱ, enabling the Institute to adapt to changing fiscal and political realities, such as the rise and subsequent drop in the price of oil and the growth of the ocean technology sector.

To the guide the Institute through this long-term process, Vision 2020 identified three elements essential to the realisation of its ambitions: first and foremost, the Marine Institute would remain dedicated to the oceans and the waterways that served them. Secondly, the Institute would develop its academic programs and its research agendas to ensure not just sustainability, but that the needs of the various marine sectors working in the oceans economy were met. Thirdly, the Institute would continue to integrate itself into the Memorial University structure. This final element was seen in the original vision as an essential contributing factor to the success of the Institute’s goals. Not only did the Marine Institute envision its future as a quasi-translator between the traditional research objectives of a university and the specific, commercial demands of industry, it saw itself as a developer of the human resources necessary for the anticipated business spin-offs from the research conducted at the Institute and elsewhere throughout the Memorial community.

The question of stability was essential at the start of the Vision 2020 implementation process: much of the Marine Institute’s relationship with Memorial was defined by high turnover at the senior administration level, which required the Institute to repeatedly make its case as a specialised entity that required a dedicated and separate funding envelope. Internally, the Institute was starting to progress toward modernity with the introduction of a new School of Ocean Technology, as well as the \$1 million purchase of its own training vessel that would provide a new cross-cutting component to the Institute’s seagoing programsⁱⁱ. Atlantic Innovation Fund monies also allowed the Institute to update its simulators at the Centre for Marine Simulation – then and now a core component of the Institute’s industrial business model.

The Institute envisioned a provincial economy driven by ocean industries, with the training and education to support these industries provided by the Marine Institute and its partners elsewhere in the Memorial community. The series of internal multi-year implementation plans would position the Institute as a Centre of Excellence in marine and fisheries technology, encompassing through its research, industrial, and academic activities all that was required to become not just Canada's foremost fisheries and marine institute, but also the leading and most comprehensive marine institute on the continent. To do so, the Institute would have to re-evaluate its purpose and operations in a series of areas.

Successive implementation plans would group these into five areas:

1. *Students & Programs*
2. *Infrastructure and Technology*
3. *Research and Development*
4. *Internationalisation & Outreach*
5. *Conditions for Success.*

It would firstly revamp its academic programming to offer a full range of education opportunities from short-course, industrial training courses all the way up the academic pyramid to doctorates (see right). Major changes to the Institute's academic programming would include the conversion of certain programs into applied bachelor's degrees, as well as the introduction of graduate programming at both the master's and doctoral levels. To support this, the Schools of Maritime Studies and Fisheries would be joined by two new Schools of Ocean Energy and Ocean Technology – the former of which would be the hub of all research and development on the offshore sector, as well as the emerging renewables sector, while the latter would house the Institute's expertise in geomatics and communications, and develop capacity in underwater technology and ocean mapping.



As part of its continued R&D enhancements, the Institute predicted that it would not only be operating in new marine sectors such as biotechnology, fish health, and pollution response,

but that it would also be doing so in geographic settings new to the Institute. Vision 2020 anticipated the establishment of an entity called MI North to oversee outreach across all three territories and partnerships in Russia, Finland, Alaska, and Greenland. Its international presence would

not be limited to the Arctic; Vision 2020 saw the US' eastern seaboard and Pacific Northwest as locations for potential satellite offices, mandated to link the Institute with the industrial activities of those regions. Furthermore, the Institute projected the demand for its R&D capacities in Brazil, the Caspian and South China Seas, and Russia's North Pacific regions – all in response to the boom of offshore petroleum projects in the early 2000s. With relationships across the world, Vision 2020 proposed that the Marine Institute be the manager of the “largest global graduate placement program in Canada”ⁱⁱⁱ.

Ultimately, Vision 2020's goal was to position the Marine Institute as a World Oceans Institute operating in the 'global oceans economy'. This document will detail the efforts made by the Institute to realise Vision 2020 and determine whether it has been successful in doing so.

CHAPTER II

Understanding the implementation plans and what happened

A BACKGROUND TO THE LAST 10 YEARS AT THE MARINE INSTITUTE

At the start of the Vision 2020 process, the Marine Institute was in the process of procuring its own research and training vessel, establishing an Office of Research and Development, establishing a School of Ocean Technology, and restructuring the then-called Division of Degree Studies and Research.

The formation of the School of Ocean Technology (SOT) in 2007 was integral to fulfilling one of Vision 2020's key pillars: the establishment of the Marine Institute as a centre of excellence in marine and fisheries technology. The School's own research centre, the Centre for Applied Ocean Technology (CTec), housed at the Institute's Holyrood facility, allows the Marine Institute to be a leader in one of the five primary themes of the oceans economy – ocean technology^{iv} - and puts into practice the Institute's principles such as innovation, collaboration, and research. The Centre also contributes to positioning the Institute as a leader in the field through its *Journal of Ocean Technology* and annual technology conference that it hosts, "Ocean Innovation". SOT is also the only remotely-operated vehicle (ROV) training institute in North America and the only post-secondary institution in the world that offers such training.

In addition to the School of Ocean Technology, the Institute houses a suite of specialities within its two other schools and more than half a dozen research centres. The School of Fisheries, for example has been a major partner of the fishing industry on which the province relies extensively, providing research and development capacities for the industry not just in Newfoundland and Labrador, but also across the country, as well as globally. The School of Maritime Studies – the largest of its kind in Canada – is long established with its own culture and identity in the region. It not only trains all of the Institute's seagoing students but was also at one point described as "the flagship" of the Royal Canadian Navy's (RCN) training system, providing courses to marine engineers and naval combat systems operators.

One of the major changes in the past decade has been the discontinuation of the RCN's training program at the Institute, which is now taught within the RCN. This resulted in the loss of a significant revenue stream and a primary supplier of students for the Marine Institute. Though the withdrawal of RCN students was foreseen and spread over several years, the mental shock of such a shift in both operational requirements and student presence on-campus appears to continue to trouble the Institute. Despite this, the Institute continues to be a valuable partner for the RCN and is working to develop new curriculum models for future naval training programs.

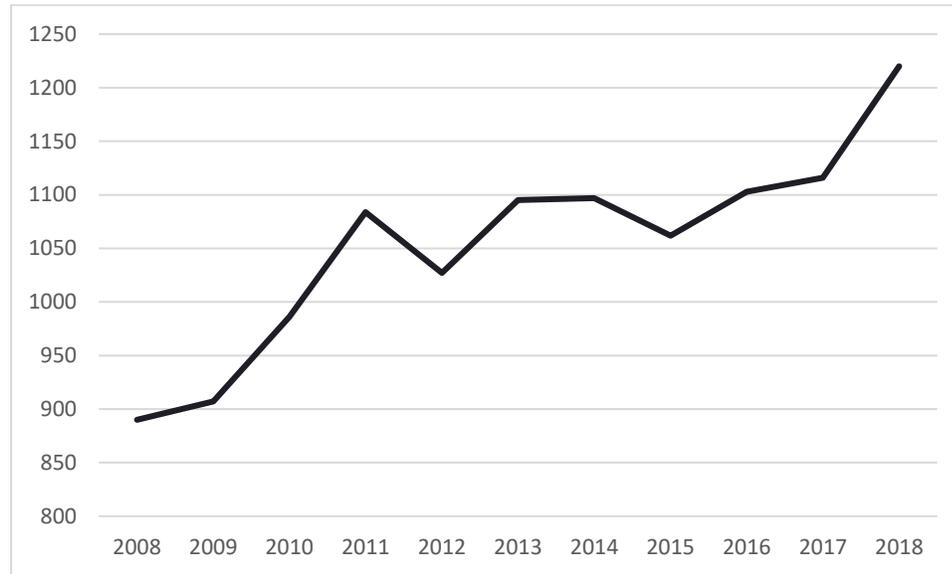
For decades, due in large part to the Institute's close connection with industry and its collective commitment to excellence in training and applied research, the oceans economy was the near-exclusive purview of the Marine Institute. High-profile events in the past several years indicate the stature the Institute holds within the global oceans-related education community. In 2012, the Institute hosted the annual meeting of the International Association of Maritime Universities, an organisation in which the Institute plays an active role and to whom the Institute and Memorial have provided two former presidents. The World Seafood Congress was held at the Marine Institute the year after, and in 2014, the world's largest oceans conference came to St. John's, again hosted at the Institute. All would confirm that the school's reputation within the oceans sector is well established.

However, the Institute is facing increased competition to its sole claim of expertise over the oceans sector. Elsewhere in Canada, research capacities and expertise at other institutions are challenging the positioning and superiority of certain elements of the Institute's operations: the University of Ottawa's understanding of and research

into the Arctic continues to grow, while Dalhousie University is developing competencies in both maritime studies and marine safety. Such challenges have in some cases presented new opportunities for the Institute to better or redefine itself, while others have created cause for concern. For example, the Institute now faces external competition in some of its training programs from private providers, resulting in fewer industry short-course students. The downturn in the price of oil has also compounded this, as companies are less likely to send their employees on "option" (albeit industry standard) courses. In other instances, with no comparator institution in terms of comprehensiveness, the Institute has struggled in some respects to adapt to the university and its incentive structure. Presenting a convincing case that the Institute's scientists and experts require a specialised research platform separate from the university's centralised systems has been one particularly problematic area. Likewise, enrollment briefly declined when student enrollment was momentarily centralised within the university in 2004, removing from the Institute the opportunity to articulate itself or its own selling points.

The Marine Institute's overall enrollment numbers have seen steady growing since the re-integration of recruitment responsibilities^v. Rapid growth from 2009 to 2011 brought enrollment to its current numbers, which average around 1,100 students per-year – a 25 percent increase from 2008. However, while growth appeared to have stagnated for much of the decade, a substantial growth in enrollment for 2018-19 has resulted in a 12 percent increase since 2011. Low growth was particularly prominent in undergraduate and diploma programs, whose enrollments either stagnated or declined recently. Again, a 25 percent increase in enrollment at the undergraduate level for 2018-19 has

Figure 1: Total headcount enrollment at the Marine Institute, 2008 to 2018



reversed some of these trends. In 2018, the Institute's most popular credentials below the graduate level were the Diploma of Technology (largely for marine engineering and nautical science), the Bachelor's Degree, and the Technical Certificate, respectively. Substantial growth in graduate enrollment numbers has also allowed the Institute to maintain fairly consistent student numbers. This has been the greatest area of growth for the Institute and has steadily increased since a concerted effort to enhance and promote graduate programs began in 2010. Online and research-based master's students have been the primary source of new students to the Institute, compensating for losses in other programs. This is particularly noticeable since the second implementation plan, which saw the introduction of new graduate programs (see Figure 2), such as the Master of Maritime Management and Master of Technology Management, and new diploma programs through the School of Ocean Technology.

Much of this growth has come from the Master of Technology Management pro

gram, which has seen an increase of 59 percent in the past 5 years (see Figure 3). The number of students enrolled in the program has grown by a factor of nine since its first offering in 2010. The effect of graduate enrollment on overall enrollment is even more evident when considering the distribution of students within the different credentials from 2008 compared to 2018. In 2008, the majority of students (almost 70 percent) were registered in diploma or certificate programs. In 2018, although these students still constitute half of the total student body, graduate students now account for almost 20 percent of students at the Marine Institute (see Figure 4).

The growth in undergraduate learners and on-campus graduate students present new and real challenges for the Marine Institute, such as physical space – in particular for research-based graduate students. In addition, the number of distance learners (mostly online master's students) has also grown, increasing the need for academic and technical supports for both students and faculty.

Figure 2: Increase/decrease in headcount enrollment at the Marine Institute by credential, 2008 to 2018

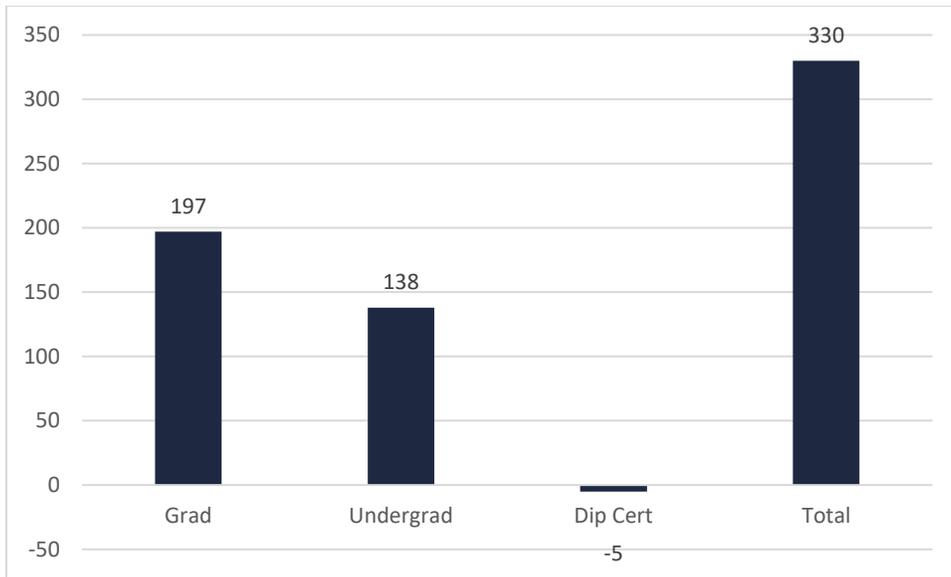
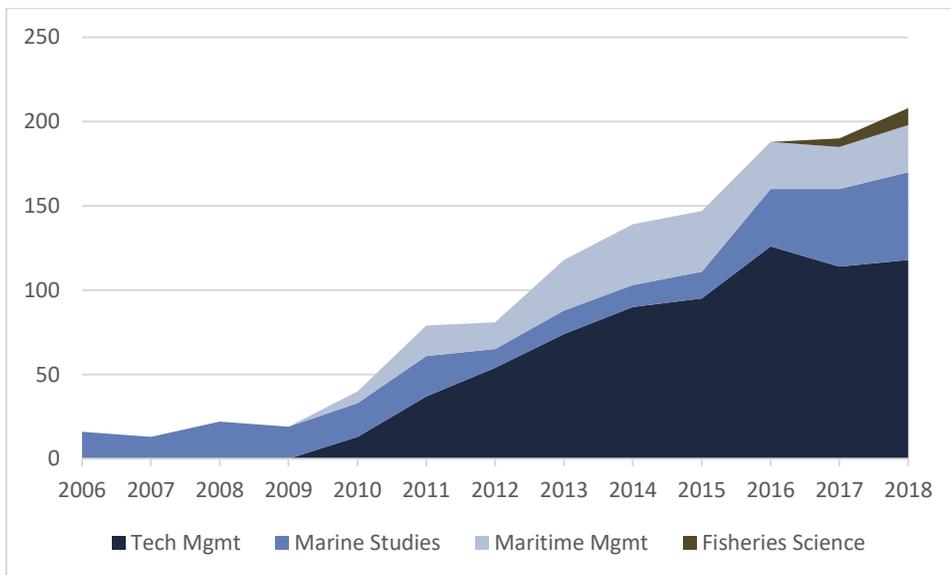


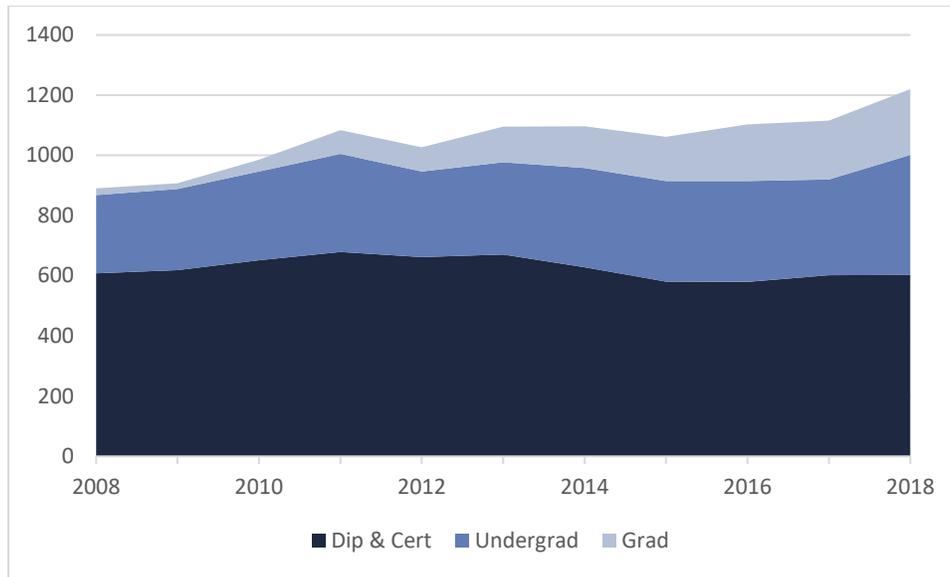
Figure 3: Headcount enrollment in master's programs, 2008 to 2018



The Institute is also a fully commuter campus^{vi}, so providing academic and social integration at the cohort-level to develop a sense of community on-campus continues to present challenges. All of this is overseen by Student Affairs, which is responsible for recruitment and enrollment, work-integrated learning (WIL), health and wellness, and student supports including academic transitions, risk management, and disability services. Student Affairs is also

responsible for managing the relationship with the student union. The Student Affairs portfolio and the director position were created in 2013 with a direct reporting structure to the Associate Vice-President, Academic and Student Affairs^{vii}. The most positive change has been the way in which the Student Affairs portfolio has operationalised on-campus. All activities are now centralised within a single entity with the flexibility and skillset to respond to

Figure 4: Headcount enrollment at the Marine Institute, by credential, 2008 to 2018



changing student demands as students themselves articulate their needs better and more clearly.

Prior to 2007, the Institute reported to the Vice-President Academic portfolio and competed annually among up to 20 university-wide priorities all in search of funding. The Institute's importance both within the university structure and within the province's postsecondary landscape was further illustrated under the new leadership, as it was identified as one of the university's three chief priorities to receive strategic investment funding from the provincial government. Other internal changes at the Institute and the University, such as the creation of the multi-campus model and elevating the most senior executive position at the Institute to that of a Vice-President of Memorial (with responsibility for the Marine Institute), further allowed the Institute to professionalise its leadership structure. The Institute also deemed it vital for the success of its degree programming that the school's chief academic officer to have credibility on the other Memorial campuses, in order to articulate the Institute's purpose and contributions to the province's education system as-a-

whole. Hence, the elevation of the position to the rank of AVP and the Heads of Schools as equivalent to decanal positions elsewhere within the university structure.

The change in the Institute's position within the university coincided with the province's uptick in offshore-supplied riches. As the operating grants provided by the provincial government grew, the deficit that had for several years concerned the senior leadership at the Institute were addressed through the strategic funding increases to the base budget. Even when public contributions started to decline again in 2014 because of the decline in the price of oil and that effect on the public treasury, the Institute had started to diversify its revenue streams, seeking more international contracts and reducing its dependency on the provincial marine industries.

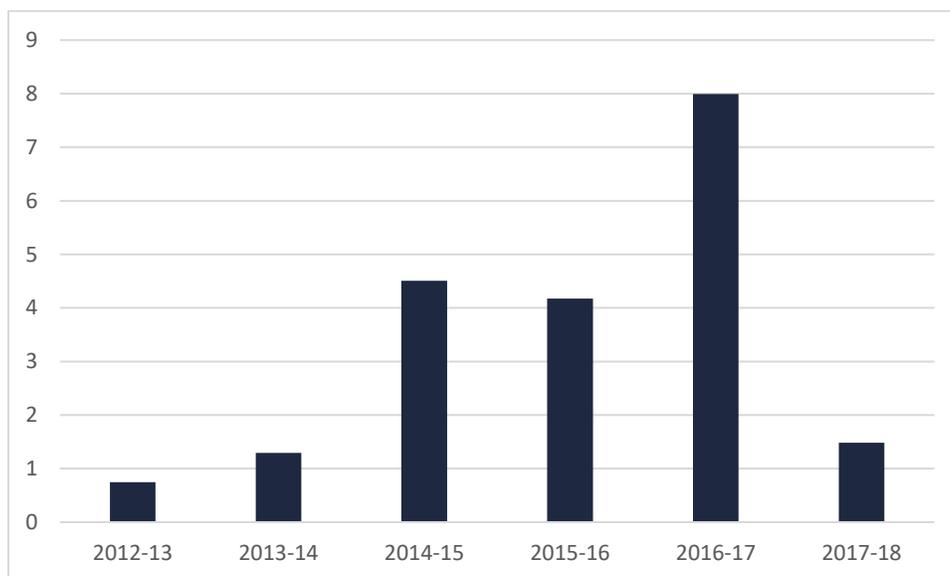
In addition to revenue diversification, Vision 2020's second implementation plan included the establishment of the Centre for Fisheries Ecosystems Research and the enhancement of the Centre for Marine Simulation, as well as the expansion of the Holyrood Marine Base (soon to be called,

“The Launch”). The Institute also committed to further developing its education and applied research functions in the Town of Holyrood. The Holyrood facility, for which there are plans to include another building to house industry collaboration, research, and classroom spaces, joins the extensive physical and technological infrastructure that constitutes the Marine Institute. Its main campus and academic building, where the central administration and School Heads are housed, along with the majority of academic programming, is in St. John’s at the Ridge Road Campus. The Institute has further facilities at Foxtrap, where its firefighting and ocean safety components from the Offshore Safety and Survival Centre (OSSC) are housed. Holyrood also hosts the Institute’s vessel fleet and is the launch-point for the OSSC’s at-sea components. The Institute also has the Safety and Emergency Response Training (SERT) Centre in Stephenville, where it delivers its technical certificate in fire rescue and some community-based education programs. The Institute maintains offices

in Lewisporte, St. Albans on the Coast of Bays, and in Iqaluit, NU.

For much of the Institute’s applied research and program delivery, its capital infrastructure, spread out across these facilities, is mission critical. The Ridge Road Campus contains the largest flume tank in the Americas, a 24/7 aquaculture facility, a series of state-of-the-art simulators including an offshore operations simulator, three dynamic positioning simulators and a full mission ship’s bridge simulator, a hydrostatic test chamber, an acoustics tank, and a food processing plant. In many ways, the Institute’s core business – whether this is defined academically or project-based – is capital intensive. For the Centre for Sustainable Aquatic Resources (CSAR), marketing the flume tank, that it is ready and open for business, is an instrumental aspect of their business plan. This is even more evident for the off-site facilities such as Foxtrap, where the OSSC houses its indoor training tank and helicopter underwater escape trainer.

Figure 5: Major infrastructure expenditures from plant funds, in millions of dollars, 2012 to 2017

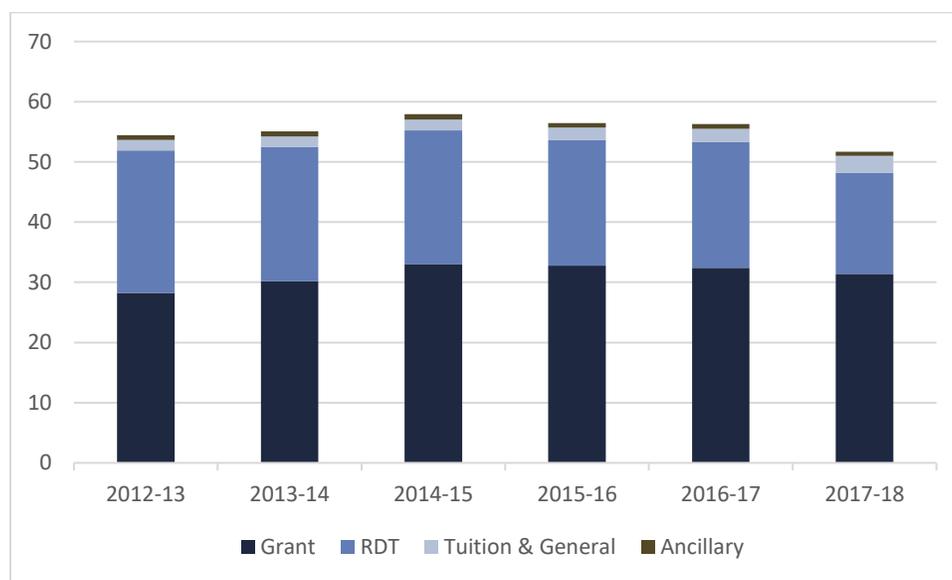


Since 2011, the Institute has spent a cumulative \$24 million on its major capital infrastructure projects^{viii} (see Figure 5), which include storage facilities and revitalisation at the OSSC, new simulators for the ROV programs at the Ridge Road Campus, further construction of the facility for the offshore operations simulator and the simulator itself, and since 2015, the construction of the marine base at Holyrood. This period also coincided with the significant growth in the formalisation of the Institute’s research capacities through the creation of two positions within the Office of Research and Development to support further collaboration with Memorial’s Office of Research at the St. John’s campus, as well as enhance grant-writing functions at the Institute. In that time, ‘Research’ funding more than tripled, peaking at \$9 million in 2013-14, including its first incidence of NSERC funding.

Non-grant revenue – that is, all monies generated by the Institute that do not come from the provincial government – has been decreasing for the past five years (see Figure 6). The decline in project revenues mirrors that of the Institute’s overall gross revenues, which have dropped 22 percent since 2012. The Institute’s primary non-grant revenue generators – the three Schools, the Division of Ocean Safety, and MI International – have experienced a decline in revenue by more than 20 percent since 2012; overall project revenues from these units are down by 30 percent over the past five years. The School of Maritime Studies is the only School whose revenues have decreased by less than 10 percent in this time

One positive outcome of this ongoing pursuit of revenue appears to be the development of very respectable consultancy

Figure 6: Total overall revenues from primary sources, in millions of dollars, 2012 to 2017



competencies – evidenced in the number of contracts the Institute’s various units sign on an annual basis. This is most recognisable in the Institute’s international activities, which are coordinated by MI International. Through MI International, the Institute has a long history of international

private sector and development consulting, with strong relationships with the formerly-called Canadian International Development Agency (now Global Affairs Canada) and other national and multinational development assistance portfolios around the world. Including faculty and

staff on international projects also plays a significant role in diversifying the Institute's research, development, and training (RDT) portfolio. In 2011-12, the Institute managed almost 20 projects in more than a dozen countries, with further projects

across Africa, Southeast Asia, and the Caribbean the following year. The number of projects has grown by 50 percent since then: in 2017-18, MI International led 31 projects overseas.

Figure 7: Total RDT revenues, by major unit, in millions of dollars, 2012 to 2017

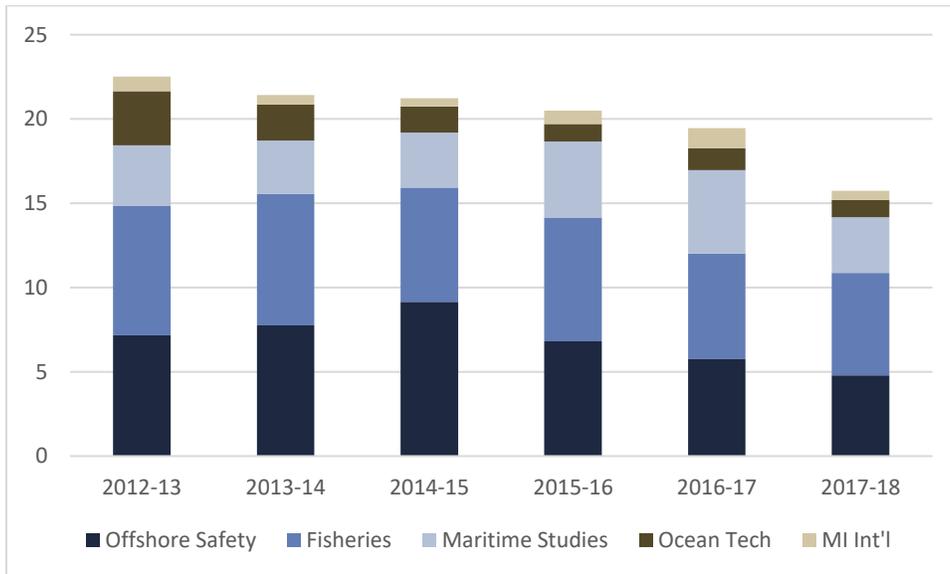


Figure 8: Total research revenues, by Research Centre, in millions of dollars, 2012 to 2017

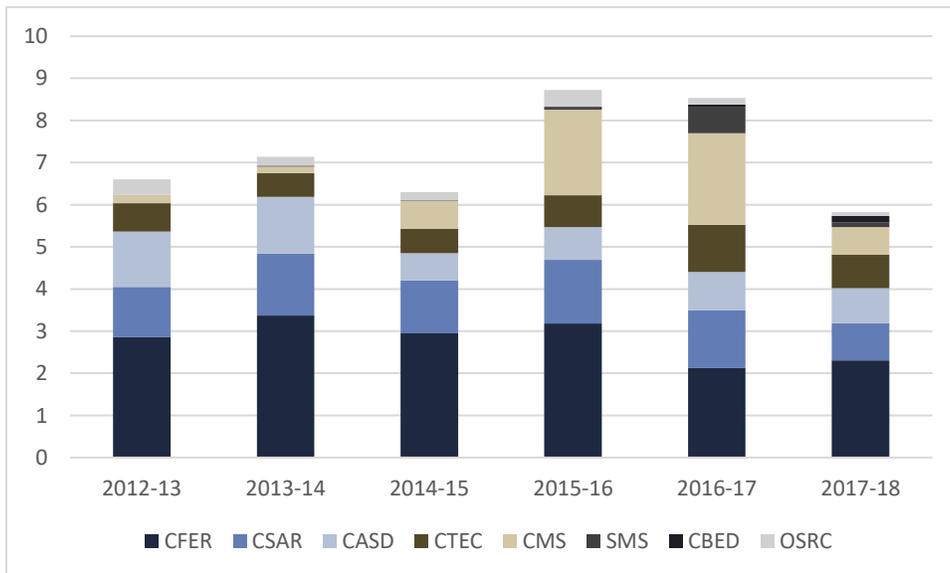
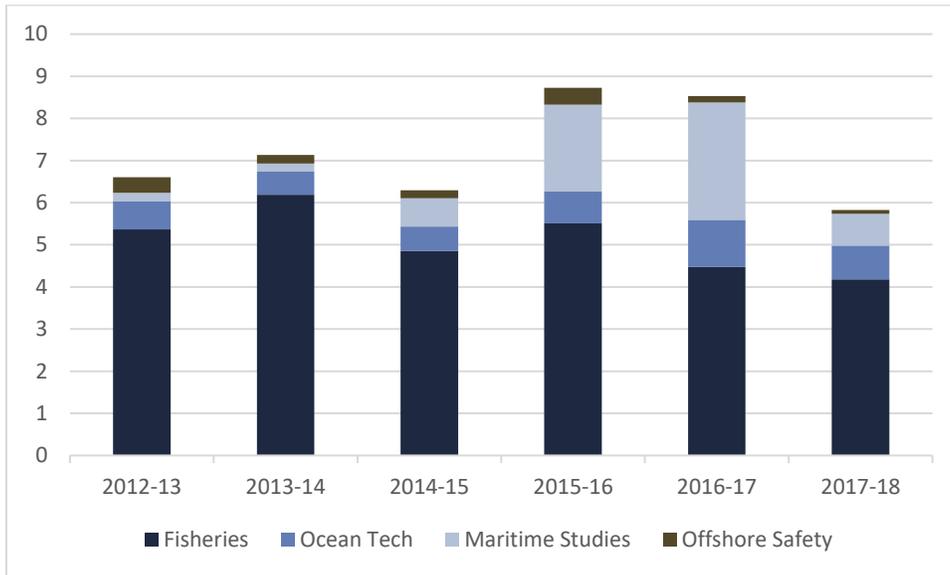


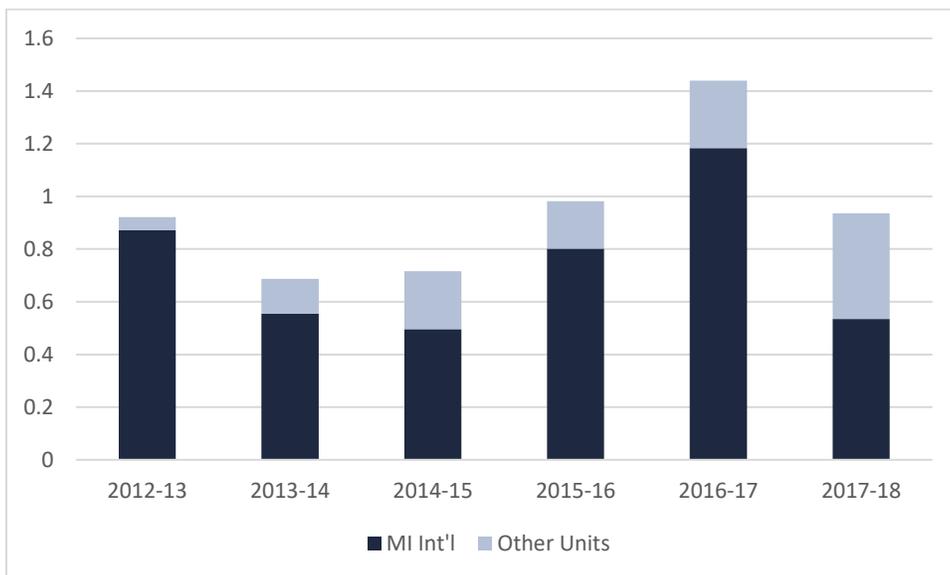
Figure 9: Total research revenues, by School, in millions of dollars, 2012 to 2017



Up to 12 percent of Institute employees (30 to 40 personnel) in any given year are engaged in international work. MI International aims to provide four new employees annually with international experience, mostly by facilitating outbound mobility. It

does so by identifying faculty members with less-developed international experience and incorporating their expertise into project bids. Occasionally, the office also attaches students to projects to grow their intercultural competencies.

Figure 10: International RDT revenues, in millions of dollars, 2012 to 2017



Although MI International has never been singularly focused on the enrollment aspect of the Institute's internationalisation,

it does have an international student coordinator among its staff. It has also supported overseas recruiting efforts,

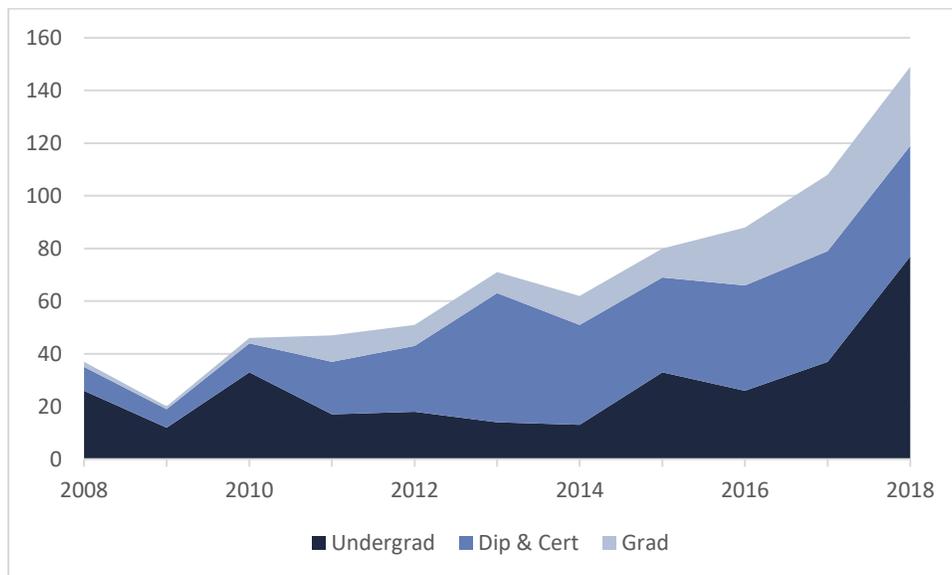
which have expanded to include countries such as China, Norway, Chile, as well as countries in the Caribbean and Southeast Asia – namely Singapore, Vietnam, and Malaysia. Consequently, the number of international students enrolled at the Institute has grown over the past decade and international students now account for roughly 10 percent of the Institute’s student body.

China remains the largest single source of international students for the Institute, accounting for roughly one-half of its international student body in 2018-19. For the past decade, China has been the largest source of international students at the Marine Institute, though the proportion of Chinese students has diminished in that time due to increased diversity.

Table 1: Top 5 source countries of international students at the Marine Institute, 2008 to 2017^{ix x}

2008		2013		2017	
China	57%	China ^{xi}	17%	China	47%
United States	5%	India	13%	India	8%
India	5%	United States	11%	United States	8%
Saudi Arabia	5%	Nigeria	8%	Nigeria	7%
Mexico	5%	Iceland	8%	Bahamas	5%

Figure 11: International student enrollment, by credential, 2008 to 2017



Interestingly, the rate at which international student enrollment is growing substantially outpaces that of domestic students and indeed the Institute’s student body overall. While overall enrollment had been fairly stagnant from 2012 to 2017, growing by less than 9 percent international students increased in number by 110 percent. This reflects the growing presence of international students in the Marine Institute community. In 2018-19,

registration for domestic students increased by 6 percent from the previous year, while international student enrollment grew by almost 40 percent, helping the total student body grow by 9 percent. An important observation is the shift in the types of credentials pursued by international students. In 2008-09, the overwhelming majority of international students (70 percent) at the Institute were registered in a bachelor’s degree program.

In 2017-18, international students were more evenly distributed across the three major credentials: one-quarter of international students are enrolled at the graduate level, while 34 percent are registered in bachelor's degrees. In 2008, the two most popular programs for international students were Bachelor of Technology and Diploma of Technology (Naval Architecture). They accounted for 75 percent of international enrollments. In 2018, Bachelor of Technology students constituted half of all international students at the Marine Institute. Other popular programs were: Master of Technology Management (7 percent), Advanced Diploma in Food Safety (6.7 percent), and Diploma of Technology in Marine Engineering (5 percent).

DEFINING RESEARCH AT THE MARINE INSTITUTE

Historically, the research enterprise has been a challenge to define at the Marine Institute. Internally, the close connection between applied research, industrial response, and general consulting work – while contributing to the Institute's success and earning it a burgeoning reputation – has typically been conflated into an overarching “Research” umbrella. This report seeks to clarify that umbrella.

As such, this report will refer to the entirety of the Institute's project revenue generating activities – including applied research, industrial response, and consultancy activities – as *Research, Development, and Training* (RDT). RDT revenues constitute a significant portion of non-grant revenues (78 percent in 2017-18, this historically RDT revenues have also constituted more than 85 percent of non-grant revenues).

Tracking research-specific revenue generation in accurate detail is problematic prior to 2012-13, though a change in the Institute's internal budgeting and financial reporting process that year has rendered it clearer to identify research-specific revenues from the past five years. By grouping projects into different types (eg, research, operating or services, training, etc), the new model reveals that in the past three years, research revenues actually accounted for 25 percent of RDT monies. This is double the average proportion of research revenues from 2012 to 2014. This represents a substantial growth over the past several years in the proportion of RDT funds stemming from research projects.

Financial trends further indicate that research revenues are also accounting for more of the overall revenue generation at the Marine Institute, increasing from an average of 12 percent between 2012 and 2014 to an average of 22 percent between 2015 and 2017.

CHAPTER III

Assessing the Institute's efforts in realising Vision 2020

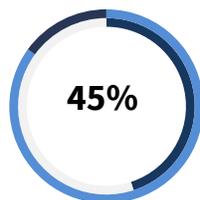
AN ANALYSIS OF IMPLEMENTATION FROM 2015 TO PRESENT

Summary of Assessment

From what can be observed, the Institute has met the broad objectives as set out in its Vision 2020. By its own measure – it graduates students from every province and territory across the country – the Marine Institute is Canada's foremost fisheries and marine institute. By the nature of the robustness of its academic program and R&D operations, as well as its unique capital assets, the Institute is also the most comprehensive marine institute in North America. Though the Institute may have comparator institutions for its individual programs, or its Schools or Research Centres, as a whole the Marine Institute stands alone, perhaps even globally.

A review of the Institute's 2015 implementation plan identified more than 90 individual action items to be completed by the end of Vision 2020. Of these items, 85 percent have already been or are on-track to be accomplished. In some respects, action items were designed without clear markers of termination (ie, using language such as, "continue doing" or "maintain capabilities in"), but there is evidence to suggest that the Institute is doing what they said they would.

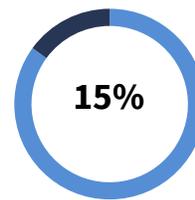
Accomplished



Ongoing



Unclear or Incomplete



The Institute's progress through the five major areas of priority as defined by the 2010 and 2015 implementation plans can be summarised as such:

Students & Programs <ul style="list-style-type: none">• Excellent (<i>Vast majority of action items accomplished</i>)
Infrastructure and Technology <ul style="list-style-type: none">• Good (<i>Majority of items on-track or still ongoing</i>)
Research and Development <ul style="list-style-type: none">• Good (<i>Significant progress has been made</i>)
Internationalisation & Outreach <ul style="list-style-type: none">• Excellent (<i>Almost everything accomplished</i>)
Conditions for Success <ul style="list-style-type: none">• Good (<i>Solid progress, but plenty of potential still left</i>)

Interviews with researchers at the Institute and partners in industry make awareness of the Marine Institute and its activities and capabilities are siloed. The entire supply chain across the spectrum of marine sectors is aware of what the Marine Institute does in individual fields – regardless of which sector in the oceans economy one operates, the Institute is known as a place where clients can “come in with a problem and come out with a solution”; however, few know about the breadth of programs and training on offer. Active efforts to underscore the comprehensive strength of the Institute should remain a priority: while each aspect of the marine industries may have a number of different, specialised postsecondary institutions in the world, only at the Marine Institute does it appear that all these elements are brought together. The Institute's research profile is, thus, practically unheard of in the world for an institution of its size and its success in that regard can be attributed to careful

attention to client sensitivities across the full spectrum of marine industries.

The Institute's research activities fulfill two core requirements: they generate revenues to fund the human resources complement and they allow the institution to meet its mission to support the economic development of Newfoundland and Labrador. Together, these core requirements address not just a public desire to have well-educated citizens, but also that of industry to have a highly-trained future workforce.

Through its academic and training programs, the Institute also plays a key role in rural economic development. In many ways, the Institute's strengths in community-based education delivery (CBED) should be considered integral to the organisation's successes in making itself relevant to the broader Newfoundland and Labrador community. In fact, the Marine Institute's CBED capacities were identified in a Memorial-wide task force report on

Indigenisation and Indigenous learning. The Institute has been using CBED as a tool to develop Aboriginal engagement in Labrador and in Nunavut and was likely a strong contributing factor to Memorial's success in securing its partnership with the Nunavut Arctic College.

In sum, the Marine Institute has a strong value proposition, with a worldwide reputation in marine sectors such as aquaculture and fisheries. It provides industry-leading training and academic programming and is widely recognised within the oceans industry as "the place to go for all things maritime." It offers a breadth of programming that allows it to develop the operation and technical skills of the future marine workforce, to the extent that countries like Norway are looking to study the Marine Institute model as part of its own education development processes. Furthermore, the diversity of its research enterprise allows the Institute to account for fluctuations in individual marine sectors and continue to serve the collective oceans industry. That comprehensiveness has been noted as an essential element of how the province of Newfoundland and Labrador expects to present itself to the world as part of multilateral accords like the Comprehensive Economic Trade Agreement with the European Union.

The Institute has achieved a reputation for excellence and comprehensiveness, though it has not necessarily accomplished the full list of individual tasks and action items as detailed in each of the five-year implementation plans for Vision 2020. This is most evident in areas that identified that a detailed strategy would be developed, such as in internationalisation. Clearly the Institute has boosted its international profile within the student body, in terms of the contracts it wins overseas, and with the experience it offers its teach-

ing and student complements. Intercultural competencies have increasingly become a necessary skill for Institute graduates, and the globalisation of the classroom and learning environments at the Marine Institute will be an integral part of the long-term plan for the institution. However, the Institute's international operations continue without a documented strategy.

Likewise, the Institute has a comprehensive marketing strategy with three distinct pillars, serving the needs of the institution's academic, R&D, and industrial functions. While the marketing and communications unit certainly *acts* strategically, it does not have a formal strategy. Examples such as these are not necessarily problematic on their own; indeed, success is not measured in an organisation's ability to check boxes. In the Marine Institute's case however, the expected high rate of leadership turnover presents particular problems for the institution with respect to both knowledge management and knowledge transfer. These two will undoubtedly be very big priorities in the next couple of years and the Institute should anticipate that the first implementation plan for The Next Vision will centre on the progress of these vital areas.

Where the biggest challenge for the Marine Institute is observed is in its financial stability. The organisation has a budgetary model that is simultaneously reliant on the supply the provincial government grant, student tuition, and on the good health of the offshore economy. Despite a period of economic prosperity at the turn of the decade, recent trends in both of these factors have been far from positive. Though the Institute believes it has some room to grow its market share of domestic students – likely through competition against other postsecondary institutions in the

province and the other campuses at Memorial – shrinking demographics in Newfoundland and Labrador indicate that this is not a sustainable financial model. Though it has managed to establish a comfortable surplus for technology and infrastructure renewal projects, it is almost certain that the Institute will observe a decline in its longer-term finances unless it can hedge against both demographics and the oil and gas sector.

The next sections below describe in more detail the specific progress made in each of the five priority areas first mentioned in Chapter 1. The following assessments are

based on analyses of institutional data pertaining to enrollment, finances, research, and human resources, as well as interviews with a variety of institutional stakeholders at the Marine Institute, the Memorial community, and in industry.

NB: Although research, development, and training (RDT) revenues were considered collectively in the previous chapter, in this chapter, research and development (R&D) and training are separated – the latter is assessed together with academic programming and enrollment, while the former is assessed on its own.

TO BE ACCOMPLISHED

Responding to the *Urgent* crowding out the *Important*:

- Student recruitment plan with enrollment targets, including international
- Long-term lifelong learner recruitment and supports plan
- Long-term infrastructure maintenance and renewal plan
- Long-term human resourcing and succession plan(s)
- Comprehensive internationalisation strategy
- Comprehensive advancement plan
- Business development strategies
- Long-term financial planning
- Long-term and comprehensive marketing and communications plan
- Long-term Memorial collaboration and integration plan

Students & Programs

OVERVIEW

- Assessment: - Excellent (*Vast majority of action items accomplished*)
- Areas of Achievement:
- The development & advancement of graduate programming
 - Student support services
 - Student placements and work-integrated learning
 - Overseas study integration
- Areas for Improvement:
- Laddering & bridging elements, particularly in MUN system
 - Lifelong learning infrastructure(s)
 - Conversion of diploma programs to applied bachelor's

A key priority for the Institute has been growth in existing degree programs and expansion into new degree programs. The senior leadership and academic staff view this as essential to the Institute's success. Degree programs allow the Institute to do three things: first, it can offer laddering options from diploma programs. Secondly, the Institute can, if it chooses, shift away from shorter, industry-related training courses, which used to be its bread-and-butter but where it is now losing market share. Thirdly, degree programs enable the Institute to further establish its comprehensiveness by offering a full suite of academic programming from short-course training through to PhDs, fulfilling one of its critical ambitions.

Table 2: Vision 2020 enrollment targets, predicted and actual

	Academic Students	International Students	Industrial Students
<i>Vision 2020 Target</i>	1,450	20% (290)	14,000
<i>2018-19 Enrollment</i>	1,220	12% (149)	4,693 ^{xii}

To study the evolution of the Institute's academic offerings, it can be useful to analyse enrollment trends over the past decade. This can give particular insight about where the demand for certain programming is coming from and may provide an indication as to where the Marine Institute may be successful in the future. Furthermore, growing enrollment is one of the priorities for the institution as part of its final

implementation plan, as students are "the primary focus of the Marine Institute"^{xiii}.

Vision 2020 established some benchmarks with respect to enrollment: 1,450 students would be registered in its academic programming, one-fifth of which would be international, while industrial programs would train up to 14,000 students per year.

Although the Institute has not achieved its academic enrollment targets^{xiv}, the increase in student numbers from 2017-18 to 2018-19 does offer a change from the stagnation that appeared to have set in since 2011. The Institute will face real challenges in achieving its goal of 1,450 students by 2020 (this requires an almost 20 percent increase in enrollment over the next 18 months) and is limited in doing so because of three factors: the first is that all demographic forecasts indicate that its primary recruiting base is diminishing; an immediate response to this may appear to be to recruit more students from outside Newfoundland and Labrador. However, the Institute faces some further challenges in doing that, namely that the Institute appears to suffer from a branding issue in the Atlantic region.

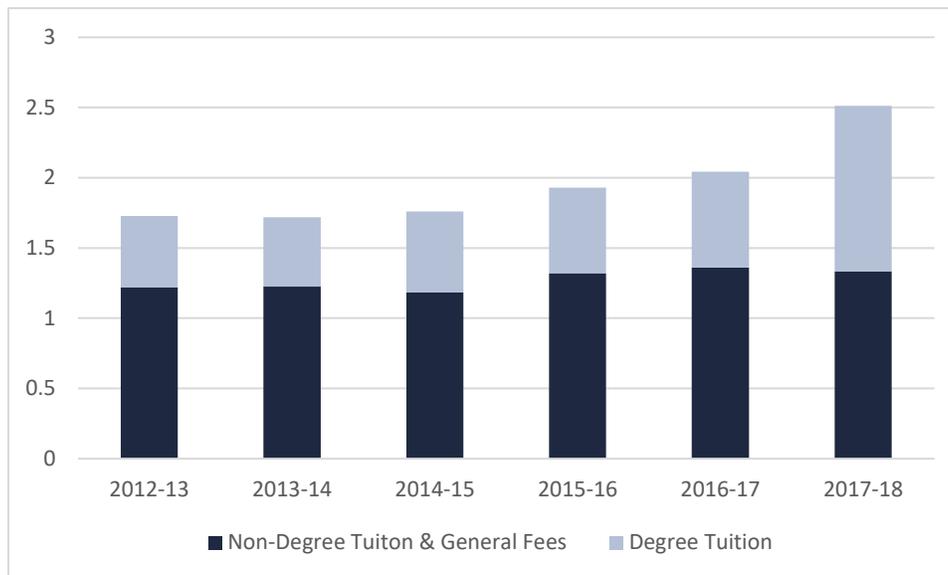
This branding issue is the second factor that restricts the extent to which the Institute can realistically grow its student body and has been raised by students, who wish to see more classmates on campus (particularly in programs with lower enrollment). The word 'institute' appears to carry a negative connotation, leading to the widely-held (or widely-enough) belief that any institution monikered an 'institute' is both poorer in quality and lower in academic standards than either a university or a college. Some of these concerns may stem from an apparent lack of awareness among teachers in the public school system of the Marine Institute and its role within the provincial postsecondary landscape. Where the Newfoundland and Labrador population is an important source for future students and that Vision 2020 is explicit in its goal to "[i]ncrease general awareness of MI as an education institution"^{xv}, addressing this problem in a way that notes both the independence of the Marine Institute (as a separate campus

from Memorial's St. John's campus – and there are reasons to want to maintain that impression of separation) and its connection with Memorial University (as an understood and recognised institution of quality) should be a high priority.

The third limiting factor is the fact that increasing the number of students enrolled in academic programs also places an additional financial pressure on the Institute due to the current provincial tuition structure, which limits how much funding the Institute can generate from new students^{xvi}. In 2017-18, tuition revenues accounted for 6 percent of total non-grant revenues. Tuition across the board for all Memorial students increased effective 2017-18 to include campus infrastructure renewal and student services fees. International student tuition fees additionally increased for degree programs at Memorial, effective 2017-18, compounding the effect in revenue growth generated from degree program tuition (see Figure 12).

The Institute has been successful in recruiting students from Nova Scotia and Ontario, and internationally, and testimonies from recruitment efforts suggest that the Institute's profile has been raised as an institute of excellence in the field. However, the cost of delivery of programs and services for students – particularly international students – is greater than monies brought in through tuition revenues, which are not a substantial revenue source for the institution anyway. This is not to say that the Institute has not been increasing the number of international students enrolled. Indeed, that number has grown over the past decade and international students accounted for 12 percent of the Institute's student body in 2018-19, comparable with the national average.

Figure 12: Aggregate tuition revenues, in millions of dollars, 2012 to 2017



Enrollment alone is not a definitive factor of success – the numbers above and the figures in Chapter 2 will indicate that the Institute has been successful in attracting and recruiting students to its degree programs, particularly at the graduate level; they will also reveal that the Institute has not yet met the quantifiable target it set for itself in this regard. Vision 2020 further

elaborates on the importance of the Institute’s learning culture. As such, this section will also consider excellent progress made in work-integrated learning (WIL), an essential component of many students’ academic experience at the Institute, as well as students’ academic and career success.

In some respects, academic success for the bulk of the on-campus students (ie, those in diploma and certificate programs) is dictated by the attendance policy. Transport Canada requires students to maintain a strict 90 percent attendance record. As such Student Affairs has developed an early-detection system that allows its staff to monitor students who may require more supports as they progress through their

studies. Furthermore, initiatives have been undertaken over the past two years to improve retention rates, focusing on the basic math and physics competencies of students. In response to inconsistent base knowledge in mathematics and physics, the Institute has started providing practice workbooks to incoming students in an attempt to boost their understanding and command of these two subjects. Likewise, the Institute has adjusted the student-instructor ratio and established a help desk for students needing further support in these subjects.

Year-to-year retention over the past three years has been fairly consistent. The Institute retained 76 percent of its first-year diploma cohort from Fall 2016 to Fall 2017; its target was 75 percent. Fall-to-winter retention has also been steady and is generally higher than year-to-year retention. In 2017-18, the Institute retained 81 percent of its first-year diploma cohort into the winter semester. The average winter semester retention over the past three years

has been 82 percent, short of the institution's target of 90 percent. Although these numbers are high, this is not to say that the drop-out rates are not an issue for the Institute (see table below); indeed, some students enroll at the Institute with the impression that it may be a less rigorous academic credential without fully understanding the workload, attendance requirements, or WIL components (nautical science students spend up to 12 months in total at-sea) of certain programs.

The WIL component is an important facet of the academic experience for students at the Marine Institute. The Office of Career Integrated Learning (OCIL) is responsible for all WIL-related programming and supports at the Institute and is a key pillar of the Student Affairs portfolio. It manages between 350 to 400 placements annually

(one-quarter of the student body) and provides a dedicated placement officer to each of the Institute's Schools who are not only responsible for placing the students but also for monitoring their progress during the work term. OCIL has successfully been able to achieve a high placement rate, averaging over 95 percent since 2012. For many of the programs, this rate is upwards of 98 percent – though for the remotely-operated vehicle (ROV) program, which is more exposed to fluctuations in the fortunes of the oil and gas sector, placement rates have varied over the years. Industry downturn in the first half of the decade prompted the Institute to make adjustments to its curriculum and work-term requirements for these students, resulting in dramatic increases in placement rates, which are now above 90 percent.

Table 3: Graduation rates for the 2012-13 incoming cohort in select Diploma of Technology programs

Name of Program	Time-to-Diploma Grad Rate^{xvii}	Time-to-Diploma +1y Grad Rate
<i>Marine Engineering^{xviii}*</i>	62%	62%
<i>Nautical Science[*]</i>	43%	50%
<i>Engineering Systems Design^{xix}</i>	38%	38%
<i>Food Technology^{**}</i>	67%	n/a
<i>Ocean Mapping[*]</i>	38%	50%
<i>Environmental Technology</i>	50%	50%
<i>Remotely-Operated Vehicles^{xx}</i>	28%	31%
<i>Naval Architecture</i>	67%	67%
<i>Ocean Instrumentation[±]</i>	25%	63%

* Indicates 4-year programs

** No 2012-13 cohort, so 2013-14 cohort counted

± No longer offered; the 2012-13 cohort was the final one

Career advice seems to be shared among individual faculty members, School Heads, and OCIL, which is positive, particularly for an institution like the Marine Institute. That teaching staff are making connections for students in the labour market is a benefit to the students given both the size of the Institute and the relationship between its academic programs and industry. OCIL is acutely aware of its responsibility in ensuring the success of students

and in preparing students to be ambassadors for the Institute. Indeed, for many employers – especially those outside the province – the Institute is only as good as its last student placement. As such, student success is critical to OCIL's business model as every work term that does not pan out has the potential to shrink the employer base for the Institute. That said, it is unclear if any formal structure of career guidance exists. The Institute is certainly

providing its students with the guidance they require, though its staff do so without any formal framework.

As WIL is critical to the career success of graduating students, the Institute has made investments to provide additional supports in this regard. In 2011, the School of Fisheries introduced a new course to better prepare students ahead of their placements. In 2013-14, Institute students achieved a 96 percent placement rate. Some challenges still persist, stemming in part from the growing internationalisation of the Institute's operations and student body. This has manifested in two different ways: first, the growth in the number of international students and secondly, the growth in the demand for international placements. In the past, low numbers of international students requiring or seeking work terms enabled OCIL to rely on industry contacts to make placements. The increase in international students has meant that this individualised support has become challenging to provide. OCIL is not positioned to manage the workload that would be required to place large numbers of international students in both Transport Canada-regulated programs^{xxi} and in other Institute programs.

OCIL has also observed an increase in the number of students requesting international opportunities during their work terms, which Vision 2020 previewed and identified as a measure of success for the Institute. To compensate for this increase in demand, OCIL has adopted an internal policy of requiring all seagoing students to fulfill their first (of three) placements domestically. Subsequent placements can be opened up to include an international component. The policy is maintained because OCIL is also responsible for the training to prepare students for their new work environments and the adaptation required, an adaptation in OCIL's experience

that can be too great to overcome for students during their first placement. To prepare students for international placements, in the past five years OCIL has taken on a bigger responsibility in internationalising the education experience at the Institute and is involved in pre-departure intercultural competency training for students. Furthermore, it has developed two streams for students seeking international placements based on their requirements, adaptability, and readiness: a) students are placed with an international crew, and b) students are placed with a Canadian crew working internationally.

It is clear that the Institute has improved in the areas of student success and with respect to academic programming – by growing overall enrollment by more than 25 percent, by almost tripling the number of international students and their proportion, and by dramatically increasing the number of graduate degrees offered and students enrolled in those programs. It has also made improvements to the way it provides for the academic and career success of its students. However, Vision 2020 articulated specific and quantifiable measures which it has failed to meet. It may reach them by the 2020 deadline (this may be unlikely for enrollment as it would require significant growth that far exceeds historical or reasonable growth patterns), but by that simple measure of success, the Institute has not achieved its goal.

A recurring theme in assessing the progress made toward Vision 2020 is the absence of formalised procedures or structures despite existing and vibrant practices. This is evident in a variety of different areas, as mentioned earlier in this chapter. The same logic applies to academic programming, where formalised (ie, written down, easily accessible) academic and career success support systems appear lacking. It is unclear, too, if these are

being monitored or tracked at an institution-level rather than at a departmental-level. More important, longer-term targets for the Institute toward which it should further consider – many of which have to do with the academic programming itself, rather than in enrollment – have not been formalised in a strategy. For example, the status of the conversion of advanced diploma programs to master's programs or Diploma of Technology programs to applied bachelor's degree programs is not apparent.

In the same vein, laddering and bridging of diploma to degree programs continues to be a problem and a hindrance for students. The failure to integrate into the credit-hour system used by the rest of the Memorial academic structure poses a serious challenge to the further coexistence of the Institute's programs within the broader Memorial community. Students have expressed frustration at their inability to transfer diploma credits to bachelor's programs offered at Memorial's other campuses, which also undermines the Marine Institute's promise to provide the entire spectrum of academic laddering. One obvious example is the disconnect between the naval architecture *diploma* at the Institute and the naval architecture *degree* offered at Memorial's main campus. It is clear that the Institute is growing and dynamic; it is less clear if the college structure is flexible enough to adapt to the needs of the Institute as it looks to the future. The careful balance of these two realities should be considered in the future.

Infrastructure and Technology

OVERVIEW

<u>Assessment:</u>	- Good (<i>Majority of items are on-track or still ongoing</i>)
<u>Areas of Achievement:</u>	- Major advancement of Holyrood marine base development - Establishment of technology renewal initiative - Capital upgrades for research centre facilities - Completion of Campus Master Plan process
<u>Areas for Improvement:</u>	- Maintenance and renewal forecasting - Ownership of buildings & facilities, especially Ridge Road

Vision 2020 states that the Institute not only has but will continue to maintain world-class facilities. How the Institute has defined 'world-class' has evolved through each implementation plan, though the second iteration from 2010 provides the most detail in terms of what infrastructure renewal would look like. The plan articulates the ambition for a 100,000 sq ft expansion of the Ridge Road Campus and for the procurement of an ice-capable training and research vessel, as well as the expansion of the Foxtrap facility, the launch of the marine base at Holyrood, and the establishment of an industry incubation centre. In 2015, with two of the five tasks accomplished, the new implementation plan became less detailed on *how* the Institute intended to revitalise or obtain additional infrastructure. In part, this can be explained by the fact that the Institute does not own its Ridge Road or Foxtrap facilities, which are owned and maintained by the provincial government. As such, upgrades to either require a myriad of interdepartmental and bureaucratic negotiations for even the most minor infrastructure installations (such as new, to-code stairs at the OSSC).

Though the industry incubation centre has not necessarily materialised in the way envisioned by the Institute in 2005, the Marine Institute is increasing its involvement with Memorial's own incubator, the Genesis Centre. Seven years ago, Genesis launched an ocean technology-specific program, supported by the provincial government. Of the seven companies that graduated from the program, three are still in operation today – all led by Institute graduates. One-third of the 200-odd business ideas that have come through the Genesis Centre in the past three years have

been ocean technology-related. The movement in this area suggests there may be potential for a St. John's-based microcluster around marine simulation, with the military and defence clients as a major source of revenue and funding. The Institute would have unique access to this microcluster and could contribute significantly given its wealth of capital assets in simulation.

It is apparent that the Campus Master Plan initiative was designed to address many of the gaps between the Institute's ambitions as laid out in Vision 2020 and the reality of

its operating and fiscal environment. The Campus Master Plan appears to have been a useful process for the Institute, particularly for its senior administration and planners, to articulate its physical needs and priorities. To an extent, the Plan's success was structured in an all-or-nothing approach, defined in no small part by the transfer of ownership for the Ridge Road Campus to the Institute. This transfer has not occurred, so there have been challenges in moving the Master Plan forward. To further compound the problem, the \$21 million in deferred maintenance on the Ridge Road has not been addressed^{xxii}. The momentum and success of the marine base project at Holyrood over the past decade has led to it becoming the highest capital infrastructure priority along with the procurement of a training vessel. The single-minded focus is a reflection of the limitations placed upon the Institute's ambitions by fiscal realities and constraints.

Where the Institute appears to have made the most progress is in the development of its main library, the Dr CR Barrett Library, for which it has since 2010 had the ambition of becoming a centre of excellence dedicated to oceans research and resources. Beginning that year, the Library began developing program-specific research resources, facilitating the shift to more research-intensive activities by students and employees. The following year, it established a writing centre to further support the academic success of its students. Today, it houses one of Canada's largest marine collection and it is expected to adopt the NRC Oceans Library's entire collection when it eventually closes. To date, however, the Institute has yet to establish a formalised development plan for the Library and internal estimates suggest that upgrades to the Library to the extent envisioned in the Vision 2020 implementation plans would require up to \$25 million. Nor has a measure been established to

evaluate whether the Library has met its ambition of providing "an environment for the discovery, utilisation, and sharing of information"^{xxiii}. As the oceans economy evolves to adopt a more technology-heavy focus, ensuring the relevance and excellence of its Library would likely be an important component of the Institute's future.

Of concern is also the fact that the Institute does not appear to have the protocols in place to identify renewal projects in a more medium- to long-term fashion, as dictated by the 2010 implementation plan. For the most part, the Institute has managed to get by with a 'fix it when it breaks' approach. The process for allocation in these instances is at the discretion of the senior leadership team, though the Institute is working with industry partners to better understand future technological requirements to continue being a leader on the training and applied research fronts. Although planning has historically occurred, it is only in the last two to three years that the Research Centres have been planning short-, medium-, and long-term capital needs in a centralised manner. It is evident that for an institution so reliant on its capital assets to not only generate revenue but to provide the academic training at the core of its mission, this approach is wholly unsustainable.

The Marine Institute lives and dies with its infrastructure. To be world-class, the Institute must continue to not just have the best people in the world, but the best equipment in the world. That equipment is likely to get more hi-tech over the next couple of years, which will require a shift in approach for the Institute. To maintain leadership in an oceans economy increasingly becoming IT-intensive, the technological tools at the Institute's disposal matter just as much as its physical assets like simulators and vessels. Part of this

shift may be in the leadership structure at the Institute: like many of the companies with which it works in the marine industries, the Institute has a CEO (the VP), its COO (the AVP, Administration), its Chief Academic Officer (the AVP, Academic). It appears – given the evolutions in the oceans economy and the anticipated greater emphasis on technology and technological skills – that it would be worth the Institute’s while to have a discussion about establishing a Chief Technological Officer position to ensure that the organisation has all the necessary tools it will require to continue being a world-class institute for the next 15 to 20 years.

Overall, infrastructure and technology continues to be a challenging area for the Institute. Neither Memorial nor the Marine Institute have assumed ownership of the Institute’s primary buildings, nor does it appear that there would be the financial capacity at either institution to do so, unless operational and deferred maintenance funding was simultaneously transferred to the university along with the facilities. This has been the principle hindrance to the expansion of the Ridge Road Campus, which was at the heart of the Master Plan’s ambitions for the Institute. The question of ownership and the Institute’s capacity to make changes to its physical infrastructure is reflected in the perennial issue of parking on campus. It is clear that the Institute’s infrastructure and technology is (or is increasingly) mission critical. The decreasing likelihood of the Institute’s ability to realise the ownership transfer of its Ridge Road facilities also raises the question of whether the Institute ought to be seeking a new, purpose-built location. However, even this option seems unlikely given the lack of mobility of the Institute’s main capital assets. Though a relatively minor issue, it is representative of the struggles that the Institute faces in this regard.

Finally, the most glaring miss with respect to the third implementation plan’s objectives for the Institute’s infrastructure and technology needs has been the absence of an information management structure. The next couple of years will present a substantial test for the Institute as senior personnel who store institutional memory and knowledge transition toward retirement. The Institute is already experiencing the consequences of poorly-managed knowledge transfer in the area of business development. Knowledge management and transfer will continue to be a priority and will be necessary “to make efficient and effective decisions”^{xxiv} about the future of the Institute

Internationalisation & Outreach

OVERVIEW

<u>Assessment:</u>	- Excellent (<i>Almost everything accomplished</i>)
<u>Areas of Achievement:</u>	<ul style="list-style-type: none">- Grown the international profile of the Marine Institute- Expanded MI faculty and staff international experience- Enhanced cross cultural training & competency development- Increased internationalisation- Aboriginal training and partnerships- Fulfilling mission to the province- Solid reputation among clients for research and training
<u>Areas for Improvement:</u>	- Need a formal strategy

The original Vision 2020 was ambitious in its internationalisation aims. Despite a mandate to serve first and foremost the people of Newfoundland and Labrador, the Institute also expected to have its “presence felt throughout [...] Canada, and in countries around the world”^{xxv}, which included attracting more international students to the Marine Institute^{xxvi}.

A key challenge to the Institute in enhancing the international character of its academic programs continues to be the provincial tuition structure. As it stands, international students, like other students at the Institute, are understood to be “deficit generators” for postsecondary institutions in Newfoundland and Labrador, which is to say that they cost more to train than they generate through tuition fees. However, institutions like the Marine Institute require tuition monies raised through international students to fund globalisation efforts of their classrooms. The Institute’s ability to graduate students with multicultural competencies who can work in Canada and abroad has been identified by industry and faculty within the Institute as a core skill and graduate competency for the

Institute’s students, and is expected to play an integral part of the long-term plan for the institution. MI International’s strategy with respect to internationalisation is quite unlike that of most other academic institutions, which rely primarily on the recruitment of international students to compensate for shortfalls in public funding to the operating grants and consider international projects and consultancy-based work as a secondary revenue source^{xxvii}.

MI International has never been primarily focused on the international student aspect of the Institute’s internationalisation efforts, though it does have an international student coordinator housed within its office.

Table 4: List of international MOUs signed by the Marine Institute, 2013 to 2018

Coordinating Unit	Countries	Partner organisations and institutions
MI International	New Zealand, Indonesia, Tanzania, Vietnam, Germany, Suriname, Antigua, Grenada, Guyana	FISH Safety Foundation; Ministry of Research, Technology, and Higher Education; Bow Valley College; Nha Trang University; Tra Vinh University; Hochschule Bremen City University of Applied Science; WUSC; College of the North Atlantic and Dar es Salaam Institute of Technology; Stichting Polytechnic College, Lerarenopleiding Beroepsonderwijs; Antigua State; Linden Technical Institute; TA Marryshow Community College; Government Technical Institute Guyana
School of Maritime Studies	Latvia, South Korea, Spain, Philippines, Croatia	Novikontas Maritime College, Korean Ship Safety Technology Authority, Navantia SA, Maritime Academy of Asia and the Pacific, Faculty of Maritime Studies at University of Rijeka
School of Ocean Technology^{xxviii}	China, Ireland, United States	Jiangnan University, Ireland's Marine Institute, Dublin City University, National Underwater and Marine Agency
School of Fisheries	Iceland	Matis
Office of Research and Development	Ireland	Ireland's Marine Institute

Where the Institute has been particularly successful is in the development and implementation of memoranda of understanding (MOU) with different institutions and partner organisations around the world as part of the Institute's international activities. Almost two-thirds of the MOUs signed in the past three years have been with partners in Asia, Africa, North America, and Europe. Many of these are coordinated by MI International, which handles most of the government-funded projects and those that are funded by Canadian government agencies with an international portfolio (mostly through Global Affairs Canada). The table below illustrates the types of partnerships that the Institute has sought overseas.

Vision 2020 is clear in that the Institute's international operations are to be "guided by a comprehensive internationalisation strategy."^{xxix} Although the Institute has operated an international consultancy for

more than 30 years, Vision 2020 identified the need for dedicated resources to further its work in "fostering individual, cultural, and economic growth in the world community."^{xxx} Subsequent implementation plans mandated the international office with the development and initiation of an internationalisation strategy. To date, MI International has not developed a long-term internationalisation strategy, nor does it operate with an annual work plan. This is not to say that the office does not act strategically; however, a formalised protocol or institution-wide guiding document does not appear to exist. In part, this can be explained by the opportunistic nature of MI International's operations (some may say they are "strategically opportunistic"), which is reflective of a broader institutional culture.

Through its academic and training programs, the Institute also plays a key role in rural economic development. In many

ways, the Institute's strengths in community-based education delivery (CBED) should be considered integral to the organisation's success in making itself relevant to the broader Newfoundland and Labrador community beyond St. John's. In fact, the Marine Institute's CBED capacities were identified in a Memorial-wide task force report on Indigenisation and Indigenous learning. The Institute has been successful in using CBED as a tool to develop its Aboriginal engagement in Labrador and in Nunavut, where the Institute provides training to roughly 300 students annually through the Nunavut Arctic College^{xxxi}. The Institute also has 40 self-identified students enrolled on average per-year, making up 4 percent of the total student body. This has been relatively unchanged over the past five years. In 2018-19, there were 55 self-identified Indigenous students at the Marine Institute. The bulk of these students are registered in the various diploma and certificate programs.

Research and Development

OVERVIEW

<u>Assessment:</u>	- Good (<i>Significant progress has been made</i>)
<u>Areas of Achievement:</u>	- Research-based master's programs - Recruitment of Research Chairs for all Schools - Restructuring research supports to promote faculty research
<u>Areas for Improvement:</u>	- Alignment & coordinate with Memorial research activities - Long-term forecasting of projects and revenues

It is clear from the first iteration of Vision 2020 that the Institute envisioned deeper and more meaningful research integration with the rest of the Memorial community. It saw itself as the bridge between the needs of an industry looking to the future and an academic institution in the pursuit of knowledge creation and discovery. In its own words, the Institute sought to be the linkage point “to solve practical problems [...] focusing on the strategic gap between fundamental research and commercialisation.”^{xxxii} By the midway point of Vision 2020, the Institute’s attention was fully turned to the formalisation of their research processes. Having already established and staffed an Office of Research, the Institute proceeded to prepare for a longer-term strategic plan to guide its research activities through to the end of Vision 2020, complete with promotion plans to highlight the Institute’s research capacities and a revitalisation of its Research Centres. It did so by moving CTec out to Holyrood in 2012, three separate upgrades to CMS’ simulators, enhancing processing capabilities at CASD in 2012 and in 2013, and by adding MV Shamook to the fleet for training and research purposes. The Institute also added an industrial research chair position in the School of Fisheries in 2016 and a Canada Research Chair in Ocean Mapping in 2018, and began offering research-based masters and PhD programs in Fisheries Science in 2017.

Changes to the Institute’s research portfolio continues to pose one of the most resource-intensive challenges for the organisation. Significant positive progress can be assessed against the clear and purposeful growth in graduate programming, as well as in the support systems designed to better support the fundamental research activities of the Institute. Reprofiting the institution’s research enterprise has not been an easy endeavour, but the Institute has managed to do so without sacrificing

its more-recognised activities and expertise in applied research. In 2017, nine of the Institute’s 12 NSERC-eligible researchers had received funding from the agency. The School of Fisheries’ success through the Ocean Frontier Institute means that it expects to increase the number of publishing scientists by seven-fold compared to 2010. Of concern though is the steady decline in R&D revenues, precipitated mostly by decreases in funding from historically reliant funders such as ACOA, the provincial fisheries ministry, and CCFI.

The Marine Institute is recognised by both industry and in the innovation ecosystem for being a special and unique entity in terms of research capacity because of its nimble, client-centred approach to applied research. This approach is, to a large extent, necessitated by the industrial training that the Institute conducts. Its ability to “get things done” and “be relevant to someone” makes it an attractive destination for clients around the world. For the most part, the Institute’s solicited client-base is international – half of CSAR’s clients, for example, come from outside Canada. In some Schools, such as Fisheries and Ocean Technology, the majority of applied research partners are international, particularly from the Nordic countries (especially Norway), continental Europe, and the United States. In some respects, the Institute’s researchers are forced to seek international projects because of restrictions on demand for oceans-related research in Canada. General frustrations can develop periodically because while so much of the Institute’s research work is focused on the oceans, “so much of the country is not”. However, the internationalisation of the Institute’s clientele has also posed new challenges in attracting traditional, domestic sources of funding, such as the Canada Foundation for Innovation (CFI), which requires a certain level of ‘national relevance’ to fund projects.

One element of the Institute’s attractiveness as a research partner is its capacity to deliver the full spectrum of research. The Institute’s recent move to include within its portfolio increased in-house TRL 1-3 research is an acknowledgement of the need for a higher level of basic scientific knowledge in order to continue to enhance its TRL 4-6 competencies and the demand for them^{xxxiii}. This is a key facet of the Institute’s competitive advantage: it is recognised regionally as an academic and research institution and has an established

global reputation for its applied research. Highly-qualified personnel are integral to the Institute’s plans to continue this evolution of its research portfolio. Roughly half of the academic and teaching staff at the Institute – which includes instructors, research technical professionals (RTPs), research scientists, two research chairs, and a librarian – have post-graduate or advanced degrees, while one-fifth of the staff have senior marine qualifications.

Increased intensity in TRL 1-3 research activities has also posed challenges with respect to the Institute’s revenue generation model. In part, some of the concern about the effect of increased TRL 1-3 research on revenue generation can be attributed to nomenclature: ‘Research’ tends to be used almost interchangeably with ‘contracts’ at the Institute, which broadly covers the majority of applied research, development, and training projects as well as services (such as facility rental of the simulators, vessels, or flume tank) conducted by the various units at the Institute. It is not always clear that employees make the distinction between each of these functions. Indeed, the conflation of revenues with ‘Research’ is further utilised in international financial reporting, implying that all of these revenues could broadly be considered ‘Research Revenues’^{xxxiv}. Grouping these different contracts and projects under the umbrella term ‘Research’ also obscures exactly what kind of research the Institute is doing and by whom. This mentality may contribute to difficulties in accepting fundamental research as an essential function of the Institute, rather than a drain on already sparse resources dedicated to the pursuit of revenues from applied research funding, particularly when considering the net costs of certain types of research and projects. In interviews with employees from throughout the Insti-

tute, it was noted that the expression, “research for show, training for dough” has been used in the past.

Financial concerns have fuelled more anxieties about the need for revenue generation, it appears at all costs. As the Warrian Report notes, “[t]he culture of [the Marine Institute] is dominated by the imperative of Cost Recovery”, which can result in the Institute losing “focus on how to grow the pie^{xxxv}”. Much of the Research Centre directors’ jobs involve relationship management and business development, though on an ad-hoc basis. With little capacity to plan unit workflow more than one to two months out because of the spontaneous nature of client recruitment and how contracts are awarded, directors appear to exert tremendous energy “chasing money” to meet their financial obligations to the Institute. For some directors, successfully winning bids means they can afford staff salaries^{xxxvi}. For others, clients agreeing to direct their projects to the Institute is merely the first step, as payment is contingent on receiving externally-funded grants. This is particularly common in the fisheries industry, where clients work with the Marine Institute almost exclusively on the condition that an external funder pays for the research. Industry partners in this sector who have the capacity to pay for that research outright tend to move those functions in-house, negating the need for the Institute’s researchers. As such, one of the core competencies of the Institute Research Centres has become grant writing. The Centre for Marine Simulation houses its own grant-writing capacities, for example, which it uses for larger technology transfer projects. Additionally, in SOT, the CTec can spend up to 20 percent of its time writing grants. With a Canada Research Chair (CRC) in Ocean Mapping in place, availing to the School Tri-council funding, it expects to spend even more time on proposal and grant preparation.

It has been noted that directors often feel inundated with paperwork and more often than not are siloed within their own Research Centres so as to ensure they meet short-term and annual revenue targets. Some indications have been given that the directors are contemplating an integrated support system that would include pooling resources for grant writing, business development, and marketing, which could help alleviate some of these stresses^{xxxvii}. In addition, this could even help increase the efficacy of the Research Centres’ revenue generation models. Although the Institute reports gross revenue, it rarely talks about revenue generation in net terms, which can hide the true cost of the work that the Institute does from a research and development perspective. Although the Institute’s R&D consultancy competencies are developing and growing, such is evidenced in the number of contracts signed on an annual basis, it is less clear that the Institute understands which types of projects are more efficient than others.

For example, although MI International generated more than half-a-million dollars in gross revenue in 2017-18, it only brought in a net \$64,000. Research Centres such as the Centre for Fisheries Ecosystems Research (CFER), established in partnership with the provincial and federal governments with a purpose to publish the fundamental research it conducts on the sustainability of fisheries stocks in Newfoundland and Labrador, is one of the largest gross revenue generators at the Institute. However, in net terms, it contributes less than one-tenth of a percent of the money it brings in. This is hardly surprising given the Centre was designed to pursue larger funds such as those offered by federal granting agencies and was never intended to be established as a revenue centre. This example is illustrative of the need to study the net contributions of research

units, particularly with respect to TRL 1-3 and TRL 4-6 R&D projects.

In addition to assessing the efficacy of the Institute's research activities, one must also consider the collaborative nature of those activities – a theme underscored in all of Vision 2020's implementation plans. It is unclear the extent to which a collaborative relationship with Memorial's St. John's campus has been developed and serious work remains to be done on this file. Relationships between individual researchers and employees appear to be good and there are signs that cross-campus collaboration is taking place and has certainly grown in the past several years, but this is less evident at the decanal rank (equivalent to School Heads and Assistant Heads at the Institute) or higher. The Institute suffers from a sense of insecurity and struggles with the issue of its own reputation within the broader Memorial community, particularly on the question of R&D. Despite being a successful source of revenue generation and possessing a world-renowned reputation for applied research, the lack of publications and Tri-Council funding has presented challenges to the research units at the Institute, particularly the Office of Research. Having to constantly prove the Institute's research capacities to the Memorial community draws resources and energies away from what could otherwise be directly dedicated to research initiatives.

Indeed, staff at the Marine Institute have noted that the Office of Research at Memorial's St. John's campus appears to be more often at odds rather than in support of the research efforts of the Institute. This should not be misunderstood as an active effort on the part of the Office of Research to stifle the research activities conducted at the Institute; rather, many of the prob-

lems are derived from a lack of understanding of the Institute as a research entity and its unique characteristics (that it is ISO-certified, for example). Admittedly, the Institute has failed to adequately articulate or promote its own capabilities to the university and is, as such often treated as an afterthought. Certainly, the Institute is "not new at research" and its employees reject the notion that it should be treated as such. As the Marine Institute continues to balance its research intensity in favour of increased fundamental research, the success of its research ambitions is contingent on its ability to work closely with large research institutions such as Memorial University. The move to more TRL 1-3 research has helped to bridge the administrative functions of the research capacities at both campuses, partially because federally-funded programs such as Mitacs, CFI, and Tri-Council are administered centrally through Memorial. The administration of funding may present an opening from which increased collaboration may be developed.

Conditions for Success

OVERVIEW

<u>Assessment:</u>	- Good (<i>Solid progress, but plenty of potential still left</i>)
<u>Areas of Achievement:</u>	<ul style="list-style-type: none">- Employee retention- Identifying potential management talent- Professional development investments and opportunities- Attraction and recruitment of highly-qualified staff (especially doctoral and post-doctoral professionals)- Culture of success, entrepreneurship, and collaboration- Enhancing and integrating planning processes- Organisational restructuring- International certification
<u>Areas for Improvement:</u>	<ul style="list-style-type: none">- Need a succession plan- Clear financial reporting mechanisms- Long-term financial planning- Alumni association and advancement activities- Marketing and communications of MI's capabilities

The Institute defines conditions for success as the elements required to supplement the other four pillars of Vision 2020's implementation – Students & Programs, Infrastructure and Technology, International & Outreach, and Research and Development. This final pillar covers areas of the Institute's operations that underpin progress made in each of the other pillars, including: human resources, leadership, finances, advancement and alumni, and marketing.

Vision 2020's third implementation plan identifies the value of the Institute's human resources and its need to develop and maintain that strength "through ongoing resource planning"^{xxxviii}. This was first identified in the second plan and many of the same objectives were carried through to the 2015 plan. One could read two hypotheses from this: the first is that succession planning is an ongoing activity and the Institute decided that its repeated inclusion

in the third plan would serve as a necessary reminder that this work is continually required as a condition for success.

The second is that the Institute did not accomplish the task as laid out in its 2010 plan. The reality is likely a combination of the two possibilities, but the presence of the latter suggests there may be both room for improvement and cause for concern with respect to staffing at the Marine Institute.

In part some of this apparent complacency with respect to human resourcing can be attributed to the generally low turnover of employees at the Institute. In general, if employees stay beyond their first two years, there is a good chance they will be at the Institute in the long-term. This is evidenced in the number of faculty who have been at the Institute for upwards of twenty years. For the most part, employees at the Institute – who are overwhelmingly Newfoundlanders and Labradorians – inherently believe the Institute contributes positively to the economic and education spheres of the province and as such are more inclined to want to stay and “contribute to that ‘good’”. They see the immediate impact of the research done by the Marine Institute in and for Newfoundland and Labrador and take pride in the high employment rate of their students.

Furthermore, the working environment at the Institute is such that the traditional academic hierarchy is less immediately in peoples’ faces and the senior leadership makes a concerted effort to recognise work done by the staff and faculty. On top of that, employees at the Institute enjoy a good work life and are treated fairly by the organisation and by their coworkers. Collectivity is emphasised starting with the hiring process, as collaborative abilities, along with attitude, spirit, and work ethic are prioritised to ensure cohesion between and among units.

Employees are also required by nature of their jobs to participate in the Institute’s self-attributed entrepreneurialism, and all contribute to the ‘complete package’ that the Institute offers to its clients. Administrative staff, too, understand that they are integral to the external-facing elements of the Institute as the first point-of-contact with the public. The Warrian Report describes entrepreneurial spirit^{xxxix}:

“What the operating deficit challenge has done is embed a deep commitment to Cost Recovery in the norms and incentives of the instruction. It has by necessity created an entrepreneurialism in the institution and its staff and by necessity it has led to the close interaction and relationships with private industry that is evident to all.”

All teaching employees are required to have a postsecondary instructor certificate, which is the base qualification for teachers at the Institute. The Institute also encourages all instructors to obtain at least a master’s degree and provide pay incentives for those who do. Employees also have the opportunity to engage in professional development through a jointly-managed fund and on an ad-hoc basis^{xl}. Completion of education degrees through Memorial are also encouraged, the incentives for which are also built into the collective agreement.

Roughly half of the academic and teaching staff at the Institute – which includes instructors, Research and Technical Professionals (RTPs), research scientists, two research chairs, and a librarian – have post-graduate or advanced degrees, while 22 percent have senior marine qualifications.

Where the Institute has made progress with respect to human resource planning is through a Memorial-wide succession planning program. Sixty-five staff members across Memorial’s three campuses, included several from the Marine Institute, were identified as ‘high-flyers’ and invited to participate in program, which included leadership training, mentorship and other educational and training supports^{xli}.

Table 5: Qualifications of academic and teaching staff, 2018

	Bachelor	Master	Doctorate	Other	Total
Senior marine qualifications	4	8	1	32	45
No marine qualifications	37	62	23	40	162
Total	41	70	24	72	207

Although the succession program did not guarantee promotion, two-thirds of participants were promoted internally. Internal promotion has been much the case for the Marine Institute: many of the School Heads and Assistant Heads have been promoted from within, as have the majority of the current managers. There is somewhat of a belief that perhaps it does not need a formal succession planning structure because the current model – that relies on senior leaders identifying and nurturing talent into the management streams – seems to be working thus far for the Institute’s needs. This is reflected in statements made by those who have been promoted ‘through the ranks’ to management positions using this model. These individuals, and indeed those who work with them, see themselves in the implementation plans (see, specifically, “Conditions of Success” in *2015 and Beyond*), providing greater buy-in to the mission statement of the Institute.

Vision 2020 also identifies specific targets with respect to research-focused staff toward which the Marine Institute should strive. In 2010, the Institute indicated that it wished, by the end of the Vision 2020 process, to grow from 24 up to 45 people employed full-time in research-focused capacities. By 2015, with research personnel accounting for more than 60 employees^{xlii}, the Institute turned its attention to the attraction and recruitment of Research Chairs – the next step in further fulfilling its own definition of advanced applied research^{xliii}. The goal for the Institute was to have 3 Research Chairs by 2020. As of

2017-18, the Institute has two Research Chairs: an Industrial Research Chair in stock assessment at the School of Fisheries and a Canada Research Chair in ocean mapping at the School of Ocean Technology. Plans for an Industrial Research Chair in the School of Maritime Studies are in the preliminary phases.

By its own acknowledgement, the Institute does not appear to be good at human resource planning. Though turnover is generally low because of high employee satisfaction, managers also give the impression they are reluctant to reduce headcounts in their units in fear of permanently losing the skillsets possessed by certain individuals. However, within the next 48 months, the Institute expects to see much of its management and senior instructors retire, and with them some serious institutional memory and knowledge. In just the next three years – realistically the furthest that the human resources team can plan with respect to salaries and severance packages given the unpredictability of the Institute’s financial situation – almost 40 senior staff could retire. The seamless succession is evidently a priority for the leadership group at the Institute, though it is not always obvious that the organisation is engaged in medium- to long-term planning to accommodate for those changes, which includes changes in personnel in the human resources functions. Already, the Institute has lost sizeable capacity in its business development capabilities^{xliiv}. It is also rehiring some instructors, who left the Institute for industry jobs, to teach as a

stopgap measure. Knowledge management and transfer processes remain a critical step yet to be completed.

The importance of knowledge transfer is apparent when examining the Institute's culture: though the distinct culture of the Marine Institute – internalised and externalised by the staff from the lowest ranks to the senior-most levels – is a key feature of the institution and an obvious contributor to its collective success, there seems to be little comprehension as to how that culture has developed the way that it has. The Institute has benefited from having the right leaders at the right time, which has enabled them to achieve one of the largest determinants for success: the combination of both a budget envelope specifically for the Marine Institute, and a campus model through which they would be an equal player within the broader Memorial community. Thirteen years after the start of the Vision 2020 process, the Institute has been successful in this regard. To complement this, the Institute has established over the years a series of key characteristics that they seek in new employees. While many employees have advanced industry or educational qualifications and experience (see table above), all potential recruits are assessed on their collaborative abilities – lone wolves do not survive at the Institute – and their interest and ability to work with multiple partners.

The conversion of the head of the Institute from Executive Director to Vice-President reinforced the notion that the Marine Institute was a campus of Memorial University, on equal footing (to a degree) with Grenfell and St. John's campuses. This was followed in subsequent years by the creation of the two AVP positions, for Administration and Finance, as well as for Academic and Student Affairs. Together, the senior leadership team are responsible for the implementation of a leadership model that

bridges traditional command-and-control with that of traditional academic management, facilitated by the co-management of the school's daily operations by the two AVPs. School Heads and Assistant Heads are viewed as being instrumental to the development of the Institute's culture and to maintaining a strong understanding of what the Institute is and who they are. As such, Heads are permanent positions (the closest the Institute offers to tenure). Conversely, teaching positions at the Institute, while unionised, are not tenured, which affords flexibility should there be a need to reprofile a particular School based on industry trends or student demands.

This adaptability is an inevitable feature of the Institute and one on which it prides itself. Some may describe this characteristic as entrepreneurialism, as it speaks to the can-do, get-it-done attitude embodied by employees that has made the Institute such an attractive partner for research and other projects. The Institute has a self-image of being flexible and entrepreneurial, though the organisation's nimbleness does not always translate into an ability to accurately forecast emerging trends. For example, the Institute has not been as proactive as it could be in divesting itself of certain short-course training programs, despite knowing that it is continuing to lose market share to external competition.

Reluctance to change, like at any other organisation, is normal, but as the Institute prepares for what will be another monumental generational shift in vision, it would do well to take stock of those concerns and from where they originate.

As an example, the increase in TRL 1-3 research and the hiring of more PhD-credentialed faculty members have created tensions, particularly for employees who may be expressing insecurity about their jobs due to lower credentialing or because the Institute has not articulated where they fit

into an institution increasingly resembling, in part, the larger university. That a number of employees' salaries are also funded on incremental monies also makes fundamental research funding less palatable under the current budgetary structure. Furthermore, despite a self-professed entrepreneurial spirit, the Institute does not appear to be collectively addressing questions internally about the future of their respective industries and the global oceans economy. Less time, rather than more, seems to be spent contemplating how the Marine Institute should be immediately addressing technologisation of the marine industries. This will require changes not just to the skillset of the teaching faculty, but in the nature of academic programming. For example, while the diploma programs may remain 3- or 4-year programs going forward, the level of sophistication of that program is likely to increase dramatically. The success of the Marine Institute to date has been in its ability to evolve with its changing realities; there is evidence that the organisation, given its significant modernisation over the past decade, can seem to be resting upon its laurels.

A response to the gathering speed of change at the Institute – necessitated either by changes in the fiscal landscape or the impending termination of Vision 2020 – has been increased siloing. The Institute's leadership offers great discretion to individual units to innovate and to pursue funding opportunities. As with many organisations, the trade-off to that discretion is a siloing effect. Addressing short-term needs appears to be prioritised by managers and employees across the board, often at the expense of the longer-term vision as laid out by Vision 2020. Many employees know roughly where the Institute is destined, though few may be invested in the details of what that future was supposed to be. As such, little time

appears to be dedicated to longer-term thinking because so much of the focus is on combatting the perennial 'deficit' of having to generate half of the Institute's operating budget through RDT. A noticeable element of the Institute's culture is its cost-recovery discipline, a trait also mentioned in the Warrian Report. Engraining in the minds of employees that the Institute starts with a multi-million dollar 'deficit'^{xlv} can be a useful motivator^{xlvi}, but it can also come at the cost of efficiency where the pursuit of projects is not prioritised.

The Marine Institute is unique among public education institutions as their finances are built around contract revenues. In many ways, the core operations of the Institute are designed to serve that purpose, which has created a competing tension between those who believe that the principle purpose of the Institute is its academic mission (and with it, fundamental research), and those who believe that its applied research capabilities are at the heart of the Institute's *raison d'être*. Despite the core operations being built around a particular revenue generation model, the Institute does suffer from a general lack of awareness and literacy of its finances. Managers and directors have, by-and-large, bought into the accountability ethos of the entrepreneurial spirit of the Institute, but the movement of individual dollars are difficult to follow through complicated financial reporting structures. Financial literacy will continue to be a medium-term challenge, particularly as budget cuts become the perceived norm. The fate of the government-provided operating grant is arguably the greatest pressure point for the Institute and from it stems most of the tensions. The transition from annual deficits to an influx of \$6 million spread over 3 years only for those new monies to be drawn down by half in the last 2 years has required concerted efforts to strategically

cut resources without affecting the Institute's essential services. The grant constitutes more than half of total revenues and although it steadily rose from 2008 to 2014 with the province's healthy economy, it has been decreasing every year since – again correlated to the state of the province's finances.

In the meantime, the Institute has a surplus reserve of \$3 million, which they have accumulated over the last several years that will help it anticipate cuts to public monies in the coming years; however, those monies are in theory earmarked for infrastructure renewal projects which are necessary to keeping the Institute at the cutting-edge of the sectors in which it works. Still, the fear of missing revenue generation targets, given that reliance on external soft monies, combined with tight margins, remain at the forefront for the senior leadership.

As such, the Institute, like the rest of the Memorial community and the postsecondary sector in Newfoundland and Labrador, has had to address substantial budgetary reductions over the past five years. To address cuts to the provincial grant of 8.45% over the past five years, each unit at the Institute has implemented cuts to their respective budgets, primarily to operational expenditures, including travel, as well as attrition, layoffs and redundancies. The most recent reductions in public funding and the expected \$500,000 reduction in base funding for 2019-20 will likely be further managed through attrition, highlighting again the need for ample knowledge transfer processes by that time.

A change in the Institute's budgeting process in 2014-15 as part of that strategic plan has helped the Institute conduct more medium-term financial planning, the goal of which would be to enable long-term academic planning. It is difficult to say, however, that the Institute can predict

the market relevance of its programs and research functions much beyond 2 years, in part because of the unpredictability of the industry on which it is reliant for substantial portions of their revenues. The lack of formalised plans with respect to capital financing also contributes in part to this limitation. Again, this is not to say that the Institute or various members of the Institute's senior staff are not strategically thinking ahead to pockets of money that may become available in the next three to five years. For example, the foresight of an impending recession in the next two to three years may allow the Institute to anticipate increased government appetite at the federal and provincial levels to spend on capital projects. Additionally, OFI monies may become available in the next five years, as too will the Oceans Super-cluster monies.

While a siloing effect poses challenges to certain areas with respect to research, finances, and collaboration, the full breadth of the Institute's comprehensiveness also presents particular difficulties in appropriately marketing the spectrum of the Marine Institute's capabilities available to potential clients and partners. As such, a robust marketing strategy would be needed. Such a strategy would have to be flexible enough to adapt to differing demands of research and academic units, as well as those of industrial clients and prospective students. This is why each successive implementation plan for Vision 2020 has stressed the need for the Institute to not only develop a marketing strategy, but to invest in the necessary resources to implement it. It is one thing for an organisation to know its intrinsic value – and the evidence would suggest that the Marine Institute, its students, employees, and industry partners are well-versed in the institution's value – but it is another to be able to convince others of it.

A recurring theme of the Institute's progress through Vision 2020, particularly of the implementation plan, is that though the Institute has been broadly successful at achieving the spirit of Vision 2020's objectives, it has been less diligent at formalising procedural requirements and work plans in written form. The marketing and communications team is no different, and in practice has a marketing strategy, but not formally so. In praxis, this strategy is three separate and parallel strategies working together to articulate the Institute's strengths in academic programming and student recruitment, research, and industrial relations. Identifying the need for three separate marketing messages and shifting their focus away from simply the Institute's physical capital to include its human capital were concerted efforts to respond to the demands of Vision 2020 and were one of the stand-out achievements of the process.

These changes are reflected in the new marketing and promotional material for the recruitment team, the graphics for which are now 90 percent supplied or produced by current students and alumni. The marketing team has also taken its role in the student recruitment process seriously and is arguably the most successful at conveying the Institute's strengths and value in this area. Prospective and current students know the unique and comprehensive qualities of the Marine Institute and those who do attend do so because of the quality of education, the research potential, and the hands-on experience in both the classroom and through WIL. Throughout their studies, students acknowledge that the Institute appropriately prepares them for success, in part because close ties with industry make instructors also professional mentors as well as teachers. Not only do students graduate with a global skillset that enables them to work "out there or in here" – their certifications

and credentials are global, versus trade-specific qualifications such as Red Seal, which must be transferred between provinces – but students also believe they "fix real-world problems" through the research conducted at the Institute.

The research component of the marketing strategy has also benefited from the shift in messaging toward the quality of its employees. This has been particularly important in light of the Institute's transition from mostly TRL 4-6-intensive work to include more TRL 1-3 research over the past seven years. Although much of the Institute's strengths with respect to advanced applied research continues to highlight the physical resources available through research units, the Institute is now actively emphasising the expertise of the personnel leading these research projects, a task aided by the recruitment of the Research Chairs. The marketing team also has a mandate through Vision 2020 to support the production of the *Journal of Ocean Technology*. With a reach of over 50 countries, offering a blend of peer-reviewed and other articles, the publication is an avenue to more widely promote the research culture at the Institute. More formal structures to further develop the messaging for the Institute's research units have been established: the marketing team hosted a session at the Research Centres' year-end retreats, bringing an analytical lens to their planning processes and consulting on how best to sell the skills and qualities of their scientists to potential clients. However, the effectiveness of these sessions and the coordination of messaging across research units is unclear. Some of this confusion can be attributed to the frequent conflation between marketing and business development – the former is interpreted as being "fluffy", while the latter means money. This distinction between the two would affirm certain impressions within the Institute that the organisation

undervalues ‘soft’ skills, of which marketing is one.

The industrial relations plan remains the least developed of the three marketing initiatives, in part because the plan had previously been the responsibility of the Office of Development and Engagement, which was essentially responsible for partnerships and client management. This element of the marketing strategy has already been identified as increasingly important due to the advancement of the Oceans Supercluster. The Institute’s first attempt at articulating the range of its industry responsiveness through training and partnerships was produced in late 2015 through the “A Deeper Knowledge” publication. This overview of the Institute and its capabilities was highlighted at trade shows across the country and the world. It is in this area that the Institute has the most potential to engage with its alumni. Although the Institute does not have either an advancement strategy nor an extensive alumni database, many of its graduates now occupy key positions within the marine industries. They serve two potential purposes: in addition to being strong industry partners (half of the Industry Advisory Committee are Institute graduates or have been working with the Marine Institute for more than a decade), they can also provide guidance on how to market the Institute to potential clients such as themselves. Importantly, the diversity of alumni expertise would better prepare the Institute to articulate the comprehensiveness of the Institute’s capabilities.

One last area worth mentioning that is not measured in Vision 2020 but is nevertheless important for the Institute to consider with respect to both organisation culture and the Institute’s position as a leader in the field is the gender breakdown of its student body and staff. Gender continues to be a question for the Marine Institute

given the nature of its work within traditionally male-dominated industries and research fields. Historical photos of the Institute’s previous iteration as the College of Fisheries indicate the progress the Institute has made with regard to recruiting and retaining more women among its staff and its students. However, enrollment numbers suggest that much of this development has stagnated in the past decade: despite the number of female students increasing by 52 percent, compared to 37 percent growth in total enrollment, this only represents a 2 percent increase in the proportion of female students over the past decade.^{xlvii}

Perhaps discouragingly, the percentage of women enrolled in two of the Institute’s long-standing Diploma of Technology programs – Marine Engineering and Nautical Science – has decreased in the past decade. In 2008, these female students in these two programs accounted for 13 and 15 percent of enrollments. In 2018, these numbers had dropped to 9 percent each. This is arguably a more important consideration for the Institute rather than overall numbers given the variance across different programs but also because this is a key indicator when comparing the Institute against its international counterparts.

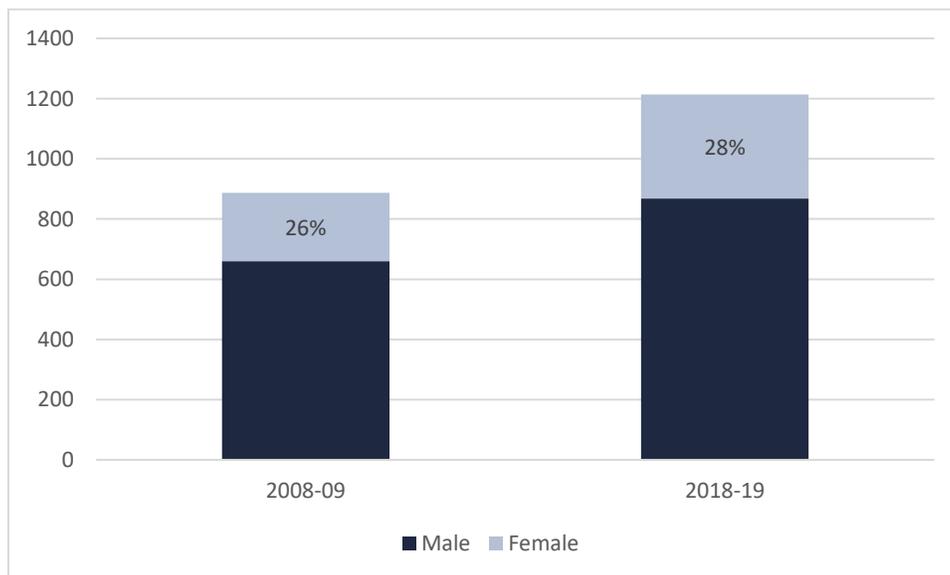
A survey of the European Union’s maritime institutions’ programs revealed that 15 percent of nautical science students in Europe were women, while 8 percent of marine engineering students were women. While the Marine Institute appears to be at par with its European comparator programs in marine engineering, it lags considerably behind in nautical science. This is even more striking when considering that 10 years ago, 15 percent of students in the Institute’s nautical science program were women.

On the staff side, 30 percent of the teaching complement are women, as was the

case in 2008. Although efforts to increase the proportion of women over the past five years^{xlviii} demonstrate that efforts are being made to maintain a sizeable proportion of female instructors, the Institute's teaching complement is not necessarily keeping pace with the changing demographics of the student body it is instructing. Better work appears to have been made in the management ranks, where women constitute 37 percent of staff. In support and administrative functions, almost 60 percent of staff are women. This may be worth including in a broader conversation about

culture and gendered aspects of the Institute's operations. Given the intense focus on 'hard' skill development at the Institute, this can be especially felt in areas of operations that rely on, or require, 'softer' skill sets, as mentioned above, in areas such as marketing. Although this is not necessarily treated as an afterthought at the Institute, there is a concern of undervaluation linked to the question of 'soft' skills. This could be worth reflecting upon as the Institute continues to redefine itself.

Figure 13: Proportion of students by gender, 2008 to 2018





FOOTNOTES

ⁱ For consistency, the three implementation plans which constitute foundational documents of Vision 2020 are referred to in this report as, “LAYING A FOUNDATION” (2005), “UNDER CONSTRUCTION” (2010), and “TAKING OWNERSHIP” (2015).

ⁱⁱ Previously the Institute had leased its vessels from the federal government.

ⁱⁱⁱ *Laying a Foundation*, 15.

^{iv} The five themes are: oceans technology; environment and living resources; safety, security, and emergency resources; policies and regulations; and management.

^v To address the lower-than-expected enrollment numbers caused by centralisation, the Institute hired its own enrollment management coordinator to oversee its recruitment efforts in 2009. The following year, it hired a graduate recruitment officer.

^{vi} Approximately 50 students live in the residences on Memorial’s St. John’s campus.

^{vii} The student affairs portfolio existed previously but was a shared responsibility across the institution.

^{viii} Much of these funds were acquired through project work with external funders.

^{ix} This does not include students that the Institute may train either overseas or through overseas contracts, such as the various Indonesia projects.

^x The concentration of students from Mexico, Iceland, and the Bahamas from 2008, 2013, and 2017 respectively appear to be one-off instances and not indicative of a longer-term or consistent trend.

^{xi} Due to differing registration schedules between MI and its Chinese partner institutions, not all Chinese students were counted at the time of reporting. As such, it can be assumed that the proportion of Chinese students within the student body would otherwise be greater.

^{xii} 2017-18 enrollment numbers.

^{xiii} *Taking Ownership*, 16.

^{xiv} It may be worthwhile to note that enrollment targets were established before the RCN departure and increased competition in the short-course training from private sector providers and these factors should be taken into consideration.

^{xv} *Taking Ownership*, 16.

^{xvi} The tuition structure does not apply to any new degree programs that the Institute may introduce, so that may be a potential avenue for revenue generation.

^{xvii} Graduation rates are calculated according to institutional time-to-diploma guidelines, which for this analysis is considered three years unless otherwise indicated. Students not part of the first-year cohort and who transfer into the program afterwards are not counted in these numbers.

^{xviii} This program has had a historically high success rate for graduates within institutional time-to-diploma guidelines. Except for the 2009-10 cohort, most previous cohorts dating back to 2008-09 had at least a 50 percent success rate.

^{xix} This appears to be an anomaly. Previous and successive cohorts have graduated with at least a 50 percent success rate, rising to more than 70 percent for the 2013-14 and 2014-15 cohorts.

^{xx} This, too, appears to be an anomaly. The program usually has a graduation rate of between 40 to 50 percent either within time-to-diploma guidelines or time-to-diploma plus one year.

^{xxi} The federal transport ministry only certifies Canadian citizens or permanent residents, making students who have yet to obtain the necessary residency status in Canada more challenging as work term placements. This affects recruitment processes, as the Institute may be reluctant to admit international students where the Institute cannot guarantee that they will productively move through the entirety of the program through to proficiency certification. For now, domestic enrollment numbers in Transport Canada-regulated programs have not required the Institute to definitively address the issue.

^{xxii} The Institute currently sets aside 15 percent of its renewal budget for technology-specific projects (the equivalent of \$800,000). It has also earmarked its cumulative surplus, developed over the past five years, for renewal projects yet to be identified.

^{xxiii} *Taking Ownership*, 41.

^{xxiv} *Taking Ownership*, 40.

^{xxv} *Laying a Foundation*, 14.

^{xxvi} The exact number has evolved over time. In 2005, the aim was closer to 800, which was pared down to 350 international students in 2010. In the 2015 implementation plan, the Institute aimed to have roughly 300 students enrolled in its academic programs, included in the minimum of 350 international students that it would train worldwide.

^{xxvii} See chapter 4 of [THE STATE OF POST-SECONDARY EDUCATION IN CANADA](#).

^{xxviii} Includes MOUs signed by the Centre for Applied Ocean Technology.

^{xxix} *Under Construction*, 31.

^{xxx} *Laying a Foundation*, 15.

^{xxxi} The Institute attempted to bring Nunavut students to St. John's, which was not successful largely attributed to the challenging transition from their home communities to the Institute and St. John's. In addition to eliminating the culture shock, on-location instruction also removes many of the racial barriers, be they in the classroom or in the community.

^{xxxii} *Laying a Foundation*, 11.

^{xxxiii} Developed by NASA in the 1970s, technology readiness levels (TRLs) are a conceptual framework to determine the maturity of certain technologies and their transfer. Universities typically tend to work within levels 1-3 (basic discovery, conceptualisation, and proof of concept), while the Marine Institute was found to traditionally work predominantly within levels 4-6 (lab validation, environmental validation, demonstration of operability). For more information, see Peter Warrian and David Wolfe's 2017 paper, "Research and Technology Transfer at the Marine Institute, Memorial University of Newfoundland".

^{xxxiv} See *2017-18 Financial Analysis Report*, 20.

^{xxxv} Page 7.

^{xxxvi} Some Research Centre employees are funded through soft or incremental monies; others are funded through core budgets provided to each Research Centre by the Institute.

^{xxxvii} NB: these are not unlike some of the recommendations found in the Warrian Report.

^{xxxviii} *Taking Ownership*, 39.

^{xxxix} Page 35.

^{xl} The co-management of the fund by both the union and management is incorporated into the collective agreement. Ad-hoc options are available for advanced education for faculty and staff. Provisions are also in place for instructors to return to industry for up to one year as a skill refresher, ensuring that the instructor complement is familiar with industry innovations. This allows for academic programs to intuitively self-correct without formal processes and maintain their relevance.

^{xli} Applicants were welcome to participate with the backing of their supervisors, department heads, deans, etc. The program ended after three years due to budget cuts.

^{xlii} *Taking Ownership*, 31.

^{xliii} The Institute defines it as, "the melding of [fundamental research] with applied research and innovation" in *Taking Ownership*, 31.

^{xliv} Some of this is also attributable to financial limitations which restricted the Institute from hiring replacements for the position. However, indications that the position would eventually need to be filled were in the making for several years.

^{xlv} The Institute's operating grant from the provincial government covers roughly half of its operating expenses. As such, the Institute starts every academic year with roughly \$28 million in debt and therefore must, over the course of that year, recover all of that money through RDT projects. Certain research and training contracts can guarantee up to \$17 million. A lot of energy across all research units is then expended on a daily basis in search of the remaining \$10 million.

^{xlvi} Despite not achieving its \$70 million target for an annual budget (revenues in 2017-18 were almost \$52 million), the Institute's commitment to generating non-grant revenues resulted in 39 percent of revenues originating from non-grant sources in 2017-18 (*Taking Ownership* set a target for 40 percent).

^{xlvii} Students who preferred not to disclose their gender constituted less than 1 percent (0.3 percent in 2008 and < 0.1 percent in 2018.)

^{xlviii} The proportion of female instructors had fallen to less than 25 percent of the teaching complement in 2013.

