

Marine Studies Initiative, Oregon State University
Learning Models Working Group Report
January 15, 2015

Executive Summary – (updated on March 19, 2015)

Learning models within the Marine Studies Initiative (MSI) are based on the premise that the lives and careers of all people can be enriched through ocean literacy. The goal of the Learning Models Working Group (LMWG) is to create a unique environment that integrates marine literacy throughout OSU academic programs while expanding innovative marine education and training opportunities for students, professionals, and life-long learners. Through MSI learning models, OSU will be able to meet the marine education needs of an artist in residence on the coast, a doctoral student studying ocean climate modeling, a middle school science teacher looking to expose their class to marine education, or a working professional looking for specialized training - while also demonstrating to all students how marine topics and case studies might broaden their perspective, enhance their educational experience, and inspire creativity.

Oregon State University currently has a number of successful undergraduate and graduate marine-related academic programs and a notably strong and large pool of faculty involved in teaching and research in marine topics. OSU has roughly 185 faculty with marine expertise, offers 100 marine courses, and, in 2014, graduated 150 students with an undergraduate or graduate marine degree, option, certificate, or specialization. Although many of these degrees, courses, and programs are internationally renowned and highly regarded within their respective fields, they do not have a collective presence at OSU. Marine related degrees and courses are offered through multiple colleges and academic units and can therefore confuse incoming as well as matriculated students looking for opportunities to pursue marine studies at OSU. Furthermore, OSU marine education is heavily weighted toward natural sciences and engineering, leaving much room to expand into business, liberal arts, public health fields, and the social sciences. Lastly, only 20% of marine courses are offered at OSU's Hatfield Marine Science Center in Newport, highlighting opportunities for growth and expansion of marine educational opportunities on the coast. To meet the MSI academic goals, the LMWG has six overarching recommendations:

- Create a Marine Studies Office
- Expand and enhance marine-related courses in all colleges
- Expand and enhance undergraduate and graduate degree options, minors, and certificates
- Create an interdisciplinary marine studies undergraduate major and minor with emphases on liberal arts and social sciences
- Increase internship and international student opportunities across marine-related degree programs
- Continue to foster K-12, community college, professional, and noncredit education partnerships

Marine Studies Office staff and advisors will help incoming students navigate the various paths to marine education at OSU. MSI learning models will substantively enhance and expand current course and degree options. Baccalaureate core courses have the greatest potential to reach large numbers of students and generate tuition revenue to help support MSI. For example, a three quarter long, lower level series of marine baccalaureate core courses could be created to support students in the investigation of the power and influence oceans have on earth and all living things. From the arts to the natural sciences, oceans would be explored through questions, dialogue, inquiry, art, field trips and technology. This series of courses would intentionally highlight the different ways scholars view the

ocean (from the social sciences, the arts and humanities, and the natural sciences) and would integrate intellectual and practical skills throughout.

Large opportunities for growth in marine studies at OSU include options, minors, and certificates within existing programs in addition to a new Marine Studies degree through the College of Liberal Arts. There is a rich human history in marine literature, art, and culture and some of the most pressing environmental issues will have the greatest effects on the ocean and densely populated coastal communities. The human dimension of marine ecosystem change is increasingly emphasized in all aspects of marine science and liberal arts.

Current graduates from marine science programs at OSU find employment within a wide variety of organizations, including government agencies, academic institutions, teaching professions, environmental consulting firms, health fields including veterinary medicine, and nonprofit organizations to name a few. Potential employers for MSI Marine Studies graduates will include these types of organizations as well as many others. Most importantly, however, is that MSI learning models will use ocean literacy as a framework for teaching students to be skilled, erudite, and articulate critical thinkers, prepared to pursue any career path they wish, while also contributing to society as informed citizens.

OSU currently does not have the staff to design and implement a truly revolutionary educational program that the MSI seeks to achieve. To accomplish this, pedagogical, curricular, and program development experts are recommended as next-step hires (including some with K-12 experience). Additionally, some new faculty hires might be at an administrative or Professor level to assist in providing guidance and leadership to MSI educational programs.

There are a variety of overarching topics that MSI may select as signature areas of distinction or centers of excellence, many of which would translate well into MSI learning models. For example, the topic of marine food production could be investigated through the question “Should I Still Eat Fish?” where students explore the natural and social sciences, economics, and politics of global fisheries and aquaculture. The LMWG has provided the foundation by which these types of innovative and transformative educational programs could be implemented at OSU. MSI learning models will help OSU fulfill its unique role as Oregon's land and sea grant institution and contribute to OSU's three signature areas of distinction: (1) advancing the science of sustainable earth ecosystems; (2) improving human health and wellness; and (3) promoting economic growth and social progress.

Introduction

Overview: The Marine Studies Initiative (MSI) Learning Models Working Group (LMWG) was established to define and recommend the learning models most appropriate for Oregon State University's MSI. The LMWG is a 25-member team consisting of a diverse array of faculty, graduate students, and academic staff from every college within the university and includes:

Learning Models Working Group Members

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Robert **Suryan** (co-chair), Associate Professor, Fisheries and Wildlife, CAS

Scott **Baker**, Professor and Associate Director, Marine Mammal Institute, CAS

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Tara **Williams**, Associate Dean, UHC

Our group met five times for 2 hours each (Oct. 30, 2014, Nov. 13, 2014, Dec. 5 and 12, 2014, and Jan. 9, 2015) and used the four key objectives (below) provided by the MSI Executive Committee as a guide to our discussions.

- **Key Objective 1:** Refine learning model to inform curricular development for the Marine Studies Initiative (MSI).
- **Key Objective 2:** Identify thematic areas for curricula development that enhance existing programs and develop the new Marine Studies degree across colleges allowing students flexibility to link disciplines around their core area(s) of interest.
- **Key Objective 3:** Challenge faculty to rethink what graduate and post-graduate education means in the context of the Marine Studies Initiative.
- **Key Objective 4:** Engage faculty from across campus (and new hires as they arrive) in developing new curricula for delivery in the MSI using the principles identified in Objective 1. Upper division and graduate course programs will include residency opportunities in Newport.

We have structured our report to address five key areas: 1) Educational Goals and Opportunities of MSI, 2) Existing Strengths of Marine Education at OSU, 3) Summary of Key Academic Recommendations, 4) Detailed Review of Academic Recommendations, and 5) Marine Studies Educational Challenges and Needs.

Education Goals and Opportunities of MSI

Overview: We envision a learning and teaching environment in marine studies for all Oregon State University students that promotes disciplinary and multidisciplinary collaborative learning and teaching and emphasizes experiential (laboratory, field, agency, industry, and/or issue-based engagement) and problem solving coursework. At the core of the MSI is the development of academic programs that combine multiple disciplines focused on the marine realm, thereby creating novel thought and solutions by crossing disciplinary boundaries. Below are our mission statement, our overarching educational goals for MSI, and a list of proposed educational topics in marine studies at OSU.

Mission statement: Learning models within the Marine Studies Initiative seek to create a unique environment that integrates marine literacy throughout OSU academic programs while expanding innovative marine education and training opportunities for students, professionals, and life-long learners. These efforts will greatly enhance OSU's ability to provide students, faculty, citizens, governments, and industries with the knowledge and skills to promote a healthy future for oceans, people, and the planet.

Overarching educational goals of MSI at Oregon State University:

- Use marine studies education to increase marine literacy at all levels within the University and foster student success and diversity.
- Enhance existing, and create new, marine educational programs with the goals of understanding the conservation and sustainable, safe, and healthy use of the oceans and their marine resources.
- Partner across OSU colleges and campuses to offer highly collaborative and interdisciplinary learning.
- Offer experiential and problem solving learning models at the Hatfield Marine Science Center and other coastal and ocean sites in collaboration with government and industry partners, to help solve real ocean and human health problems in a marine setting.

- Offer opportunities for regional to global educational experiences through exchange programs, internships, and research opportunities.

Proposed educational topics in marine studies at Oregon State University:

- Marine Sciences – ocean sciences (oceanography, geology, chemistry), marine systems biology, fisheries and wildlife, marine mammals, marine conservation, marine genomics, coastal estuarine ecosystems.
- Marine Resources—marine natural resources management, policy, applied economics, business, culture, and planning.
- Ocean and Human Health (One Health) – occupational and environmental health (including disaster preparation/management/response, occupational/community health and safety, risk assessment), commercial seafood production/processing/nutrition/dietetics, marine pharmaceuticals, pollution, climate change, fisheries and emerging diseases (animal and human), conservation medicine, aquarium science and animal care, aquaculture sciences.
- Marine Innovation and Technology—ocean engineering, ocean energy, marine products marketing and innovation, and marine technical training.
- Big Data Analysis to inform Marine and Climate Science—Bioinformatics, biostatistics, marine system science, climatology, meteorology, and ocean modeling.
- Marine Studies in Liberal Arts and Humanities—governance, policy, culture, history, literature, and art.
- Marine Education and Literacy—communication, teacher training, K-12, aquarium and museum display design, and free choice learning.

Existing Strengths of Marine Education at OSU

Overview: Oregon State University currently has a number of successful undergraduate and graduate marine academic programs and a notably strong and large pool of faculty involved in teaching and research in marine studies (an informal survey shows that OSU has roughly 185 faculty with marine expertise; 59 in CAS, 56 in CEOAS, 30 in COS, 13 in COE, 8 each in PHHS and CLA, 7 in CVM, 2 in COP, and 1 each in COB and COEd; Appendix 1).

The existing educational programs range from ocean and coastal sciences, marine biology, fisheries and wildlife science, marine applied economics, marine resource management, marine public policy, and ocean engineering (Appendix 1). Undergraduate degrees with marine options or specializations include Biology, Earth Sciences, Environmental Sciences, and Fisheries and Wildlife Science. Together, in 2014, there were approximately 465 undergraduate students at OSU (90 of which graduated in the same year) that were specifically focused on marine systems. Graduate degrees (MS, PhD) with a strong marine focus include Applied Economics, Civil Engineering, Earth, Ocean and Atmospheric Sciences, Fisheries Science, Wildlife Science, Marine Resource Management, and Zoology (currently Integrative Biology) (Appendix 1). In 2014, the number of graduate students in marine fields at OSU was approximately 264, with 67 graduating in the same year. In addition to degree programs, there are approx. 100 marine courses, 20% of which are taught at Hatfield Marine Science Center (HMSC), and most focusing on marine biological sciences, physical sciences, and engineering. An additional 50 courses have some type of marine content, and are spread throughout the university curriculum.

Some other notable marine educational opportunities at OSU include: 1) summer internships for undergraduate students hosted mainly at HMSC [roughly 40 students participated in 2014 and were

sponsored by a variety of sources including a National Science Foundation Research Experience for Undergraduates grant (joint program between HMSC and CEOAS), HMSC Visitor Center, NOAA, US EPA, Oregon Sea Grant, and Oregon Department of Fish and Wildlife, among others], 2) sponsorship of the Salmon Bowl, the annual tournament-style academic competition for high school students (part of the National Ocean Science Bowl), designed to test students' knowledge of math, science, and social science in the context of the oceans (~90 high school students compete each year with ~70 volunteers from OSU and other agencies), 3) a strong K-12 program and Visitor Center at HMSC managed by Oregon Sea Grant focusing on providing marine literacy for the general public (approximately 10,000 K-12 children participate annually, 150,000 visitors see the Visitor Center, and \$125,000 in donations are raised), 4) research and travel award funds for graduate students through HMSC (e.g., Markham Research Award), Integrative Biology (e.g., ZoRF funds), Fisheries and Wildlife Sciences (e.g., Carlson Memorial Scholarship), and CEOAS (travel awards, Nekton award, Ocean Science seagoing opportunities) and 5) partnerships with community colleges including the Aquarium Science Program at the Oregon Coast Community College (Box 1), 6) 4-H Marine Science Ambassadors summer camp on the OSU Corvallis campus and at the HMSC for high school students to raise awareness about the health of the ocean and how changes are impacting various ecosystems and human life. The HMSC Visitor Center also serves as a "social laboratory" for the Free Choice Learning Program created by Oregon Sea Grant. Science and Math Education (SMED), Marine Resource Management, and Environmental Sciences offer graduate study in free choice learning.

Box 1. OSU College of Veterinary Medicine (CVM) and the Oregon Coast Community College (OCCC) have a unique partnership in an Aquarium Science degree and certificate at the community college. Aquarium science students commonly exchange between OSU and OCCC. Furthermore, Oregon Sea Grant and CVM often host aquatic veterinary externships and preceptorships at HMSC for senior veterinary students from OSU and other colleges around the country.

While many of these degrees, courses, and programs are well known and highly regarded within their respective fields, they do not have a collective presence at OSU. Marine related degrees and courses are offered through multiple colleges and academic units and can therefore cause confusion for incoming as well as matriculated students looking for opportunities to pursue marine studies. Additionally, OSU marine education is heavily weighted toward natural sciences and engineering, leaving much room to expand into business, liberal arts, public health, and social sciences. Finally, only 20% of marine courses are offered at HMSC, many of these in the life sciences, thus not taking full advantage of the experiential, collaborative, and problem solving learning environment that can take place on the Oregon coast. Below, we provide a proposed strategy to integrate and expand marine education at OSU.

Summary of Key Academic Recommendations for the MSI

Overview: Key recommendations of the LMWG are given below. Please refer to the **Detailed Review of Academic Recommendations** section for greater detail to each recommendation and for the context within which these recommendations were made.

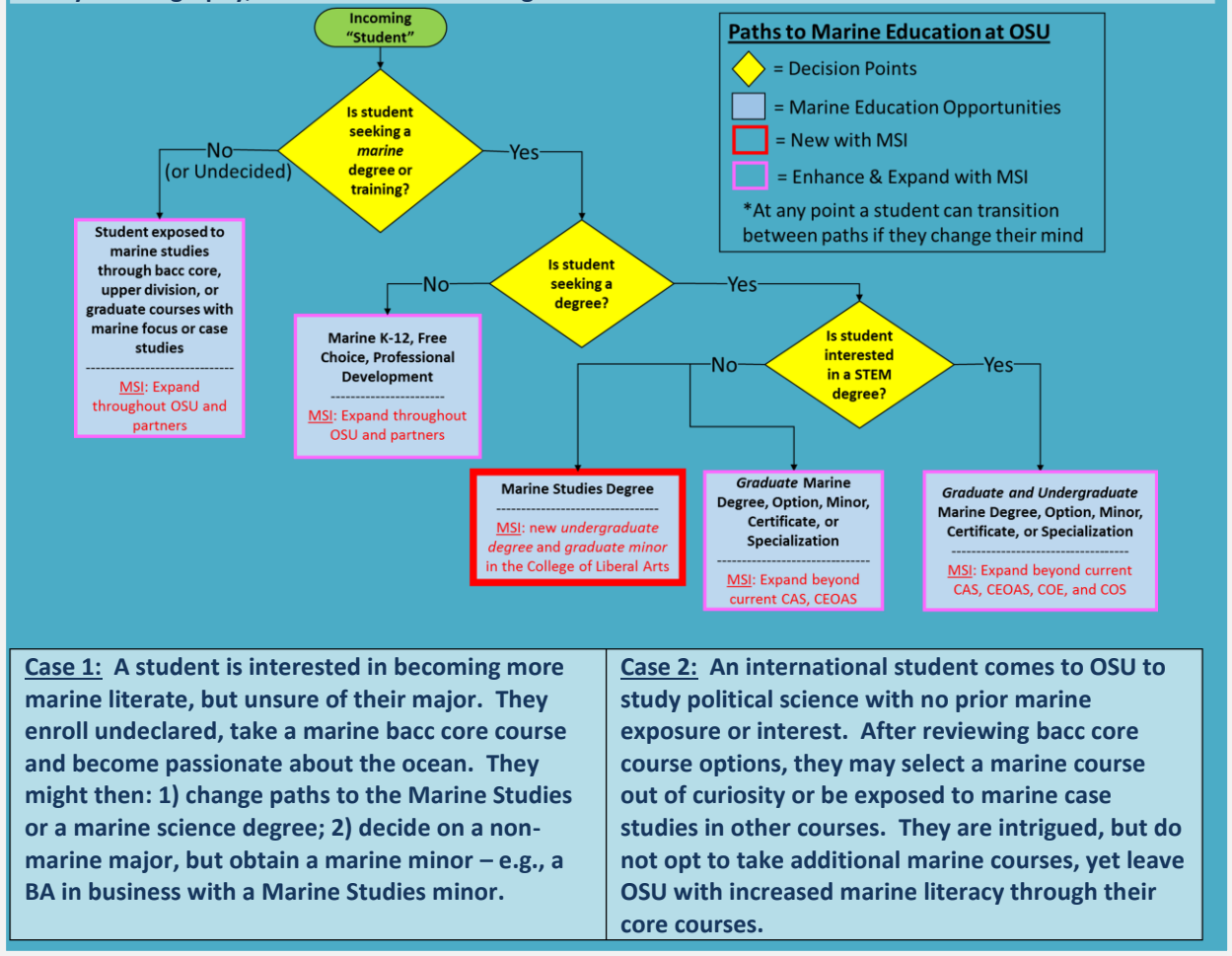
1. **Create a Marine Studies Office** on the Corvallis campus that serves as an organizational hub for the various marine degrees, courses, and educational outreach offered across colleges at OSU.
2. **Expand and enhance marine-related courses in all colleges** with a special focus on marine studies baccalaureate core courses, writing intensive courses, experiential disciplinary and interdisciplinary capstone courses, and cross disciplinary graduate courses.

3. **Expand and enhance undergraduate and graduate degree options, minors, and certificates** within existing disciplinary degree programs. These degrees and certifications should use similar models to successful existing programs.
4. **Create an interdisciplinary, liberal arts, marine studies undergraduate major and minor** that focuses on the human dimensions of marine systems—social, political, and cultural issues of the coast, ethics and sustainability, and ocean and human health (One Health). The emphasis of these degrees will be placed on the social sciences, humanities, and arts of the coasts and oceans.
5. **Increase internship and international student opportunities across marine-related degree programs** that give students research and career experiences locally within Oregon as well as internationally.
6. **Continue to foster K-12, community college, professional, and noncredit education partnerships** that promote pathways to marine educational programs at OSU as well as continuing education opportunities for coastal communities.

Detailed Review of Academic Recommendations

Overview: Our discussions have led us to make six academic key recommendations with the goal of increasing the collective presence and visibility of marine education at OSU. Part of this collective presence involves explicitly identifying the pathways students, professionals, and citizens would follow to best pursue their marine educational goals at OSU. Box 1 shows a simplified diagram and examples that a person coming to OSU could use to identify the marine educational opportunities available to them. The terminal boxes represent new or existing but expanded courses, degrees, or programs that would give students the most choices possible. In addition to these choices, we highly recommend the establishment of a marine education organizational hub that would serve to increase the visibility of marine education, provide important student services, and organize and develop curricula among the colleges, academic units, and HMSC. Below we provide the rationale and specific suggestions that support our key recommendations. Please keep in mind that these are merely suggestions and have not undergone collective approval by the faculty or administrators within colleges or academic units.

Box 2. Paths to marine education at OSU. Incoming “student” refers to any person coming to OSU for education, ranging from a student with no current interest in the ocean to a graduate student intending to study oceanography, or a K-12 teacher seeking marine short-courses.



1. **Create a Marine Studies Office** on the Corvallis campus that serves as an organizational hub for the various marine degrees, courses, and outreach offered across colleges at OSU.

Rationale: The many pathways to marine education at OSU will require considerable coordination and advising. The Marine Studies Office would be the initial contact point for marine studies inquiries at OSU. This is not to redirect traffic from current marine program offices and advisors, but to fulfill the role as a hub to coordinate among academic units and to direct those needing assistance, especially prospecting students. An inquiry into marine-related studies at OSU would first direct the student or prospective student to this office, which then—following the pathways outlined in Box 1—would redirect the student to relevant colleges or academic units depending on their interests.

Suggestions: The Marine Studies Office will work with departments and colleges at OSU to:

- a. Recruit students to marine programs at OSU.
- b. Work closely with advisors in departments/colleges to place and advise students interested in marine studies.

- c. Maintain a highly visible website with continually updated information about marine educational opportunities at OSU and with a searchable database for marine courses.
 - d. Coordinate student services and exchanges within OSU and among other universities and community colleges (e.g., courses, housing, ensure articulation agreements are established and maintained, etc.)
 - e. Work closely with colleges to coordinate curricula design and implementation based on student needs/requests across MSI.
 - f. Schedule courses and lecture/lab spaces.
 - g. Provide training for teaching assistants.
 - h. Provide equipment and technology support for classrooms and field trips.
 - i. Assign/schedule classrooms at HMSC and on main campus to make sure courses can be broadcast to and from main campus via Polycom or other means. Based on past experience, this can be a logistical nightmare and will require central coordination.
 - j. Track/monitor/evaluate success of the MSI (i.e., number of students, revenue, other metrics) and manage/balance budget(s) to run the educational programs.
 - k. Serve as a repository for all internship opportunities related to the MSI (at HMSC, along the coast and internationally)
 - l. Provide information on marine related scholarships, clubs, and other career enhancement opportunities both inside and outside of OSU.
2. **Expand and enhance marine-related courses in all colleges** with a special focus on marine studies baccalaureate core courses, writing intensive courses, experiential disciplinary and interdisciplinary capstone courses, and cross disciplinary graduate courses.

Rationale: Our survey of existing marine courses (see Appendix 1) shows that of the roughly 150 marine or marine-related courses at OSU, nearly 85% are focused on natural science and engineering, with the remaining mostly focused on social and economic sciences. In addition, there are very few marine baccalaureate core courses (those that exist, e.g., Bi/FW 111 Introduction to Marine Life of the Sea, OC 103 Exploring the Deep, OC 201 Oceanography are always filled) that can promote ocean literacy to a wide and diverse student body, and very few Writing Intensive courses with a marine theme (e.g., Bi 450 Marine Biology, FW 497 Aquaculture, OC 334 Polar Oceanography). Our survey also shows that of the exclusively marine types of courses, only ~20% are offered at HMSC, and many do not have an experiential learning component (i.e., field or laboratory experience) or an interdisciplinary nature (except see <http://hmsc.oregonstate.edu/academics/courses-hmsc>). Finally, although 70% of the marine or marine-related courses offered at OSU are at the graduate level, many are strictly disciplinary in nature. Below we provide some suggested courses that could be added to the marine curricula to enhance marine literacy, experiential learning, and multidisciplinary marine education university-wide.

Suggestions: Below are possible courses that could be created:

- a. Baccalaureate core courses
 - Marine Studies Series— a three quarter-long series of lower level courses that support students in the investigation of the power and influence oceans have on earth and all living things. From the arts to the hard sciences, oceans will be explored through questions, dialogue, inquiry, art, field trips and technology. This series of courses will intentionally highlight the different ways scholars view Marine Studies (from the social sciences, the arts and humanities and the hard sciences) and will integrate the

intellectual and practical skills throughout: writing, teamwork, information literacy, and many types of critical thinking. Designed by faculty from several colleges, with the assistance of Kay Sagmiller from the Center for Learning and Teaching at OSU, to ensure accurate disciplinary content and perspectives. Suggest teaching on Corvallis campus (initially) with field trips to HMSC.

- Blue Planet: Our Oceans and You—a large baccalaureate science core course providing an interdisciplinary overview of marine biology, perhaps team-taught among the academic units of Integrative Biology, Microbiology, Fisheries and Wildlife, and CEOAS. Suggest teaching on Corvallis campus (initially) with field trips to HMSC.
- “Should I Still Eat Fish?”—A large baccalaureate core course considering the natural and social science, economics, public health, and politics of global fisheries and seafood production, perhaps team-created between Applied Economics, CEOAS, CPHHS, and Fisheries and Wildlife. Suggest teaching on Corvallis campus (initially) with field trips to HMSC.
- Our Future Oceans – a Contemporary Global Issues synthesis course that would focus on the impact of human society on the characteristics and function of the 21st century ocean. To be taught by CEOAS and other marine faculty.
- Baccalaureate courses organized around problems and/or big ideas. These courses would illustrate relationships, cause and effect, and other complex ideas that surround marine life, politics, economics, communities, etc. Focus on such topics in marine studies as food and energy security, human health, ecosystem services, or global change.
- Marine- related jobs – course identifying all the potential jobs that one could pursue that are related to the marine environment

b. Writing Intensive courses

- Critical Thinking and Communication in Marine Studies (similar to existing Z/Bi 319)—a WIC for marine studies undergraduate majors that helps students approach problems scientifically, use critical thinking and analytical skills, and learn to communicate scientific information formally and informally through writing and speaking. The course would focus on interdisciplinary marine studies with numerous informal and formal writing opportunities and assignments during the term. The course would aim to prepare students for scientific, technical, and/or management and policy careers.
- History of Marine Sciences—a WIC for marine studies undergraduate majors similar to the above course but focusing on the history of the marine sciences.

c. Experiential disciplinary and interdisciplinary courses

- Create quarter-long capstone experiential courses, similar to Bi 450 Marine Biology (<http://hmsc.oregonstate.edu/academics/courses-hmsc>; <http://www.marinebio450.blogspot.com/>), to be offered at HMSC in disciplines such as liberal arts, ocean sciences, engineering, and fisheries and wildlife. This type of course could be required for all or certain marine studies majors. Offer in the summer as well.
- Create quarter-long capstone experiential courses similar to the above but highly integrated, bringing together students from around the university, to give them experiential (laboratory, field, agency, industry, and/or issue-based engagement) and problem solving opportunities. This type of course could be required for all or certain marine studies majors. Offer in the summer as well.
- Create a number of liberal arts and humanities undergraduate courses that do not exist at OSU, including, e.g., Coastal Communities (social science and anthropology) Marine/Maritime Literature (English), and Marine/Maritime History (history), History of

Marine Sciences (history), Marine Environmental History. Suggest offering on the Corvallis campus first but expanding to HMSC over time. Offer in the summer as well.

- Create a practicum course for marine studies students, which emphasizes outreach and public engagement in any field, utilizing the Hatfield Visitor's Center and free choice learning expertise of the Sea Grant Extension staff. Similarly, a course in K-12 experiential education could benefit OSU students and Oregon residents.
- Create a sustainability colloquium that uses narrative to explore issues related to exploitation and sustainability of marine resources through the eyes of an historical figure/event/place that students can visit/interview. For example, focus on Barry Fisher, and explore the history of commercial fishing in US west coast through the lens of that person.
- Expand the new Field Oceanography (OC 295) class to always include at least a week of ship time on the large OSU vessel, the *RV Oceanus*. This action would allow for more students to participate in the class.
- Consider offering these courses within the honors college format. Honors college courses are traditional small and use active, experiential types of learning modes.
- Create a public health course that focuses on oceans and public health.
- The Physical Activity Courses (PAC) offered on the coast could be increased beyond outdoor recreation and education for those MSI students housed there. Outdoor recreation courses emphasizing leave no trace and marine education and protection.

d. Graduate courses

- Create quarter-long capstone experiential courses for graduate students, to be offered at HMSC in all disciplines with graduate degrees that emphasize marine studies (e.g., fisheries and wildlife, ocean science, civil engineering, MRM, zoology, liberal arts, public policy, marine mammal genomics, marine mammal physiology). This type of capstone course might serve to jumpstart a research project and dissertation chapter for the student. Potentially offer in the summer as well.
- Create quarter-long capstone experiential courses for graduate students but highly interdisciplinary, bringing together students from around the university, to give them experiential (laboratory, field, agency, industry, and/or issue-based engagement) and problem solving opportunities. This type of capstone course might serve to jumpstart a research project and dissertation chapter for the student. Themes of interest might include: marine system science, human dimensions of marine systems, computational and quantitative marine science, fisheries and food security, risk and uncertainty quantification and communication, and marine education and citizen science. Potentially offer in the summer as well.
- Create a number of liberal arts and humanities graduate courses that do not exist at OSU, including, e.g., Coastal Communities (social science and anthropology) Marine/Maritime Literature (English), and Marine/Maritime History (history).
- Create 1-2 week short courses ("boot camps") to be offered at HMSC, similar to OC 515 Oregon Coast Math Camp OEAS 500 Cascadia Field course, and Z565 Marine Conservation Science and Policy. For example, a successful collaboration with University of Washington provided an intensive quantitative modeling course for graduate students and agency scientists in 2014, and could be a model for future cross-institutional efforts. These could include such topics as:
 - Coastal ecosystem services and coastal hazards.

- Recent advances in marine mammal science: team taught – summer, 2-4 weeks, including bioacoustics, molecular ecology, telemetry/foraging ecology, photo ID/capture-recapture models, and spatial ecology and MPAs.
 - Professional training in such topics as the organizational structure of marine-related institutions outside of academia, or collaborative and interdisciplinary research, or communicating science.
 - Applied coastal ecosystem research (with a field component involving designing a mini-research project).
 - Marine genomics – could either be a 2-week short course or quarter long (preferably the latter). It could be team taught by faculty from Integrative Biology, Microbiology and Fisheries and Wildlife. It would be experiential with students collecting and preserving samples to process them in the genetics lab at HMSC.
3. **Expand and enhance undergraduate and graduate degree options, minors, and certificates** within existing disciplinary degree programs. These degrees and certifications should use similar models to successful existing programs.

Rationale: Our survey shows (Appendix 1) that OSU has a few undergraduate degrees that have marine options or specializations, including Biology (Marine Biology Option; <http://catalog.oregonstate.edu/OptionDetail.aspx?id=278>), Earth Sciences (Ocean Science Option; <http://catalog.oregonstate.edu/OptionDetail.aspx?code=659&majorid=901>), Environmental Sciences (Aquatic Biology Option; <http://catalog.oregonstate.edu/OptionDetail.aspx?id=217>), and Fisheries and Wildlife Sciences (varied specializations but include e.g., Fisheries, Marine Mammal Science, Marine Conservation Biology, Marine Ecology; <http://catalog.oregonstate.edu/MajorDetail.aspx?major=733&college=01>). Options are transcript visible while specializations are not. For that reason, options provide students with official documentation of their marine educational experience at OSU. Most undergraduate degrees have minors with the exception of Oceanography (<http://catalog.oregonstate.edu/MinorDetail.aspx?minor=660&college=24>), but none have a specific marine focus.

Much of the graduate marine education at OSU occurs within disciplinary degrees although most are flexible to allow interdisciplinary program of study design. Graduate degrees (MS, PhD) with a strong marine focus include Applied Economics, Civil Engineering, Fisheries Science, Wildlife Science, Earth, Ocean and Atmospheric Sciences, Marine Resource Management, and Zoology. There are very few marine or marine-related graduate minors and certificates at OSU. Examples include Marine Resource Management (Minor and Graduate Certificate), Fisheries and Wildlife Administration Professional Science Masters Degree, and Graduate Certificates in Fisheries or Wildlife Management.

We envision the creation of marine options, minors, and certifications that can be used to enhance traditional graduate and undergraduate disciplinary degrees.

Suggestions: Below are possible degree options, minors, and certificates that could be created for existing disciplinary degree programs.

- a. Undergraduate degrees
 - Create marine degree options for Fisheries and Wildlife, Zoology, and potential other degree programs.

- Create an undergraduate Marine Studies minor that is strong in liberal arts and social sciences. See Recommendation #4 below for more information about the proposed major.
 - Make the Ocean Science Option within Earth Science a standalone BS degree to attract more attention to undergraduate oceanography.
- b. Graduate degrees
- Create a graduate Marine Studies minor and certificate that are strong in liberal arts and social sciences. See below for more information about the proposed undergraduate major.
 - Create applied graduate marine certificates in the various educational topics such as sustainable seafood, ocean engineering, aquatic animal medicine, and data management and analysis.
4. ***Create an interdisciplinary, liberal arts, marine studies undergraduate major and minor*** that focuses on the human dimensions of marine systems—social and cultural issues of the coast, ethics and sustainability, ocean and human health (One Health), and marine policy. The emphasis of these degrees will be placed on the social sciences, humanities, and arts of the coasts and oceans.

Rationale: OSU has well established and highly regarded education and research programs in marine and natural resource economics, ocean engineering, and ocean sciences. While MSI can substantively enhance and expand these established programs, the most logical direction for new growth in marine studies at OSU is in the arts and humanities. There is a rich human history in marine literature, art, and culture. Many of the most pressing environmental issues will have the greatest effects on the oceans and coasts, thereby impacting coastal communities and beyond. The human dimension of marine ecosystem change is increasingly emphasized in all aspects of marine science and liberal arts marine studies degree will expand the reach of marine programs at OSU toward a more holistic, One Health (e.g., <http://www.onehealthinitiative.com/>) model.

Suggestions: Below are suggestions to create a new Marine Studies degree:

- a. Create a Category 1 proposal for an undergraduate liberal arts major and minor, emphasizing social sciences, governance, business, humanities, and arts of the coasts and oceans. Form a committee of interested faculty and advisors to develop curricula.
 - b. Link the Marine Studies program with the Environmental Arts and Humanities Initiative.
 - c. Offer a baccalaureate core marine studies course (see Recommendation #2 above).
 - d. Require students to be in residence at HMSC or other coastal learning center for some period of time.
 - e. Integrate student activities with vibrant coastal arts community programs.
 - f. Provide opportunities for artists or writers in residence at HMSC.
5. ***Increase internship and international student opportunities across marine-related degree programs*** that give students research and career experiences locally within Oregon, the West Coast, nationally, and internationally.

Rationale: An education in marine studies provides students with knowledge and skills needed to contribute as informed citizens in guiding social progress and change and, importantly, to secure future jobs. A degree alone, however, is not always sufficient to prepare students for employment. Many traits that employers seek are beyond knowledge gained in courses alone. Above all, employers often seek critical thinking, problem solving, and practical skills beyond basic knowledge. The best way for students to obtain these skills while obtaining job resume-building experience is

through internships and student exchanges. HMSC, in particular, and coastal communities throughout Oregon, provide many opportunities for student internships in all aspects of marine studies. Furthermore, the University and faculty at OSU have broad collaborative networks to provide students with international internship experiences.

Suggestions: To increase the number of marine internships and international student opportunities, OSU should:

- a. Seek additional endowments that specifically support student internships and experiential learning.
 - b. Seek partnerships with local governments, non-profit organizations, and businesses to facilitate routine internship exchanges. These include, but are not limited to:
 - All state and federal resource agencies at HMSC and the region.
 - Oregon Coast Aquarium, OMSI, Marine Discovery Tours, HMSC Visitor Center
 - Throughout MSI at OSU, e.g., Marine Studies degree students gaining experiential opportunities by joining an oceanographic research cruise (“writers at sea”) or a Whale Watching Spoken Here Oregon State Park site.
 - Oregon Sea Grant, Northwest Natural Marine Renewable Energy Center.
 - c. Use the Marine Studies Office to match upper division or capstone student projects with marine faculty research activities, e.g., computer software engineering students design a machine vision algorithm to help identify images of marine plankton or engage in ocean condition prediction.
 - d. Work with government programs such as Environment For The Americas that promote internships for underrepresented students and recent graduates
 - e. Facilitate student exchanges with collaborating marine labs through the National Association of Marine Laboratories and similar internationally affiliated laboratories.
 - f. Work with OSU International Programs to promote course offerings at HMSC to international students;
 - g. Work to ease transitioning between Corvallis and HMSC for international students under all circumstances.
 - h. Encourage students to apply for NSF’s East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI).
6. **Continue to foster K-12, community college, professional, and noncredit education partnerships** that promote educational pathways to marine educational programs at OSU as well as continuing education opportunities for coastal communities.

Rationale: OSU currently has some strong partnerships on the coast with the Oregon Coast Community College aquarium science program and the K-12 STEM education hub. Programs such as these are critical in providing a pipeline of potential future students for OSU. Also, by partnering with community colleges, OSU can help provide a wide variety of marine specialized professional training and adult free-choice learning such as the Seataqua series (<http://oregoncoastcc.org/seataqua>).

Suggestions: To continue to foster K-12, community college, professional and noncredit education partnerships, OSU should:

- a. Secure stable funding for K-12 programs. Many of these exist solely on temporary grant funds.
- b. Provide advisors that are located within or regularly visit community colleges to foster communication and faculty collaboration.

- c. Coordinate with community colleges to ensure enrollment eligibility for international students.
- d. Coordinate and/or offer regular professional development short-courses or workshops for professional aquarists and aquaculturists.
- e. Coordinate and/or offer regular continuing education opportunities in aquatic animal health, medicine and One Health for practicing veterinarians and physicians. Possibly partner with the new health education training center at Samaritan Pacific Communities Hospital. Work with OSU's STEM Academy to develop PI-lead summer camps at HMSC.

Marine Studies Educational Challenges and Needs

Overview: The implementation of the academic recommendations described above will require overcoming a number of current institutional challenges facing marine education at OSU. Below we list some of the key challenges facing marine educational programs at OSU and recommend a number of solutions. Additional detailed discussions of the topics below can be found in the HMSC Education Needs Assessment, the HMSC External Review, and the HMSC Strategic Plan (see References).

1. Curricular challenges

Issues:

- a. Avoid replicating, competing, and/or eliminating current degrees. Rather, enhancing current programs will likely be needed to “jump start” the student population on the Corvallis and HMSC campuses.
- b. If the marine studies degree is a cross-college program, it may not be successful because there may be limited faculty/department buy-in and/or no clear ownership or incentive to participate. This could manifest itself in:
 - i. An unwillingness to provide support (funding, projects, etc.) for Marine Studies degree students, including space within high enrollment courses.
 - ii. Marine Studies degree students feeling a lack of “belonging” to any program—this was the case for the Biology degree and the Environmental Sciences degree prior to moving them to departments.
- c. The Marine Studies degree could be less marketable than a traditional marine science or marine resource management type of degree. How many students will want a degree in marine studies and how will they use it?
- d. Attraction of students to newly created baccalaureate core courses as well as existing marine options, professional degrees, and certificates may have to “support” Marine Studies arts degree while it gains momentum.
- e. Students in degree programs with less scheduling flexibility for required courses may find it difficult to commit full terms at HMSC. Core courses need to be offered early in curriculum development or broadcast to HMSC to encourage residency.
- f. Marine courses at OSU are not all listed with a single designation, therefore, they are difficult for students to find throughout the OSU catalogue and to identify similar courses.
- g. Much of current K-12 education is grant-funded and, therefore, the programs do not have long-term stability. These programs provide a pipeline of future students and their long-term stability is critical.
- h. Unwillingness of many faculty on main campus to broadcast their courses to students stationed at HMSC or elsewhere on the coast.

Recommendations:

- a. Coordinate marine education through the Marine Studies Office and ensure there are sufficient advisors.
- b. Include academic advisors in existing marine programs during MSI curriculum planning.
- c. Maintain an online database where students can search and compare marine courses
- d. Facilitate exchange among marine and non-marine faculty so that non-marine faculty can incorporate marine examples and case studies to increase marine literacy for non-marine majors.
- e. Provide incentives to core curriculum departments to broadcast service courses such as statistics, physics, math, and writing to classrooms at the coast.

- f. Promote flexibility in existing degree programs to allow students to spend one or more terms at HMSC (course substitutions, experiential learning credit).
- g. Provide Ecampus online hybrid courses so that students that are place bound have access to courses on campus and on the coast.

2. **Infrastructure challenges**

Issues:

- a. Determine logistics involved in running a Marine Studies Office including the number of staff, their duties, and the location of the office.
- b. Additional classrooms are needed on the coast. HMSC currently has 4 classrooms that can accommodate up to 90 students total, with a maximum of 30 students in any one class. The four teaching wet labs with running seawater can accommodate up to 100 students (20-25 each), however, only two are committed to college level courses and student projects, the other two to youth education instruction (K-12 Sea Grant Program).
- c. Existing HMSC classrooms are designed for traditional lecture and science laboratories, therefore consider building alternative classroom/learning spaces that foster social learning, arts, and humanities.
- d. Small boats and diving facilities and training are needed for academic programs.
- e. Current student housing is insufficient to support expansion. Existing long-term housing at HMSC can accommodate a maximum of 62 students. Additional short-term (1-3 nights) bunkhouses can accommodate an additional 32 students. Current occupancy is 50% in fall, 50% in winter, 80% in spring, and 98% in summer.
- f. Visiting teaching faculty housing is very limited and will need to be expanded as course offerings are increased.
- g. Most conference rooms and one of the classrooms at HMSC have teleconferencing equipment, however, on campus in Corvallis classrooms with teleconferencing capability are limited or insufficiently used (except for the Department of Fisheries and Wildlife).
- h. Regularly scheduled shared transportation between Corvallis and Newport only occurs once a day and can cost passengers as much as \$10 per trip.

Recommendations:

- a. Build new classroom and laboratory space at HMSC, including the latest teleconferencing equipment.
- b. Outfit more classroom and laboratory space with the latest teleconferencing equipment on the Corvallis campus.
- c. Share classroom and lab facilities with Oregon Coast Community College, however, similar to HMSC, they are relatively low capacity (maximum of 24 students), and are also in high use most days of the week.
- d. Additional classroom buildings could be located near the community college to be used as shared space and so that it is close to new housing and other student services.
- e. Seek partnerships with private developers and the community college to build off-site housing in Newport, preferably up near the community college, which has close access to HMSC and is out of the tsunami inundation zone. Design in student common areas, entertainment, and recreation.
- f. Program visibility needs to be equally strong on the Corvallis campus and on the coast so that neither is “isolated”, i.e., well recognized and publicized at both locations.
- g. Build a facility for small boats and diving operations.
- h. Operate a free shuttle service between Corvallis and Newport with more trip times.

3. Teaching Needs

Issues:

- a. Many of the faculty who currently teach marine courses either in Corvallis or at HMSC do so part-time either because they do not have dedicated FTE for teaching due to their position descriptions, or they mostly teach non-marine courses for their respective degree programs. For example, most CEOAS faculty have roughly 0.25 teaching FTE and most of the Integrative Biology and Fisheries and Wildlife faculty, who teach the majority of the marine biology courses at OSU, only teach 1-2 marine courses over a two year period. The remaining teaching load consists of non-marine courses.
- b. If HMSC is going to expand its teaching mission, the teaching faculty at HMSC will need to expand significantly. Most faculty in residence at HMSC have little or no teaching FTE and do not have curriculum development FTE.
- c. Graduate students in residence at HMSC are primarily supported through research funding, with only a few teaching assistantships available (e.g., BI 350 GTA in spring term, FW-supported GTAs in fall term, HMSC supported in summer, Ecampus classes).

“Additional teaching FTE will be a game-changer, otherwise we [HMSC] will remain a research station that does some teaching.”

Recommendations:

- a. Sufficient numbers of faculty both at HMSC and Corvallis need to be hired or given additional teaching FTE to support the courses and degrees recommended within this report.
- b. Create enough GTAs to support marine teaching both at HMSC and Corvallis.

4. Funding and tuition models

Issues:

- a. Tuition is currently inconsistent – spring and summer students pay through an Ecampus model, while fall students pay on campus tuition and fees.
- b. On campus tuition model does not provide funds back to the teaching unit, nor to HMSC itself; this reduces incentive to create new courses or expand programs.
- c. Incentives are not available to encourage faculty to develop new course or curriculum offerings, especially multidisciplinary courses that cross traditional department or college lines.

Recommendations:

- a. Create funding models so that tuition dollars go back to units for A) co-teaching courses with faculty from different units and B) courses taught at HMSC. A good example is Ecampus, which has flourished with the huge incentive that a majority of the tuition dollars go back to the unit teaching the course.

References

Educational needs assessment for Oregon State University’s Hatfield Marine Science Center. 2013 <http://hdl.handle.net/1957/42252>

External Review Team for Oregon State University Hatfield Marine Science Center. 2010. Report of an external review Oregon State University Hatfield Marine Science Center, September 16-17, 2010. Corvallis: The University. 22 pp. <http://hdl.handle.net/1957/41540>

Oregon State University Hatfield Marine Science Center Strategic Plan 2006
<http://ir.library.oregonstate.edu/xmlui/handle/1957/5036>

Appendices

Appendix 1: Summary of an informal survey that yields conservative estimates of academic units within colleges that have marine degrees, marine courses, and/or faculty who teach or conduct research on marine subjects. Please contact Sally Hacker (hackers@science.oregonstate.edu) or Rob Suryan (rob.suryan@oregonstate.edu) for the expanded data file.

Marine Studies Initiative, Learning Models Working Group										
List of academic units within colleges that have marine degrees, marine courses, and/or faculty who teach or research marine subjects										
15-Jan-15										
Please note that these are conservative estimates										
COLLEGE DEPARTMENT/ ACADEMIC UNIT	MAJORS	DEGREES	MARINE OPTION OR SPECIALIZATION	NO. MARINE STUDENTS 2014 undergrad (grad)	NO. MARINE STUDENTS GRADUATE D 2014 undergrad (grad)	TOTAL NO. MARINE COURSES (NO. AT HMSC) (NO. AT SREC)*	ADDITIONAL COURSES WITH SOME MARINE CONTENT	TOTAL NO. FACULTY WITH MARINE EXPERTISE (NO. AT HMSC) (NO. AT SREC)*	TOTAL NO. FACULTY CONDUCTING MARINE TEACHING	NO. FACULTY CONDUCTING MARINE RESEARCH (SOME MARINE RESEARCH)
AGRICULTURAL SCIENCES										
Applied Economics	Applied Economics	BS, Minor	None	0	0					
	Applied Economics	MS, PhD, Minor	Marine Res/Policy	3	3					
Total Department				0 (3)	0 (3)	2 (0)	4	8 (1)	8	5 (3)
Biological/Ecological Engineering	Ecological Engineering	BS, Minor	None	0	0					
	Biological/Ecological Engineering	MS, MEng, PhD	None	?	?					
Total Department				0 (0)	0 (0)	0 (0)	0	1 (0)	0	0 (1)
Botany and Plant Pathology	Botany	BS, Minor	None	0	0					
	Botany	MS, PhD	None	?	?					
Total Department				0 (0)	0 (0)	0 (0)	1	4 (1)	1	4 (0)
Fisheries and Wildlife	Fisheries or Wildlife Science	BS, Minor	Varied Specialization	100	25					
	Fisheries or Wildlife Science	MS, PhD, Minor	Varied Specialization	46	8					
	Fisheries/Wildlife Management	Grad. Certificate		30	10					
	Fisheries/Wildlife Administration	PMS		3	0					
Total Department				100 (79)	25 (18)	17 (14)	20	37 (16)	15	25 (12)
Food Science and Technology	Food Science/Technology	BS, Minor	None	0	0					
	Food Science/Technology	MS, PhD, Minor	None	46	8					
Total Department				0 (0)	0 (0)	2 (2)*	0	7 (0)(4)*	7	5 (2)
Horticulture	Horticulture	BS, Minor	None	0	0					
	Horticulture	MS, PhD	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	2 (0)	0	1 (0)
TOTAL COLLEGE				100 (82)	25 (21)	21 (14) (2)*	25	59 (18)** (4)*	31	40 (18)
BUSINESS										
Strategy/Entrepreneurship	Business Administration	BA, BS, Minor	None	0	0					
	Business Administration	MBA, PhD, Minor	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	1 (0)	0	1 (0)
TOTAL COLLEGE				0 (0)	0 (0)	0 (0)	0	1 (0)	0	1 (0)
EARTH, OCEAN AND ATMOSPHERIC SCIENCES										
Earth and Environmental Science	Earth Sciences	BS, Minor	Ocean Science Option	25	None Yet					
	Environmental Science	BS, Minor	Aquatic Biology Option	80	20					
	OEAS	MS, PhD, Minor	NA	65	15					
Total Degrees				105 (65)	20 (15)	38 (2)	6	54 (2)	53	54 (0)
Marine Resource Management	MRM	MS, Minor, Grad Cert	NA	0 (20)	0 (10)	14 (0)	0	2 (0)	2	2 (0)
TOTAL COLLEGE				105 (85)	20 (25)	52 (2)	6	56 (2)**	55	56 (0)
EDUCATION										
Education	Education	BA, BS Double Deg	None	0	0					
	Mathematics/Science Education	MS, PhD	None	?	?					
	Math/Integrated Science Teaching	MAT	None	0	0					
Total Department				0 (0)	0 (0)	1 (0)	0	1 (0)	1	1 (0)
TOTAL COLLEGE				0 (0)	0 (0)	1 (0)	0	1 (0)	1	1 (0)
ENGINEERING										
Civil/Construction Engineering	Civil Engineering	BS	None	0	0					
	Civil Engineering	MEng, MS, PhD	Coastal/Ocean Spec.	26	8					
Total Department				0 (26)	0 (8)	12 (0)	2	8 (0)	7	8 (0)
Electrical Engineering	Electrical Engineering	BS	None	0	0					
	Electrical Engineering	MEng, MS, PhD	Marine Renew Energy Spec.	2	0					
Total Department				0 (2)	0 (0)	1 (0)	0	2 (0)	0	2 (0)
Mechanical Engineering	Mechanical Engineering	BS	None	0	0					
	Mechanical Engineering	MEng, MS, PhD	Marine Renew Energy Spec.	5	0					
Total Department				0 (5)	0 (0)	1 (0)	0	3 (0)	0	3 (0)
TOTAL COLLEGE				0 (33)	0 (8)	14 (0)	2	13 (0)	7	13 (0)
FORESTRY										
Forest Ecosystems/Society	Natural Resources	BS, Minor	None	0	0					
	Recreation Res. Management	BS, Minor	None	0	0					
	Forest Ecosystems/Society	MS, PhD, Minor	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	0 (0)	0	0 (0)
TOTAL COLLEGE				0 (0)	0 (0)	0 (0)	0	0 (0)	0	0 (0)
GRADUATE SCHOOL										
	Environmental Science	MS, PhD, Minor	None	10	3					
	Environmental Science	Professional MS	None	0	0					
Total Degree				0 (10)	0 (3)	0 (0)	0	NA	NA	NA
TOTAL COLLEGE				0 (10)	0 (3)	0 (0)	0	NA	NA	NA
LIBERAL ARTS										
	Liberal Arts (multiple)	BA, BS, Minor	None	0	0					
	Public Policy	MA, MS, PhD	None	6	0					
	History of Science	MA, MS, PhD	None	0	0					
	Applied Ethics	MA	None	0	0					
TOTAL COLLEGE				0 (6)	0 (0)	0 (0)	0	8 (0)	2	4 (4)
PHARMACY										
Pharmaceutical Sciences	Pharmaceutical Sciences	PhD, Pharm D.	None	0 (5)	0 (1)	1 (0)	0	2 (0)	0	1 (1)
PUBLIC HEALTH AND HUMAN SCIENCES										
Biological/Pop Health Sciences	Public Health	BS, Minor	None	0	0					
	Public Health	MS, PhD	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	8 (0)	0	7 (1)
TOTAL COLLEGE				0 (0)	0 (0)	0 (0)	0	8 (0)	0	7 (1)
SCIENCE										
Chemistry	Chemistry	BS, Minor	None	0	0					
	Chemistry	MS, PhD, Minor	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	4 (0)	0	4 (0)
Integrative Biology	Biology	BS, Minor	Marine Biology Option	160	25					
	Zoology	BS, Minor	None	100	20					
	Zoology (Integrative Biology)	MS, PhD, Minor	None	25	5					
Total Department				260 (25)	45 (5)	10 (7)	11	13 (3)	12	9 (4)
Mathematics	Mathematics	BS, Minor	None	0	0					
	Mathematics	MS, PhD, Minor	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	1 (0)	0	1 (0)
Microbiology	Microbiology	BS, Minor	None	0	0					
	Microbiology	MS, PhD, Minor	None	18	4					
Total Department				0 (18)	0 (4)	0 (0)	6	9 (0)	5	9 (0)
Statistics	Statistics	BS, Minor	None	0	0					
	Statistics	MS, PhD, Minor	None	0	0					
Total Department				0 (0)	0 (0)	0 (0)	0	3 (0)	0	3 (0)
TOTAL COLLEGE				260 (43)	45 (9)	10 (7)	17	30 (3)**	17	26 (4)
VETERINARY MEDICINE										
Veterinary Medicine	Veterinary Medicine	DVM	None	0 (0)	0 (0)	1 (1)	0	7(1)**	1	3 (4)
TOTAL OSU				465 (264)	90 (67)	100 (24) (2)*	50	185 (24)**(4)*	114	152 (32)
* OSU Seafood Research and Education Center, Astoria, OR										
** 24 faculty at HMSC share 3.0 teaching FTE										

Appendix 2. List of contacts made by the LMWG committee members regarding the MSI. In addition to the contacts listed below during this effort, over 200 individuals from OSU, HMSC, Newport, coastal communities, and other academic institutions (including community colleges) provided input to a recent assessment of needs and opportunities to expand academic programs at HMSC (HMSC Educations Needs Assessment, see references).

Committee Member	Contact	Interaction
Hacker, Sally	Department of Integrative Biology, OSU	Reported on the goals of the MSI and the meetings underway. The discussion with faculty involved answering their questions up to this point in the process.
Hacker, Sally	Dean Sastry, COS, OSU	Briefly discussed the progress of MSI and promised to update him as reports were being completed.
Hacker, Sally	Brock McLeod, Chief Advisor, DIB, OSU	Discussed the progress of MSI LMWG and asked about marine curricula development as related to marine studies.
Suryan, Rob	Ric Brodeur, Senior Scientist, NOAA, HMSC	MSI and potential collaborations with agencies
Suryan, Rob	USGS Co-Op Unit, Dept FW, OSU	Discussion of the progress and potential of MSI and learning models
Suryan, Rob	Multiple ODFW staff, HMSC	Discussion of the progress and potential of MSI and learning models
Suryan, Rob	Ted DeWitt, Research Scientist, EPA, HMSC	MSI and potential collaborations with agencies
O'Malley, Kathleen	Christina DeWitt, Director OSU SREC	Discuss role of food science in MSI, industry partners, and obtained a list of faculty and courses involved in marine food sciences,
Sard, Nick	Jessica Luo, UMiami/OSU Graduate Student	Discussed a similar type of Bachelor of Art Degree envisioned for the MSI taught at Stanford: https://humbio.stanford.edu/about
Vega Thurber, Rebecca	Dept of Microbiology	Discussed how Microbiology maybe involved including developing an MS option in the degree and providing new baccalaureate core classes such as marine microbiology and associated labs.
Haller, Merrick	COE Dean's Office	Facilitated Barth & Cowen MSI open forum for COE, discussed role of COE faculty in MSI with Dean Ashford
Haller, Merrick	COE faculty: Robotics, Coastal & Ocean, Geomatics, engineering education	Discussed potential educational programs related to MSI
Hann, Courtney	Marine Resource Management Graduate Student, CEOAS, OSU	Discussion of MSI with other graduate students to provide feedback and input during MSI meetings
Capalbo, Susan	CAS /AEC department	MSI and potential collaborations and integration with our research and teaching programs, and especially the EEP undergraduate major, and our 4+1 AGP program pilot
Conway, Flaxen	Marine Resource Management faculty and students	Shared the goals of MSI and the charge of this work group with various MRM faculty and students, answering questions and listening to their input and concerns.

Wickham, Charlotte	Department of Statistics, OSU	Updated on working group progress at faculty meetings, and obtained a list of faculty with marine experience.
Wickham, Charlotte	Rich G. Carter, Department of Chemistry, OSU	Obtained a list of faculty and courses involved in marine sciences.
O'Malley, Kathleen	Coastal Oregon Marine Experiment Station Advisory Board	Discussed the MSI and received feedback from various board members
Miller-Morgan, Tim	Christiane Lohr , CVM	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration
Miller-Morgan, Tim	Susan Tornquist, CVM	Possible collaborations related to developing a CVM role within the MSI
Miller-Morgan, Tim	Anna Jolles, CVM	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration
Miller-Morgan, Tim	Aimee Reed, CVM/Biomedical Sciences	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration
Miller-Morgan, Tim	Rhea Hanselmann, Department of Integrative Biology	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration related to One Health and Conservation Medicine
Miller-Morgan, Tim	Julia Burco, ODFW	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration related to Wildlife and Conservation Medicine
Miller-Morgan, Tim	Jan Spitzbergen, Department of Microbiology	Possible collaborations related to developing a CVM role within the MSI. Certificates in Aquatic Animal Medicine and One Health. Expanded relationships with the OCCC Aquarium Science Program and increased professional development opportunities.
Miller-Morgan, Tim	Jerry Heidel, CVM	Possible collaborations related to developing a CVM role within the MSI and research opportunities/collaboration
Miller-Morgan, Tim	CVM	Possible collaborations related to developing a CVM role within the MSI
Kincl, Laurel	Marie Harvey, Associate Dean for Research and Graduate Programs, CPHHS	Discussion of the progress and potential of MSI and learning models
Kincl, Laurel	Anna Harding and Norman Hord, Co-Directors, School of Biological and Population Health Sciences, CPHHS	Discussion of the progress and potential of MSI and learning models
Kincl, Laurel	Various faculty meetings, CPHHS	Reported on the goals of the MSI. The discussion with faculty involved obtaining ideas and interest.