

2017-18 Marine Studies Initiative Annual Report

Submitted by: Jack Barth, Executive Director, MSI

MSI MISSION: *Create a healthy future for our ocean and the planet through transdisciplinary research and teaching that emphasizes collaboration, experiential learning, engagement with society and problem solving.*

Website: marinestudies.oregonstate.edu

EXECUTIVE SUMMARY

It has been a busy and fulfilling second full year of implementation for the Marine Studies Initiative (MSI). We continue to build the MSI leadership team and welcome the hiring of a full-time Academic Advisor. The Academic Advisor focuses on recruiting activities for the upcoming MSI academic programs by working with the OSU enrollment team, leading MSI outreach across Oregon, and forging partnerships across campus. HMSC Director Bob Cowen hired a Strategic Planning Director and is searching for a Manager of Operations. MSI is also investing in both academic and information technology support at HMSC in anticipation of the buildup there of the MSI program.

The MSI is pushing forward on two related academic program priorities. We are working with units across campus and HMSC to serve as a “hub” for coordinating marine-related course development and delivery. This year we established a working relationship with the College of Liberal Arts to achieve our second academic program goal, the building of the new Marine Studies major and minor program that CLA will host. We are working with CLA leadership to create the Marine Studies major and minor. CLA has established a Marine Studies program writing team, co-led by CLA Associate Dean Marion Rossi and MSI Associate Director Kristen Milligan, and tasked them with finalizing and shepherding the proposal through the OSU curriculum approval system. The MSI-created minor, based on existing OSU courses, will both inspire the curriculum for the major and be modified as needed to be in sync with the major. Creation and approval of the Marine Studies degree program is a major goal for 2018-2019.

During this last year, we have pushed forward on several transdisciplinary, marine-related research programs. We were pleased to be able to award nearly \$50K, with an equivalent match, to three research projects funded by the privately supported Eder Family Dungeness Research Fund. Through MSI Executive Director Barth’s co-chairing of the new, legislatively created “Oregon Coordinating Council on Ocean, Acidification and Hypoxia,” we are informing the research agenda and priorities on this important issue. In May 2018, we conducted a three-day workshop in Newport, Oregon, attended by more than 110 participants from OSU, industry, government agencies, and community partners, to consider the future of seafood and ideas for developing a new focus on innovations in seafood systems research, education, and partnerships. We are just now seeing new opportunities in the coastal resilience and thriving coastal communities theme, including a potential new initiative on “Coasts and People” at the National Science Foundation.

This past year was both pleasing and challenging with respect to the new MSI building at HMSC in Newport. Working with OSU Capital Planning and our terrific architecture and GC/GM team, we have finished the design of a truly iconic building that boasts added safety features for HMSC and South

Beach community. In March 2018, we were pleased to host the construction launch at HMSC. Ground preparation started in May 2018 with expected building completion in winter 2019.

In summary, a second, very busy year for growth of the MSI program with notable accomplishments in moving the academic program forward, holding a major “Food from the Sea” workshop, and guiding the new MSI building in Newport to construction. We sense enthusiasm and positive response for the MSI program across campus and look forward to working to deliver on OSU’s strategic planning goal to “advance the Marine Studies as an OSU signature transdisciplinary learning option with undergraduate research as a core element.”

1. PERFORMANCE INDICATORS

The Marine Studies Initiative is a new entity at OSU, so is actively developing our performance metrics. Our 2016-2025 Strategic Plan set out a number of milestones, on which we assess our progress in this section. We also report on some early metrics accomplished during 2017-2018. The MSI Leadership team assesses effectiveness by reviewing activities to confirm they are in line with MSI’s Strategic plan. We assess *collaboration* by the number of relationships built where the other party showed mutual interest by initiating contact, returned communication and/or took action facilitating MSI’s mission.

Major milestones from the “Marine Studies Initiative 10-Year Strategic Plan, 2016-2025”

- Develop curriculum and establish a Marine Studies Office – The Corvallis MSI office added a full-time Academic Advisor this past year, joining our full-time Administrative Assistant hired in AY16-17. We also increased the MSI Associate Director’s FTE to 0.75 in recognition of the growing workload. We plan to hire part-time Associate Directors for research and outreach and engagement in the coming year or two. We are providing 0.25 FTE support each for an Academic Advisor and for Information Technology Support at HMSC. Two student workers are essential contributors to our office’s function—supporting digital and print communications and office operations. The Marine Studies major and minor curriculum are being developed in partnership with MSI.
- Construct world-class facilities – The new Marine Studies Building at HMSC in Newport design was completed and construction began in May 2018. Completion of this 72,000 square-foot, state-of-the art research, education, and outreach and engagement building is slated for winter 2019. The Port Orford Field Station contributes to the MSI mission to create a coast-wide initiative. Recent investments there include a diving air fill station and increased bunk capacity.
- Establish effective governance, organizational and support structures – MSI leadership has worked with AMBC to establish MSI fiscal and hiring procedures; we have an effective Corvallis-Newport MSI leadership team that meet regularly to review and plan MSI activities.
- Organize and expand personnel – Our MSI administrative structure is nearly in place, with increased HMSC MSI personnel support and part-time Associate Directors for research and for outreach and engagement on the horizon; we are working on identifying shared faculty hires for this coming year.
- Establish centers of excellence – see our discussion of the creation of a center for “Seafood Systems and Innovation”, also known as “Food from the Sea” below.
- Communicate program value – We launched a new MSI web page, send updates to an MSI listserv, and have an active presence at OSU and coastal events (OSU 150th, State of the University, State of the Coast, Marine Science Day).

- Achieve fiscal success – We are actively pursuing private donations to build the MSI program and are working with outside partners (government, industry) to identify opportunities to co-fund faculty positions.

Performance Metrics

Networking campus wide – The MSI leadership team networked across campus with various units and colleges. This includes OSU colleges (CLA, COEAS, CAS, COS, COE, COB, COF, CVM, CPHHS, COPh, COEd), OSU departments and programs (Fish and Wildlife, Environmental and Molecular Toxicology, Graphic Design, Applied Economics, Ocean Sciences, Environmental Sciences, Environmental Arts and Humanities), OSU Faculty Senate and other entities (Oregon Sea Grant, HMSC, Research Office, Extension, Clatsop, Oregon Coast, and Southwest Oregon Community Colleges, the Coastal STEM Hub, the Academy for Lifelong Learning, and the National Oceanic and Atmospheric Administration.

Research Money Awarded – Eder Family Dungeness Crab Research Fund: \$47,500; Eric and Wendy Schmidt Ocean Acidification and Hypoxia Fund: ~\$90,000; Oregon Department of Fish and Wildlife support for OSU-ODFW Marine Reserves Science Researcher \$50,000

Presentations at Regional, National and International Meetings about the MSI– 3; State of the Coast, Oct 2017; Cape Perpetua Land-Sea Symposium, Nov 2017; Ocean Sciences Meeting, Feb 2018.

Marine Courses – Number of existing marine-related courses at OSU = 100; Additional existing courses with some marine content = 50; Number of new marine courses funded by MSI for development = 13; Number of new Marine Courses committed for first delivery in AY18-19 = 7

Direct interest in MSI – Number of individuals signed up for regular updates from the MSI academic advisor in the last 3.5 months = 39 (25 undergraduate students, 3 graduate students, 6 high school students, 1 middle school student, 2 post-bacc individuals, 2 unknown). We are managing a growing database of middle school, high school and college students, external partners, businesses, and others interested in MSI and its new major, minor and certificates.

Summer 2018 Interns at the coast, sponsored by MSI – 5 OSU students, 1 University of Vermont student; OSU departments/programs involved include Ecological Engineering, Environmental Science, Ocean Sciences, Environmental Arts & Humanities, Digital Communication Arts, Anthropology, Business and Entrepreneurship, and the University of Vermont’s Ecological Agriculture.

Social Media – During this academic year, we established a presence on three social media platforms – Facebook (89 followers), Instagram (305 followers), and Twitter (116 followers). This has increased the visibility of the MSI, allowing the initiative to reach new audiences.

OSU First-Year START Programs – Estimate of MSI student engagement is over 300 incoming, international and transfer students.

2. EDUCATION AND LEARNING

The Marine Studies Initiative’s overarching education and learning goal is for OSU to provide a transformational educational experience centered on marine studies. We aim to expand innovative, marine education and training opportunities for all types of students--- through cultivating the

enhancement and expansion of existing programs, creation of a university-wide marine studies degree program hosted by the College of Liberal Arts, and supporting new educational strategies.

In the past academic year, we made headway toward our goal for increasing ocean literacy across OSU and beyond. Core to our work are issues of raising and equalizing student success, recruitment of diverse and high-achieving students, streamlining, and development of new pedagogical models.

Working to engage all OSU units – Building on momentum started in the first year of the Marine Studies Office (AY16-17), we continued in AY17-18 to build collaborations across campus in support of the MSI's academic goals. In addition to incentivizing and fostering new and expanded programs, our office strives to serve as an organizational hub for various marine-related degrees, courses and educational opportunities and outreach across the program. The website is one tool for communicating opportunities across campus, and we are working to keep up with the high demand and need for additional resources on the website e.g., course database, internships. We also sought specific collaborations with different programs across campus. We try to work across the spectrum of programs, from those with well-established marine-related curricula (e.g., existing marine-related majors) to those with interest in developing new avenues for their students to incorporate issues of the coasts and ocean into their studies. For example, program staff, including Executive Director, have given MSI briefings and orientations about HMSC to CLA faculty. These meetings have led to various academic development efforts currently underway, including scoping of how to deliver successful CLA-based programs at the coast. Another example is work with CEOAS, Integrative Biology, and Fisheries and Wildlife for summer 2018 curriculum planning, including advertising and incentivizing course delivery. Ending this spring term, we brought together nearly 35 MSI-affiliated faculty who were actively involved in this past year's academic development efforts to exchange ideas and share updates; attendees included those hired as part of the Provost Initiative hiring in 2014-2015, as well as many other marine faculty supported by individual colleges (COE, CEOAS, CAS, CLA).

Completion of initial staffing – We are pleased to share that initial staffing of the Marine Studies Office in Corvallis is now complete. In spring, we welcomed the addition of a new academic advisor, Cynthia Leonard. Our goal is to make our office a premier supportive resource for students interested in the coasts and ocean. The work includes coordination with academic units and advisors across campus and faculty and staff at Hatfield Marine Science Center to ensure students have clear pathways and access to marine-related curricula and other training opportunities such as internships. Also and importantly, this position supports the development of the new Marine Studies degree program in the College of Liberal Arts and eventual student recruitment and advising.

Development of new marine studies degree: – This year has been important for establishing a working relationship with the College of Liberal Arts to build the new Marine Studies major and minor program that CLA will host. Work in this past year builds directly on the extensive, cross-campus scoping in academic year 16-17 for the marine studies minor and collaboration with CLA leadership, notably Dean Rodgers, Associate Dean Marion Rossi and CLA School Heads, to create the framework for the creation of the Marine Studies major and minor. A subcommittee of faculty from different programs (CLA and its School of History; Environmental Sciences; HMSC; Center for Teaching and Learning; Fisheries and Wildlife) completed its work in Spring 2018 to develop recommended conceptual design and pedagogical approaches/outcomes for the new major and review of existing marine-related courses for inclusion in the new degree. CLA has established a Marine Studies program writing team, co-led by CLA

Associate Dean Marion Rossi and MSI Associate Director Kristen Milligan, and tasked them with finalizing a new degree program proposal for the OSU curriculum approval system. The MSI-created minor, based on existing OSU courses, will both inspire the curriculum for the major and be modified as needed to be in sync with the major. Creation and approval of the Marine Studies degree program is a major goal for 2018-2019.

New courses – A number of new marine-related courses were offered this past year, including “Food from the Sea” (CAS-FW) and “Oceans in Peril” (COS-IB). Recognizing the need to develop new courses in support of the Marine Studies degree and to bring students to the coast, the MSI supported two formal course development processes. In Fall 2017, a Professional Learning Community led by the Center for Teaching and Learning involved nearly ten faculty in a structured course to develop new courses using high-impact pedagogical methods. We are in the process of working with some of these faculty to bring their courses to realization/delivery, such as the lower division Baccalaureate Core “Humans and the Ocean” led by Susanne Brander (EMT) in collaboration with College of Liberal Arts to be offered as a pilot in winter term 2019. In spring 2018 and in partnership with CLA, we initiated a competitive call for marine studies course development from CLA faculty that resulted in the selection and funding of six courses to be developed, incorporated into the marine studies curriculum, and offered for the first time in AY18-19. Also in Spring 2018, we established a MSI working group to focus on planning for advancing the goal to bring more students to the coast.

Growing programs at the coast

Marine Studies Building – the building combines seismic/vertical evacuation engineering design elements with core programming needs (academic and research space, innovation lab, auditorium, and community/interaction space). The design is an iconic expression of form and function – where the form clearly identifies the vertical evacuation (safety) mission of the building and efficiently provides premier spaces for innovation, academics, research and community (all hallmarks of HMSC and MSI). The Marine Studies Building includes two configurable 30- and 60-student “dry” classrooms, a “wet” – freshwater only – 30-student teaching lab, the Innovation Lab for student projects, and a 300+ person auditorium being designed to host large classes as well as seminars and community events. The architectural and engineering team is led by YGH Architects and the GC/GM is Anderson Construction. Construction began by May 2018, with project completion by winter 2019.

Student Services – Affordable and available student housing and access to student support services are critical elements for student success in living and learning at the coast. HMSC leadership have been working with a number OSU Campus resources to provide available student housing and access to student support services for students at the Hatfield campus. These have included discussions with the OSU Student Health Services about the possibility of inclusion and access of Dual Partnership Program students at OCCC to OSU health services.

Student Housing – In response to President Ed Ray’s decision and goal to move student housing out of the tsunami zone, and in partnership with University Housing and Dining Services (UHDS), OSU has committed to and initiated the construction of student housing near the Oregon Coast Community College (~1 mile from HMSC central campus). The architect/design firm, Hacker leads the design/engineering phase, and Gerding Builders will serve as the GC/GM for the project.

Academic programs to “Study at the sea” – Student experiential learning was another focal point of our work over the past year. Working simultaneously on various fronts, MSI and affiliated staff and faculty have been conceptualizing and advancing new student opportunities and identifying mechanisms for increasing student access to the sea and coastal communities building on efforts at the HMSC. In summer 2017, HMSC hosted 37 **undergraduate student interns** through a number of programs including the National Science Foundation’s Research Experience for Undergraduates program, Oregon Sea Grant, Marine Mammal Institute, and HMSC-based public agencies (NOAA Hollings Scholar program, NOAA Living Marine Resources Cooperative Science Center, and EPA Greater Research Opportunities).

Working closely with the College of Science (COS), College of Agricultural Sciences (CAS), College of Earth, Ocean, and Atmospheric Sciences (CEOAS) and the College of Liberal Arts (CLA), MSI and HMSC continue to develop the **summer session at the coast**. In summer 2017, HMSC hosted 11 courses with 51 students through combined field course offerings through COS, CAS, CEOAS, and CLA. These courses support degree pathways for undergraduate and graduate students in biology (marine biology option), fisheries & wildlife science, food science and technology, oceanography, and environmental sciences. The 2017 Fall term at HMSC, a Fisheries and Wildlife (FW) focus, combines undergraduate and graduate students in ten courses such as “Estuary Ecology” (OC 434/534) and “Early Life History of Fishes” (FW/OC 474/574). HMSC’s enrollment was 88 students (45 undergraduates, 43 graduates and postbacs) for the 2017 fall term. Courses were also offered during the intersession period (between end of summer and start of fall terms) and included upper-division and graduate courses like OC 515-Oregon Coast Math Camp, FW 426/526 Coastal Ecology and Resource Management, and a new addition, GEO 508-Intensive Field Course (IFC): Introduction to NRT core concepts. Enrollment for winter 2018 (24 undergraduates) and the spring 2018 term (12 undergraduates). The spring 2018 term also included (16 undergraduates, 3 graduates) included the signature 15-credit marine biology course (BI 450) and veterinary medicine course (VMB 727-Ornamental Fish Medicine).

First-year weekend immersion courses were expanded (BI 111 -Intro to Marine Life in the Sea: Marine Habitats, FW 113 Intro to Marine Life in the Sea: Seabirds and Marine Mammals) and are now offered at Hatfield twice in the winter and FW 113 (formerly BI/FW 111 and FW 199) in the spring term. These lower-division experiential courses serve as a pathway to introduce marine science content, orient students to HMSC, and as a recruitment opportunity for undeclared major students. Two marine-related **U-Engage courses** were part of the Fall 2018 term that exposed students to marine research at OSU (ALS199-Lunar Forces, Edible Sea Vampires, Marine Zombies and other Curiosities of the Sea and ALS199- Inspired by the Sea) and included a field trip experience to the coast and HMSC.

The culture of student experiential learning continues to grow at HMSC and is most evident in the following annual **summer venues for student presentations**: Markham Marine Research Symposium (June), Summer Session Student Symposium (July), Sea Grant Summer Undergraduate Scholars Symposium (August), and the Research Experience for Undergraduates (REU) Symposium (August).

HMSC is also reaching out to **Oregon community colleges and other Oregon institutions** as a resource for their courses and programs. These institutions utilize HMSC for class visits and occasional overnights and include University of Oregon (HIST 415/515 – The Environmental History of the Pacific Ocean), Treasure Valley Community College, Chemeketa Community College, Oregon Coast Community College, Linfield College, University of Wisconsin-Plattville, and the University of Portland.

HMSC continues to add **student scholarships** in marine science through research partners. A new scholarship fund honors the passing of HMSC Program Manager Maryann Bozza, supporting non-traditional student internship opportunities in the Marine Sciences.

Recruitment and Student Success – In addition to the work described above specific to recruiting and supporting students at HMSC, our Corvallis office has focused in some very direct ways to cultivate relationships for student recruitment and success. Our academic advisor led the development of outreach materials about “putting the ocean in your major” to communicate that any student at OSU can get involved in coastal and ocean issues. This new effort launched in spring 2018, with some notable early successes in terms of student interest and engagement. We are also actively building relationships with OSU staff and students involved with different types of groups to reach as many student populations as possible—for example, with First Generation, Sigma Delta Omega-Women in Science, Native American Longhouse, STEM Leaders Program. At the pre-college level, we continue to increase visibility of marine studies at OSU through hosting of afterschool K-12 STEM club in Port Orford, outreach with high school teachers across the state (e.g., conferences), supporting high school interns at HMSC and Port Orford, and Ocean Salmon Bowl contributions. In addition to the community college outreach led by HMSC, the MSI Office in Corvallis with assistance from University Outreach and Engagement has been facilitating conversations with a number of community colleges (SWOCC, Clatsop, Umpqua) about increasing pathways to OSU from these colleges. MSI is participating in OSU’s First Year and transfer START programs for the first time this summer.

3. RESEARCH AND CREATIVE WORK

During this last year, the Marine Studies Initiative (MSI) has pushed forward on several transdisciplinary, marine-related research programs. We are guided by MSI’s Strategic Plan Goal 2 to “Pioneer transdisciplinary marine studies by building on Oregon State’s world-class marine research and scholarship and forming networks that span scientific, political and socio-cultural disciplines.” The Strategic plan outlined a number of research areas that MSI might pursue and we have spent a significant amount of time on two of these – **Ocean Acidification and Hypoxia (OAH)**, **Food from the Sea** – while working to identify opportunities on a third, **Coastal Resilience**.

We were pleased to be able to award \$47.5K, with an equivalent match, to three research projects funded by the privately supported **Eder Family Dungeness Research Fund**. This fund is a great example of both the commitment of a fishing family – Bob and Michele Longo Eder are Newport-area fishing boat owners and operators – to solving the challenges facing wild-caught fisheries and their belief in the Marine Studies Initiative to bring together a diverse set of researchers to solve these challenges. The three projects are:

- “Tracking Crab Movements in Sand Flat versus Reef Habitats: Consequences of Differential Food Availability and Implications for Protection vs. Catchability,” by Co-PIs Sarah K. Henkel, OSU Integrative Biology and Hatfield Marine Science Center, and G. Curtis Roegner, NOAA Fisheries.
- “Community effort for quantifying the harmful algae Pseudo-nitzschia presence and abundance in the near bottom waters on Heceta Bank, Oregon,” by PI Xiuning Du, Cooperative Institute for Marine Resources Studies, Hatfield Marine Science Center, with collaborators Kelly Corbett and Leif K. Rasmuson, Oregon Department of Fish and Wildlife

- “Building Capacity for Fishermen First Aid and Safety Training (FFAST),” by Co-PIs Laurel D. Kincl and Viktor E. Bovbjerg, OSU College of Public Health and Human Sciences

With support from Eric and Wendy Schmidt, MSI continues to pursue research, education and outreach activities on “Ocean Acidification (OA): Advancing Understanding, Education and Communication of a Transdisciplinary Ocean Challenge.” Graduate student Brian Erickson successfully defended his Marine and Resource Management Masters degree focused on teaching about OA in K-12 schools. Graduate student Michael Moses has designed a week-long training session on how to measure the key OA parameters in the field, to be delivered in late August 2018 at HMSC. Scientists, field technicians and managers will learn the best ways to monitor and track changing ocean conditions in Oregon’s coastal waters by attending this short course. The curriculum will be transitioned to an MSI course and offered regularly at HMSC.

Through participation on the new, legislatively created “**Oregon Coordinating Council on Ocean, Acidification and Hypoxia (OAH)**,” we are helping to set the research agenda and priorities on this important issue. MSI teamed with the Oregon Department of Fish and Wildlife (ODFW) to hire a state-funded, fulltime ODFW staff person to further the goals of Senate Bill 1039 regarding Ocean Acidification and Hypoxia. The Marine Studies Initiative hosts Charlotte Regula-Whitefield in our Corvallis office two days a week to facilitate work preparing a report from the Oregon Coordinating Council on Ocean Acidification and Hypoxia that MSI Executive Director Barth and ODFW Marine Resources Program Manager Caren Braby co-chair. Through this partnership, MSI and ODFW are furthering OAH research, education, and outreach and engagement activities across the state, for example the Schmidt-funded MSI activities described above. Council Co-Chairs Barth and Braby will participate in Oregon Legislative Days in September 2018 to give legislators an update on the Council’s progress.

In May 2018, we conducted a three-day workshop “**Food from the Sea**” in Newport, Oregon, attended by more than 110 participants from OSU, industry, government agencies, and community partners, to consider the future of seafood and ideas for developing a new focus on innovations in seafood systems research, education, and partnerships. We expect the workshop plan to drive faculty hiring, catalyze transdisciplinary research, and offer education and internship opportunities for our students.

We are just now seeing new opportunities in the **coastal resilience and thriving coastal communities** theme, including a potential new initiative on “Coasts and People” at the National Science Foundation. MSI Executive Director Barth visited the National Science Foundation in June 2018 to talk with NSF program managers about how the “Coasts and People” program is being developed. He offered for OSU to help host a regional workshop to outline the elements of the “Coasts and People” program.

We are also proud to report on research supported at the OSU MSI’s Port Orford Field Station (POFS), ably facilitated by POFS Manager Tom Calvanese. Because of their regular presence in waters around Port Orford, there are several gray whales research projects underway. In collaboration with Leigh Torres from OSU Marine Mammal Institute’s Geospatial Ecology of Marine Mammal Laboratory, one project focuses on gray whale foraging behavior and includes an intensive 2-month summer field project that includes a graduate student, a MSI-supported undergraduate intern, and two local high school students. A second project, in partnership with NOAA’s Newport hydroacoustic group, uses hydrophones deployed near the Redfish Rocks Marine Reserve to monitor gray whale activities. On the rocky intertidal shore, researchers from the Partnership for Interdisciplinary Studies of Coastal Oceans

(OSU Integrative Biology) pursue long-term ecological monitoring. A team led by OSU Integrative Biology's Francis Chan, in collaboration with POFS's Tom Calvanese, places an ocean acidification pH sensor in the Redfish Rocks Marine Reserve. An OSU-ODFW partnership to study juvenile fish recruitment in and near the Redfish Rocks Marine Reserve is in its sixth year. Lastly, in collaboration with OSU Fish and Wildlife's David Noakes, a study is underway to understand how Elk River salmon olfactory cues work to reduce straying of hatchery fish onto wild salmon spawning grounds.

Attracting and retaining exceptional faculty and staff – MSI is pursuing partnerships to make joint faculty hires. Potential partners are with other OSU units and with the National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center. The Food from the Sea center should include several faculty positions; we consider our Oregon seafood industry partners as well as the aforementioned NOAA partnership as essential to the development of this center. We expect to move on new faculty hires in 2018-2019. We continue to co-support **Susanne Brander in the Environmental and Molecular Toxicology** department, College of Agricultural Science, to pursue marine-related research and to lead planning across campus for a potential faculty cluster hiring in aquatic/marine toxicology that MSI may champion and help support. We also expanded support of our **MSI Port Orford Field Station Manager Tom Calvanese** to 1.0 FTE in recognition of the increasing amount of work associated with both running the field station and hosting its expanding research program. The FTE increase helped to retain Tom in his position.

Supporting innovation and entrepreneurship – Through OSU MSI's Port Orford Field Station, Tom Calvanese is leading a collaboration with the Port of Port Orford and commercial fishermen on economic development inclusive of research and education. One example is the needed technical and research-based expertise needed for cultivation of dulse seaweed. We are also in the early stages of preparing a proposal to the Lemelson Foundation for a marine technology and innovation program that will involve course development at OSU and use of the Innovation Laboratory being built in the new Marine Studies Building at HMSC. Innovation is at the heart of our MSI "Food from the Sea" center of excellence concept, with a focus on innovations in seafood systems research, education and partnerships.

Cultivating partnerships with industry and other external stakeholders – In addition to the seafood industry partnering described in our "Food from the Sea" activities above, we are cultivating partnerships with other external stakeholders. These include the Oregon Museum of Science and Industry, the Oregon Science Teachers Association, the Oregon Council for Social Studies, the Girl Scouts of Oregon & Southwest Washington and Benton County, the Newport Chamber of Commerce, and potential internship sponsors (e.g., Advanced Research Corporation, Newport, Oregon). OSU MSI's Port Orford Field Station is partnering with Oregon Sea Farms to advance edible seaweed (dulse) culture operation at the Port of Port Orford.

4. OUTREACH AND ENGAGEMENT

MSI is guided by its goal to develop and sustain partnerships and outreach and engagement efforts that will allow the Marine Studies Initiative to deliver social, economic and environmental benefits to the diverse interests represented across the state. These outreach and engagement approaches build on Oregon State's success as a Land, Sea, Sun and Space Grant university, provide benefits to all partners, are responsive to coastal needs, and complement and enhance existing partnerships.

MSI participates in and sponsors several major marine outreach and engagement events each year. Marine Science Day at the Hatfield Marine Science Center draws thousands of visitors interested in learning about marine-related activities at HMSC. In August 2017, MSI interacted with hundreds of people at “OMSI After Dark” and was involved in talks, events and tabling at the Oregon Sea Grant Fest in February 2018. We participated with marine displays at the 2017 University Day, the 2018 State of the University in Portland and the September 2018 Student Sustainability Fair.

We were happy to roll-out the design of the new Marine Studies Building at HMSC at a public event in Newport in November 2017. We followed this with a celebration of the construction launch of the new building in March 2018 at HMSC. This event was attended by OSU leadership, including speaker President Ray, state government leaders, including speaker Representative David Gombert, county and local leaders, as well as donors and OSU faculty, staff and students.

Perhaps MSI’s most successful event was the “OSU150-Celebrating Marine Sciences” during the February 2018 Ocean Sciences Meeting in Portland, Oregon. The biannual Ocean Sciences Meeting draws thousands of international marine scientists, and we invited leaders from across the nation to join us at the Oregon Historical Society’s museum in Portland to celebrate the highly acclaimed tradition of marine science at OSU. We also engaged alumni attending the Ocean Science Meeting and also those living in the Portland area. MSI led the planning and hosted this event, obtaining donated seafood and beverages from many local Oregon companies. The event was supported by MSI, Oregon Sea Grant, HMSC, the OSU Research Office and the Colleges of Science, Engineering, Agricultural Sciences, Liberal Arts, and Earth, Ocean, and Atmospheric Sciences. MSI also participated in other noteworthy OSU150th events related to the winter term, sea grant celebration including the screening of “Saving Atlantis” and hosting tours of the Ocean Observing Center on south 99W.

Engagement with government and other non-OSU entities – During this past year, two marine-related bills were passed by the Oregon Legislature and signed by the Governor. The MSI leadership were key academic resources for legislators seeking to engage with university expertise to inform these important efforts. First- HMSC Director Bob Cowen contributed to the now established Task Force on Maritime Sector Workforce Development, on which he serves. The goals and outcomes from this Maritime Sector Workforce Development Task Force will advance training of students for readiness in the maritime sector, a goal also shared with the MSI. MSI Executive Director Jack Barth responded to requests for information and advice from legislators as they were working to develop and ultimately pass Senate Bill 1039, establishing an Oregon Coordinating Council on Ocean Acidification and Hypoxia. Barth now co-chairs this Council along with fellow co-chair Caren Braby, the Marine Program Manager for the Oregon Department of Fish and Wildlife. The goals and outcomes from this Council’s recommendations will guide priorities and funding for this important issue facing Oregon’s coastal waters and seafood industry. Tom Calvanese, Port Orford Field Station Manager, is a member of both the Oregon Ocean Acidification Monitoring Working Group and the Territorial Sea Plan Rocky Shores Working Group.

Both Jack Barth and Bob Cowen regularly interact with Oregon’s Coastal Caucus and Cowen is a board member for various economic development groups. MSI engages frequently with the National Oceanic and Atmospheric Administration on topics of mutual interest. We also have regular interactions with marine-related faculty and leaders at the University of Oregon and Portland State University. HMSC hosts and participates as a partner with the Oregon Coast STEM Hub for K-20 education, and the HMSC

Director serves on the South Slough National Estuarine Research Reserve Management Commission and the Board of Directors for the Oregon Coast Aquarium.

MSI co-sponsors an OSU-ODFW Marine Science Integration Researcher who works with professors, postdoctoral fellows, students and resource managers in research on ecosystem dynamics of the nearshore ocean. Ashley Knight just completed her role in this position and a search is underway to select a new person. The Marine Science Integration Researcher is just one example of the increased OSU-ODFW interaction that is facilitated by a new OSU-ODFW interagency agreement signed in September 2017, the creation of which was led by MSI Associate Director Kristen Milligan. This interagency agreement has now been used by MSI to facilitate funding of three projects at OSU in support of the Oregon Marine Reserves program.

Recruitment and Outreach to Student Populations – Beyond the undergraduate development, we have been growing collaborations with a number of OSU programs to deliver marine studies learning opportunities to diverse student populations at statewide, national, and international levels. MSI was a co-supporter of the 20th Annual National Ocean Science Bowl, hosted at OSU after selection by the Consortium for Ocean Leadership and with local coordination led by Flaxen Conway on behalf of Oregon Sea Grant. Approximately 200 high school students from across the country attended this competitive event and participated in career development activities and field trips, including a smaller group trip on the OSU *Research Vessel Pacific Storm* sponsored by MSI and led by MSI Executive Director Jack Barth. We have also met with Honors College, International Programs, and Outreach and Extension throughout this past year to scope program development opportunities as part of this 10-year initiative.

HMSC Academic Programs developed outreach activities including full day programs for the Louis Stokes Alliance for Minority Participation (LSAMP) Summer Scholars program, OSU Educational Opportunities Program (EOP), and the OSU Department of Fisheries and Wildlife CONNECT Day. These are in addition to outreach and engagement activities for the OSU Tour Ambassadors program, OSU La Grande Ambassadors program, National Ocean Science Bowl, and INTO Oregon State University students and counselors.

Science Communications and Events – In addition to science communications such as blogs and social media, HMSC hosts an interdisciplinary seminar series weekly and events for the public monthly, including “Science on Tap.” Special events in the HMSC Visitor Center and behind the scenes are held throughout the year. We continue to advance strategies and protocols for using communications tools to amplify and give context to the many voices from OSU and our partner organizations. We seek to highlight the diverse people and projects in various colleges and professional fields, at all career stages, with compelling connections to the marine environment. Our goal is to use deliberate and coordinated digital communications strategies, including social media, to increase the impact of our work in the context of the Marine Studies Initiative.

Approximately 150,000 visitors and over 11,000 K-12 students engage in activities at the HMSC Visitor Center annually. The HMSC Visitor Center was significantly updated this last year, a series of delayed maintenance issues were completed that allowed the opportunity to reconfigure the flow of the exhibit space. The enhancements have improved public access to interpretive content as well as better accommodating large summer crowds.

Port Orford Field Station – The Port Orford Field Station (POFS), supported by Oregon Sea Grant prior to 1 July 2017, but now part of the Marine Studies Initiative, is also growing as a location for outreach and engagement. MSI’s POFS is engaged with Port of Port Orford to promote inclusion of marine research, education, and engagement during planned expansion of seawater system as part of redevelopment project. Other activities at POFS include: established the Port Orford Field Station Advisory Board that reviews and advises awards from scholarship funds; Station Manager is member of Redfish Rocks Community Team whose goal is to support outreach and engagement about Redfish Rocks Marine Reserve and support training of volunteer interpreters (Redfish Rangers); launched a local Science Pub with presentations from PISCO, ODFW, and OSU; participated in the 5th Annual Redfish Rocks on the Dock event and an OSU 150th event at POFS; initiated a POFS twitter feed.

5. DIVERSITY AND INCLUSION

Enhancing the diversity of the Oregon State community is essential to sustaining excellence and to preparing students for a globally connected world. The Marine Studies Initiative supports the university’s goals of increasing the diversity of faculty, staff and students through targeted new hires and enhanced retention efforts, developing more comprehensive work-life balance initiatives for all employees, and pursuing equity in student success and quality learning.

MSI office hiring to date, including staff positions and student interns, has promoted diversity and inclusivity. Both staff and summer intern hires included minorities. MSI’s Port Orford Field Station (POFS) is an accessible and welcoming facility for students and researchers of all abilities and ethnic backgrounds. POFS researchers included international, racially diverse, non-English speaking, LGBTQ, and students with disabilities. New MSI building plans and academic programming are being developed with outreach to underrepresented groups in the education and coastal communities in mind. The building design was created in partnership with OSU’s office of Equal Opportunity and Access to insure safe and efficient access for all that seek to use the building. We are especially proud of the effort put into designing unique and clear safety signs, including evacuation path designations for abled and people with disabilities building users.

MSI sponsored and attended the annual OSU Salmon Bake hosted by the Native American Longhouse Eena Haws, and co-sponsored and participated in Women in Marine Sciences’ SMART--Sexual, Misconduct, Awareness, Reaction, Training. We are building relationships with the Sigma Omega Delta Women in Science sorority, First Generation students, and non-traditional students via our community college network and email lists. Our MSI academic advisor is signed up to be a mentor for a First-Generation college student. MSI Executive Director Jack Barth took part in OSU’s ADVANCE Seminar in June 2018, an interactive learning experience centered on analyzing the operations of difference, power, and privilege in higher education, with particular attention to STEM disciplines.

6. EMPLOYEE DEVELOPMENT AND SUPPORT

The Marine Studies Initiative believes flexibility is a key strategy to successfully retaining and continuously challenging the program’s own versatile, high-level professionals. MSI does so by making space within ever challenging and dynamic roles to explore professional networking and mentorship opportunities across the curriculum and multi-campus culture. MSI supports creating opportunities for

employees to attend OSU and non-campus related professional courses, accommodate schedule to provide for personal fitness, family life and spirituality.

A core value of the Marine Studies Initiative is the creation of collaborative efforts across the curriculum and multi-campus culture. These efforts, fundamental to the goals of MSI, present professional networking and mentorship opportunities and employees are encouraged to participate. Our Advisor and Administrative Assistant both engage in successful mentorships on campus among various colleges. MSI offers Student Worker employment opportunities to students of various disciplines and backgrounds. Our student positions provide real-life job experience and experience in development of a higher education program.

MSI models a professional culture that is open, welcoming and supportive. New employees receive tours and campus-wide introductions and are encouraged to attend meetings, events and network with various other units and colleges. New employees are encouraged to attend New Employee Breakfast, University Day, Training Days, and other campus wide events. MSI is committed to getting students to coast and we believe our employees and student workers should also have regular visits to the coast.

7. RESOURCE STEWARDSHIP

MSI leaders actively engage in private fundraising, originally for support of the new Marine Studies Building at HMSC in Newport, but now focused on MSI program development. We worked with the OSU Foundation to formulate and submit several MSI initiatives for consideration in inclusion in the new OSU fundraising campaign. MSI Executive Director Barth and HMSC Director Cowen regularly visit coastal communities and potential donors, for example a trip in December 2017 to Astoria. We maintain a relationship with a major local donor to OSU's Port Orford Science and Education Support Endowment Fund and to the Port Orford Development Fund. Awards from Port Orford Development Fund are supporting, for example, whale research, intertidal research, internships, and science communication.

Emergency preparedness for earthquake/tsunami and other hazards is central to HMSC operations. As OSU's marine lab, the Hatfield Marine Science Center relies on access to the ocean for field and ship-based research, experiential education, proximity to stakeholders and seawater pumping for wet lab research. HMSC conducts two formal drills each year and multiple outreach and training exercises including new student/employee orientation. HMSC has been integral to local efforts to develop evacuation sites complete with caches of emergency supplies and interpretive signage along evacuation routes. This year HMSC donated a municipality sized emergency water filtration system to the City of Newport to bolster regional emergency preparedness. This inclusive approach has served as a model for other coastal organizations and communities.