

Educational Needs Assessment for  
Oregon State University's Hatfield Marine Science Center

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August 15, 2013



## Executive Summary

The Hatfield Marine Science Center (HMSC) is a key asset of Oregon State University (OSU), and essential to being a global leader in marine science research and education. HMSC's 49-acre campus includes research and teaching laboratories, housing, and ship operations supporting 300 employees representing OSU, federal, and state agencies. Located on the Yaquina Bay estuary in Newport Oregon, HMSC is centrally placed within a continuum of ecosystems from coastal mountains to the open ocean. Newport is a vibrant coastal town with a large commercial fishing fleet, tourist industry, recreation, and coastal arts community. Between HMSC's interagency campus, Visitor Center and ship operations facility, NOAA's research vessel marine operations center, the Northwest National Marine Renewable Energy Center, and Ocean Observing Systems, the marine science enterprise is emerging as a major economic driver in Newport and throughout the coast.

Recent strategic planning and external reviews of HMSC programs highlighted all of these strengths, and recognized significant untapped potential for expanding HMSC academic programs. More recently, OSU has looked toward HMSC and Newport as the next site for significant expansion of educational opportunities to include an additional 500 or more students. The purpose of this report is to identify pathways to fulfill these goals. Herein, we synthesize input from over 200 individuals throughout OSU, HMSC, Newport, coastal communities, and other academic institutions (including community colleges). The following summary identifies needs, highlights opportunities, and proposes a phased approach to expansion.

The primary needs identified for academic program expansion at HMSC include:

1. Additional full time equivalent (FTE) teaching positions at HMSC for program development and teaching (currently there is < 1.5 FTE for teaching among ~13 tenure-track faculty in addition to a full time academic program coordinator);
2. Housing options and appropriate services for all students to minimize logistical constraints of living and studying outside of Corvallis;
3. Additional classroom, laboratory, and small boat facilities;
4. Equitable tuition funding model that addresses costs of HMSC, academic units, and the University administration;
5. Standardized FTE-based compensation of faculty for teaching courses at HMSC;
6. Creation of a marine science minor/major or certificate with a requirement for undergraduate students to take some coursework on site at HMSC;
7. Augmented academic connections to all four coastal community colleges to increase opportunities for four year degrees.

HMSC academic programs should focus on experiential learning that bridge all aspects of natural and social sciences. These programs will build on existing strengths in marine science. Through a lens of ocean literacy, students will study current and emerging issues ranging from science in the arts to climate change impacts. The unique educational setting at HMSC provides a fluid integration of research with teaching and community engagement, thereby stimulating new avenues of investigation and learning. Applied learning would be organized about real-world problems and issues so students are engaged with research in a variety of venues including field, laboratories, and the community.

Ideally, any programs at HMSC should complement rather than compete with those on the Corvallis campus. Likewise, programs developed should utilize OSU's full potential, providing students with an unparalleled experience capitalizing on synergies between the Corvallis campus, HMSC and the coastal/marine setting.

A phased approach is recommended for achieving expanded academic programs at HMSC. In Phase I, the focus is on enhancing and expanding HMSC's current capabilities and signature strengths, while Phase 2 introduces new opportunities building on existing partnerships.

- Phase I (1-5 years) focuses on enhancing and expanding upper division undergraduate and graduate education. The student population will grow to 50-80 graduates and 150-200 resident undergraduates. A full suite of undergraduate and graduate courses ( $\geq 32$  credits) will be offered during all four academic terms. Courses that cross the many disciplines of marine studies and ocean literacy while fulfilling core program requirements will be developed. The foundation will be laid for partnering with the Oregon Coast Community College beginning with articulation agreements and shared teaching facilities. Infrastructure investment includes student housing and services, faculty offices, classrooms, laboratories, and field services such as a small boat program.
- Phase II (6-10 years) builds on the momentum of Phase I with greater recognition of new and expanding opportunities. Student population will grow to 80-110 graduate students, 200-300 resident undergraduate students, and 100-150 people involved with professional workshops and certifications. A full suite of undergraduate and graduate courses ( $\geq 64$  credits) will be offered during all four academic terms including hybrid and shared courses between the Corvallis and HMSC campuses. Graduate students will be able to meet their course requirements without needing to commute to or be in residence in Corvallis. HMSC will have solidified and expanded its signature courses and unique niche in contributing to the marine enterprise at OSU. With increased interest and enrollment in marine sciences at OSU, some course duplication between the Corvallis campus and HMSC will begin to occur without being detrimental to either interest. Expanded undergraduate courses will contribute to the OSU baccalaureate core. The partnership with OCCC and other coastal community colleges will build on a solid foundation focused on a smoother transfer process, skills based training for marine technology and professional certifications. Infrastructure investments will include additional housing, appropriate student services, classrooms, food service, lecture hall, and meeting space.

There may be a limited number of students with sufficient passion to study marine science, however, there is an unlimited number whose lives and careers can be enriched through ocean literacy. Indeed, as stated by the HMSC external review panel, "[Our] goal should be to increase marine science literacy and exposure in all disciplines at OSU, and make HMSC the face of marine science and marine policy on the coast." Elevating education to be in balance with research at HMSC will diversify the current funding model. Sustained investment in these efforts will help establish OSU as a preeminent University for marine education, research, and engagement. Furthermore, expanded academic programs at HMSC 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.

## Table of Contents

Introduction.....	5
Signature Educational Programs .....	6
Suggested Courses.....	7
Recommendations for course offerings at HMSC .....	7
Student Opportunities and Challenges.....	8
Recommendations .....	9
International Student Opportunities and Challenges.....	10
Recommendations .....	11
Professional and Noncredit Education Opportunities and Audiences .....	11
Community College Partnerships, Possibilities, and Needs.....	12
Recommendations .....	13
Infrastructure Issues and Recommendations.....	13
Housing.....	14
Classrooms .....	14
Research Teaching Space .....	15
Student Study and Office Space .....	15
Information Technology .....	15
Recommendations .....	16
Teaching Faculty (FTE) Needs and Recommendations.....	16
Recommendations .....	17
Funding Education and Tuition Model .....	17
Recommendations .....	18
Scaling Up Educational Opportunities .....	19
References.....	20
Appendix 1: Interviewees and Respondents .....	21
Appendix 3: Tuition Schemes and Proposed Models .....	23
Appendix 4: Relevant Development Opportunities From HMSC Strategic Plan.....	24

## Introduction

### Background

The HMSC Implementation Task Team (Task Team) reviewed the output of the 2010 External Review of HMSC. The Task Team report, released in March 2012, details priorities for changes at HMSC arising from the External Review. The Task Team recommended a “needs assessment” for education programs at HMSC, with an eye to growth as the capacity of the main OSU campus is saturated. The Task Team noted that “...there should be a cohesive marine science based curriculum developed and delivered using infrastructure and personnel that reside at HMSC and at the Corvallis campus. The academic programs should be well integrated with complementary programs delivered in Corvallis, and build upon the breadth and experience of all marine faculty at OSU.” The Task Team further recommended the need to “Conduct an opportunity/needs assessment to determine the demand for and related costs for marine based academic programs if they were offered at HMSC.”

In the fall of 2012, President Ray suggested that HMSC can help OSU address Governor Kitzhaber’s 40/40/20 Plan (Oregon Revised Statutes) through growth of the educational program. The Plan’s goal is by 2025 for 100% of Oregon students to obtain a **high school diploma or equivalent**, and 80% of these to students to obtain post-secondary education, including half with 4 year degrees and half with 2 year degrees or professional certifications. OSU, in collaboration with community colleges, can increase educational capacity on the Oregon coast thus helping to obtain this goal and promote economic development for coastal communities. HMSC has a history of providing excellent experiential education for OSU’s students as well as opportunities to be mentored by potential employers in natural resource agencies. Exploring future options for expanded academic opportunities is timely. Consequently, a Working Group was established under the auspices of the HMSC Director’s Office.

### Scope

The Working Group addressed all matters associated with undergraduate, graduate and postgraduate coursework, undergraduate and graduate research, and academic policy at HMSC. While we acknowledge the value and leadership that HMSC provides on informal education, this report is intentionally directed towards formal education. We considered the needs and opportunities for growth in HMSC academic programs across disciplines and OSU colleges. Discussions included the potential for collaboration with the other universities, community colleges, and state and federal agencies. Between March and June 2013, we reached out to over 200 individuals from throughout OSU, HMSC, the Newport community, and other academic institutions including community colleges through 36 interviews, 5 focal groups, and an online survey (Appendix 1). During these interactions, we discussed:

1. Need, opportunity, demand, and challenges for expanded course opportunities;
2. Professional certification needs for coursework and/or training;
3. Opportunities for areas of integration and cross-disciplinary teaching and learning including:
  - Human Dimensions
  - Fisheries Economics

- Ocean Engineering
  - Ecological Modeling
  - Marine Policy
  - Environmental Humanities
  - Renewable energy
  - Free Choice Learning
4. Capacity at HMSC for expanding the offering of undergraduate awards/programs/majors, postgraduate coursework awards/programs;
  5. Community college pathways and articulation agreements with a focus on Oregon Coast Community College (OCCC), and ultimately all five coastal community colleges;
  6. Emerging educational and training issues and trends impacting marine labs and field stations.

### **Signature Educational Programs**

The HMSC strategic plan calls for the development of “signature instructional, research, and outreach programs that build upon and benefit from [its] unique location, environment, facilities, and partnerships.” Assessment participants consistently encouraged HMSC to play to its strengths when developing academic programs and look for niches that remained unfilled by other institutions. A strength is experiential education that is closely linked to research endeavors and addresses current issues. An inspirational education comes from more than classwork; it is the experience of being immersed in an intellectually stimulating environment such as a working waterfront, a research vessel, or an active research lab. People are the other vital element of experiential education. For instance, many HMSC graduate students benefit from dual mentorship by HMSC faculty and agency scientists. These unique opportunities for students at HMSC will contribute to building high quality graduate and undergraduate marine-related education.

The HMSC External Review Panel as well as participants in this assessment highlighted that HMSC should strengthen its ties with currently underrepresented departments or colleges including Earth, Ocean, and Atmospheric Sciences, Forestry, Engineering, Business, and Liberal Arts. Nearly all ocean sciences involve aspects of engineering and business. Given that these disciplines comprise a large proportion of OSU faculty and students, a greater partnership between these particular disciplines and OSU marine studies was encouraged. Botany, Plant Pathology and Forestry are natural resource programs with the potential to greatly increase their coastal or marine focus. That said, HMSC should remain open to a broad swath of potential partnerships with all academic disciplines including the arts, supporting the approach that many students’ educational experience would be enriched by integration of a marine perspective.

Signature programs at HMSC could also include more specialized courses that would engage OSU students and appeal to those outside OSU. These can be adaptive and conform to the needs and demands of the time, but require sustained investment to develop the reputation of innovative marine education. Potential signature programs include:

- Marine genomics
- Coastal and marine technology engineering
- Collaborative fisheries science
- Marine field techniques
- Marine economics and resource management
- Experiential and STEM education training

- Marine aquatic veterinary medicine
- Ocean literacy and the arts
- Aquaculture and food science
- Ecosystem science-based regional ocean modeling

### Suggested Courses

HMSC has begun to expand course offerings working toward a full complement of 16-32 credits each term (Appendix 2). Currently the most complete and consistent curriculum is offered in the spring as BI 450, a 16 credit course required for students pursuing an undergraduate Marine Biology option in the Biology Program. Fall courses are provided through the Department of Fisheries and Wildlife. Revised summer offerings being piloted during 2013 are offered from a variety of departments/colleges and have the potential to collectively provide students a full complement of course options (16+ credits). Winter term courses are currently limited and target graduate students, first year undergraduate and non-majors. Expansion of winter term course offerings will likely include skills-based courses such as GIS, statistics, programming, and data visualization. Overall, a transition to consistently offering a full complement of core courses each term is progressing.

Recommendations for course offerings at HMSC

Overall:

- Implement a full complement of courses offered consistently each term;
- Avoid teaching classes alternate years;
- Work with academic units to ensure more HMSC courses fulfill degree and baccalaureate core requirements;
- Minimize use of temporary course #s (e.g., 499, 599) or courses listed without instructor names. This makes courses difficult for students to find;
- Consider labeling courses taught at HMSC as MS### in listings to readily distinguish as taught at HMSC, regardless of which college/department the course is through;
- Offer zero week (weeks before fall or after spring quarter) and spring break course offerings, including intensive field courses and online hybrid courses with field component following each term;
- Enable marine courses taught on campus to have a field and/or experiential component if they do not already;
- Offer courses that may absorb overflow from high demand courses taught on campus;
- Develop cornerstone courses for a marine option available through all departments/colleges;
- Provide training in large and small vessel operations and scientific diving.

Undergraduate Students:

- 1-2 courses that fulfill Science Technology & Society and other baccalaureate core course requirements;
- Experiential courses (e.g., BI/FW 111 series) that satisfy students' desire for 1-2 unit introductory courses;
- Courses that integrate scientific writing, illustration and photography;

- Marine courses that contribute to the Education double degree.

#### Graduate Students:

- Courses that address science skills such as GIS, statistics, science writing, data management, programming, website design, and software use;
- Salmon ocean ecology course;
- Marine food web dynamics;
- Marine spatial ecology;
- Marine field techniques course;
- Free choice learning in marine studies as part of teacher training and link to the online Master's degree;
- Marine courses that contribute to the high school biology teaching certification.

#### Professionals:

- Courses and workshops for science educators nationally and internationally (e.g., community college, high school, aquariums, museums) for career development or to maintain certification;
- Advanced training in marine aquaculture and aquatic species health;
- Marine technical skills based courses.

### **Student Opportunities and Challenges**

Learning about the ocean has great appeal to many students. Upon entering college, a much larger percentage of students express an interest in marine science than ultimately study within the field. OSU offers a wide range of 2 credit U-Engage courses; the class with a marine biology focus consistently fills first, indicating that demand is greater than current capacity. Thus, there is a potential untapped source of students who might focus on marine science, and equally important, a large pool of students who want to integrate some knowledge of the ocean in whatever field of study they choose. Students do not always explore course catalogs, so marine studies need to be promoted to students, regardless of whether they intend to study science or other disciplines. Early engagement of students could help retain students with interest in marine science, STEM fields as well as the marine context in general.

Students add an important academic dimension and youthful exuberance to a marine lab. This is certainly true for HMSC. Yet, current students face significant challenges if they want to reside full-time at HMSC. HMSC students can feel like “forgotten children” as their academic homes typically limit their investment beyond the Corvallis campus. For example, HMSC graduate students pay similar fees as their Corvallis campus colleagues *without* receiving equitable services, including, and especially, healthcare. Further, there are limited teaching assistantships for HMSC graduate students as well as an inconsistent pay scale when compared to the Corvallis campus. There is also no formal graduate student advocate to help them navigate and resolve these inequities.

Degree requirements dictate program plans and schedules. This poses a significant issue for HMSC students as there are not enough courses at HMSC or offered via polycom from the Corvallis campus to satisfy requirements or interests. One reason for the latter is that Corvallis instructors have no incentives to ‘polycom’ courses to HMSC. The overall result is a lack of consistency in

courses offerings (i.e. not annually) which makes planning difficult and often necessitates commuting between HMSC and Corvallis to meet program/course needs. One possible solution to this problem is access to E-campus courses. However, E-campus courses have an additional per credit fee and are only partially covered by tuition remission plans for graduate students. In general, there are more incentives to be a Corvallis student than there is for a student to be resident at HMSC full time. Another approach would be student exchanges among marine labs with transferability of credits. This would be very useful for those students seeking specialized training provided by specific institutions.

Meeting student needs goes beyond providing engaging and well-recognized academic programs. This includes offering attractive social and recreational opportunities (especially for undergraduate students). Newport and the central Oregon coast have much to offer through organizations such the Surfrider Foundation, Aquarium Dive Team, and Yaquina Bay Yacht Club, and facilities including the Newport Recreation Center and the Performing Arts Center. However, there must be a concerted effort by the University and the community to support opportunities targeted at students including expanded services for health and wellness.

Currently, there is not a critical mass of students in residence at HMSC to justify the provision of all the services and courses necessary to fulfill student needs. Consequently, most students have to juggle difficult logistics between Newport and the Corvallis main campus. Increasing the student population will create a positive feedback loop to attract more students to HMSC as well as justify the expanded course offerings and university supported services. At present, there are approximately 20-30 graduate students in residence during any a given term, up to 25 undergraduate students in fall and spring, and 35-40 undergraduate students and interns in the summer. The only consistent student population is the graduate students. Establishing “a critical mass” of students is needed to support and sustain the appropriate student services and academic programs

## Recommendations

### *General*

- By 2020, expand student population to 50-80 graduates, 150-200 resident undergraduates. A full suite of undergraduate and graduate courses ( $\geq 32$  credits) for students in full or partial (e.g., online hybrid) residence offered during all four academic terms;
- By 2025, expand student population to 80-110 graduate students, 200-300 resident undergraduate students, and 100-150 people involved with professional workshops and certifications. A full suite of undergraduate and graduate courses ( $\geq 64$  credits) will be offered during all four academic terms including hybrid and shard courses between the Corvallis and HMSC campuses. Graduate students will be able to meet their course requirements while remaining at HMSC with courses on site or taken remotely. Expanded lower division courses will contribute to the OSU baccalaureate core and 2+2 program with OCCC will be fully implemented, as well as additional partnerships with OCCC and other community colleges, such as skills based training for marine technology and professional certifications;
- Allow HMSC undergraduate and graduate students to take Ecampus courses as part of their fee plateau to avoid commuting and support elimination of the plateau;
- Provide additional housing scholarships or subsidies while in residence at HMSC;
- Develop student exchange programs with other marine labs.

### *Undergraduate Students*

- Target opportunities specifically to major vs. non-major and upper division vs. lower division that align with requirements;
- Improve outreach to students from various academic units including working at the student level with the Marine Team and the administrative level of the Marine Council;
- Provide more upper division course sequences like the spring marine biology courses;
- Create a marine science minor requiring residence at HMSC for 1-4 quarters;
- Provide online hybrid courses so that students that are place bound have access to HMSC courses;
- Develop additional courses that fulfill the biology requirement with a marine emphasis.
- Increase opportunities for undergraduate students to obtain Research or Arts Fellow transcript notations in marine experiential education via HMSC;
- Include one day of undergraduate orientation at HMSC.

### *Graduate Students*

- Entice students with the research support facilities that are unparalleled compared to many other marine labs;
- Develop student exchange programs with other marine labs;
- Expand current connection between Oregon Museum of Science and Industry (OMSI) and OSU doctoral program in free choice learning given OMSI's planned environmental education center in Newport;
- Use community resources in teaching (e.g., Visitors Center, Oregon Coast Aquarium, OMSI) to interest students in becoming STEM teachers;
- Work with the Graduate School to identify a graduate student advocate that can work across academic units to resolve issues with course programs and fees.

### **International Student Opportunities and Challenges**

International students add an important perspective to university courses, in addition to representing another pool of students who might be interested in taking courses at HMSC. OSU currently hosts over 3,000 international students. Most are enrolled in programs with outlined articulation towards a degree. They are often motivated to take advantage of summer and zero week courses in order to stay enrolled or maximize their coursework during the time they spend within their host country. Summer courses also provide substantial tuition breaks for international students. Some international students are interested in marine studies, but like domestic students, the courses need to fulfill their baccalaureate core requirements.

Exchange students, ~100 of OSU international students, are generally on campus for 1-3 terms and seek diverse cultural experiences. Their course schedule is typically completed one year in advance; therefore, it is critical that course offerings are stable annually. Attracting a pool of international students provides potential synergies with OCCC as these students would be interested in basic college level courses. They would also need housing so increase the pool of potential tenants for student housing.

International students will be interested in a wide variety of courses offered at HMSC. Specific fields of study include:

- Quantitative marine science, including fisheries stock assessment and ecosystem based management
- Aquarium and aquaculture sciences

At this point, OSU is limited in offering certificates and non-degree education to international students. F-1 and J-1 students need to enroll full-time (12 credits) each term. These students, however, can pursue a certificate while enrolled as a full-time student. For certificate programs, it is best to work with international students who are already enrolled at OSU. HMSC is designated as a separate campus through the Department of Homeland Security, therefore, international students spending extended periods at HMSC may be required to formally transfer to the HMSC campus.

Recommendations

- Work with International Programs to promote course offerings at HMSC to international students;
- Work to ease transitioning between Corvallis and HMSC for international students under all circumstances;
- Coordinate with OCCC to ensure enrollment eligibility for international students.

### **Professional and Noncredit Education Opportunities and Audiences**

A wide array of the public is interested in professional and non-credit educational opportunities. HMSC faculty and instructors have co-directed very successful partnerships with the Oregon Coast Aquarium, Lincoln County School District, and the University of Oregon that include OCAMP (Oregon Coast Aquatic and Marine Science Partnership) and COSEE (Centers for Ocean Sciences Education Excellence). These programs promote ocean literacy education in K-12 and community colleges through teacher training, OSU faculty guided class projects, and student internships. They also provide an invaluable resource to the OSU research community through collaborations with P.I.'s in designing highly competitive "broader impact" components for grant proposals. OCAMP and COSEE are examples of fixed duration grant funded projects. They demonstrated the potential for establishing a variety of programs sustained through OSU academic units and University Outreach and Engagement. Such programs could attract teachers nationally from K-12, community college, and aquariums seeking credit and noncredit continuing education needed to maintain certifications or for professional development and career advancement. These efforts could develop into a center for lifelong STEM learning at HMSC.

Through partnerships among OSU academic units and OCCC, a wide variety of professional certification and training programs could be offered that include hybrid and evening courses in disciplines ranging from STEM topics for professionals to technical trade training. Target audiences would be domestic and international, and including the aquarium and aquaculture industry. Courses could be offered during the evening for local professionals, on weekends as part of online hybrid options, or all weeklong providing the added incentive of visiting the Oregon coast.

Potential target audiences include:

- K-12 and community college teachers

- Zoo and aquarium educators
- Aquaculture
- Professional naturalists
- Marine and coastal engineers
- Marine technical professionals

### **Community College Partnerships, Possibilities, and Needs**

Expanded education programs for OSU on the coast will require strong ties with all coastal community colleges including Clatsop Community College, Tillamook Bay Community College, Oregon Coast Community College (OCCC), Lane Community College and Southwestern Oregon Community College. In this assessment, however, we will focus on initial partnerships needed with OCCC serving Lincoln County. A strong partnership between OSU and OCCC will be mutually beneficial in bolstering academic programs at both institutions. This is true currently and also critical for progressing toward a 2+2 program. The strongest and most consistent partnership between HMSC and OCCC in recent years has been the Aquarium Science Program. Other partnerships including course articulation agreements, however, have dwindled due to lack of attention from both institutions. Reestablishing articulation agreements and developing additional synergistic programs in the near term are some key initial steps to building a stronger partnership.

While articulation agreements are not necessary for the Associate of Arts/Oregon Transfer Degree, they are required to transfer credits for courses within a specific degree offered through a given academic unit at a university. A lack of funding and focus has made it difficult to provide articulation support for community college students at OCCC. At Southwestern Oregon Community College, the Oregon University System funded a director at the University Center and OSU provided advising for students interesting in transferring to 4-yr programs. This is the type of commitment needed. Students transferring from community colleges in Oregon are a significant cohort and comprised 19% of graduating OSU undergraduates in 2011. OSU transfer students succeed well with comparable probability of graduating in six years (82.2%) compared to students who enter OSU as freshmen and persist to their third year (82.9%). (Oregon University System, 2012a, 2012b).

A stronger partnership between OCCC and OSU will help attract more students to both institutions. Unique signature programs that students cannot get elsewhere would be attractive. Additionally, students would have access to courses that are over capacity in Corvallis while living on the Oregon coast.

Currently, limited basic, life, and physical science courses are offered at OCCC. Expanding these courses would provide HMSC graduate students teaching opportunities while enhancing the OCCC basic curriculum. Community college students express interest in marine science but cannot currently pursue this subject. Offering several marine-based courses that fulfill the science elective for AA/OT students could be very popular. OSU participation in OCCC open houses and other recruiting venues would expose more students to the educational options offered by both institutions.

A 2+2 program with OCCC could be mutually beneficial for both parties, as evidenced by success between OSU Cascades and Central Oregon Community College, and the fact that many successful

community colleges exist within towns with equally robust universities. At the outset, it is important for programs at OCCC and OSU to be complimentary, as is the case between HMSC and the Corvallis campus. Ideally, students could seamlessly transition between OCCC and OSU courses, allowing students to make full use of dual enrollment. Articulation support services with student advisors will be critical in preparing students for transitioning to a 4-yr degree whenever they decide to chart that course. Realistically, many community college students will not transfer because they are place bound or need specific skills training. Some estimates are < 25% of community college students will be interested in transferring to a 4-yr program. At Southwestern Oregon Community College, however, ~ 60% of students are enrolled in the AA/OT program. When presented with guidance and alternative pathways with clear benefits from the onset, students will take advantage of newly recognized opportunities to further their education or technical training.

Administrative steps in establishing the 2+2 relationship with a community college include strong relationships among key leaders, primarily the Presidents, the Academic Deans, Enrollment Services/Student Affairs Deans, and local government. Also, a strong relationship between HMSC and the Corvallis campus is critical at both the administrative and faculty level. Financial support for services such as library and student affairs is critical. As noted by several interviewees “the State cannot support an 8<sup>th</sup> university.” Rather, a robust 2+2 program would truly enhance educational opportunities for coastal residents.

#### Recommendations

- Establish articulation agreements for relevant courses;
- Provide articulation support services for students prior to and after transferring to OSU;
- Expand STEM courses at OCCC through partnership with OSU;
- Develop technical training courses through OCCC and OSU that focus on marine technology and coastal engineering;
- Design a wide variety of hybrid classes that allow flexibility for traditional and non-traditional OCCC and OSU transfer students;
- For out of state transfer students, resolve or make clear to students the differences in obtaining resident tuition status between community college and university.

#### Infrastructure Issues and Recommendations

Student housing, lab, and classroom facilities consistently ranked high among infrastructure needs identified by study participants. With increased enrollment and faculty, infrastructure needs will also include student services (health and recreation) and offices. Some of this new infrastructure will be at HMSC where access to existing resources and services is required. However, other facilities that support student life and possibly some teaching and research efforts will be built elsewhere, possibly on property adjacent to OCCC. This separation revolves around two concerns: safety and maintaining the existing research environment. Student housing should be located outside of the tsunami inundation zone. Additional teaching and research spaces should be designed to address the site’s inherent risks in responsible and feasible ways. HMSC currently supports an “open door”, collegial multi-agency marine lab atmosphere that many cherish and want to see preserved as the student population grows. These concerns must be addressed as we plan additional infrastructure and growth.

## Housing

Existing student apartments at HMSC can functionally accommodate 52 students and have 50% occupancy in fall, 50% in winter, 80% in spring, and 98% in summer. Short-term (1-3 nights) bunkhouses can accommodate 32 students and range from 10% occupancy in January to 70% occupancy in May. Two manufactured home units on site can accommodate a total of 10 people full-term or longer (generally visiting faculty or staff). The local rental market is challenging as there is seasonal pressure for vacation rentals and limited reasonably priced short and long term options. Additional student housing is unquestionably needed to better accommodate current demands and expand to full-term programs.

OSU students face difficult challenges when relocating from Corvallis to Newport, or vice versa. Students often have to forfeit hard sought accommodations to move either direction or face paying two rents. The difficulty is reduced for spring and summer term students as many have moved out of Corvallis housing. It is worse in the fall or winter terms when students often have to commit to a full year lease to secure housing for the academic year. In this situation, it would make sense to stay in Newport for a full year, rather than a term, if sufficient curricula were offered. Alternatively, arranging opportunities for shared leases between housing in Newport and Corvallis through University or private property managers will ease the burden of one term transitions.

In designing new student housing, it is important to consider the different needs of undergraduate and graduate students. Some may be more willing to share space and want more social and recreational amenities but others may need more separation or permanent living spaces, especially those with families that require additional space. When attracting students from outside the area to a 2+2 program, housing for freshman students is a must. Funding student housing construction would require creative solutions involving donor funds, state bonding, and public-private partnerships.

## Classrooms

HMSC's largest classroom can accommodate 30 students. This is the main teaching classroom and heavily booked during spring, summer, and fall terms. The second largest is the distance education classroom that can accommodate 19 students with full remote conferencing with campus. Two additional classrooms accommodate 15-20 students. The classrooms are also in demand for training sessions frequently offered by HMSC residents. The four teaching wet labs with running seawater accommodate 20-25 students each. Two are committed to youth education instruction and the other two to college level courses and student projects. The Guin Library renovation projects will provide an additional two meeting/classroom spaces when completed in 2014 and we anticipate high demand from HMSC residents.

The current HMSC classrooms can only accommodate a small to modest expansion in academic programs. Significant expansion of any academic program at HMSC would necessitate expanded classroom facilities. Additional classroom space could also be used by agencies. For example, NOAA's groundfish observer program now conducts multiple 4-week training sessions for 100% observer coverage of west coast trawl fisheries. The new OCCC campus has classroom and science lab facilities. However, similar to HMSC, they are relatively low capacity (maximum of 24 students), and are also in high use Monday through Thursday.

## Research Teaching Space

There is shared state and federal lab space at HMSC that is excellent for collaborative research but problematic for teaching. The size of rooms (unusable for teaching a class of over 8 students) and the difficulty of gaining short-term access permission are challenges. Classes requiring more in-depth research are limited to the two wet labs. Most graduate students are housed in the lab spaces of their major professors. Construction of additional classrooms and research space would free up existing spaces for conversion to teaching labs.

## Student Study and Office Space

Currently, the only common student study space is in the Guin Library. Originally built for 100 full time students and 300 staff in 1990, it is being renovated to address changing needs in 2013/14. The Library has adequate study space for small groups and individuals, but would be challenged if the student population increased beyond 200. Additional student space would be needed to retain the library as a quieter place to study.

Graduate student office space is also limited to two common areas with cubicles, one in a NOAA building (20-25 desks) and one in an OSU building (5 desks), and limited carrel space (18 desks) in the Guin Library. The graduate student space in the NOAA building is currently adequate in terms of size, but problematic because students have limited or no access after hours or on weekends. Additionally, students are required to have a government ID to access the building, which can be particularly time consuming or prohibitive for non-US citizens. Additional graduate student and post-doctoral fellow space for 20 is planned in the Guin Library renovation.

## Information Technology

Relatively recent upgrades to HMSC information technology infrastructure have been extremely beneficial. Currently the fiber optic connection is not fully taxed and could support expanded use for educational programs. In the future, with expansion of data transmission from genome sequencers and ocean observing systems through HMSC, greater bandwidth may be needed.

OCCC has sufficient fiber optic connectivity within its new campus. OCCC's current bridge can support all possible endpoints. Therefore, IT requirements are manageable in moving toward a greater integration with the community college and can be addressed using models developed for OSU Cascades.

Video conferencing systems are readily available for HMSC students and staff to connect with Corvallis campus and elsewhere. The College of Agricultural Sciences has expanded video conferencing capabilities and enjoys easy connectivity with HMSC. This is not the case for other colleges, which limits HMSC students from remote connection to classes on campus (beyond Fisheries and Wildlife), as well as for seminars and thesis defenses. It is currently easier for Corvallis students to attend HMSC courses remotely than HMSC students to connect remotely to courses in Corvallis. Corvallis faculty often decline to use video conferencing due to limited availability of equipment, unfamiliarity with use of equipment, need to move classes to rooms equipped for video conferencing, or lack of incentive if the additional effort is only for a few students on the coast. Increasing the number of students in resident on the coast and applying their IT fees to remote videoconferencing support for on campus course instructors could help resolve this problem.

HMSC classrooms and meeting rooms have been updated with adequate media equipment for teaching and presenting. Judicious use of Technology Resource Fees have allowed all rooms to have similar equipment making operations and training smoother and simpler. Ongoing support for equipment and IT staff is provided by the HMSC Director's Office. As educational demands and the resident student population increase, IT staff levels, expectations, and funding will need to be addressed.

## Recommendations

### Housing

- Additional housing scholarships and subsidies;
- Exploration of shared housing agreement between HMSC and University Housing and Dining;
- New housing in Newport to accommodate increased student population;

### Classroom

- Additional teaching classrooms, with at least one capable of holding larger groups;
- Computer/Electronics teaching lab (e.g., statistics, computer modeling, GIS);

### Research Teaching

- Additional multi-purpose wet/dry labs;
- Small boat and dive facility for classes and student projects/research;

### Student Work Space

- Additional student common space;
- Provision of graduate student work space if not accommodated in labs;

### Information Technology

- Funding for videoconferencing support on the Corvallis campus;
- Expansion of teaching technology in Corvallis academic units to promote videoconferencing for teaching at HMSC;
- Funding model for IT support of students and teaching

## Teaching Faculty (FTE) Needs and Recommendations

Additional teaching appointments at HMSC was the highest ranking need among the over 200 participants in our assessment. One cogent comment during a focus group discussion was that additional teaching FTE “would be a game-changer, otherwise we [HMSC] will remain a research station that does some teaching.” Currently, among approximately 13 tenure track faculty, there is less than 1.5 teaching FTE in total. Hiring additional faculty with teaching and research appointments that represent diverse expertise and academic units on main campus is needed to provide expanded courses and graduate student mentoring at HMSC. Some of this FTE should support strategic academic planning and program development. The External Review Team recommended that a faculty representative from HMSC should be appointed to facilitate education at the Center by engaging faculty, administrators, and staff on both campuses. This is soon to be accomplished with the hiring of a new Zoology faculty member charged with working with “HMSC

leadership to develop and promote undergraduate academic programs and curricula at HMSC”.

Expanded teaching FTEs can be achieved through new faculty and instructor hires. Current faculty with research appointments are interested in contributing to OSU’s educational mission. This requires revision of position descriptions and funding for that effort. An additional key teaching resource is OSU courtesy faculty residing in agencies who contribute to courses at HMSC and greatly enhance the student’s marine lab experience, as well as exposure to careers post graduation. Tapping into this willing pool of educators is invaluable for OSU. Although, since graduate or undergraduate instruction is not within the position description of agency scientists, tactical incorporation of their expertise into teaching faculty designed courses is the most cooperative approach (FW426/526, Coastal Ecology and Resource Management is a good example). That said, numerous courtesy faculty do teach graduate level courses or informal research skills-based courses.

Faculty from several colleges expressed the need for OSU to provide equitable support for teaching classes. Currently the two primary models in use for HMSC courses are credit based and FTE based. In general, FTE based compensation was considered most equitable and should be standardized among academic units. The College of Earth, Ocean, and Atmospheric Science, College of Science, and College of Agricultural Science have similar FTE commitments for teaching in a 9 month, tenure track position: 45-50% teaching and advising, 40-45% research and 10% service. The teaching commitment equates to 3 classes per year (~ 9 credits - University expectation is 0.1 FTE per course) plus student advising. For the following recommendations, 1 FTE is defined as one 9 month appointment that includes 50% FTE for teaching and advising of 3-5 graduate students.

## Recommendations

- By 2020, add 10-14 FTE to HMSC through revised position descriptions for existing HMSC faculty and new hires. New hires should complement current faculty expertise while also teaching classes and conducting research that utilizes HMSC facilities (e.g., sea water system, Visitor Center) and field laboratories (e.g., estuaries, coastal communities). This would allow  $\geq 32$  course credits per term.
- By 2025, add an additional 10-14 FTE. HMSC will have solidified and expanded its signature courses and unique niche in contributing to the marine enterprise at OSU. With greater recognition and enrollment in marine studies at OSU, some course duplication between the main campus and HMSC will begin to occur without being detrimental to either interest, thereby allowing additional teaching FTE to exist at HMSC. This would allow  $\geq 64$  course credits per term.

Growing the HMSC faculty is a key step toward creating a critical mass of graduate and undergraduate students required to establish a robust, sustainable program and needed student services.

## Funding Education and Tuition Model

Most current funding for academic programs comes from the Research Office through the HMSC Director’s Office budget. This covers the Academic Program Coordinator salary, facilities, IT and

occasional instructors. Teaching lab equipment and classroom upgrades rely on Technology Resource fees, and a variety of other sources including private donors and other departments. Most teaching FTE is provided through departments and colleges with the Fisheries and Wildlife Department committing consistent effort. The External Review Team commented that these are “inappropriate sources [for academic funding] (i.e., the Research Office) or highly unpredictable sources such as the departments and colleges on campus.”

The HMSC Strategic Plan noted that incentives are not available to encourage faculty to develop new course or curriculum offerings, especially multidisciplinary courses that cross traditional department or college lines. Targeted fees for non-Corvallis courses increase the burden on students and are not an appropriate solution. The net result is that colleges and departments have no incentive to invest in developing and offering classes beyond the Corvallis campus. Therefore, a new, uniform funding model is needed that is equitable to HMSC, academic units, and the University that support academic program coordination, development and delivery.

Currently, there are three tuition schemes for OSU classes: Academic Year (AY), Summer Session (SS) and Ecampus. The AY and SS models do not address the cost to a facility other than the Corvallis campus; this inhibits course offerings beyond OSU main campus. The Ecampus model assumes no facility cost but substantial administrative and course development costs; these are covered by the \$75 per credit fee. The AY model has the bulk of the fees added to the first credit with incremental additional fees up to 12 credits and then plateauing. The SS model adds fees to the first credit taken; additional credits do not result in additional fees.

The net result is that Ecampus tuition is lowest for students taking < 4 credits, SS tuition is lowest for students taking 5-12 (undergraduate) or 5-9 (graduate) credits, and AY tuition is lowest for students taking  $\geq 13$  (undergraduate) or  $\geq 10$  (graduate) credits. Differences in costs among the three models can be substantial, up to \$1,400 per term for undergraduate and \$3,700 per term for graduate students taking a full 16 credits (Appendix 3).

Tuition should be shared equitably among all units investing in course delivery. These may include the department who covers the cost of instruction, the facility for use of space and coordinating staff, Central Administration for registration and business affairs and Central Enterprise for marketing. Additional course fees could be charged for courses requiring specialized facilities such as labs. Regular fees applicable to the Corvallis campus would need to be adjusted so that student services (e.g. medical services, recreation, information technology) can be provided off campus.

Creating an equitable tuition model for non-Corvallis courses has been a work in progress for several years without finalization. Several models for tuition allocation are currently being discussed (Appendix 3). The expansion of academic programs at HMSC provides the opportunity to create a model that would work for other OSU facilities beyond the Corvallis main campus.

#### Recommendations

- Adopt a tuition scheme for non-Corvallis campus courses that returns 70% of tuition to the unit providing the instruction, 20% to the facility hosting the instruction, and 10% to Central Administration.

## Scaling Up Educational Opportunities

Throughout our conversations, we sensed enthusiasm for expanded educational opportunities on the coast and better use of HMSC as a teaching facility embedded in the research environment. One participant said: “I enjoy having the vitality students bring with them and the energy and passion they have. Our community has always embraced our students and learning about what they do. I can see this as being a new dynamic within the community we live in.” There was also recognition of the challenges of geography, funding and policies. There is potential for increasing HMSC’s capacity to address the educational desires of students and the community needs. While this assessment focuses on students, infrastructure and faculty, many we spoke with see an expansion of educational opportunities as a means to boost the coastal economy with a better educated workforce. As one person stated: “more living wage jobs would only help the coast to grow and would attract great people to the coast to study and live”. There is interest in improving sustainable business opportunities related to science and the marine environment.

Expanding HMSC academic programs would increase our interactions with the Lincoln County schools, and OCCC enhancing opportunities for all students. People see this as “positive for the community” and “good for coastal youth to know what academic opportunities are available should they want a local college option.” Keeping local students on the coast and recruiting students from elsewhere are positives.

There may be a limited number of students with sufficient passion to study marine biology. However, there is an unlimited number whose lives and careers can be enriched through ocean literacy. A current HMSC student commented: “I love the coastal life and treasure the sense of being a part of a healthy ecosystem. I want to help maintain it and improve it. I want others to have access to it and to learn about it”. We concur with the HMSC External Review Panel, “[Our] goal should be to increase marine science literacy and exposure in all disciplines at OSU, and make HMSC the face of marine science and marine policy on the coast.” Elevating education to be in balance with research at HMSC will diversify the current funding model. Sustained investment in these efforts will help establish OSU as a preeminent University for ocean science education, research, and engagement.

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[External Review of the Hatfield Marine Science Center.](#)

## **Appendix 1: Interviewees and Respondents**

Number and background of over 200 interviewees and respondents from in-person and online surveys while seeking input for this report during April – June 2013.

### **Interviews:**

- OSU faculty and administration representing 17 different colleges/departments/programs (28 interviews of 37 people).
- Other marine laboratories directors and faculty (4 interviews of 5 people)
- Community college presidents (2 interviews)
- State representatives (2 interviews)

### **Focal Groups:**

- HMSC faculty, Hatfield Student Organization, HMSC agencies, Newport community leaders (4 focal groups including 25 people).

### **Online survey (# of responses):**

- University Faculty and Staff (64) – 33 Newport, 31 Corvallis
- University Graduate Students (36), 13 Newport; 23 Corvallis
- University Undergraduate Students (32)
- Agency (22)
- K-12 (5)
- Community (15)
- Community College (26)

Appendix 2: Current HMSC Courses

Listing of courses offered at HMSC during four terms of the 2012-2013 academic year.

<b>FALL 2012 - Oregon State University Courses</b>		
<b>Course Title</b>	<b>Course #</b>	<b>Credits</b>
HMSC seminar	FW 407/507	1
Coastal Ecology & Resource Mgmt (CERM) WEEK	FW 426/526	5
Natural History of Whales and Whaling	FW 419	3
Fishery Biology	FW 454/554	5
Dynamics of Marine Biological Resources	FW431/531	4
Marine Conservation Biology	FW/Z 464/564	3
Early Life History of Fishes	FW 474/574	4
Aquatic Biological Invasions	FW 421/521	4
Math on the Beach	OC 599	3
	<b>Total</b>	<b>32</b>
<b>WINTER 2013 - Oregon State University Courses</b>		
<b>Course Title</b>	<b>Course #</b>	<b>Credits</b>
Introduction to marine mammal Accoustics	FW/OC 599	3
Introduction to Marine Life in the Sea - Marine Habitats	BI/FW 111	1
FW Seminar	FW 407/507	1
Fundamentals of Molecular Ecology	FW 699	3
Genetic Monitoring of F & W	FW 599	3
	<b>Total</b>	<b>11</b>
<b>SPRING 2013 - Oregon State University Courses</b>		
<b>Course Title</b>	<b>Course #</b>	<b>Credits</b>
Marine Biology	BI 450	16
Introduction to Marine Life in the Sea - Marine Mammals	BI/FW 111	1
Introduction to Marine Life in the Sea - Marine Birds	BI/FW 111	1
Advanced Fundamentals of Molecular Ecology	FW 599	3
	<b>Total</b>	<b>21</b>
<b>SUMMER 2013 - Oregon State University Courses</b>		
<b>Course Title</b>	<b>Course #</b>	<b>Credits</b>
Introduction to Marine Biology	BI 150	4
Biology and Conservation of Marine Mammals	BI/FW 302	4
Laboratory: Field Techniques for Marine Mammal Conservation	FW 499	1
Ecology of Marine & Estuarine Birds	FW 499	3
Intro. to Geographic Information Systems	GEO 365	4
Scientific Diving	IST 499/599	4
Coastal Oceanography	OC 332	3
Marine and Estuarine Invertebrate Zoology	Z 461	4
	<b>Total</b>	<b>27</b>

### Appendix 3: Tuition Schemes and Proposed Models

Comparison of costs for one term among the three tuition schemes used at OSU (AY = Academic Year)

	Credits	Undergraduate				Graduate			
		AY Resident \$185	AY Non Res \$579	Summer Session Tuition \$185	Ecampus \$75/credit \$185	AY Resident \$421	AY Non Res \$677	Summer Session Tuition \$421	Ecampus \$75/credit \$421
Ecampus lower	1	\$601	\$995	\$539	\$260	\$844	\$1,100	\$775	\$496
	2	\$793	\$1,581	\$724	\$520	\$1,274	\$1,786	\$1,196	\$992
	3	\$985	\$2,167	\$909	\$780	\$1,704	\$2,472	\$1,617	\$1,488
	4	\$1,177	\$2,753	\$1,094	\$1,040	\$2,134	\$3,158	\$2,038	\$1,984
	5	\$1,369	\$3,339	\$1,279	\$1,300	\$2,564	\$3,844	\$2,459	\$2,480
SS tuition lower	6	\$1,561	\$3,925	\$1,464	\$1,560	\$2,994	\$4,530	\$2,880	\$2,976
	7	\$1,753	\$4,511	\$1,649	\$1,820	\$3,424	\$5,216	\$3,301	\$3,472
	8	\$1,945	\$5,097	\$1,834	\$2,080	\$3,853	\$5,901	\$3,722	\$3,968
	9	\$2,137	\$5,683	\$2,019	\$2,340	\$4,274	\$6,586	\$4,143	\$4,464
	10	\$2,329	\$6,269	\$2,204	\$2,600	\$4,274	\$7,263	\$4,564	\$4,960
AY tuition lower	11	\$2,521	\$6,855	\$2,389	\$2,860	\$4,274	\$7,940	\$4,985	\$5,456
	12	\$2,713	\$7,441	\$2,574	\$3,120	\$4,274	\$8,617	\$5,406	\$5,952
	13	\$2,713	\$8,020	\$2,759	\$3,380	\$4,274	\$9,294	\$5,827	\$6,448
	14	\$2,713	\$8,599	\$2,944	\$3,640	\$4,274	\$9,971	\$6,248	\$6,944
	15	\$2,713	\$9,178	\$3,129	\$3,900	\$4,274	\$10,648	\$6,669	\$7,440
	16	\$2,713	\$9,757	\$3,314	\$4,160	\$4,274	\$11,325	\$7,090	\$7,936
	17	\$2,898	\$10,336	\$3,499	\$4,420	\$4,695	\$12,002	\$7,511	\$8,432
	18	\$3,083	\$10,915	\$3,684	\$4,680	\$5,116	\$12,679	\$7,932	\$8,928
	Fees:	\$416	\$416	\$354	\$0	\$423	\$423	\$354	\$0

Possible models for allocating tuition among academic units and facilities (recommended model in bold)

Percentages	Instructional Unit	Facility	Central Administration (Registrar, Academic Affairs)	Central Enterprise (Summer Session, course development)
65/15/10/10	\$120.25	\$27.75	\$18.50	\$18.50
65/20/10/5	\$120.25	\$37.00	\$18.50	\$9.25
70/10/10/10	\$129.50	\$18.50	\$18.50	\$18.50
<b>70/20/10</b>	<b>\$129.50</b>	<b>\$37.00</b>	<b>\$18.50</b>	<b>\$0.00</b>
80/10/10	\$148.00	\$18.50	\$18.50	\$0.00

Based on one credit at \$185

## **Appendix 4: Relevant Development Opportunities From HMSC Strategic Plan**

### **Undergraduate courses at HMSC that enrich existing programs.**

1. Increase resident teaching FTE at HMSC (with funding from E&G) for coastal and marine science.
2. Create a Marine Science Minor, Option or Certificate Program (within existing undergraduate majors) with residency, independent research, project, or internship at HMSC.
3. Explore opportunities to develop an inter-disciplinary B.S. degree in marine and coastal sciences.
4. Develop relationships with partner academic institutions
5. Recruit additional (non-OSU) undergraduates to new and extended programs (e.g. education programs, summer internship programs) with opportunities for underrepresented groups
6. Further develop OCCC relationship with dual enrollment
7. Examine combined OSU/UO/PSU alliance for statewide programs in marine science
8. Promote and develop opportunities for other universities, community colleges, tribal colleges, and underrepresented groups to take advantage of HMSC educational opportunities
9. Increase international marine science learning opportunities for OSU students and bring foreign students to HMSC

### **Opportunities for graduate studies at HMSC.**

1. Increase resident graduate faculty at HMSC.
2. Offer graduate courses on year-round basis at HMSC examine dedicated term for students studying marine science.
3. More fully engage courtesy faculty in teaching, advising, and supporting graduate students.
4. Increase agency and industry fellowships, traineeships, and marine resource related summer jobs for graduate student education.
5. Obtain external financial support for graduate education in marine and coastal science and resource management.
6. Increase international marine science research opportunities for OSU grad students.

### **Leading national and international programs in informal education for youth and lifelong learners and extension-based outreach in coastal and marine science.**

1. Continue development as a national site for free-choice learning, based on coastal and marine themes for audiences that choose how and when to learn.
2. Increase physical capacity and staffing for youth education and life-long learning at HMSC.
3. Increase involvement and participation by agencies and academic units with Visitor Center, youth, and life-long learning educational (outreach) programming that improves science literacy.
4. Improve library resources for informal education
5. Increase extension-based educational programming around coastal, aquatic, and marine issues and opportunities, including coastal community development.
6. Expand youth and lifelong learning opportunities for diverse, under-represented, and underserved audiences.

7. Consider developing “SEATAUQUA” or elder hostel-like program featuring integration of the arts and sciences
8. Partner with OCCC and Oregon Coast Aquarium in training activities, e.g., for volunteers.

**Create programs of continuing professional education for scientists, managers, practitioners, and educators.**

1. Evaluate productive areas for program expansion (professional Ed, certificate programs, agency scientists, Distance Education).
2. Develop curriculum for fisheries management training.
3. Develop distance learning courses that contribute to OSU Extended Campus programs.
4. Offer professional development workshops (Aquaculture, Aquarium Science, Veterinary Medicine).
5. Increase use of HMSC for scientific/professional meetings.