Marine Studies Initiative

10-Year Strategic Plan
2016-2025

Oregon State
UNIVERSITY

Message from Marine Studies Initiative Leadership

JUST AS THE OCEAN HAS INSPIRED CREATIVITY FOR MILLENNIA, the Marine Studies Initiative will harness people's fascination with the sea and all it touches to motivate the next generation of students and citizens. Through its collaborative, transdisciplinary programs, this initiative will provide innovative approaches to solving ocean-related societal challenges.

We are pleased to share this Strategic Plan for Oregon State University and its external partners to achieve the successful stewardship of our ocean, including the wealth of benefits it provides to people, for today and into the future. This plan is based on the efforts of more than 125 Oregon State faculty and students, educational partners from across the state and hundreds of conversations with Oregon citizens and decision makers over the last year.

Building on Oregon State's half-century of excellence in marine sciences, we have a unique opportunity to create a globally distinct program that blends the natural and social sciences, business, engineering, education, the arts and humanities.

The time is right to launch this initiative to provide a transformational educational experience centered on marine studies, increase access to higher education for Oregon's coastal communities, elevate our transdisciplinary research to even greater global distinction, sustain and enhance the state's marine-related economy and increase marine literacy across Oregon. Please join us as we set sail on this exciting voyage.

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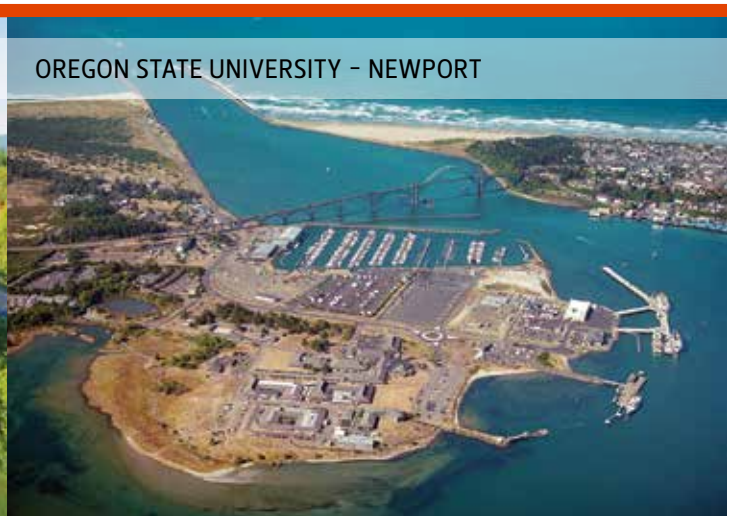


Executive Summary

The world's ocean belongs to everyone, and its health is critical to the future. The ocean is an essential life support system, absorbing carbon dioxide from the atmosphere, generating up to half of the world's supply of oxygen, producing essential protein for nearly 3 billion people, regulating global climate and providing many resources used by humans. The ocean impacts everything from weather patterns and whale migration to inland agriculture, freshwater aquifers, public health, seafood security and the economic vitality of communities along the coast and inland. Marine habitats, nearshore ecosystems and coastal communities face daunting pressures that threaten their sustainability — climate change, ocean acidification, rising sea levels, variable fish stocks, natural and human-caused disasters and many others.

Bold new approaches need to be developed to manage the ocean's resources wisely. Equally imperative is growing the next generation of leaders who can bridge the social and natural sciences to create multipronged solutions to sustain healthy ecosystems and ensure prosperity for future generations.

Oregon State University is responding to these challenges with the Marine Studies Initiative. Building on a deep history of nationally ranked programs in marine sciences and natural resources, faculty excellence, world-leading research and premier facilities, the university is pioneering a new teaching, research, outreach and engagement model to help sustain healthy oceans and all who depend on them. This initiative will unite the university's diverse strengths in a transdisciplinary program designed to meet these 21st-century local, national and global needs.

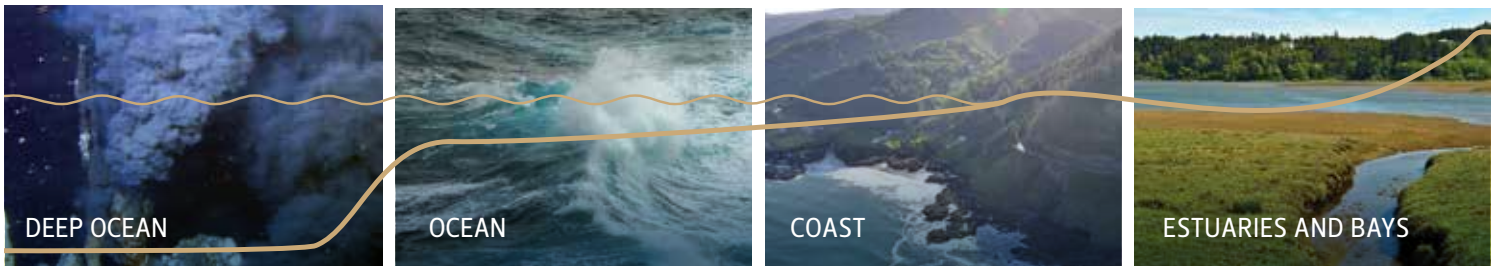
Oregon State University is one of only two universities in the United States to have land, sea, space and sun grant designations, which drive a collaborative and engaging approach to problem solving across a uniquely wide range of topics. Oregon State faculty are world leaders in biology, ecology, oceanography, economics, agriculture, engineering, sociology, writing and more. Since the ocean touches all of these disciplines, the state of Oregon offers an unparalleled living-learning laboratory with diverse ecosystems, including a 300-mile coastline featuring some of the world's most pristine marine waters, estuaries, rivers, inland watersheds and mountain snowpack. All of these habitats are profoundly impacted by the ocean and are linked to larger regional and global ecosystems.

It is our vision that through its Marine Studies Initiative, Oregon State University will be recognized as a global leader in 21st-century transdisciplinary education and research and lead the development of inclusive strategies for successful stewardship of the ocean and planet. The initiative's mission is to create a healthy future for the ocean and the planet through research and teaching that emphasizes collaboration, experiential learning and problem solving.

The Marine Studies Initiative will achieve this distinct vision by undertaking specific strategies and supporting activities within three strategic goal areas:

1. Provide a transformational educational experience centered on marine studies.
2. Advance leadership in transdisciplinary marine research and scholarship.
3. Increase societal impact from marine studies in Oregon and beyond.

The mountains-to-ocean ecosystem of Oregon is linked to the larger regional and global system. Habitats from the tallest mountains to the ocean's deepest depths are connected by biological, chemical and physical cycles that move resources through these systems. The Marine Studies Initiative will explore the marine environment and its connections to the land and atmosphere, while positively impacting economic and social progress.



The program will be built in phases to achieve the Marine Studies Initiative's 10-year vision. After an intensive planning phase during 2014 and 2015, the initiative will be launched between 2015 and 2016 with the development of marine studies curricula and the establishment of a marine studies office. An inaugural cohort of students taking advantage of new and enhanced courses and degrees will enter in fall 2016. Between 2016 and 2025, there will be additional milestones for programmatic development, faculty hires, legislative outreach, partnership building, fundraising and facilities construction. Undergraduate and graduate students and postdoctoral scholars will receive training in cutting-edge programs, such as Centers of Excellence focusing on specific topics of societal importance. This strategic plan will serve as a touchstone for subsequent implementation and program development.

By leveraging Oregon State's existing strengths and distinctions and creating new ones, the Marine Studies Initiative will harness the collective expertise of faculty and staff to advance transdisciplinary practices and innovations that promote positive change for the university and the community it serves.

AS A RESULT OF THE MARINE STUDIES INITIATIVE:

» Coastal environments and related economies will be enhanced by an increased understanding of coastal and ocean systems and the promotion of sustainability and resilience on key issues such as natural resources management, climate change impacts, food security and safety, natural hazards and renewable energy production.

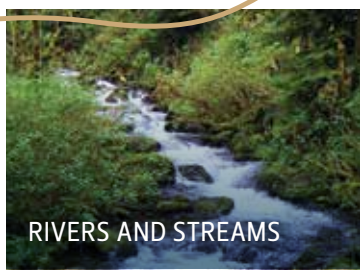
» Major marine issues facing Oregon and the world will be addressed by creating a cohesive transdisciplinary teaching and learning program and establishing a new framework of collaboration — bringing together undergraduate and graduate students, faculty, government, Native American tribes, industry partners, nonprofit organizations, communities and other institutions of higher education.

» Unique experiential learning opportunities will be offered, and an undergraduate degree program in marine studies will be launched. By 2025, the Marine Studies Initiative will have 500 students-in-residence throughout the year at the marine studies campus in Newport and up to 750 new students at Oregon State's Corvallis campus. These education programs will use and benefit from access to rich and diverse natural habitats, a network of university, state and federal partners located at the Hatfield Marine Science Center, state-of-the-art facilities and community and business partners. Educational opportunities will be extended through university outreach and engagement programs and in partnership with the state's coastal community colleges.

» Oregon State's distinctions will be leveraged by involving each of its 11 colleges, the Graduate School, the University Honors College, the Hatfield Marine Science Center, the Coastal Oregon Marine Experiment Station, the Seafood Research and Education Center and many other university centers and institutes.

» The best-possible facilities will be constructed to give students and researchers the maximum capacity to excel. This initiative will expand and connect world-class teaching and research facilities at Oregon State's main campus in Corvallis and its Hatfield Marine Science Center in Newport, beginning with the construction of a $50 million research, teaching and outreach facility in Newport.

The Marine Studies Initiative represents a great opportunity for Oregon State University to be a world leader in addressing key societal issues for today and the future while defining a new model for teaching and research that emphasizes real-world, solutions-based inquiry and collaboration across disciplines. By building on the university's many strengths, involving the entire community and working closely with many partners, this initiative will serve Oregon and beyond by embodying the university's strategic areas of distinction: advancing the science of sustainable Earth ecosystems, improving human health and wellness and promoting economic growth and social progress.



Framework for the Marine Studies Initiative

VISION

Through its Marine Studies Initiative, Oregon State will be recognized as a global leader in 21st-century transdisciplinary education and research and lead the development of inclusive strategies for successful stewardship of our ocean and planet for today and tomorrow.

MISSION

The mission of the Marine Studies Initiative is to 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.

VALUES

The Marine Studies Initiative embodies the values that guide Oregon State University (Box 1): accountability, diversity, integrity, respect and social responsibility. In addition to being guided by these values, the Marine Studies Initiative includes specific opportunities for students and faculty to explore these values and detect and address ethical dilemmas.

BOX 1: THE MARINE STUDIES INITIATIVE SUPPORTS OREGON STATE UNIVERSITY'S MISSION

As a land grant institution committed to teaching, research and outreach and engagement, Oregon State University promotes economic, social, cultural and environmental progress for the people of Oregon, the nation and the world. This mission is achieved by producing graduates competitive in the global economy, supporting a continuous search for new knowledge and solutions and maintaining a rigorous focus on academic excellence in three signature areas of distinction:

Healthy Planet: advancing the science of sustainable Earth ecosystems. This initiative will advance the science of sustainable oceans and their connection to the rest of the Earth's ecosystems.

Healthy People: improving human health and wellness. By focusing Centers of Excellence and other programs on issues of societal importance, the initiative will improve human health and wellness by fostering a healthy planet and society.

Healthy Economy: promoting economic growth and social progress. Through the initiative, faculty and staff will collaboratively engage with industry, state leaders and communities on topics of economic and social importance.

BOX 2: GLOBAL CONTEXT

A number of international efforts are charting the way for nations to meet 21st-century challenges related to marine and coastal issues. By focusing on internationally identified issues, the Marine Studies Initiative will position Oregon State University and its partners to contribute to these efforts and achieve global leadership. For example:

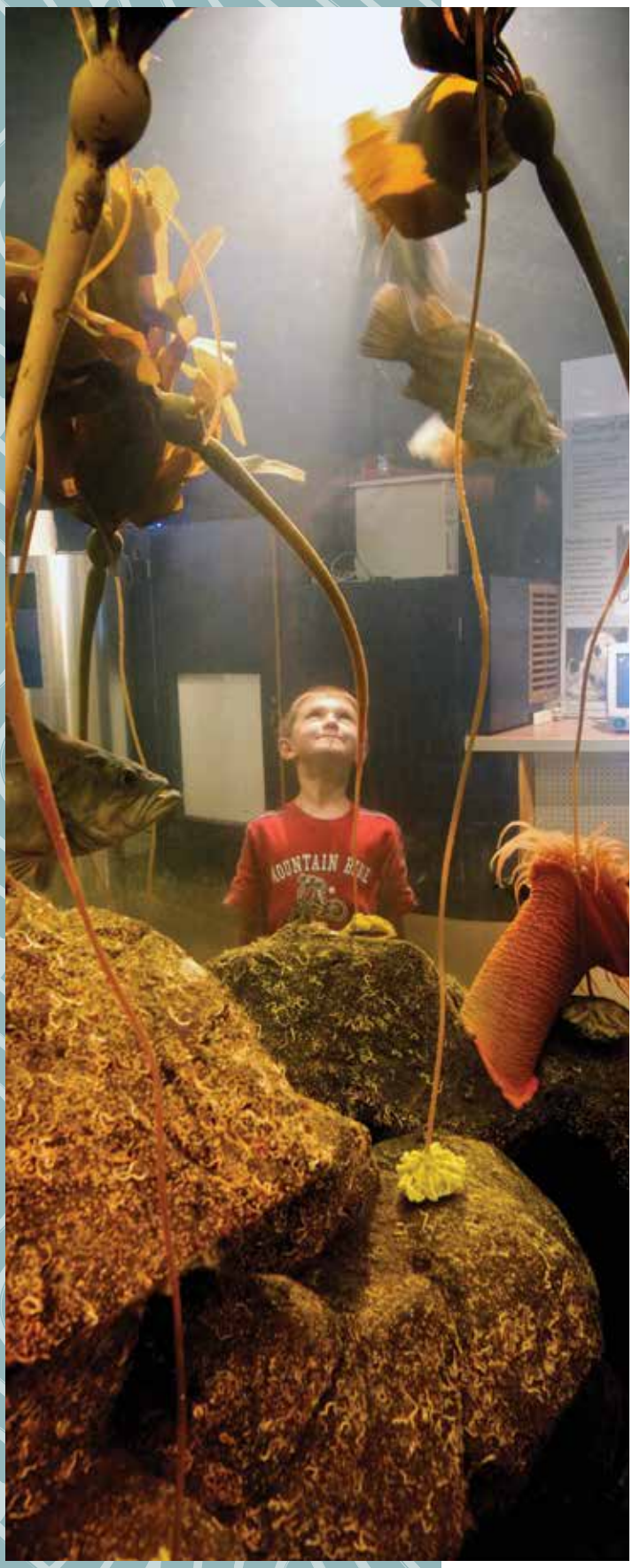
United Nations Sustainable Development Goals: The U.N. is working with governments, society and other partners to shape an ambitious framework to meet the needs of both people and the planet. A proposed set of goals will be decided by the U.N. General Assembly at its 68th session in fall 2015. The Marine Studies Initiative supports a number of the proposed sustainable development goals, which include:

» Goal 3: Ensuring healthy lives and promoting well-being for all ages
» Goal 4: Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all
» Goal 11: Making cities and human settlements inclusive, safe, resilient and sustainable
» Goal 12: Ensuring sustainable consumption and production patterns
» Goal 14: Conserving and sustainably using the oceans, seas and marine resources for sustainable development

From "Transforming our world by 2030: A new agenda for global action," the zero draft of the outcome document for the U.N. Summit to adopt the Post-2015 Development Agenda.

Blue Growth: Industry and governments are looking to the ocean for new development, jobs, innovation and a competitive advantage. Alongside established ocean industries, emerging and new activities, such as offshore renewable energy, aquaculture, deep seabed mining and marine biotechnology are bringing new opportunities, growth and greater diversity to the ocean economy. A number of groups and nations are concerned with the challenges for sustainability because of this growth and have strongly embraced the concept of a "Blue economy," otherwise known as a sustainable ocean economy. A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy. The Marine Studies Initiative will complement and support these efforts by developing innovative approaches for ocean education, research, management, policy and technology that have applications well beyond Oregon's borders.

From "The Blue Economy. Growth, opportunity and a sustainable ocean economy," an Economist Intelligence Unit briefing paper for the World Ocean Summit 2015.



Marine Studies in Oregon: Context and Background

OREGON STANDS OUT for its mixture of unparalleled access to the beach and ocean and the natural beauty of its coastline. It offers one of the most aesthetic, diverse and productive marine coastlines in the country. It is a source of inspiration, reflection and repose. The coastal economy is significantly influenced by the well-being of marine waters and freshwater systems. Hence, the ocean and coastal marine environments, as well as the inland factors that significantly influence them, are a matter of economic and cultural importance to all Oregonians.

Oregon is home to groundbreaking ocean exploration amid some of the most productive, sustainable fisheries in the world. The state's diverse, bountiful agriculture and healthy, productive forests have led to innovative solutions to water management and water policy. In this setting, we are poised to create integrated solutions to sustain the diverse ecosystems, communities and economies at the confluence of the continent and the sea.

Oregon flanks the eastern side of the North Pacific Ocean, whose currents, sea lanes and restless underlying tectonic plates link ecosystems and nations. Sitting midway between the equator and the North Pole, beneath the strong west-to-east atmospheric jet stream, Oregon's ecosystems are especially sensitive to shifting weather and climate brought on by global warming. Many of the textbook examples of coastal and marine natural and social science issues have emerged from the Pacific Northwest, including the understanding of how wind-driven coastal ocean upwelling fuels a highly productive coastal fishery. Lessons learned in Oregon have applications and impact across the globe in similar coastal and marine systems.

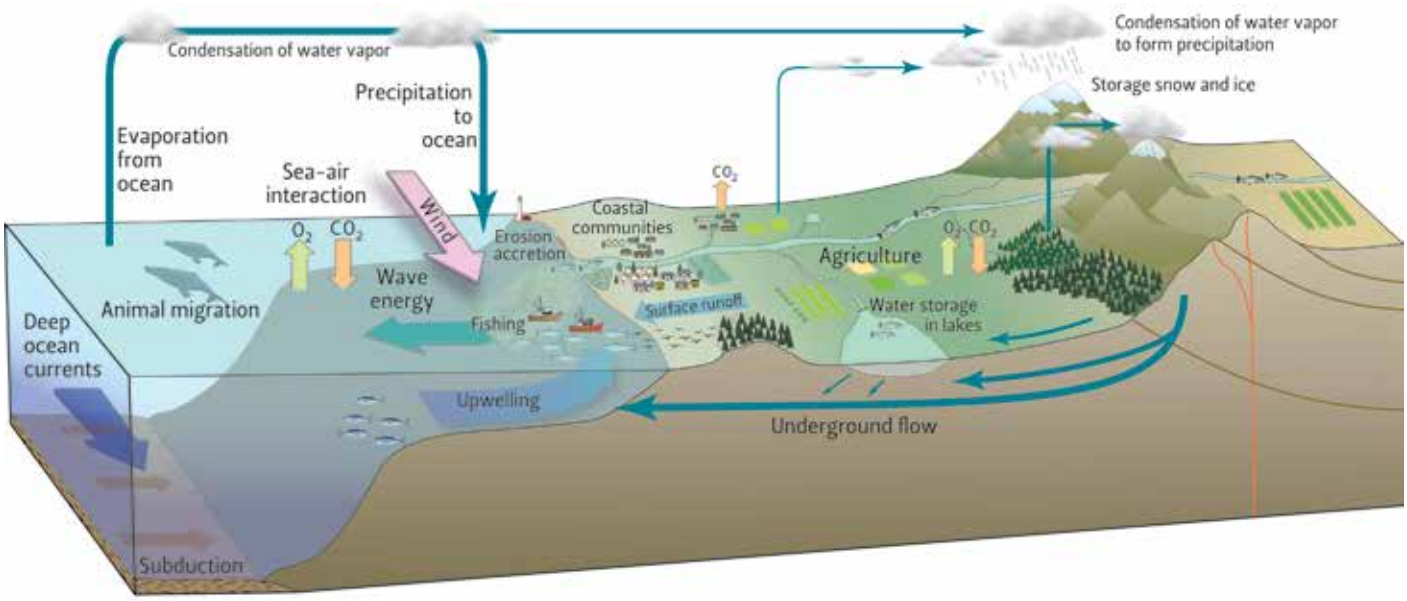
Coastal and ocean environments face unprecedented opportunities and threats. Consequently, they are providing increasingly more complex policy and management challenges. The process of decision making within this context is multifaceted, requiring effective communications and delivery of salient, timely and credible knowledge from all relevant stakeholders. A transdisciplinary approach develops the essential communication skills and knowledge networks that can support and deliver effective solutions to some of the most pressing sustainability issues.

BOX 3: MOUNTAINS-TO-OCEAN SCOPE OF THE MARINE STUDIES INITIATIVE

All life on Earth is ultimately dependent on the ocean. Covering more than 70 percent of the Earth's surface, the ocean contains 97 percent of the Earth's water. It drives the planet's entire life-support system by generating up to half of the world's supply of oxygen, absorbing carbon dioxide from the atmosphere, regulating global climate and providing resources that humans consume, including producing essential protein for nearly 3 billion people.

The land and the ocean are connected through biological, chemical and physical cycles that move resources through these systems. For example, at the northern border of Oregon, the Columbia River drains water from the snow-charged mountains of the Cascade Range into the Pacific Ocean. The Columbia and other coastal rivers move approximately 91 trillion gallons of water to the ocean each year. Moisture from the ocean then evaporates to the atmosphere and moves back to the land, falling as rain and snow to complete the water cycle. These waters are home to six Pacific salmon species and provide navigable waterways, power and a multitude of aquaculture and harvest opportunities. Extensive social, cultural and business networks link coastal communities and economies across the land-sea boundary, including fishing, shipping, Native American tribal activities, recreation and tourism.

The Marine Studies Initiative will weave together the natural and social sciences in an exceptional transdisciplinary education, research and outreach program to explore all facets of the marine environment and its dynamic connections to terrestrial ecosystems and the atmosphere, while positively impacting economic and social progress.



The mountains-to-ocean ecosystem of Oregon is linked to larger regional and global systems.

These systems provide:	Products that humans use from these systems include:	Examples of industries supported:
Nutrient recycling	Food	Fishing
Primary production	Water	Aquaculture
Soil formation	Lumber and other raw materials	Tourism
Carbon sequestration	Genetic resources	Agriculture
Climate regulation	Medicinal resources	Recreation
Waste decomposition and detoxification	Energy	Energy
Water and air purification		Wood products
Pest and disease control		

Why Oregon State University?

LONG RECOGNIZED FOR ITS LOCATION, leadership and nationally ranked programs, Oregon State is uniquely positioned to become a visionary, high-impact, international leader in marine studies by creating a holistic, outreach-oriented program unlike any other in the United States. The university will achieve this distinct vision by bridging key faculty resources across its 11 colleges, Graduate School and Honors College, tapping its institutes and centers throughout the state and engaging in new partnerships through a vast outreach and engagement network. This comprehensive mix of people, programs and facilities will not only connect students and faculty to communities along the Oregon coast and inland, it will also deliver unprecedented impact and opportunity nationally and internationally.

UNIVERSITY DISTINCTIONS

Oregon State University is one of only two universities in the United States to have land, sea, space and sun grant designations, which drive a collaborative and engaging approach to problem solving across a uniquely wide range of topics. Oregon State faculty are world leaders in biology, ecology, oceanography, economics, agriculture, engineering, sociology, writing and more. Since the ocean touches all of these disciplines, the state of Oregon offers an unparalleled living-learning laboratory with diverse ecosystems, including a 300-mile coastline featuring some of the world's most pristine marine waters, estuaries and rivers, mountains and inland watersheds. Oregon State researchers work around the globe, using lessons learned here and abroad to both strengthen the university and to extend its global impact.

Oregon State's main campus in Corvallis is located an hour from the Oregon coast, where the university's renowned Hatfield Marine Science Center sits on Yaquina Bay, providing unrivaled access to pristine and impacted habitats. The center brings Oregon State faculty and staff, agency scientists and managers and coastal communities together to address critical issues connected to the sea. With further reach along the coast and inland through its agricultural experiment stations, county Extension offices, research laboratories and centers and various educational and community partnerships, the university delivers its internationally prominent expertise to and works with communities throughout the state. These facilities, resources and program capacities are key foundations for building a transformative and highly experiential education, research, outreach and engagement program centered on marine studies that will have statewide, national and global impact.

COLLABORATIVE APPROACH

Collaboration is at the heart of the university's mission. Oregon State is home to leading researchers in interdisciplinary studies across coastal ecosystems. University programs foster exemplary research partnerships to address topics of societal importance, including climate change, natural hazards and resource exploration and utilization. Oregon State faculty and staff collaborate with other university researchers and work closely with state and federal agencies, nonprofits and other stakeholders to co-produce knowledge of societal relevance and benefits. Oregon State faculty and staff have been recognized for their efforts to work with industry partners in forestry, fisheries, aquaculture and a variety of other fields that benefit

from healthy, sustainably managed resources. Building on these strengths in collaboration, the Marine Studies Initiative will provide the structure and organization to further converge many different disciplines and perspectives on ocean-related societal challenges and meet the needs of future generations.

CHALLENGES BECOME OPPORTUNITIES

Through the Marine Studies Initiative's planning process, working groups identified specific challenges and ways in which they can be addressed. A key element for success is commitment by faculty, staff and leadership to finding ways to navigate these challenges. In its achievements, this initiative at Oregon State University will be a model for other large university transformations to meet 21st-century educational and research needs.

ACADEMIC SYSTEM

Oregon State shares many of the same challenges with other large universities that strive to build transdisciplinary programs and innovate undergraduate education, but Oregon State is uniquely positioned to address these challenges. Programs, governance and faculty support structures need to be developed to achieve the initiative's goals. Existing university cross-college programs provide instructive insights on how to approach such challenges. Traditional governance structures, such as promotional criteria, need to be redesigned and tailored to facilitate, support and encourage faculty to participate in the initiative's educational models, research, mentoring and engaged scholarship and outreach. Additionally, ongoing leadership training and other opportunities, such as communications training, will be essential for engaging faculty and staff and fostering professional development and collaboration.

EDUCATIONAL COURSES AND PROGRAMS

While many Oregon State University marine-themed degrees, courses and programs are well known and highly regarded within their respective fields, they do not have a collective presence at the university. Marine-related courses and degrees are offered through multiple colleges and academic units and can therefore cause confusion for incoming and matriculated students looking for opportunities to pursue marine studies. Additionally, Oregon State's marine education is heavily weighted toward natural sciences and engineering, leaving room to expand into business, liberal arts, public health and social sciences. Finally, only a limited number of marine courses, predominantly in the life sciences, are currently offered at the Hatfield Marine Science Center. The Marine Studies Initiative will expand course offerings to take full advantage of the experiential, collaborative and problem-solving learning environment of the Oregon coast. This initiative will make a significant impact by providing the necessary coordination through well-defined marine study degree options and student advising, strategically involving faculty from all university colleges and providing a state-of-the-art teaching and research space at the Hatfield Marine Science Center and in Corvallis.

BOX 4: COASTAL NODES

Establishing specific education, research and outreach hubs, or nodes, along the Oregon coast is one way to address the challenges associated with the distance between Corvallis, Newport and the rest of the coast from southernmost Curry County to Clatsop County in the north. The Marine Studies Initiative will develop partnerships with coastal community colleges to establish nodes where students, professionals and other community members can access the initiative's education, research and scholarly activities. One aim is to provide a mechanism for Oregon community college students interested in a four-year degree focusing on some aspect of marine studies to complete a degree in Oregon.

These nodes may also become knowledge distribution and exchange points, where students and stakeholders can access information about the initiative and its advances and can engage Extension agents, as well as other community members and organizations interested in specific projects. Coastal nodes are also an excellent opportunity to conduct research and enlist local assistance in collecting scientific samples throughout the length of the Oregon coast.

Why Oregon State University? (continued)

RESEARCH AND SCHOLARLY ACTIVITIES

With its expertise and facilities, Oregon State is poised to address broad issues of sustainability across social, economic and ecological boundaries from watersheds to the sea. Specific infrastructural and organizational improvements, however, are needed to facilitate this research and scholarship, including dedicated physical space, funding and faculty incentives. Researchers and students also require improved access to the sea, including ships and small boats, autonomous vehicles to expand observing capacity and dive support. Among the main attractions for researchers working at the Hatfield Marine Science Center are laboratories with ample supplies of high-quality seawater. The Marine Studies Initiative will provide these necessary infrastructural improvements for space, ocean access and seawater systems through the enhancement and expansion of the Newport campus. A Marine Studies office on Oregon State's main campus in Corvallis will provide additional space for involved faculty, staff and students and be a central point for coordinating Marine Studies Initiative activities. The initiative will host exploratory think tanks and establish Centers of Excellence, focused on cross-cutting research themes to facilitate the convergence of transdisciplinary research, education, outreach and engagement. These activities will engage a broad spectrum of disciplines well beyond the natural and social sciences to include arts and humanities, human and veterinary health, economics, business and engineering.

COASTAL FACILITIES AND NATURAL HAZARDS

Just offshore of the Oregon coast is the Cascadia Subduction Zone, threatening strong earthquakes and resulting tsunamis within the next century. Local, state and federal agencies have committed significant resources to help communities prepare and plan for these events. Oregon State faculty, students and outreach specialists are co-developing — with extensive coastal community engagement — the information and tools necessary to assess vulnerability and initiate adaptation strategies over the next several decades. The city of Newport is federally recognized as a "Tsunami Ready" community, with systems in place for better planning, education and awareness. The Hatfield Marine Science Center is located within the tsunami zone. The decision to construct new facilities in this location involves a careful development of safety plans and assessments of alternatives. Oregon State University has developed a construction plan that emphasizes the life safety of all occupants, taking into account factors such as seismic engineering for structural resilience and tsunami-response scenarios for evacuating to safe locations. The new construction will provide a centerpiece for how to build in a seismically active area and how to plan with communities to promote preparedness, rapid response and safe evacuation procedures.

LONG DISTANCES BETWEEN CAMPUSES, COASTAL NODES AND COMMUNITIES

Oregon's physical features are characterized by extensive desert basins and ranges, forested mountain slopes, fertile valleys and stream and river networks leading to productive estuaries and an open coastline. Rocky headlands, sandy beaches and major estuaries line the 300 miles of coastline. The coastal area is set off from the eastern valleys of the state by the mountains of the Coast Range. Due largely to topographical constraints and a very limited network of major roadways, a majority of coastal residents live very near the coastline or along narrow coastal river valleys. Overall, the population sizes and economies of coastal communities are smaller than many other parts of the state. Distances between the university's main campus in Corvallis, Cascades campus in Bend and Hatfield Marine Science Center in Newport create substantial challenges for students and faculty to be part of programs offered at each of these campuses. Likewise, connecting with all coastal communities is more difficult because of the distance. Partnerships with local organizations such as community colleges can help bridge these distances. Technological advances also provide the opportunity to design communications that ease these distances, via telepresence capabilities and Ecampus options. Developing and capitalizing on these technological advances are key elements of the initiative's planning, which can result in a world-class example of how a university program can engage across and serve widespread population centers.

BOX 5: OREGON STATE UNIVERSITY DISTINCTIONS

In addition to its land, sea, space and sun grant designations, Oregon State University is home to many groups with multiple distinctions that strengthen the Marine Studies Initiative.

INSTITUTES AND CENTERS

Oregon State University houses many interdisciplinary research centers and institutes involving multiple colleges and engaging internal and external partner organizations. Examples include:

- Hatfield Marine Science Center, located on a 50-acre campus in Newport, has involved six or more university colleges and six state and federal agencies since 1965.
- The Marine Mammal Institute is world renowned for research on whales and marine mammal ecology and conservation genetics.
- Oregon Sea Grant is an organization based at Oregon State University that serves the state, region and nation. It is a catalyst that promotes discovery, understanding and resilience for Oregon coastal communities and ecosystems.
- The Northwest National Marine Renewable Energy Center was founded by the U.S. Department of Energy in 2008. This collaborative partnership between Oregon State University, the University of Washington and University of Alaska Fairbanks is a global leader in marine energy research.
- The Oregon Climate Change Research Institute is a state-legislated institute that includes a network of more than 150 researchers at Oregon State University, the University of Oregon, Portland State University, Southern Oregon University and affiliated federal and state labs.
- The Cooperative Institute for Marine Resources Studies brings together university and NOAA researchers in a multidisciplinary collaborative to address the marine environment and sustainable use and management of marine resources.
- The Institute for Natural Resources was created by the Oregon legislature and brings the scientific knowledge and expertise of Oregon universities to bear on natural resource management.
- The Center for Research on Lifelong STEM Learning enhances understanding of how individuals with diverse life circumstances and identities become lifelong learners, practitioners and researchers in Science, Technology, Engineering and Mathematics (STEM).
- The Center for Genome Research and Biocomputing facilitates genome-enabled and data-driven research in the life and environmental sciences at Oregon State University and across the state. It seeks to improve health, better utilize natural and agricultural resources, understand the global environment and develop new bio-based products and energy sources.
- The Institute for Water and Watersheds is Oregon's federally designated water resources research institute.
- The John L. Fryer Salmon Disease Laboratory is a regional fish disease facility for conducting research on the health of fish and other aquatic animals.
- The Oregon Hatchery Research Center, a cooperative research program with the Oregon Department of Fish and Wildlife, provides facilities and expertise to answer scientific questions related to fish recovery and hatchery programs.
- The O.H. Hinsdale Wave Research Laboratory is a nationally recognized facility for state-of-the-art research and education in the areas of coastal hazard mitigation and resilience, marine renewable energy and nearshore processes.

A list of all university centers and institutes is available at research.oregonstate.edu/research-centers-and-institutes-osu.

Why Oregon State University? (continued)

DIVISION OF EARTH SYSTEMS SCIENCE Colleges of: Agricultural Sciences Earth, Ocean, and Atmospheric Sciences Forestry	Oregon State University is ranked ninth among 200 universities globally for agriculture and forestry in the 2015 QS World University Rankings. Oregon State University's Earth and environmental sciences programs are ranked 20th among world universities by the journal Nature. Oregon State University is ranked third in the nation by College Factual in its ranking of Best Places to Study Natural Resources and Conservation. Graduate programs in fisheries science and wildlife science were each ranked in the top 10 for faculty productivity among all land grant institutions (Copyright ©2014, Academic Analytics, LLC). Oregon State University was ranked No. 1 in the nation for conservation biology research by the leading professional journal Conservation Biology in 2007. The College of Earth, Ocean, and Atmospheric Sciences: » Is leading the design and construction of the next-generation, state-of-the-art Regional Class Research Vessels for the National Science Foundation, valued at up to $267 million. » Hosts the Pacific Northwest's Endurance Array, a key component of the $386 million Ocean Observatories Initiative, the largest-ever civilian investment in ocean infrastructure. » Maintains a vast and internationally renowned marine geology repository.
DIVISION OF BUSINESS AND ENGINEERING Colleges of: Business Engineering	The Oregon State University Advantage Accelerator connects innovators and entrepreneurs to necessary resources for success with emerging enterprises. The program includes startups focused on developing new products based on marine-related resources and new services designed for coastal communities. With a wide range of undergraduate program options, the College of Business provides an international, research-based education that prepares profession-ready graduates who will lead in an innovative economy. Business graduate studies include Master of Business Administration options, design programs and doctoral degrees in design and business, with several that provide an innovative focus for research and the Marine Studies Initiative. The College of Engineering is a partner with two national centers for coastal resilience: the Center of Excellence for Risk-Based Community Resilience Planning at Colorado State University and the Coastal Resilience Center of Excellence at the University of North Carolina. Geomatics faculty within the School of Civil and Construction Engineering have active research programs in three-dimensional laser mapping — called lidar surveys — for a range of coastal applications, including seacliff erosion studies, coastal habitat mapping, shoreline change and sea level rise analysis. Robotics faculty within the School of Mechanical, Industrial and Manufacturing Engineering are designing techniques to improve robotic sensing and manipulation in the physical world, including ocean-sensing technologies.

DIVISION OF ARTS AND SCIENCES Colleges of: Education Liberal Arts Science	Academic programs in science and math education, marine resource management and environmental sciences offer graduate study in free-choice learning. The Hatfield Marine Science Center's Visitor Center also serves as a National Science Foundation-funded social laboratory for the Free-Choice Learning Program created by Oregon Sea Grant. The School of Public Policy offers on-campus and online undergraduate majors in economics, political science and sociology, as well as public policy graduate degrees. Scholars of history, philosophy and religion lead programs in environmental humanities and the history of science, including the history of the Atlantic Ocean. Anthropologists perform cutting-edge marine mapping and seafloor disturbance modeling, as well as mapping the first humans crossing the Bering Strait. In the psychological sciences, research focuses on human attitudes toward coastal phenomena and decision methods for stakeholder decision processes. This effectively engages coastal communities and other stakeholders to resolve complex societal challenges associated with the ocean. College of Science researchers, together with colleagues from the Division of Earth Systems Science, lead the long-term ecosystem research and monitoring program Partnership for Interdisciplinary Studies of Coastal Oceans. Microbiologists in the College of Science study diseases in aquatic animals ranging from corals and sea stars to fish, examine the marine microbiome to understand nutrient cycling in oceans and investigate how changing environmental conditions affect marine food webs. With expertise in data visualization, modeling and analysis of biological and environmental "big data," faculty from the Departments of Mathematics and Statistics research complex data structures and are developing new curricula on topics including data analytics and quantitative biology.
DIVISION OF HEALTH SCIENCES Colleges of: Pharmacy Public Health and Human Sciences Veterinary Medicine	The Division of Health Sciences is bringing the concept and practices of the international One Health Initiative to marine studies. Together these colleges are providing learning, research and service that promote public, animal and environmental health in marine environments. In the College of Pharmacy, pharmaceutical researchers and medicinal chemists are exploring marine habitats in search of chemical compounds and microbes that have the potential to become tomorrow's cures and treatments. The College of Public Health and Human Sciences is helping to better understand our interactions with the marine environment through programs addressing seafood nutrition and safety, responses to coastal disasters, safety in the marine working environment and impacts of climate change on public health. College of Veterinary Medicine veterinarians, diagnosticians and researchers are working to improve the health and well-being of aquatic animals and are investigating the zoonotic diseases of the marine environment that pose a risk to public health.

Unifying Principles

A CORE SUITE OF UNIFIED PRINCIPLES is guiding the creation of the Marine Studies Initiative and will flow throughout its development and implementation.

USE A CONVERGENT FRAMEWORK TO SUPPORT TRANSDISCIPLINARY RESEARCH AND EDUCATION

The university will build an organizational framework that converges around Oregon State strengths to address local and global marine challenges (Box 6). It integrates efforts from different disciplines to create innovations that move beyond discipline-specific approaches to address a common challenge. A transdisciplinary approach brings participants together across a broad array of disciplines from the very beginning to jointly communicate, exchange ideas and work together to find solutions to problems. These connections around marine-related themes will spark creativity in the arts and humanities, disciplinary areas that are very effective in communicating the essence and importance of marine issues to a willing and curious public audience.

Convergence is a structural and conceptual approach for facilitating transdisciplinary education and research. As a current focus of the National Academies of Science, a convergent approach to problem solving cuts across disciplinary boundaries, provides fertile ground for new collaborations and enables new forms of innovation, products and solutions. Using a convergent approach to merge diverse areas of expertise and a network of partnerships, the Marine Studies Initiative will address challenging education and marine research problems, provide opportunities for new collaborations and enable new forms of creativity, innovation and products.

This transdisciplinary work will result in dynamic knowledge-to-action networks, where Oregon State faculty, staff and students, community partners, decision makers and other stakeholder groups engage in the process of linking research to decision making. These networks will develop trusted, long-term partnerships, facilitate coordination and exchange of information and deliver reciprocal benefits to all involved.

From: "Convergence: Facilitating transdisciplinary integration of life sciences, physical sciences, engineering, and beyond." National Academies Press, 2014.

CREATE DYNAMIC LEARNING COMMUNITIES AND UNIQUE EXPERIENCES THAT PREPARE STUDENTS FOR THE FUTURE

With beautiful wilderness, productive agriculture and a rich and diverse cultural history, Oregon offers unique opportunities to experience and learn. The Marine Studies Initiative will provide opportunities for students to experience the natural, economic and cultural environment of the Oregon coast. The development of a dynamic learning community is a cornerstone for students, faculty and partners to convene on ocean-related societal issues.

Marine studies education will go beyond the classroom, with the enhancement of student life and experiential educational and research opportunities. Courses in marine studies will emphasize problem solving and hands-on learning, with special opportunities for capstone course work and research experiences in Newport. Students will be guided through their studies by expert advisors and engage in educational experiences with their peers and teachers. Marine studies educational opportunities will be expanded through Oregon State University's Extension outreach and engagement programs and in partnership with the state's coastal community colleges.

These unique experiences will prepare students, professionals and lifelong learners for professional leadership and the workforce by giving them experience and training to navigate a spectrum of job possibilities. All aspects of the Marine Studies Initiative will support teaching of essential life skills such as critical thinking, problem-solving, collaboration and leadership.

RESEARCH, PRACTICE AND TEACH SUSTAINABILITY

As defined by the United Nations, sustainable development means meeting the needs of the present without compromising the ability of future generations to meet their own needs. Oregon State is a national leader, recognized by the Sierra Club, the U.S. Green Building Council, The Princeton Review, the Kaplan College Guide and the U.S. Environmental Protection Agency for its sustainability practices. The Marine Studies Initiative's research and education endeavor will house the diverse array of current and future research addressing sustainability challenges. Whether it is safe, sustainable seafood, clean water and energy or access to ocean-related recreation and cultural resources, Oregon State and this initiative are committed to defining, understanding and communicating the complex questions necessary to ensure a healthy future for Oregonians and for ocean resources. Students will also have opportunity to tap into the university's scholarly strengths in the fields of environmental philosophy and ethics, allowing them to explore different ways of thinking in relation to topics of sustainability.

PROMOTE DIVERSITY

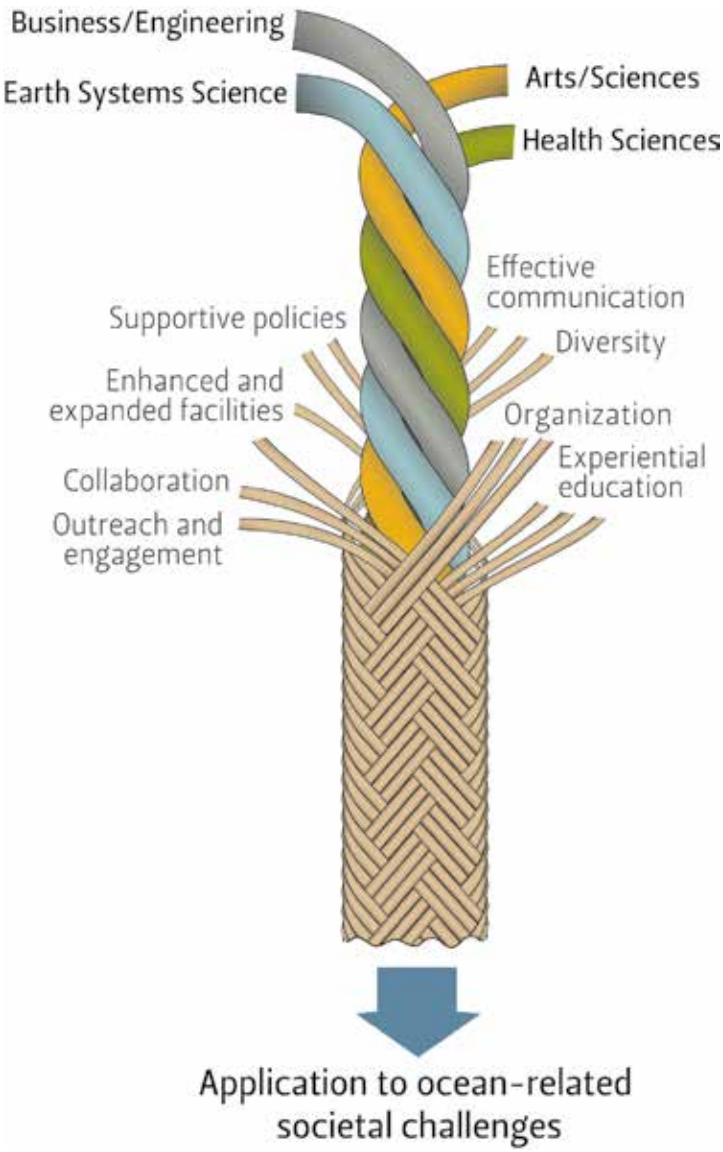
Enhancing the diversity of the Oregon State community is essential to sustaining excellence and to preparing students for a globally connected world. The Marine Studies Initiative supports the university's goals of increasing the diversity of faculty, staff and students through targeted new hires and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

ALIGN WITH OREGON STATE UNIVERSITY PRIORITIES

The Marine Studies Initiative aligns directly with Oregon State's strategic planning goals to provide a transformative educational experience, demonstrate leadership and strengthen impact and reach throughout Oregon and beyond. This initiative will help advance Oregon State's leadership in three signature areas of distinction (Box 1): advancing the science of sustainable Earth ecosystems; improving human health and wellness; and promoting economic growth and social progress.

BOX 6: CONVERGENCE

The Marine Studies Initiative will promote the integration of multiple scholarly disciplines from arts and sciences, Earth systems science, business, engineering and health sciences (blue, gray, yellow and green ropes below). A number of key programmatic features will enable this transdisciplinary program (brown smaller cords). The end result is a cohesive structure that can be used to address ocean and related societal challenges.



Goals and Strategies

TO ACHIEVE SUCCESS, the Marine Studies Initiative will undertake specific strategies to meet three major goals. This framework emphasizes transdisciplinary approaches and provides a launchpad for realizing new opportunities. A number of activities will need to take place to carry out these strategies. While the plan provides some examples, additional work is required during the implementation process to further define the necessary supporting activities.

GOAL 1

PROVIDE A TRANSFORMATIONAL EDUCATIONAL EXPERIENCE CENTERED ON MARINE STUDIES. Create a transdisciplinary environment that expands innovative marine education and training opportunities for students, professionals and lifelong learners. This includes establishing a university-wide marine studies degree program, expanding collaborations with our educational partners and engaging students in seeking globally relevant solutions.

STRATEGIES:

1.1 **BUILD COMPREHENSIVE PROGRAMS**. Design transdisciplinary educational core programs (courses, options and certificates) that foster student success and lifelong learning, engage a diverse student body, teach ethics and promote marine literacy at all levels within Oregon State University and across the state. These programs will prepare all types of students for leadership and the workforce.

1.2 **CREATE A NEW MARINE STUDIES DEGREE**. Create a transdisciplinary marine studies undergraduate major and minor that focus on the human dimensions of marine systems. These liberal arts degrees will emphasize the social, political and cultural issues of the coasts and oceans, built on a meaningful understanding of marine natural science.

1.3 **LAUNCH INNOVATIVE EDUCATIONAL EXPERIENCES**. Expand experiential learning opportunities at Oregon State's main campus in Corvallis, the Hatfield Marine Science Center and other coastal and ocean locations in collaboration with academic, government, nonprofit, Native American tribal and industry partners. Teaching and learning will focus on seeking solutions to ocean-related societal challenges.

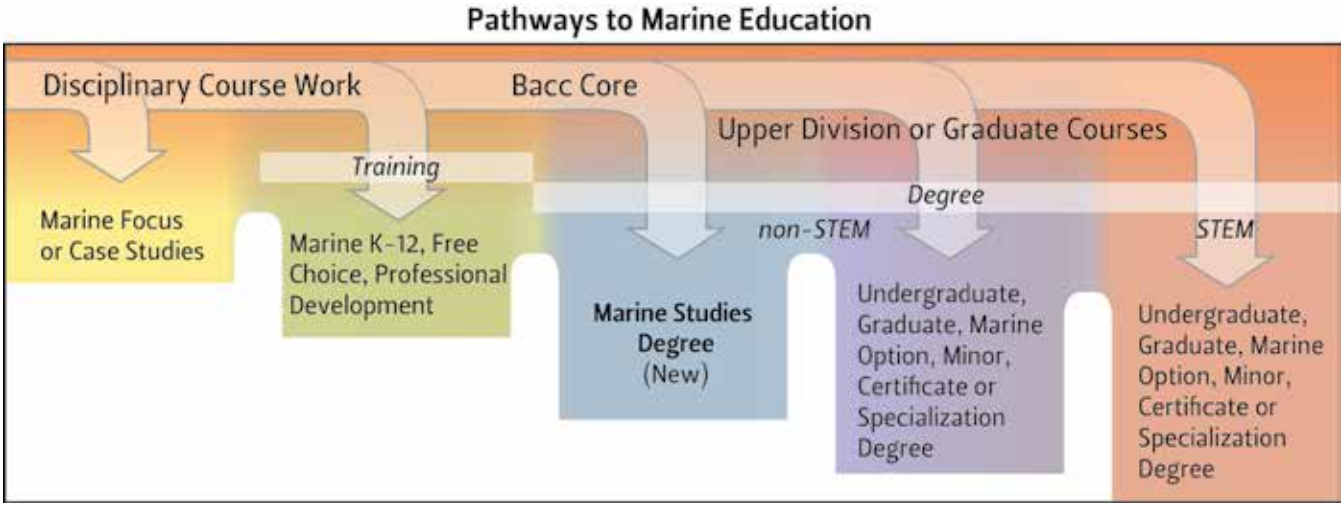
To support these strategies, the Marine Studies Initiative will:

» Establish a Marine Studies office — based in Corvallis, but with a significant presence in Newport — to effectively lead the Marine Studies Initiative and to serve as an organizational hub for the various marine degrees, courses and educational opportunities and outreach offered across the program.
» Utilizing cross-college committees, design learning experiences, course offerings and degree programs that support the Marine Studies Initiative's mission, vision and principles, including:
  ◦ Design a full-year, baccalaureate core sequence of three classes including both natural and social science aspects of the marine realm. The baccalaureate core is the university's general education program, which all students fulfill as part of their undergraduate degree. With tailored core sequence options, students build foundational skills, gain knowledge and perspectives across academic fields and develop abilities of analysis, critical thinking and problem solving.
  ◦ Develop opportunities for learning outside the classroom, including increasing experiential capstone courses, internships and others across marine-related degree programs to give students research and career experiences locally, nationally and internationally.
  ◦ Enhance existing and develop new undergraduate and graduate degree options, minors and certificates within disciplinary degree programs. These degrees and certifications will use models similar to successful existing programs.
  ◦ Design a liberal arts marine studies undergraduate major and minor that focuses on the human dimensions of marine systems.
  ◦ Engage existing faculty and hire new lecturers and advisors to support expanded teaching associated with the growth of the Marine Studies Initiative. Strategic faculty hiring priorities will be established in coordination with the research and outreach and engagement goal activities (Goals 2 and 3).

BOX 7: PATHWAYS TO MARINE EDUCATION AT OREGON STATE UNIVERSITY

The learning and teaching environment in marine studies for all Oregon State students will promote transdisciplinary collaborative learning and teaching and emphasize experiential (laboratory, field, community, agency, industry and/or issue-based engagement) and problem-solving course work.

Incoming students come from different backgrounds and have a range of interests, including students with no current interest in the ocean, graduate students intending to study very specific scientific disciplines such as oceanography and K-12 teachers seeking marine short courses. To meet the diversity of student needs, the Marine Studies Initiative will add a new undergraduate marine studies degree. It will also expand and enhance marine-related courses and degrees in all colleges, with a special focus on marine studies baccalaureate core courses, writing-intensive courses, experiential capstone courses, cross-disciplinary graduate courses and the creation of marine degree options, minors and certificates.



» Provide training to faculty on new methods to engage students through collaboration, problem solving and other creative teaching techniques.
» Develop a Marine Studies Initiative internship program. Coordinate across the university to strategically establish internships, which will be part of the suite of experiential learning opportunities. Coordination will include fundraising through both public and private sources, seeking partnerships with different public, nonprofit and private entities and establishing a centralized internship office within the Marine Studies office to administer internships and inform students of these opportunities.
» Increase international opportunities for students engaged in marine studies programs, which will promote diversity and a globally focused teaching and learning environment.
» Foster K-12, community college, professional and noncredit education partnerships that promote pathways to marine educational programs at Oregon State University, along with continuing education opportunities for coastal communities. Partnerships are a critical component of this objective and discussed more throughout in outreach and engagement goal activities (Goal 3).
» Develop and implement educational partnerships with other four-year academic institutions to provide opportunities for teaching and learning exchange.

GOAL 2

ADVANCE LEADERSHIP IN TRANSDISCIPLINARY MARINE RESEARCH AND SCHOLARSHIP. 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. From integrated marine systems science to studying society's reliance on the sea to global change and coastal community resilience, this research will advance the collective ability to accurately predict the outcomes of human actions and model the future trajectories of the world's complex ecosystems.

STRATEGIES:

2.1 **ADVANCE SCHOLARLY LEADERSHIP**. Elevate existing marine programs to internationally recognized excellence through strategic faculty hiring and increased programmatic support.

2.2 **CREATE A FRAMEWORK FOR TRANSDISCIPLINARY RESEARCH**. Develop and implement effective organizational and governance structures at Oregon State to achieve transdisciplinary collaboration that spurs innovations from basic scientific and scholarly discoveries to their practical applications.

2.3. **ENHANCE AND EXPAND BUILT AND VIRTUAL FACILITIES**. Provide environments that encourage creative collaborations that leverage the university's strengths and have meaningful impacts. This includes enhancing existing facilities and building new infrastructure. Beyond promoting collaborative scholarly accomplishments, these facilities will also support teaching, learning, outreach and engagement goals.

To support these research strategies, the Marine Studies Initiative will:

» Establish strategic faculty hiring priorities that will enable the initiative to advance its transdisciplinary research goal and support educational programs, outreach and engagement. Hiring priorities will be set by Marine Studies Initiative and Oregon State University leadership, in close consultation with university colleges.
» Foster transdisciplinary exchange through activities such as regular forums and seminar series focused on specific research and scholarly topics, student opportunities, leadership, communications training and others.
» Establish guiding criteria for selecting and establishing think tank projects and Centers of Excellence (below).
» Launch exploratory think tank projects that seek to address challenges facing society related to sustaining healthy marine and coastal environments and communities. These exploratory projects will be focused on specific questions and aimed to deliver products such as major publications, demonstration projects, symposia and scopes for future Centers of Excellence.
» Expand resources and structure for Centers of Excellence that focus multiple academic, state and federal agency, private sector and community partners on specific Marine Studies Initiative topics to provide research, scholarship, leadership, best practices and training (Box 8).
» Train the next generation of researchers and scholars by involving graduate students and postdoctoral researchers in marine studies research, think tanks and Centers of Excellence.
» Increase human dimensions research by involving social scientists and liberal arts scholars in Centers of Excellence and exploratory projects that examine human systems and how social science can aid in natural resource management and explore the cultural and philosophical dimensions of ocean and related societal challenges.
» Embrace data-to-discovery by promoting advanced mathematical, statistical and computational methods to discover, analyze, simulate and predict the structures and processes of marine and human systems.
» Identify and build infrastructure to support the research. This includes enhanced and expanded facilities in Corvallis and Newport, vessels and seawater systems for improved access to the sea and information technology for effective conferencing.

GOAL 3

INCREASE SOCIETAL IMPACT FROM MARINE STUDIES IN OREGON AND BEYOND. 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.

STRATEGIES:

3.1 **DESIGN AND SUSTAIN PARTNERSHIPS**. Develop and implement a road map for initiating and expanding partnerships with government agencies, nonprofits, Native American tribes, universities, community colleges, businesses and communities to advance the transdisciplinary teaching, learning and research missions of the Marine Studies Initiative.

3.2 **INCREASE ACCESS TO EDUCATION**. Expand Oregon State's education mission to better reach Oregon citizens from coastal and rural areas by building access to and relevancy of educational programs.

3.3 **ENGAGE, COMMUNICATE AND BE RESPONSIVE**. Expand on Oregon State's outreach and engagement strengths, such as community-based Extension agents, to connect the Marine Studies Initiative with stakeholders and ensure the program is responsive and informative to needs and interests across the state, nationally and internationally.

To support these strategies, the Marine Studies Initiative will:

» Work with Oregon State University colleges and centers with outreach and engagement expertise to identify, prioritize, plan, establish and maintain partnerships, including topics, purposes, personnel and mechanisms needed.
» Establish metrics and perform assessments of progress in creating and maintaining partnerships.
» Engage partners to create a set of coastal nodes up and down the Oregon coast. This will start with Oregon's four coastal community colleges — from north to south, Clatsop Community College, Tillamook Bay Community College, Oregon Coast Community College and Southwest Oregon Community College — but will be open to other interested education, nonprofit and industry entities.
» Identify and launch other mechanisms to enable the Marine Studies Initiative to have a community-based presence on the coast. Possibilities include K-12 educational efforts, public forums and business collaboratives to support the needs of new and existing local businesses.
» Advance national and international partnerships that promote knowledge sharing and expose students and faculty to national and global efforts through mechanisms such as student and faculty exchange programs and internships.
» Involve relevant stakeholders, including Oregon's other institutions of higher learning, public agencies, nonprofits and business partners, in exploratory think tank projects and Centers of Excellence.

BOX 8: THE CENTER OF EXCELLENCE APPROACH

Centers will focus on transdisciplinary themes to facilitate research, education, outreach and engagement. These activities will engage a broad spectrum of disciplines well beyond the natural and social sciences to include arts and humanities, human and veterinary health, economics, business and engineering. These centers will also provide a training ground for undergraduate and graduate students and postdoctoral scholars. A clear set of criteria will be designed to guide the selection and establishment of Centers of Excellence.

A number of possible centers have been identified by Marine Studies Initiative working groups on topics such as:

» Food from the Sea
» Marine Genomics
» Marine Bio-Imaging and Underwater Vehicles
» Coastal Resilience
» Renewable Energy from the Sea
» Oregon Ocean Acidification and Hypoxia
» Marine Conservation Science and Policy
» Ocean Law

EXAMPLE: "FOOD FROM THE SEA," IN LIGHT OF CLIMATE CHANGE AND OCEAN ACIDIFICATION

THE CHALLENGE

There are increasing demands for healthy seafood that is harvested from sustainable fisheries and delivered with high value to the world's markets. How can Oregon State build on its collaborative partnerships to develop innovative approaches that enable the fishing industry and managers to meet these needs while sustaining wild fisheries and estuarine, coastal and ocean ecosystems?

THE MARINE STUDIES INITIATIVE RESPONSE — A CENTER OF EXCELLENCE

» Build a program in phases, starting with scoping mechanisms that bring in outside expertise to introduce new ideas and broaden perspectives.
» Set clear goals for the center and strategically hire faculty and staff.
» Create and sustain a transdisciplinary educational and research program that supports integrated and technologically sophisticated ecosystem and food system approaches in fisheries and aquaculture.
» Build on Oregon State's established programs, including the Coastal Oregon Marine Experiment Station, the Seafood Research and Education Center in Astoria, multiple college marine ecosystem programs and Oregon Sea Grant Extension.
» Involve experts from policy, law, business, marketing, technology, economics, ecology, conservation, public health, education and social science.
» Provide students with transdisciplinary training, internships and course work focused on problem solving to prepare them for leadership in a range of professions.
» Further develop partnerships with fishing, aquaculture and other seafood industries, Native American tribes, state and federal management agencies, community colleges, other scientific institutions and international organizations.

THE IMPACT

With Oregon State's leadership and globally recognized research and education in seafood systems, the Marine Studies Initiative's innovations will be shared with the fishing industry and local communities to positively impact local economies and personal prosperity. Students will gain comprehensive and practical knowledge that supports workforce needs as well as professional training.

The Way Forward

THE MARINE STUDIES INITIATIVE WILL TAKE A UNIQUE APPROACH to discovering solutions to ocean-related societal challenges, while creating exceptional learning opportunities for students. By engaging so many disciplines, this initiative will increase understanding of ocean systems and develop new methods to increase ecosystem and societal resilience in the face of a changing climate.

Over the next 10 years, this initiative will build on the groundwork completed by working groups in 2014 and 2015. This strategic plan provides a series of goals, strategies and overarching supporting activities that reflect and integrate the scoping to date. Implementation planning will detail specifics of how the initiative will work toward and ultimately realize its goals. This plan will guide the implementation, and the working group reports will provide background and ideas for developing the specific programmatic components.

TIMELINE

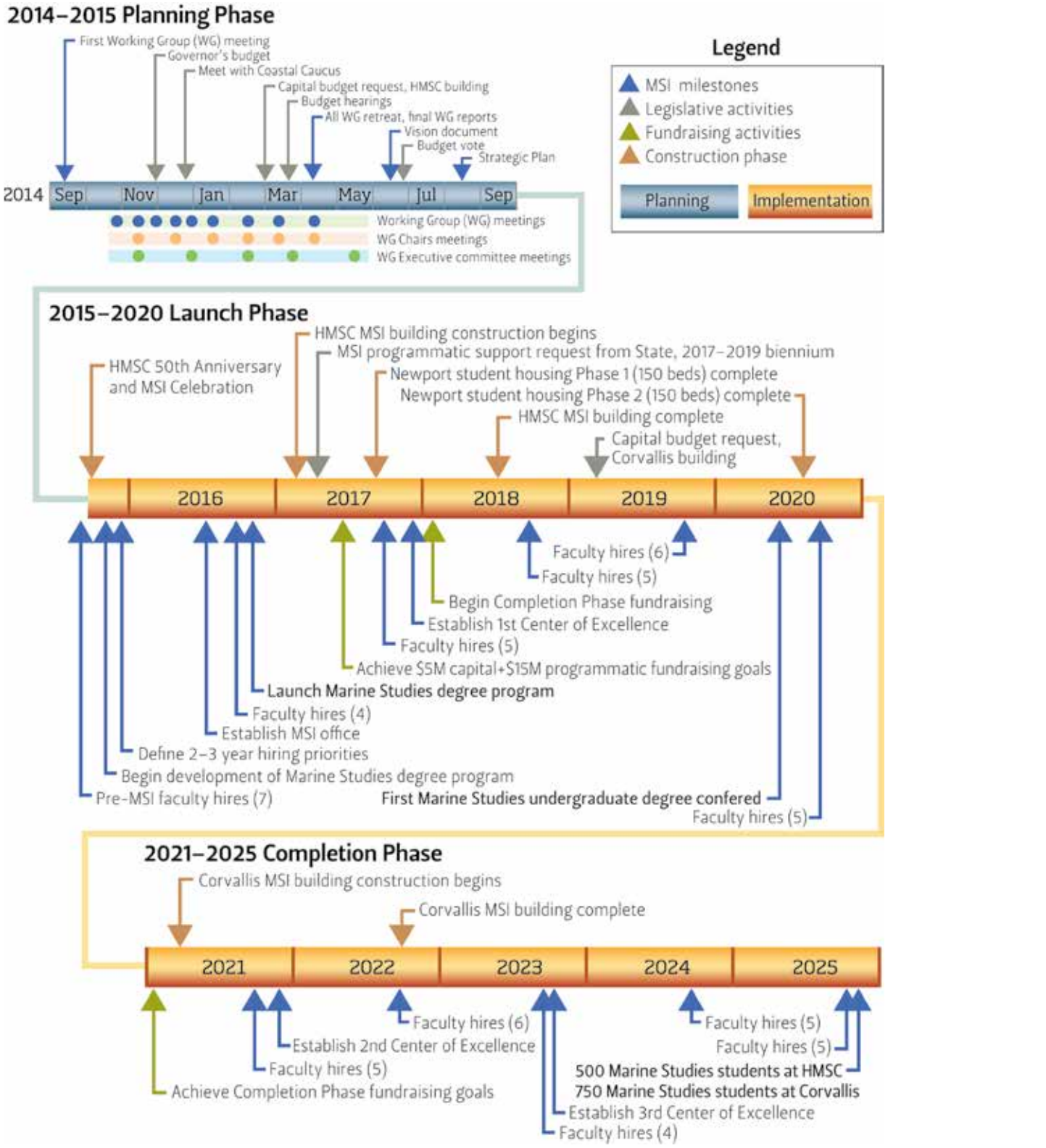
To achieve the 10-year vision, the Marine Studies Initiative will build the program in three phases:

1. The initiative began with an intensive planning phase from 2014 to 2015 involving more than 125 Oregon State faculty, staff, students and partners across Oregon. Between 2014 and 2015, extensive planning and fundraising was conducted for a Marine Studies building in Newport and programmatic support. This planning culminated with the delivery of this Strategic Plan in summer 2015.

2. The launch phase from fall 2015 through 2020 includes the development and finalization of an implementation plan, determining sources for additional fundraising, development and launch of the marine studies undergraduate degree and additional curriculum, establishing the Marine Studies office, constructing research facilities and programs, hiring faculty to support Corvallis and Newport course development and research needs and establishing partnerships. Intensive planning for the Marine Studies building and associated infrastructure at the Hatfield Marine Science Center will occur from 2015 to 2016, with groundbreaking tentatively set for 2017 and completion of the building in spring 2018.

3. The completion phase from 2021 to 2025 will establish a stable and comprehensive program that meets the goals outlined in this plan and can look forward to continued success in future years. During this phase, final faculty hires will be made, a new Marine Studies Initiative building in Corvallis that can accommodate the expected growth will be planned and launched, and new Centers of Excellence will be established. By the end of this phase, approximately 500 students will be in-residence at the Hatfield Marine Science Center over the course of an academic year, and an additional 750 new students will be in Corvallis, representing overall growth of 1,250 students across the university.

BOX 9: TIMELINE



MAJOR MILESTONES IN THE MARINE STUDIES INITIATIVE TIMELINE (BOX 9)

DEVELOP CURRICULUM AND ESTABLISH A MARINE STUDIES OFFICE. The Marine Studies undergraduate degree at Oregon State University will be launched in fall 2016 with an inaugural cohort of students taking advantage of new and enhanced courses and degree options. Leading up to this launch and as part of the implementation, the Marine Studies Initiative faculty and staff will develop the necessary academic structures — such as courses and degree options — and communicate these to current and prospective students. A Marine Studies office will be established in time to recruit and advise students for fall 2016.

CONSTRUCT WORLD-CLASS FACILITIES. New infrastructure at Oregon State's Hatfield Marine Science Center and Corvallis campus will inspire collaborative teaching, learning and research. These facilities will utilize the local environment for learning and research, provide the necessary space and resources and reflect Oregon State's sustainability goals. Construction of the Marine Studies Initiative building in Newport will begin in 2017 and be ready for incoming students, faculty and staff in 2018. Facility improvements will also include communication structures necessary for student and faculty engagement, including upgrading information technology for seamless streaming of courses and conferencing. With identified funding, groundbreaking for a new building that can accommodate and support the expected education, research and outreach growth in Corvallis will occur in 2021, with building completion planned for fall 2022. This new facility in Corvallis will be the permanent location for the Marine Studies office and provide faculty, staff, students and partners with space for classes, meetings, research and other scholarly pursuits.

ESTABLISH EFFECTIVE GOVERNANCE, ORGANIZATIONAL AND SUPPORT STRUCTURES. Governance structures will support faculty and university units who participate in the Marine Studies Initiative's educational models, transdisciplinary research and mentoring, engaged scholarship and coastal outreach and engagement. Some traditional aspects of university governance, such as promotion criteria, will be rethought and tailored for the purposes of this initiative. Inter-college agreements will support joint faculty appointments and course offerings to ensure transparency, accountability and common understanding of the unique nature of this program. Likewise, faculty position descriptions will acknowledge the unique nature of these transdisciplinary faculty appointments and the expectations for accomplishment. Ongoing leadership training and other opportunities — such as communications training — will be essential for engaging faculty and staff and fostering professional development and collaboration.

ORGANIZE AND EXPAND PERSONNEL. The Marine Studies Initiative implementation plan, to be produced in 2015, will lay out an organizational structure that can effectively support the initiative's unique programs and engage faculty through participation of current, affiliated faculty and new hires. Faculty hiring priorities will be linked to teaching, research and scholarly priorities as determined through the curriculum and Centers for Excellence development processes. The addition of faculty and staff is a critical component of each goal. As the program launches, there will be faculty hiring at both the Hatfield Marine Science Center in Newport and in Corvallis. Prior to the establishment of targeted hires during the launch phase, seven marine-related faculty have been hired: four from the university Provost's Hiring Initiative and three with individual college support. The Marine Studies Initiative timeline sets forth the additional needed faculty hiring in both Newport and Corvallis to support the anticipated marine studies program student numbers. It is anticipated that 50 new faculty will be hired during the next 10 years (2016 to 2025), split approximately evenly between Newport and Corvallis. These new hires will come from endowed professorships (and Provost match) and university-created new positions. Also essential to the organizational structure are administrative and student advisor hires to support the education, research and outreach missions.

ESTABLISH CENTERS OF EXCELLENCE. Centers of Excellence will provide critical leadership, research and training activities for specific focal areas using best practices and resources for sustained transdisciplinary pursuits. Along with new curriculum, buildings and faculty hires, plans will start immediately for establishing the first Marine Studies Center of Excellence with a goal to open the center in fall 2017. The Marine Studies Initiative and Oregon State University leadership, in consultation with faculty, staff and students, will determine the focus for this first center. A second Center of Excellence will be planned and established no later than fall 2021. A variety of potential Centers of Excellence are generating considerable interest within the university and beyond (Box 8). Therefore, strong potential exists for a third Center of Excellence to be established during the first 10 years of the Marine Studies Initiative.

COMMUNICATE PROGRAM VALUE. Throughout all phases of the Marine Studies Initiative, marketing and outreach will strategically convey the program's value and successes to prospective and established students, faculty, public and private sectors and other stakeholders. We will work closely with Oregon State communication experts to develop strategies and products to convey the value of the initiative.

ACHIEVE FISCAL SUCCESS. We will continue to develop and implement funding strategies that provide a sustained, solid fiscal foundation through a mixture of resources including tuition, state and federal funds, private sector and philanthropic sources. Frequent evaluations will ensure progress toward fundraising goals and inform future plans. Planning will include continued efforts to increase the resources necessary to fund graduate and undergraduate students through fellowships and program enhancements, faculty endowments, research funding and state-of-the-art facilities.

Between 2014 and 2015, there has been extensive fundraising for both a Marine Studies building in Newport and for Marine Studies Initiative programmatic support. This initial fundraising effort is planned for completion by June 2017. After finishing the Marine Studies building in Newport and launching the Marine Studies undergraduate program, preparations will begin in early 2018 for the completion phase, which is planned to start in 2021. Completion phase fundraising, which includes securing funds for a new building that can accommodate the Marine Studies Initiative on the Corvallis campus, will conclude in late 2020 or early 2021.

DEVELOP CLEAR AND MEASURABLE METRICS FOR PROGRAM EFFECTIVENESS. Metrics will be developed early in the Implementation Phase to help us assess the program's progress. Possible assessment mechanisms may include:

- Surveys of Oregon State faculty, staff, collaborators and representatives from external partner organizations.
- Metrics of program growth in terms of number of students, courses taught, faculty engaged and degrees conveyed.
- Agreements with community colleges to increase accessibility by a wide range of Oregon students and lifelong learners through mechanisms such as dual enrollment, degree articulation and Open Campus courses.
- Working with other universities to create opportunities that foster intellectual exchange and shared learning, such as joint graduate courses, expanded undergraduate opportunities, visiting scholar programs and joint institutes.
- Internships and apprenticeships within Centers of Excellence and partner organizations to enhance experiential learning and foster knowledge-to-action networks.
- Partnering with the private sector and state and federal agencies to design marine-related capstone projects, incubator projects and collaboration with the Oregon State University Advantage Accelerator to foster exchanges of technology to the private sector.

RESOURCES REQUIRED

A variety of efforts and resources will be required to accomplish the full potential of the Marine Studies Initiative. Importantly, the Marine Studies Initiative will have strong leadership that reaches across colleges, departments and disciplines and that reports directly to the provost and vice president for research. This leadership will be supported in their work by participation of faculty and staff, university colleges, the Graduate School, the provost and vice president for research in the development of faculty hiring priorities, new course models, inter-college agreements, Centers of Excellence and other mechanisms necessary to achieve transdisciplinary education, teaching and research.

The Marine Studies Initiative's target student number by 2025 requires a 10-year sustained faculty hiring effort to support the new and expanded degree options, professional training, certificates and courses that will attract new students to this program (Box 9). Likewise and as previously discussed, expanded facilities are critical to the program and should include new buildings

at the Hatfield Marine Science Center in Newport and on Oregon State University's Corvallis campus, as well as upgrades of existing facilities. Investments in information technology will be required to effectively connect the initiative across Oregon State campuses in Corvallis, Newport and Bend, the coast and the rest of Oregon, especially for the ability to deliver classes seamlessly at different geographic locations. It will take a mixture of private and state funding to pay for construction of these buildings and other related infrastructure.

Programmatic support is needed to accomplish the planned research, innovative classes and degrees, options and certificates and transformational learning experiences. A primary source for this support will be tuition associated with student population growth driven by the Marine Studies Initiative. Budget models for 2016 to 2025, developed by the university's Office of Budget and Fiscal Planning, show that non-tuition funding for the program will be critical in the initial launch phase and part of the completion phase until student numbers are high enough to support the projected core program expenses. However, other sources beyond tuition will be required to make the transformational strides that are needed possible. These other sources will include philanthropic, corporate and public funds. To this latter end, Oregon State University anticipates making a request to the Oregon State Legislature for recurring programmatic support for the Marine Studies Initiative, starting with the Fiscal Year 2017 to 2019 biennium.

Ultimately, the Marine Studies Initiative will be a cornerstone of Oregon State University's teaching, research and outreach mission. The rewards for any investments made in the development and establishment of the program will be compounded through the years as Marine Studies Initiative graduates carry their knowledge and skills into the workforce, as research and scholarship is applied to societal issues and as local, state, national and international stakeholders converge on the university for partnerships. The initiative's leadership will work closely with the Oregon State University Foundation and the university's Research Office and Office of the Provost and Executive Vice President to develop a secure financial footing and ensure sufficient support to reach the program's vision.

Summary

THE MARINE STUDIES INITIATIVE IS POISED TO MAKE PROFOUND IMPACTS at local, regional, national and international scales. This program will increase understanding of coastal and ocean systems throughout Oregon, nationally and globally. This initiative will also promote sustainability on key issues including food security and safety, renewable energy production, natural resources management and natural hazards, all in the face of a changing climate. By leveraging Oregon State University's existing strengths and distinctions and creating new ones, the Marine Studies Initiative will harness the collective expertise of faculty and staff to advance transdisciplinary practices and innovations that promote positive change for the university and the community it serves.

Oregon State faculty, staff and partners look forward to fulfilling the program's mission to create a healthy future through transdisciplinary research and teaching that emphasizes collaboration, experiential learning and problem solving. In this way, the Marine Studies Initiative will reach its vision of being recognized as a global leader in 21st-century transdisciplinary education and research and lead the development of inclusive strategies for successful stewardship of the ocean and planet for today and the future.

Contributors

This document is the result of work by more than 125 Oregon State University faculty, staff, students and partners across Oregon. The Marine Studies Initiative scoping process began in October 2014 with the establishment of an executive committee that provided a venue for Oregon State leaders across all units to communicate. This committee established working groups to address specific programmatic areas, listed below. These groups worked intensively to review challenges and opportunities, consult with external advisors from other institutions and make recommendations for the Marine Studies Initiative. Financial support to develop and write this strategic plan was provided by: Office of the Provost and Executive Vice President (Sabah Randhawa, Provost) and the Research Office (Ron Adams, Interim Vice President for Research, and Richard Spinrad, former Vice President for Research).

COLLEGES INVOLVED IN WORKING GROUPS

Agricultural Sciences (CAS)
Business (COB)
Earth, Ocean, and Atmospheric Sciences (CEOAS)
Education (COEd)
Engineering (COE)
Forestry (COF)
Graduate School (GS)
Liberal Arts (CLA)
Pharmacy (COPh)
Public Health and Human Sciences (PHHS)
Science (COS)
University Honors College (HC)
Veterinary Medicine (CVM)

OTHER OREGON STATE UNIVERSITY CENTERS, INSTITUTES AND OFFICES INVOLVED

Agricultural Sciences and Marine Sciences Business Center (AMBC)
Capital Planning and Development (CPD)
Center for Genome Research and Biocomputing (CGRB)
Center for Research on Lifelong STEM Learning
Center for Teaching and Learning
Coastal Oregon Marine Experiment Station (COMES)
Cooperative Institute for Marine Resources Studies (CIMRS)
Division of Finance and Administration
Division of University Outreach and Engagement
Forestry, Oceanic and Atmospheric Business Center (FOBC)
Government Relations Office
Hatfield Marine Science Center (HMSC)
Information Services (IS)
Institute for Natural Resources (INR)
Marine Mammal Institute (MMI)
Marine Resource Management Program (MRM)
National Earthquake Hazards Reduction Program (NEHRP)
News and Research Communications
Northwest National Marine Renewable Energy Center (NNMREC)
Ocean Observatories Initiative (OOI)
Office of Admissions
Office of Budget and Fiscal Planning
Office of the Dean of Student Life
Office of the Provost and Executive Vice President
Open Campus Initiative
Oregon State University Foundation (OSUF)
Oregon Sea Grant (OSG)
Outreach and Media Services
Research Office
Seafood Research and Education Center
University Housing and Dining Services (UHDS)
University Relations and Marketing (URM)
University Outreach and Engagement

EXTERNAL PARTNERS WITH WORKING GROUP MEMBERSHIP

Clatsop Community College (Clatsop CC)
Oregon Coast Community College (OCCC)
Portland State University (PSU)
University of Oregon (UO)
Watershed Management Council/Coos Watershed District
Note: Many other organizations were consulted during the working group processes. A full list is available at leadership.oregonstate.edu/marine-studies-initiative/reports-documents.

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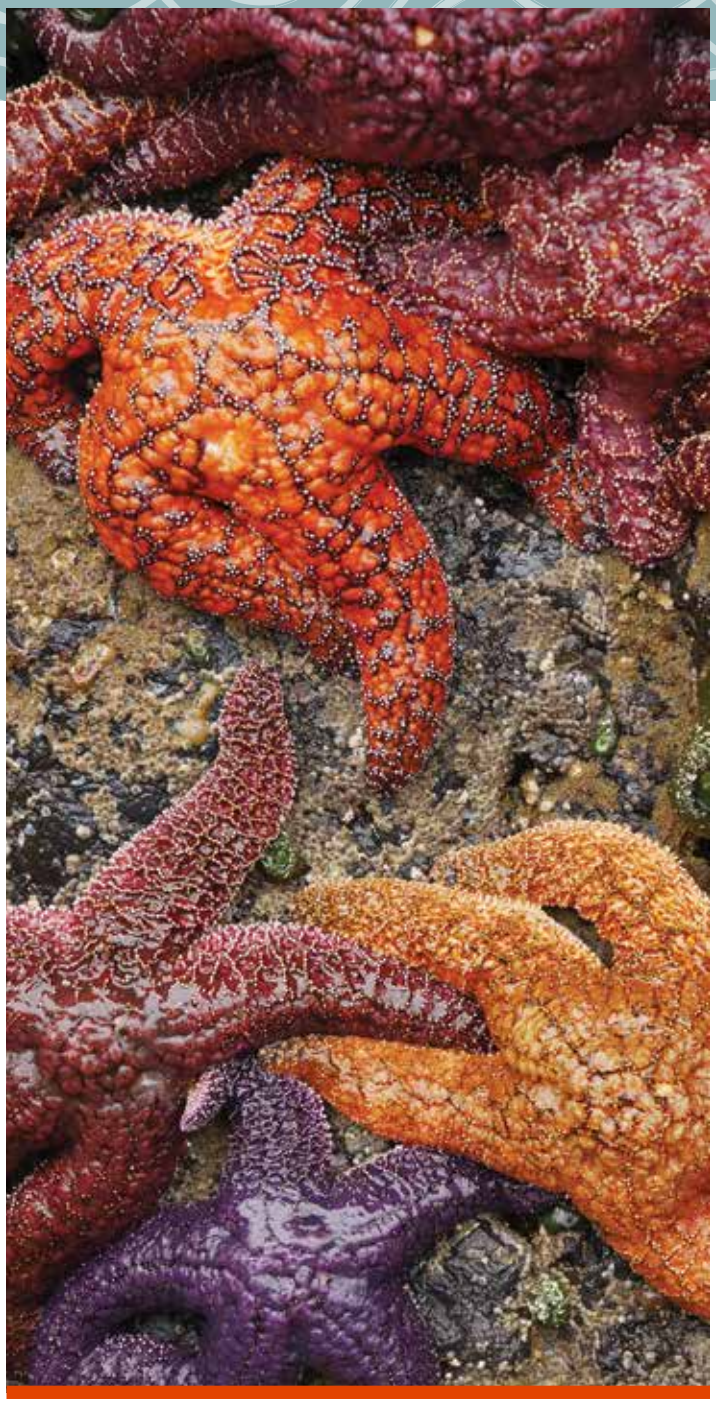

Companion documents available at **marinestudies.oregonstate.edu**

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