Oregon Coast Regional

Science, Technology, Engineering, and Mathematics (STEM)

Revised Hub Partnership Plan

Updated October 6, 2015

Executive Summary

About the Oregon Coast Regional STEM Hub

The Oregon Coast Regional Science, Technology, Engineering, and Mathematics (STEM) Hub has grown from a grassroots partnership that began with Lincoln County School District, expanded to include Tillamook School District, and now seeks to advance the STEM skills of all Oregon Coast students by utilizing local resources and issues as a means to engage students and contextualize learning.

This partnership is a collaborative of over 40 partners including Oregon Coast school districts, four community colleges, three universities, numerous state and federal agencies, and multiple business partners who share a common vision of providing world-class STEM learning opportunities for teachers and students in rural communities along the Oregon Coast. See Appendix 1 for a list of core partners.

The partners have agreed that they will not form a formal legal entity, but will utilize existing partners to advance the STEM Hub's work. The Lincoln County School District is the fiscal agent and the Hub is physically located at Oregon State University's Hatfield Marine Science Center in Newport, Oregon. Multiple and varying partners will act as leads for the proposed subcommittees and for the purpose of running specific programs and activities based on grant sources, relationships, and expertise.

About this Document

This Partnership Plan focuses on utilizing existing resources and research on best practices in order to transform STEM education for students and youth along the entire Oregon Coast. It builds on collective impact partnerships, coordinating cross-sector resources and programs to actively engage coastal communities in improving STEM teaching and learning for all students, at all levels in the K-14 continuum.

The Oregon Coast Regional STEM Hub collaboration outlined in this Partnership Plan has been conceived as a regional initiative involving local school districts, higher education, business/industry, and a diverse set of community partners. The planned geographic scope for the Hub's work is in coastal school districts and communities from Astoria south to Brookings, Oregon.

All of the Oregon Coast Regional STEM Hub's work will focus on supporting Oregon's Framework for College and Career Readiness and Oregon Department of Education's STEM Initiative, which defines STEM Education as "An approach to teaching and lifelong learning that emphasizes ***the natural interconnectedness*** of the four separate STEM disciplines. The connections are made explicit through collaboration between educators resulting in real and appropriate context built into instruction, curriculum, and assessment. The common element

of problem solving is emphasized across all STEM disciplines allowing students to discover, explore and apply critical thinking skills as they learn."

Below is a chart showing the current state of STEM education in most classrooms as well as the end goal of transformed STEM teaching. By providing adequate training and support to Oregon Coast teachers, the STEM Hub seeks to increase educator effectiveness, student engagement and proficiency.

	FROM	TO
1	Traditional lecture and limited labs in classrooms – Teacher Directed	Contextualized, project-based learning the norm; application of concepts/knowledge enabled through teachers coaching students as they learn- Student Centered
2	Low enrollment in STEM courses or lack of STEM courses and/or content especially at lower grade levels	Abundant STEM content/courses including increased exposure to STEM careers. Contextualized learning programs developed and delivered throughout K-14 learning continuum
3	Teachers have difficulty implementing STEM due to limited knowledge of STEM content and careers, feelings of being overwhelmed and isolated, limited or no technology in the classroom	Engaged and excited teachers who understand basic STEM concepts and what scientists and engineers do, are supported with effective STEM Professional Development (PD) and resources, including mentors and industry partners in and outside the classroom, and have access to adequate technology
4	STEM subjects, when taught, are treated separately in classrooms.	STEM subjects are seamlessly integrated so that students understand interrelatedness and use core principles

In addition, the Hub will focus on equity and inclusion in STEM, with the intent of reaching under-represented populations in our region; specifically, economically disadvantaged, Hispanic/Latinos, Native Americans, and female students. The Oregon Coast Regional STEM Hub will align work, as appropriate, with Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS).

Career Readiness and STEM Education in Oregon

The Oregon Education Investment Board (OEIB) was created in 2011 to set policy and distribute funding for public education in Oregon. The OEIB, chaired by the governor, is charged with overseeing efforts to create a seamless, unified system for investing in and delivering public education throughout the state. One identified goal is to ensure that by the year 2025:

- 40 percent of adult Oregonians have earned a bachelor's degree or higher;

- 40 percent of adult Oregonians have earned an associate degree or postsecondary credential as their highest level of education attainment; and
- 20 percent of all adult Oregonians have earned at least a high school diploma, an extended or modified high school diploma, or the equivalent of a high school diploma as their highest level of educational attainment.

One strategy for meeting this goal is to strengthen and expand Oregon's emphasis on STEM. A critical component of this STEM Initiative is strong collaboration and shared vision among P-20 education providers, STEM-related business and industry, student-focused nonprofits, government, informal education providers, parents and students. In 2013, the Oregon Legislature passed House Bill 3232, providing additional funding for STEM programs and activities, to foster 21st century career skills and expand access for student populations that have historically been underserved and underrepresented. This Legislation also included initial funding for six regional STEM Hubs across the state, including the Oregon Coast Regional STEM Hub. These regional STEM Hubs are intended to help partners connect and leverage resources to support STEM education in their regions, as well as create a statewide network of STEM Hubs to share expertise, disseminate best practices, and move STEM education forward on a statewide level.

Mission Statement

The Oregon Coast STEM Hub engages learners with STEM by leveraging local and regional resources and collaborating with diverse partners.

Vision Statement

Fostering a culture of STEM innovation by engaging people of all ages to create a vibrant and prosperous region.

Goals

The Oregon Coast Regional STEM Hub will help establish a coherent, rigorous, and equitable system of STEM education for all students and youth along the Oregon Coast. In addition, the Hub will help excite youth and parents about STEM education and STEM-related careers; link educators, parents and students to STEM-related educational opportunities; support the sharing of lessons learned and best practices among both formal and informal educators; and

identify and create opportunities for industry and community partners to engage with teachers and students. The long-term goals of the STEM Hub are that:

- Students have the knowledge, skills, experience, and motivation needed to enter post-secondary education and high paying, in-demand careers in STEM-related fields.
- Oregon businesses and industries have access to an Oregon-educated STEM talent pool that is highly skilled and globally competitive.
- Oregon Coast schools and teachers have the tools and support needed to deliver world-class STEM instruction.
- Coastal Oregonians have the scientific literacy and technological knowledge needed to make informed decisions in their personal lives and as citizens to address increasingly complex and interconnected local, regional, and global issues.

Expected measurable outcomes include:

1. Increase STEM interest, participation, retention, and achievement for all K-14 coastal students including those from typically under-represented populations in STEM fields (ethnic minorities, females, English Language Learners, and economically disadvantaged)
2. Improve students' 21st Century skills with a focus on critical thinking, communication and collaboration
3. Increase teachers' ability to deliver integrated STEM instruction and student experiences that incorporate Inquiry, Project/Problem, and Field-Based Learning
4. Increased graduation rates and college readiness of Oregon Coast students.

Asset Map and Analysis

This Partnership Plan is based on data collected through a community engagement process that collected input from more than 120 representatives from various stakeholder groups. These representatives participated in one of four day-long public meetings along the Oregon Coast. Meetings were held on the following dates and locations:

- Newport: April 17, at Oregon Coast Community College
- Astoria: May 1 at Clatsop Community College
- Tillamook: May 7 at Tillamook Bay Community College
- Coos Bay: May 15 at Southwestern Oregon Community College

An outside facilitator was contracted to engage participants in identifying coastal community assets that currently exist in support of STEM education. Over 500 existing programs and resources along the Oregon Coast were identified through this community engagement process, involving formal and informal educators, administrators, and students, as well as

representatives from business/industry, government, and non-profit organizations. The common take-away by participants at each of the community meetings was that coastal communities are rich in STEM resources, many of which are not commonly known and/or are underutilized.

Geographically dispersed and covering 363 miles of coastline, the Oregon Coast region is an area rich in natural resources from marine resources to coastal forests and wetlands. Unsurprisingly, an emerging theme from meeting participants along the coast was that assets currently supporting STEM education largely focus on marine and aquatic sciences content due to the proximity of local communities to the ocean; significant university, state, and federal ocean science research efforts; and the presence of numerous informal, aquatic science education organizations. A host of government and non-profit groups' environmental education programs combined with significant external funding has supported network building and STEM programming to date. Emerging STEM career opportunities in ocean observing, resource management, climate change, and marine technology poise us to develop our STEM Hub as a Collective Impact Partnership that will help prepare students for STEM majors and STEM careers.

Natural Resource Areas

The Oregon Coast provides numerous opportunities for students to engage with abundant natural resources from tidepools, to wetlands, to coastal forests. Easily accessible public sites exist along the entire coast, run by city, state and federal entities. Many of these sites provide guided field experiences with informal educators, curriculum and equipment that teachers can check out to utilize with their students. Examples include Haystack Rock Awareness Program run by the City of Cannon Beach, Yaquina Head Outstanding Natural Area in Newport run by the Bureau of Land Management, South Slough National Estuarine Research Reserve in Charleston, and Bandon Marsh National Wildlife Refuge managed by the US Fish and Wildlife Service.

Existing Partnerships and Collaborative Efforts

There are several existing formal partnerships along the Oregon Coast that can be leveraged to help support STEM education for students in our region. Recently, Regional Achievement Collaboratives (RACs) have been established that include some coastal communities: the Career and College Ready RAC in Tillamook, and the Mid-Valley Mid-Coast Partnership that includes LCSD. These partnerships involve additional post-secondary partners and share some of the same goals as the Oregon Coast Regional STEM Hub, thus, developing mechanisms for aligning the Hub's work with the RACs will be important.

Many of the Oregon Coast Regional STEM Hub partners have been involved in long-term partnerships or projects that have strengthened to form a strong foundation for the STEM

Hub. These include the Oregon Coast Aquatic and Marine Science Program, the Oregon Coast Regional STEM Center, and the Oregon Coast Education Program. All of these programs have allowed both partners and participants to develop their skills as educators in areas such as Inquiry, Project Based Learning implementation, and STEM integration, and can now serve as assets or mentors for the STEM Hub.

Research and Resource Management Agencies

Numerous government agencies were also identified as assets in our region, many of which have primary responsibility for managing public areas and natural resources. Examples include: the National Oceanic and Atmospheric Administration (NOAA), which includes the Marine Operations Center for the Pacific (MOC-P) with numerous research vessels; the Bureau of Land Management (BLM); the US Environmental Protection Agency (EPA), the Oregon Department of Fish and Wildlife (ODFW), United States Fish and Wildlife Service (USFWS); Oregon Department of Forestry; United States Forestry Service (USFS); US Department of Agriculture (USDA), and the Oregon Parks and Recreation Department. These agencies have researchers and educators that provide assistance to teachers and students in the classroom and in the field. Many have curriculum resources, equipment, and locations for field experiences or monitoring/habitat restoration projects that students can become involved in.

Because many of these agencies are located at the Hatfield Marine Science Center, Lincoln County teachers and students appear to have benefited the most from interactions with them. Although many of these agencies have offices in several locations along the Oregon Coast, it became obvious through the community meetings that not all areas have active agency partners or education programs. Working with agency staff in those areas that currently have education programs and promoting the mentoring of staff in areas not currently offering these services would increase opportunities for students elsewhere on the Oregon Coast.

Environmental Education Organizations

The Oregon Coast is also rich in education organizations with an environmental focus. The Tillamook Estuaries Partnership (TEP), South Slough National Estuarine Research Reserve (SSNERR), Columbia River Estuary Studies Team (CREST), The Nature Conservancy (TNC), local watershed Councils, and Surfrider Foundation are just a few examples. These organizations provide equipment, funding, staff, and specific authentic, contextual projects in which students and teachers can become involved. Many of these partners are currently involved in the creation of the Oregon Environmental Literacy Plan implementation strategy and can help connect environmental education and STEM statewide, including identifying additional resources to be leveraged.

Higher Education Partners

Strong partnerships with Oregon State University (OSU), the Center for Coastal Margin

Observation and Prediction (CMOP) at Oregon Health and Science University (OHSU), and Western Oregon University (WOU) helped form the foundation for the Oregon Coast Regional STEM Hub.

OSU's Hatfield Marine Science Center (HMSC) provides office and teaching space, and access to hundreds of researchers and graduate students. A recent award of $20 million dollars will help expand facilities at HMSC to create a Marine Studies Campus, which will serve 500 undergraduate and graduate students in interdisciplinary studies. This expansion will include a 110,000 square foot facility with teaching and lab space, some of which will also be available for use by the STEM Hub.

OSU staff who are currently involved in K-12 education and have committed to continued participation in the STEM Hub include individuals from the Department of Fisheries and Wildlife; College of Engineering; College of Forestry; College of Earth, Ocean, and Atmospheric Sciences (CEOAS); Department of Science and Math Education (SMED); the Marine Mammal Institute (MMI); and the Northwest National Marine Renewable Energy Center (NNMREC). In addition, OSU's Extension program has a network of agents along the coast who have partnered with teachers and afterschool programs to provide training, curriculum, and hands-on activities focused on building underwater robots, wave energy devices, and fishing gear that reduces by-catch. These Extension agents have connections throughout coastal communities that will help support the Hub's mission and activities.

Staff from the math department at WOU provides professional development to Oregon Coast teachers in integrating mathematics into STEM projects and offer professional development and graduate credits to participants. OHSU's CMOP staff provides teacher professional development on real and near-time data, oceanography and climate change impacts. The University of Oregon's Oregon Institute of Marine Biology (OIMB) has K-6 marine science curriculum developed through a former GK-12 National Science Foundation (NSF) funded grant, a facility with housing for teacher professional development, and marine researchers and graduate students.

Community Colleges

The coastal community colleges have several STEM programs that our students can look to during and after high school. Clatsop Community College (CCC) partners with Astoria, Seaside, and Warrenton-Hammond School Districts to provide introductory and intermediate classes to high school students at CCC's Marine and Environmental Research and Training Station (MERTS) and Integrated Manufacturing Technology Center (IMTC) campus. Tillamook Bay Community College (TBCC) has an Open Campus partnership with OSU and a focus on natural resources, while Oregon Coast Community College (OCCC) has a nationally unique Aquarium Science program offering both an Associate's Degree and Certificate. OCCC also has a Nursing Program that has graduated over 100 Associates level nurses and is currently expanding other

Allied Health offerings. Southwest Oregon Community College (SWOCC) offers applied science and culinary arts programs, and is currently developing additional STEM focused offerings for dual high school-college credit. They also offer several STEM associates degrees.

In addition, SWOCC and CCC currently offer TRIO programs that aim to increase the number of low income and underrepresented students in higher education. These programs provide guidance and support for high school students transitioning into the world of Post-secondary education, addressing an important transition zone in the STEM career pipeline.

All four coastal community colleges also have Small Business Development Centers (SBDCs) that provide consulting and education to small businesses, including those emerging STEM related businesses on the coast. These centers are currently located in Astoria, Tillamook, Lincoln City, and Coos Bay.

Informal Education Centers

There are also a number of informal education centers located along the Oregon Coast that focus on maritime heritage, forestry, and aquatic and marine sciences. These include the Columbia River Maritime Museum, the Tillamook Forest Center, the Oregon Coast Aquarium, the HMSC Visitor Center, the Oregon Hatchery Research Center, Cape Perpetua, Umpqua Discovery Center, and Coos Historical and Maritime Museum among others. These centers offer public and school programs and sometimes provide curriculum, teacher trainings, and equipment or kits that can be checked out by teachers. Many of these centers offer summer camps for students and interactive events such as "Marine Science Day" at HMSC that invites the public to engage in hands-on activities with local researchers. These sites also provide venues for challenge events and educator workshops.

Businesses and Industry

Traditionally, businesses along the Oregon Coast have focused on fisheries, forestry, agriculture, tourism, and service industries. Even within these more traditional industries, technology continues to progress and play an increasingly important role. The Tillamook County Creamery Association, Georgia Pacific, and the Oregon Forestry Resources Institute, including numerous timber companies, have been partnering with teachers and students along the coast in support of STEM education.

More recently, with the relocation of the NOAA Marine Operations Center to Newport, the Ocean Observing Initiative (OOI), and development offshore wind and wave energy development, the marine technology industry has shown growth and is expected to continue to this trend. Some current marine technology businesses include, Point 97, Advanced Research Corporation and The Sexton Corporation. These businesses work with teachers and students as mentors and some are even able to provide paid internships and funding for student challenges. In addition, the Marine Technology Society (MTS) and the Association of

Unmanned Vehicles Systems (AUVSI) have partnered to support student activities, as has the Central Lincoln PUD and Near Space Corporation.

Healthcare is also an increasingly important industry as coastal communities continue to grow and health care technology advances. Most coastal communities have hospitals and clinics specializing in everything from cancer treatment to pediatrics.

Many coastal communities have ports or Economic Development Councils such as the South Coast Development Council and the Central Coast Economic Development Alliance which can further help identify key businesses and industries that can support STEM education and/or inform Hub participants about needs as they relate to workforce development and career readiness of coastal students.

Existing School Programs

Several Oregon Coast schools have unique, engaging programs that might serve as a resource to others looking to create similar programs. Examples of these are the Aquatic Sciences Program at Astoria High School and the Natural Resources Program in the Tillamook School District. Both of these programs excel at hands-on, project-based learning that involves community projects with numerous scientists and industry partners.

Several schools along the coast are also involved in Oregon Department of Fish and Wildlife's Salmon and Trout Enhancement Program with students conducting water quality monitoring, stream restoration, and even rearing juvenile salmon on their school grounds. These programs not only allow students to develop STEM skills but provide additional exposure to STEM-related careers.

Several years ago Lincoln County School District (LCSD) launched an Ocean Literacy Initiative, aimed at utilizing existing natural resources and community partners to make LCSD students "the most Ocean Literate in the state if not the nation." To that end, every teacher was offered opportunities to participate in marine science related professional development as well as opportunities for their students to participate in field experiences. With the support of administration, many teachers have embraced the concept, developing their own unique, but often collaborative, projects and classes. One such example is Waldport High School, which currently offers a class in Ecotourism and has plans to add Oceanography and Marine Engineering for the 2014-15 school year.

Afterschool Programs

Although not available in all areas, most coastal communities have afterschool programs that focus on or incorporate STEM into their programming. Examples include OSU's SMILE and 4-H programs, 21st Century Community Learning Centers (Neah-Kah-Nie and Lincoln County

districts) and Scouts programs. Some communities also have recreation centers and/or libraries that run afterschool and summer programs that incorporate STEM activities. Limited STEM summer camp programs are available along the Oregon Coast and include those run at HMSC and by OMSI. The American Association of University Women (AAUW) partners with Tillamook Bay Community College to run a Tech Trek STEM focused summer camp for 8th grade girls that could be replicated in other areas on the coast.

OSU's Pre-College Programs runs the Center for Outreach in Science and Engineering for Youth (COSEY) Day Camps and the STEM Hub could partner with them to bring these camps to the Oregon Coast, particularly in areas where other STEM camp programs do not currently exist.

During the summer of 2014, Oregon Sea Grant, the Oregon Coast Aquarium, Oregon Coast Community College and several natural resource agencies are partnering with the Siletz tribe to run a month-long "Careers in Natural Resources" program for tribal youth with the goal of increasing interest in associated careers through career exposure and engagement. Connections made and lessons learned from this camp will hopefully lead to future successful STEM programs targeting tribal youth.

Student Challenges

Oregon coast students are currently involved with several different student challenge events, including LEGO Robotics, Science Fairs, Math Counts, and the annual Salmon Bowl Competition that feeds into the National Ocean Sciences Bowl. In addition, recent partnerships have led to the creation of two new student challenges on the Oregon Coast focused on Marine Technology.

Started in 2012, the Oregon Regional Marine Advanced Technology Education (MATE) Remotely Operated Vehicle (ROV) program provides teacher training, recruitment of industry mentors, and online curriculum for teachers to utilize with students grades 6 -14 who design and build underwater robots to accomplish certain tasks that are then brought by student teams to compete at the statewide competition. Mission tasks change each year, but all simulate tasks performed by remotely operated vehicles in the real world, such as launching and retrieving scientific equipment and collecting data. Student teams can compete at four different levels of increasing complexity and are scored on poster and engineering presentations as well as ROV performance. Dozens of researchers, engineers, marine technicians, and scientific divers volunteers their time to serve as judges and as support staff for the competition each year providing additional STEM career exposure for students and their parents. Winners of the upper divisions of ROVs advance to the MATE International ROV competition where they compete with top teams from around the world.

Launched during the 2013-2014 school year by the Oregon Coast Regional STEM Center in conjunction with the Northwest National Marine Renewable Energy Center (NNMREC) and other partners, the first annual Oregon Coast Renewable Energy Challenge focused on offshore

wind and wave energy technology. Partners provided multiple workshops for educators, curriculum and materials for student devices, resulting in 32 teams from Tillamook and Lincoln County School Districts participating in the first day-long event held at HMSC in April 2014. Researchers gave presentations on current projects investigating potential impacts of these technologies on marine ecosystems and associated organisms, while industry representatives served as engineering judges for the competition. The STEM Hub plans to continue to support this event by increasing access for other students up and down the coast.

Funding Sources

During the asset mapping process, numerous small grant funding sources were identified that currently support STEM activities for Oregon coast students. These included Siletz Tribal Charitable Contributions Fund, Georgia Pacific, Target Field Trips Grants, Tanger Outlet Kids Grants, Tillamook Estuaries Partnership and Oregon coastal banks. Several national granting agencies and foundations that target rural Oregon communities were also identified as potential sources of funding.

Volunteers/Mentors

One key asset that some coastal communities have already tapped into is a pool of dedicated volunteers with diverse backgrounds and expertise. From parents, to retirees, to industry representatives, volunteers who can serve as mentors in classrooms and at afterschool activities can support STEM activities where personnel and funds are limited.

Based in Newport, HMSC hosts over 350 employees and graduate students with a wide variety of STEM related expertise. The HMSC Visitor Center also has additional volunteers, many of whom are students or retired educators and engineers. Over 40 volunteers from HMSC and elsewhere in the community volunteer each year as mentors for the local science fair. These mentors commit to weekly classroom visits to assist students in completing projects for the HMSC hosted science fair. Volunteers and community mentors have also been key in running student challenge events. A total of 45 volunteers from OSU, NOAA, EPA, USDA, the Oregon Coast Aquarium, the Marine Technology Society, the National Organization for Women, and many small businesses volunteer as judges, divers, and support staff for the Oregon Regional MATE ROV competition each year.

Tillamook School District has a Community Mentor Program that actively recruits and trains volunteers to work with students on developing science fair projects as well as supporting teachers in other ways in the classroom and in the field. This program could serve as a model for other school districts seeking to recruit and involve community mentors in their schools.

Teachers

Teachers with diverse backgrounds and expertise, 75% of who have advanced degrees, populate Oregon Coast school districts. Many school districts have mentoring programs and several have dedicated STEM Resource Teachers (For example, Lincoln County SDand Coos

Bay SD). These teachers are dedicated to supporting other teachers and their students in effective STEM education and connecting them with resources. With the additional recruitment of 20+ STEM Hub mentor teachers and North and South Coast Coordinators, the STEM Hub should be well poised to increase STEM learning opportunities for students along the entire Oregon Coast.

Needs Assessment

In order to collect additional information from K-12 educators regarding current practices, needs and preferred professional development format, an online survey was developed and distributed to all K-12 teachers through coastal school district superintendents. A total of 311 survey responses (approximately 26% of the 1200 Oregon Coast teachers) were received and information incorporated into the needs assessment from the community meetings. While the data reported here is a summary for the entire coast, we have disaggregated data by district and school and can provide that information to target needs more specifically.

Student demographics and achievement data was also obtained for coastal school districts using online state and federal sources and is included in the tables below.

District	# students	# teachers	% Free or Reduced Lunch	Poverty Rate %	Diversity %							
					ELL	SpEd	White	Afr. Am.	Hisp.	Nat. Am.	Asian	Minority
Lincoln County	5200	256	63	26.6	6.3	14.2	69.6	0.8	14.8	8.2	0.6	24.4
Tillamook	1950	119	59	22	12	13.3	67.6	0.2	26.3	1.1	1.8	29.3
Warrenton-Hammond	896	52	57.2	24.8	2.5	18.3	82.3	0.9	8.9	2.1	2.5	14.4
Astoria	1890	104	47.1	25	5.5	15.2	79.6	0.3	13.6	0.9	12	16
Seaside	1500	90	54.6	21.1	10.1	18.3	75.8	0.6	18.3	1.5	2.9	23.2
Nestucca	462	27	69.7	20.5	12.3	18.6	75.5	1.1	15.8	3.0	0.6	20.4
NeahKahnie	773	53	62.5	19.2	3.1	11.9	78.8	0.5	11.1	2.9	2.0	16.6
North Bend	2400	111	42.7	20.9	1.1	11.9	80.8	1.1	7.6	5.7	1.9	16.4
Coos Bay	3100	143	64.1	28.9	1.7	17.3	71.4	0.7	12.7	5.9	1.6	20.8
Siuslaw	1322	62	52.9	22.4	2.6	15.4	66.3	0.5	11.3	6.3	3.5	21.6
Reedsport	650	33	65.2	32.2	3.1	18.0	74.9	0	12.6	4.9	0.8	18.3
Bandon	745	40	57.3	21.5	0.8	14.6	80.5	0.1	8.2	2.3	1.9	12.5
Brookings	1630	74	59.5	19.8	1.7	12.6	65.0	1.0	12.0	4.5	1.1	18.7
Port Orford	283	18	62.5	54.8	0	15.9	88.0	0.4	6.7	1.1	1.4	9.5
Total	**22,801**	**1,182**										

Demographics of Partnering School Districts (Federal Education Budget Project 2012)

Of the 14 participating districts along the Oregon Coast, 11 of 14 are below state averages (highlighted in yellow) for the percentage of all students meeting or exceeding academic benchmarks in mathematics, 10 of 14 are below state averages in science, while only 5 of 14

are below state averages in reading. Additionally, 8 of the 14 districts are below the state average graduation rate, 11 of 14 are below the state average for post-secondary enrollment, and 9 of the 14 districts have a dropout rate higher than the state average (highlighted in green). In analyzing the data by subgroups, all districts report lower percentages in academic achievement than for their total population averages, while dropout rates for subgroups are higher. Clearly, the Oregon Coast STEM Hub needs to focus on raising academic achievement, graduation rates, and college enrollment of ALL students, including subgroups, and decreasing the drop-out rate for all.

Student Achievement (all grades), Graduation Rates, Dropout Rates and College Enrollment

District	Reading (% meet/exceed)	Math (% meet/exceed)	Science (% meet/exceed)	Graduation Rate	Dropout Rate	College Enrollment
Lincoln County	64.7	50.3	55.9	62.6	4.3	48.6
Tillamook	65.9	58.9	50.5	76.1	2.1	50.0
Warrenton-Hammond	63.8	53.5	67.8	57.9	5.2	69.1
Astoria	79.7	67.8	57.0	59.8	4.6	60.8
Seaside	72.5	51.2	59.4	69.2	3.3	64.4
Nestucca	69.9	53.2	57.3	76.9	1.7	46.3
NeahKahnie	76.3	71.6	79.4	87.5	2.1	58.6
North Bend	62.8	49.3	59.4	66.5	3.7	63.0
Coos Bay	60.8	49.6	56.5	51.1	5.0	54.2
Siuslaw	72.2	58.7	71.8	65.9	4.7	55.6
Reedsport	51.0	36.4	56.2	57.6	6.2	55.8
Bandon	79.0	67.3	73.4	72.9	4.7	55.6
Brookings	66.9	58.0	68.3	57.4	4.0	51.4
Port Orford	72.0	52.8	72.7	78.3	1.9	43.2
State Averages	**65.1**	**62.1**	**70.6**	**68.4**	**3.4**	**61.1**

(2013 Oregon Report Cards)

An additional needs assessment was also conducted by OSU's Hatfield Marine Science Center in 2013 as part of an external review process and strategic planning. That needs assessment included over 270 surveys and interviews with students, community members, staff, and partners. Relevant results from the report titled "Educational Needs Assessment for Oregon State University's Hatfield Marine Science Center" are also included below.

Educator Needs

The community meetings and teacher surveys identified many barriers and challenges that currently limit STEM education in coastal classrooms. These include the need for a common understanding of what STEM is and what STEM inclusion looks like. In addition, the need for Professional Development (PD) on STEM/NGSS/CCSS integration at various grade levels was a common theme. In addition to training, teachers also reported they need access to STEM curriculum that is connected to the new standards they are now required to teach. Support from school boards, administration, and the community also ranked high as a need. Although

few coastal school districts have a designated partnership or community liaison, it was identified as a need for many areas. Access to scientists, mentors, and citizen science projects was identified as a high need. Teachers also reported the need for smaller class sizes, a reduction in standardized testing, more time and increased funding.

Of the 311 teachers who responded to the survey, 55% do not hold a degree in the STEM subjects that they teach, 41% reported they do not have adequate access to PD in Science, and 52% reported they do not have adequate access to PD in Technology or Engineering. Teachers indicated that their preferred formats for PD were (in order of ranking): 1) during the school day with release time, 2) through collaborative study groups, 3) multiple days during the summer, or 4) after school/evenings in person. In addition, the majority of teachers ranked the following as *very important* considerations when choosing PD: obtaining new ideas and/or resources to use with students, funds or materials to support classroom activities, and the opportunity to interact with colleagues. More than half of the respondents said they needed the PD focused on: deepening their content knowledge, designing and implementing Project Based Learning (PBL), integrating technology, effective STEM teaching strategies, addressing CCSS through STEM, and STEM curriculum resources.

In teacher surveys, the number one need outside of PD was programs for students in the classroom, followed by STEM curriculum tied to the CCSS and NGSS. Teachers also ranked technology, field programs near their school, and field equipment as high needs.

The number one resource teachers said they needed from the Oregon Coast Regional STEM Hub website was STEM lesson plans, followed by STEM PD information. Funding opportunities, community partners' information and information on STEM student opportunities were also rated as high needs.

Student Needs

Student needs that have been identified in our area through the community meetings include the need for STEM internships, apprenticeships, and STEM careers exposure; contextualized learning experiences; computer coding education; access to technology; opportunities for mentoring; out-of-school STEM opportunities; more dual credit courses for high school students; and parental support. Also identified as critical was better communication and alignment between high school, community college, and university educators to increase student preparation and reduce the need for post-secondary enrollment in developmental math and other remedial coursework. Finally, the need for social and economic issues to be addressed so that students come to school ready and able to learn was expressed by many participants at the community meetings.

The educational needs assessment conducted by HMSC also reported the need for increased collaboration between OSU and coastal community colleges, with a goal of creating a 2+2 program with Oregon Coast Community College and eventually others. An expansion of STEM courses at OCCC in partnership with OSU was also recommended.

The HMSC needs assessment also identified the need for increased physical capacity and staffing for youth education at HMSC and called for increased involvement and participation by agencies and academic units in HMSC youth education to improve science literacy. It was also suggested that such opportunities for diverse, under-represented and underserved audiences be expanded.

Community/Industry Needs

Through the community meetings, industry representatives expressed a need for employees with critical thinking and communication skills who were motivated, innovative, problem solvers. Also acknowledged was the need in many communities for economic development to attract STEM businesses, creating and retaining jobs and talent. Lastly, the need for a common vocabulary, a place to announce events, connect individuals, collect and share success stories was also recognized.

The HMSC educational needs assessment identified the expansion of educational opportunities as a means to boost the coastal economy with a better-educated workforce. Many respondents also expressed an interest in improving sustainable business opportunities related to science and the marine environment.

Summary

Although numerous assets exist in Oregon coastal communities that support STEM education, there appears to be a "disconnect" between many teachers and potential resources and partners. Potential partners don't always understand teacher needs and constraints, and key information does not make it to the teachers in an efficient manner, thus resources that do exist are often underutilized. Current PD opportunities are not adequate to meet teachers' needs, in most schools inadequate support exists to integrate STEM effectively, and in most areas, students lack out-of-school STEM opportunities and STEM career connections.

High-leverage Strategies and Programs

The Oregon Coast STEM Hub will support STEM improvement, by collecting and disseminating information about evidence-based best practices. The STEM Hub will also develop partnerships with industry and informal education providers, seek funding for existing STEM programs and work with partners to develop new programs to address current and future identified needs of Oregon Coast teachers and students.

The Oregon Coast Regional STEM Hub will support schools in providing STEM learning opportunities and providing teacher PD that focuses on strategies that will produce

measurable increases in the college and career readiness of students, including traditionally underrepresented populations. The Hub will achieve its mission in three strategic ways:

1. **STEM Experiences**: Supporting STEM learning experiences for students and youth by providing connections to STEM professionals in the classroom and in the field, equipment and resources for carrying out STEM-related activities, and opportunities to showcase student-created designs and STEM projects by participating in student challenges;
2. **Networking**: Creating a STEM network of resources, programs, and professionals to support STEM learning for students, including a website which serves as a clearinghouse or conduit for connecting business and community resources with educators, parents and students.
3. **Professional Development:** Facilitating Professional Development (PD) for teachers and partners in effective instructional practices focusing on inquiry, STEM integration, and Project Based Learning (PBL) while meeting the Next Generation Science Standards (NGSS) and Common Core State Standards (CCSS);

Strategy: Contextualized, Student-centered Learning Experiences

Based on national research around best practices for STEM education, the Oregon Coast Regional STEM Hub will support STEM learning activities that are student-centered, provide hands-on experiences, and contextualize learning by involving community mentors while focusing on current and emerging issues. The STEM Hub will strengthen connections between the rich resources in our coastal communities, and the schools, teachers and students who are seeking relevant, hands-on, career-focused, experiences that help students envision how academic learning relates to their future and potential career paths.

Characteristics of Effective STEM Education:

- Integrate the disciplines of science, technology, engineering, and math (STEM)
- Integrate and deliver both formal and informal STEM learning opportunities for students
- Provide authentic experiences, contextual learning, and career awareness through partnerships with businesses, industries, agencies, and non-profits in the community
- Focus instruction on problem solving and critical thinking skills through inquiry and design
- Include effective instructional strategies that develop collaboration and teamwork
- Develop communication and literacy skills
- Include the use of standards-based performance assessments
- Provide post-secondary and career relevance and connections

In addition to utilizing currently identified best practices and national and state standards for guidance, the Oregon Coast Regional STEM Hub will focus on the collection, analysis, and reporting of STEM education data within our region, with the goal of identifying additional effective practices and programs. Common measures will help identify potential programs for expansion or replication as well as support dissemination of best practices throughout the network of partners. STEM Hub staff will also rely on the STEM Experiences Sub-committee to identify programs and activities to seek funding for and help plan their implementation. See Appendix 2 for STEM Hub Sub-committee Roles and Responsibilities.

Connecting students with mentors in and out of the classroom will be a priority for the STEM Hub. Over 150 community mentors currently work with teachers and their students in coastal communities. Efforts to identify an increasingly diverse group of mentors will continue, with special emphasis on recruiting mentors that are female and/or minorities. To further connect students to researchers and industry, the STEM Hub will work to identify and develop student internship and job shadowing opportunities.

Another critical component in maintaining student engagement in STEM pathways is the need to develop parental support for student participation in STEM programs and activities. In an effort to increase parental understanding and support, the STEM Hub will work with partners to develop, support and host community STEM events along the coast that engage participants in hands-on STEM-related activities, provide partners a venue for highlighting in school and afterschool STEM programs and opportunities, and allow us to showcase student projects and success stories.

Some specific examples of Student-centered learning experiences that will be promoted through the Oregon Coast Regional STEM Hub are:

- The Oregon Regional Marine Advanced Technology Education (MATE) Remotely Operated Vehicle (ROV) Program
- The Oregon Coast Renewable Energy Challenge
- Lego Robotics
- Science/STEM Fairs
- STEM Careers Exploration Programs
- Internships
- Summer Bridge Programs
- Girls in STEM Programs
- Student Field Experiences
- Project Based Learning
- Math Counts Competition

Strategy: Develop STEM Hub Network

The Oregon Coast Regional STEM Hub will serve as both a physical and virtual location. The STEM Hub website will connect educators, students, parents, industry, and other community members to a vast network of community and online resources for supporting STEM education both in the classroom and out-of-school. Educators can post requests for classroom mentors or scientists to work with their students in the field, industry representatives can post internship opportunities, and parents can find STEM summer camps and afterschool activities. This website is envisioned to be a "one-stop" site for all coastal STEM stakeholders with an event calendar showing upcoming opportunities, access to the STEM Hub Facebook page and Twitter feed, and a wealth of resources to support students at all levels.

The STEM Hub Communications and Outreach Sub-committee will assist the Communications Coordinator in developing a marketing plan, including appropriate messaging and identifying avenues for publicizing events and activities. They will also provide feedback regarding the Website structure and suggest modifications to improve usability.

The Backbone is a group of representatives from different organizations, rather than one organization or entity (see Structure Diagram A), but is physically hosted by Oregon State University's Hatfield Marine Science Center. The Oregon Coast Regional STEM Hub will:

1. Build and maintain on-going relationships with STEM Hub partners and stakeholders (K12, higher education, informal education, industry, government and community partners).
2. Bring partners together on a regular basis to develop short and long range plans for the Oregon Coast Regional STEM Hub.
3. Oversee the development and implementation of Oregon Coast Regional STEM Hub-sponsored programs.
4. Maintain STEM Hub online resources and create an asset map of STEM activities and resources within the region that can be shared and promoted.
5. Collaborate with organizations and other STEM Hubs to match community resources to educators needs.
6. Align STEM Hub activities with Common Core State Standards and Next Generation Science Standards.
7. Build capacity of volunteers and mentors to provide meaningful experiences for students, tied to learning outcomes.
8. Collect and analyze assessment data from Oregon Coast Regional STEM Hub partners and create evaluation reports on the effectiveness of STEM Hub programs in meeting goals.

Strategy: Educator Mentoring and Professional Development

The Oregon Regional STEM Hub brings together partners with diverse backgrounds, interests, and expertise around STEM education. Working together, each partner school district and community partner will contribute to creating a STEM Learning Community, rich with opportunities. Mentoring will be emphasized throughout the STEM Hub as all partners have a perspective and expertise to offer. Working together to understand each other's needs and viewpoints we will forge a common vision that will enable us to see the myriad of collaboration opportunities available for the benefit of all students.

Through the STEM Hub, a variety of professional development opportunities will be made available to all partners. Professional development opportunities will be based on needs assessments and program availability. Due to the large geographic area being targeted, every effort will be made to accommodate remote participation in PD. PD opportunities will also be made available in various formats when possible to accommodate schedules and learning styles.

Some proposed PD opportunities for the 2015-2016 school year include day-long workshops supporting involvement in student challenges which will be hosted and/or promoted by the STEM Hub, including alternative energy workshops (wind, wave, and solar) and Remotely Operated Vehicle (ROV) workshops. During these workshops, teachers will learn how to design and build devices and will be provided kits and/or materials to utilize with their students.

Oregon Coast educators will also have the opportunity to attend the Fall COASTALearning Symposium, a two-day conference with breakout sessions and workshops led by researchers, formal and informal educators covering a wide range of STEM-related topics. Attendees can increase their content knowledge, obtain new curriculum and resources, and make valuable connections with partners to support the implementation of STEM activities in their classroom.

The Oregon Coast Regional STEM Hub Professional Development Facilitators will work with the Professional Development Sub-committee to identify specific activities, dates and locations. The North and South Coast STEM Hub Satellite Coordinators (see Appendix 3 for Position Description) will assist in this process as well as helping to make logistical arrangements for PD in their geographical area. Marketing of and recruitment for PD will occur through the STEM

Hub website, social media, and the coast wide network of mentor teachers and STEM Hub partners.

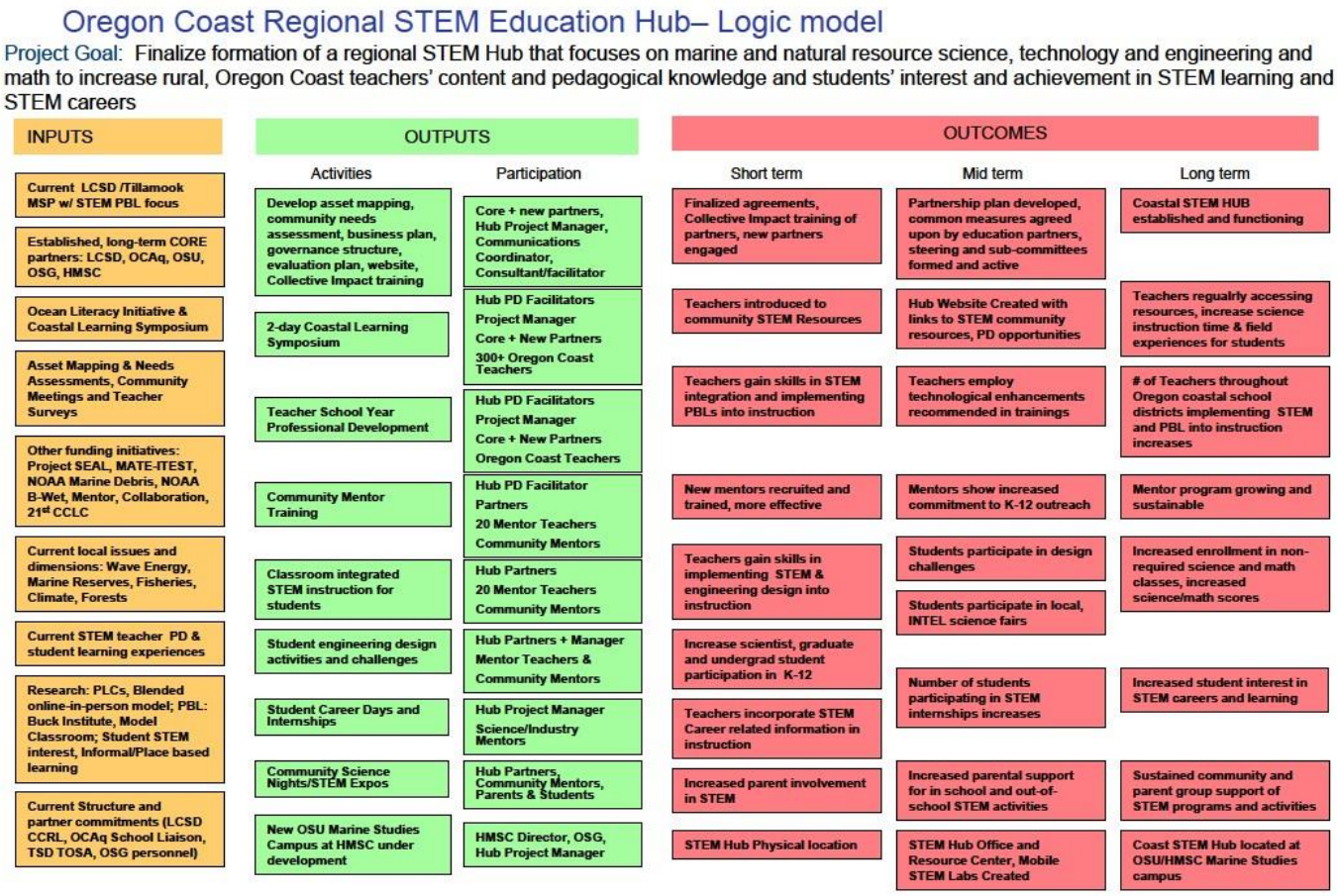
Proposed Professional Development Activities Supported by the Oregon Coast STEM Hub

Professional Development Activity	Format	Intent
COASTALearning Symposium	2-day conference in Newport	Introduce and connect educators with STEM and coastal resources
Spotlight on STEM	Monthly seminars/webinars	Increase participants content knowledge of STEM topics and research
Engineering Challenge Workshops	Single day in-person workshops	Prepare educators to facilitate STEM activities in classroom in preparation of student design challenges
Community Mentor Trainings	Quarterly workshops (mixed format)	Prepare community members to support STEM education
STEM and NGSS	TBD	Preparation for implementing NGSS in K-12 classrooms
STEM Curriculum and Activities PD	Variable depending on program. Hub will contract services with reputable programs (Private Eye, Project Wet, etc.)	Introduce participants to additional curriculum and activities that support STEM integration including PBL
Integrating Technology Workshops	Single day in-person workshops using contractors (SENSE-IT, Vernier, StreamWebs)	Provide instruction on effective use of technology in PBLs (using mobile devices, building and using sensors with students)
Computer Coding Workshops	Single day in-person workshops	Provide teachers instruction and resources on how to teach coding to K-12 students

The Oregon Coast Regional STEM Hub will plan professional development opportunities that are rich in STEM content and model best practices. The Hub will work with educators, program providers, and industry partners to demonstrate how various types of STEM activities connect with and support the CCSS and NGSS. Participants will also learn how to integrate informal education and community-based experiences as part of the STEM learning continuum.

Data and Evaluation Strategies

The following logic model was developed for the Oregon Coast Regional STEM Hub and details Hub activities, participants, and proposed short-term, mid-term, and long-term outcomes.



The Oregon Coast Regional STEM Hub is in the process of employing a contract evaluator to help create evaluation tools, analyze data, and create evaluation reports which will be reviewed by the Steering Committee and posted on the STEM Hub website for public review. STEM Hub mentors, coordinators, and superintendents of partnering school districts will be responsible for the actual dissemination of teacher- and student- surveys and collection of school-related data/statistics.

The following are proposed common measures for teachers and students involved in the Oregon Coast Regional STEM Hub. These measures will be reviewed by education partners, modified as needed, and adopted by September 2014. Some of the data will be provided by participating school districts as detailed in the signed partnership agreement. Other data will be collected using surveys developed by STEM Hub staff and a contracted evaluator.

Proposed Common Measures for the Oregon Coast Regional STEM Hub

Proposed Measure	How Evaluated	Who Will Collect Data
Number of Teachers Participating in STEM PD	Attendance Rosters, sign-in sheets	Facilitators send to Program Manager
Number of Teachers Changing Practice (Implementing STEM and PBL in Classrooms)	Survey of teachers	Evaluator
Number of Students Taking Advanced Science and Math Coursework or STEM Electives	District enrollment records	District data sent to evaluator
Number of Students Involved in Voluntary STEM Activities (Afterschool STEM Programs, Camps, and Competitions)	Survey of activity providers	Evaluator
Number of Teachers Involved in STEM Hub Activities and Using STEM Hub Resources	Website downloads, surveys, attendance	Program Manager
Number of Hours Spent Teaching Science, Technology, and Engineering in K-6 Classrooms	Survey of K-6 teachers in participating districts, Fall 2014 and June 2015	Evaluator
Percentage of Students Meeting State Benchmarks in Science and Math	District and State Assessment records	District data personnel, Evaluator

Sustainability

Financial Strategy

The Lincoln County School District will serve as the fiscal agent for the backbone for grants and philanthropic gifts that support the Oregon Coast Regional STEM Hub's offices, personnel, and programming. All partners will retain administrative and financial authority for the grants and contracts for which their employees serve as principal investigators.

The backbone organization (core staff) and programming for the Oregon Coast Regional STEM Hub are currently funded by the core partners through a cost-sharing arrangement that includes contributions from the Hub's core partners, as well as grants and contracts that are secured by core and collaborating partners from public and private sources. All partners will work together to raise funds for collective activities that benefit all members. The STEM Hub fundraising approach will be targeted based largely on recommendations from the STEM Hub Sustainability Sub-committee. This working group will help identify sources of funding for programs and activities, as well as funding to support the backbone organization. The STEM Hub anticipates seeking funding from federal, state, and local funding sources, including

private business and charitable foundations. Included below are currently identified potential funding sources for the STEM Hub as well as potential revenue streams generated by partnership activities, such as professional development or student competitions open to teachers and students from outside of the Oregon Coast region.

Potential Sources of Funding for the Oregon Coast Regional STEM Hub

Federal Sources	**Program**	**Lead Entity**	**Anticipated Due Date**
National Science Foundation	ITEST DRK-12	University	November 6, 2014 October 16, 2014
Department of Education	Math & Science Partnership Grants	School Districts, University	TBD
NOAA	BWET, Marine Debris, Environmental Literacy Grants	University, Non-profit	TBD
State Sources	**Program**	**Lead Entity**	**Anticipated Due Date**
Connecting to the World of Work funds HB3232	STEM Hub Grant	LCSD	Currently funded until June 2015
Connecting to the World of Work funds HB3232	STEM/CTE School RFP	School District	TBD
Private Sources	**Program**	**Lead Entity**	**Anticipated Due Date**
Georgia Pacific Foundation	Community Grant Program	LCSD	November 2014
Local PUDs	Community Grant Programs	District or partner 501c3	Annually
Tillamook County Creamery Association	Community Grant Program	District or partner 501c3	Annually
Siletz Tribal Foundation	Charitable fund for youth and/or education	School Districts, 501c3s	Quarterly
Tanger Outlet Mall	Educational improvement Grant	LCSD	Annually
National Education Association	Student Achievement, Leadership and Learning	Individual or groups of teachers	February, June, October yearly
Ford Family Foundation	Positive Youth Development	District or partner 501c3	Annually
Trust Management LLC		District or partner 501c3	Feb and Aug 2015
American Honda Foundation	Youth STEM	LCSD or other partner district or partner 501©3	August,November, February, May

Oregon Community Foundation	Community Grant Program	District or partner 501c3	February and August Annually
Gray Family Foundation	Teacher PD and Community Fieldtrips	District or partner 501c3	Annually
Revenue-Generating Activities	**Program**	**Lead Entity**	**Dates**
Professional development	COASTALearning Symposium	Oregon Coast Aquarium	October 2014
Student Challenges	MATE ROV Competition	Oregon Sea Grant	May 2015

In addition to seeking our own funding sources, STEM Hub staff will work with researchers to incorporate student and teacher activity into Broader Impacts as required by federal grants they apply for and receive. We will also support teachers in grant writing/seeking through grant writing workshops.

Longer-term potential strategies for seeking funding would be hiring a contract grant writer and/or charging a small per student or teacher user fee to participating school districts. Below is a chart estimating major costs associated with running the Oregon Coast Regional STEM Hub and implementing strategies identified in the Partnership Plan. Funding source is indicated and identified as in-kind when applicable. Unsecured funding is *italicized*.

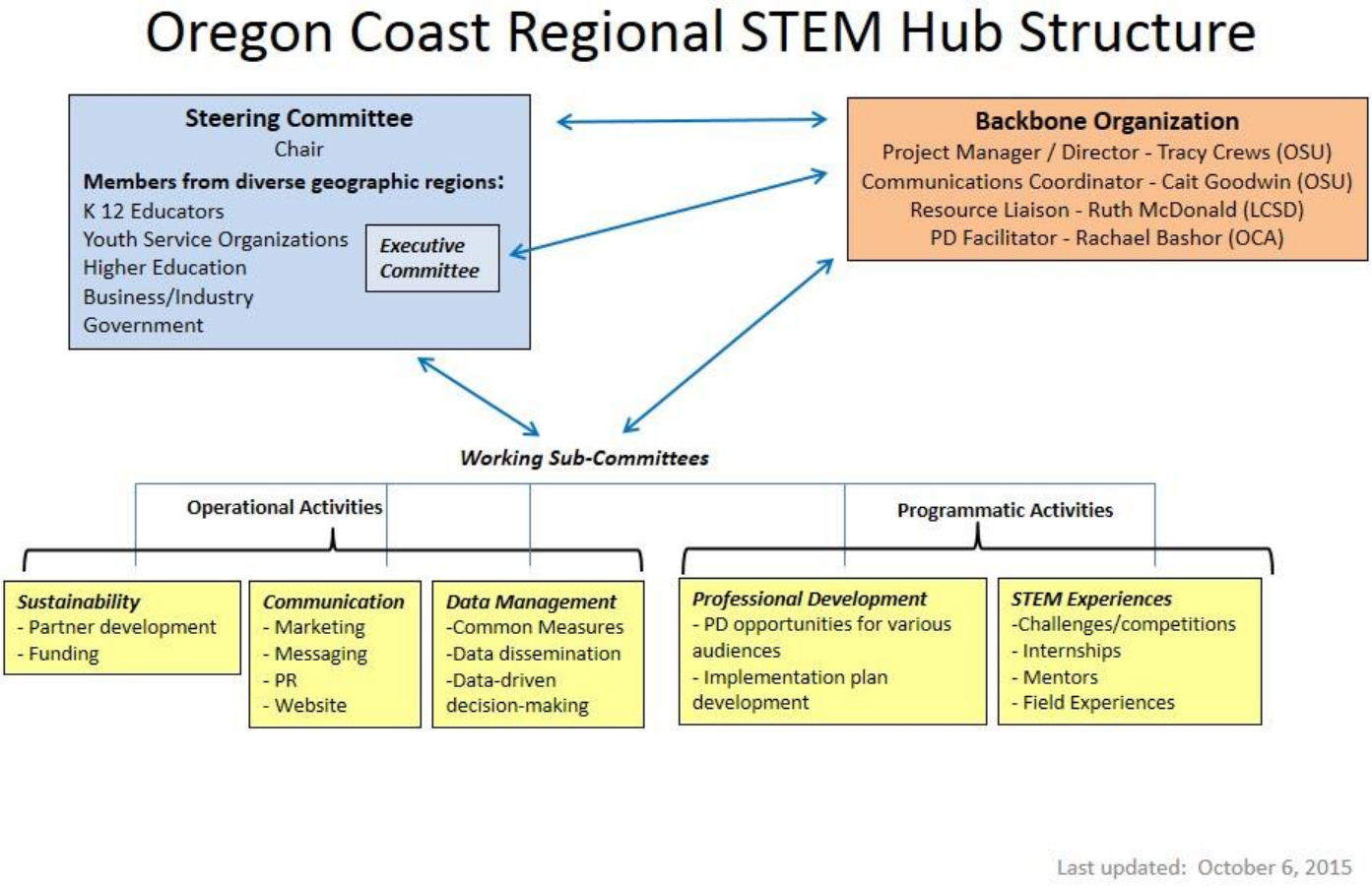
Strategy	Activity	Comments	Year 1: Funds	Year 2: Funds	Year 3: Funds
STEM Hub Formed	Convene and facilitate community meetings, steering committee, work groups; execute partnership plan	.6 FTE for Project Manager, .4 FTE for Communications Coordinator, .2 Partnership Liaison, .2 FTE Fiscal Support, .20 FTE Satellite Coordinators x 2	$158,000 ODE STEM Hub Grant Funding *add in .2 of Ruth? , .10 matching?	*$250,000 Includes .5 FTE for an Executive Director*	*$260,000 Includes .5 FTE for an Executive Director*
One: Build STEM Hub Network	Create Hub Website, Social Media Connect STEM activities to teachers and classrooms	Website designed and hosted by OSU Communications Coordinator maintains website, blog, Facebook Page, etc.	$1600 from STEM Hub Grant (ODE)	Web Hosting Fees & IT Support *$800*	Web Hosting Fees & IT Support *$900*
	STEM Hub Support	Travel expenses and supplies	$20,000 from STEM Hub Grant	*$22,000*	*$24,000*
	Physical location	Office at HMSC	$16,000 from OSU (In Kind)	$16,000 from OSU (In Kind)	$16,000 from OSU (In Kind)

Strategy	Activity	Comments	Year 1: Funds	Year 2: Funds	Year 3: Funds
Two: Professional Learning Community and Teacher Professional Development	Learning Community of 23 mentor STEM Teachers + backbone/core partners	Identify effective practices: substitutes, workshops, travel .40 FTE for PD facilitators	$85,000 from STEM Hub Grant	*$90,000*	*$95,000*
	Coastal Learning Symposium	Costs to run 2-Day Conference for 350 educators	$8,000 from STEM Hub Grant + $105,000 from LCSD (Teacher Pay to attendees)	*$10,000* + *$110,000 from LCSD (Pay to all LCSD teachers attending)*	*$12,000* + *$115,000 from LCSD (Pay to all LCSD teachers attending)*
	Other workshops/ PD for Hub teachers and partners	Substitutes, stipends, workshop costs, materials for classroom implementation	$120,000 from STEM Hub Grant + $20,000 from partners (In Kind facilities use)	*$125,000* + $20,000 from partners (In Kind for facilities use for PD)	*$130,000* + $20,000 from partners (In Kind for facilities use for PD)
Three: Student Learning Experiences	STEM mentors; mobile STEM learning labs; scaling up effective strategies	Support student participation in challenge events, citizen science projects, etc.	$120,000 ODE STEM Hub Grant + $7000 from MATE Center NSF Grant	*$125,000*	*$130,000*
	Busing/Subs for Field Experiences		$30,000 ODE STEM Hub Grant	*$35,000*	*$40,000*
Program Evaluation	Evaluator: common measures, aggregate data, evaluation	Contract Evaluator	$15,000 ODE STEM Hub Grant	*$20,000*	*$25,000*
Admin Fees	LCSD/OSU	7% per current grant	$44,000 ODE STEM Hub Grant	*$50,000*	*$60,000*
TOTAL			**$749,600**	***$873,800***	***$927,900***

Governance

The Oregon Coast Regional STEM Hub will convene a Steering Committee to provide policy direction, leadership, and oversight advice to the Backbone personnel. This committee will consist of approximately 15 individuals representing K-12 education, higher education, industry/business, government, and non-profit organizations. Since the STEM Hub covers a geographically dispersed area, every effort will be made to obtain representation from all areas along the coast (North, Central and South).

Diagram A



Members present at the initial meeting will select a Steering Committee Chair. The Chair will convene a minimum of four board meetings per year. Members will serve renewable one-year terms. See Appendix 4 for the current list of Steering Committee members and their affiliations and Appendix 5 for the Steering Committee Roles and Responsibilities.

At quarterly meetings, Steering Committee members will receive an oral and/or written report on the STEM Hub activities, program implementation, and associated evaluation. They will make recommendations to inform continuous improvement and long-range planning. The Oregon Coast Regional STEM Hub Partnership Agreement will define the role and extent of participation for each of the core partners. The terms of the Partnership Agreement for each core partner will be reviewed and renewed annually.

Appendix 1 : Oregon Coast Regional STEM Hub Current Partner List , Oct 2015

Industry Partners

- Advanced Research Corporation
- Central Lincoln PUD
- Georgia-Pacific
- KidWind
- Near Space Corporation
- Port of Newport

Community Organizations / NGOs

- Lincoln County Interpretive Association
- National Organization of Women, Coastal Oregon Chapter
- Northwest Aquatic and Marine Educators Association
- Oregon Coast Aquarium
- Oregon Museum of Science & Industry
- Salmon Drift Creek Watershed Council
- Seashore Family Literacy Center
- Tillamook Estuaries Partnership
- Youth Development Coalition

School Districts/ESD

- Astoria
- Warrenton-Hammond
- Seaside
- Neah-Kah-Nie
- Lincoln County
- Siuslaw
- Reedsport
- Mapleton
- North Bend
- Coos Bay
- Coquille
- Powers
- Bandon
- Central Curry
- Port Orford/Langlois

- Brookings-Harbor
- South Coast ESD

Regional Achievement Collaborative

- South Coast Connect for Success

Post-Secondary Education Institutions

- Clatsop Community College
- Oregon Coast Community College
- Oregon Institute of Marine Biology / U of O
- Oregon Sea Grant - OSU
- PreCollege Programs – OSU
- Southwestern Oregon Community College

Government Agencies

- Bureau of Land Management
- NOAA/NMFS/Northwest Fisheries Science Center
- NOAA Marine Operations Center – Pacific
- Oregon Parks and Recreation Department
- South Slough National Estuarine Research Reserve
- US Fish & Wildlife Service

Centers and Institutes

- Hatfield Marine Science Center - OSU
- MATE Center at Monterey Peninsula College
- Northwest National Marine Renewable Energy Center (NNMREC)
- Oregon Forest Resources Institute
- Oregon Hatchery Research Center (ODFW)

Appendix 2 : Oregon Coast Regional STEM Hub Sub-committee Groups

Oregon Coast Regional STEM Hub Sub-Committee Groups

Background

The Oregon Coast Regional Science, Technology, Engineering, and Mathematics (STEM) Hub has grown from a grassroots partnership that began with Lincoln County School District, expanded to include Tillamook School District, and now seeks to advance the STEM skills of all Oregon Coast students by utilizing local resources and issues as a means to engage students and contextualize learning.

The Oregon Coast Regional STEM Hub's goals are to:

- Improve student performance in STEM subjects
- Increase interest in and improve preparation for STEM careers
- Increase proficiency in STEM concepts necessary to make personal and societal decisions
- Create enhanced teaching capabilities by providing professional development opportunities

This partnership is a collaborative of over 40 partners including Oregon Coast school districts, four community colleges, three universities, numerous state and federal agencies, and multiple business partners who share a common vision of providing world-class STEM learning opportunities for teachers and students in rural communities along the Oregon Coast.

The partners have agreed that they will not form a formal legal entity, but will utilize existing partners to advance the STEM Hub's work. Although the Lincoln County School District is the fiscal agent and the Hub is physically located at Oregon State University's Hatfield Marine Science Center in Newport, Oregon, multiple and varying partners will act as leads for the proposed sub-committees and for the purpose of running specific programs and activities, based on grant sources, relationships, and expertise.

As a Collective Impact Partnership, we are striving to leverage our resources in three strategic ways:

1. **Professional Development:** Provide feedback regarding Professional Development (PD) for teachers and partners in effective instructional practices focusing on STEM integration and Project Based Learning (PBL);

2. **STEM Experiences**: Identify opportunities and supportiSTEM learning experiences for students and youth by providing connections to STEM professionals in the classroom, out of school providers and in the field, equipment and resources for carrying out STEM related activities, and opportunities to showcase student created designs and STEM projects;

3. **Communications**: Help create a STEM network of resources, programs, and professionals to support STEM learning for students and youth, including a website which serves as a clearinghouse or conduit for connecting business and community resources with educators, parents and students. Assist with marketing strategy and social media campaigns.

4. **Sustainability:** Identify potential funding sources and other opportunities from all sectors and support grant-writing efforts.

5. **Data Management:** Identify baseline data to be collected, assist in the dissemination of disaggregated data to partners, and advise on common measures.

Sub-Committees will be critical in the development and implementation of the STEM Hub's Professional Development activities and Student Learning Experiences, as well as helping to promote STEM Hub and assisting with the creation and implementation of the Sustainability Plan. Sub-Committee members are not expected to actually run Hub programs or activities but to provide input and assistance as needed.

Sub-Committee Member Expectations:

- Support the Oregon Coast Regional STEM Hub's mission and values
- Commit to serving on the designated Sub-Committee for a one-year term
- Attend all quarterly meetings (may participate in person or remotely)
- Actively engage in sub-committee, providing input on proposed activities
- Attend STEM education and/or outreach events as applicable
- Leverage professional networks to assist with STEM Hub and associated activities

Optional Sub-Committee Member Contributions:

- Host/support STEM Hub activities in your area
- Promote partnerships with industry, educational institutions and other stakeholders
- Help secure sponsorships/funding as appropriate

Appendix 3: STEM Hub Area Coordinator Position Description

Oregon Coast Regional STEM Hub Area Coordinators
Position Description
*Funded from October 1, 2015 -- June 30, 2016

Although the founding/backbone organizations of the Hub are physically located in Newport and Tillamook, the Hub intends to serve educators and students along the entire Oregon Coast. The Oregon Coast STEM Hub is partially supporting two (2) "Area Coordinators" – one from the North Coast and one from the South Coast to:

- Act as a liaison between the Oregon Coast STEM Hub project personnel and regional school district teachers, administrators, community partners, businesses, and higher education.
- Ensure communications and announcements from the Hub are distributed electronically and in print throughout the satellite region.
- Assist in arranging logistics for satellite area professional development and student challenges.
- Encourage and help recruit educators to become involved in Hub activities.
- Facilitate, or assist in facilitation of professional development in satellite region
- Assist in data collection, survey promotion from satellite region participating teachers, schools and districts.
- Represent the Hub to local media about STEM efforts in the Satellite region.
- Spend between 30-40 hours per month on STEM Hub business

Qualifications:

- Must be an employee of one of the participating satellite area organizations, with approval from top-level supervisors.
- Bachelor's degree and teaching license.
- 3 years' experience as a classroom teacher, preferably of science, technology, engineering, and/or mathematics or elementary multiple subjects)
- Experience as a participant in STEM professional development
- Experience coordinating and/or delivering professional development
- Proficiency with Microsoft Office suite, Google Docs, email lists management
- Excellent oral and written communication skills
- Effectively collaborate with staff from multiple organizations, use time effectively; and focus on details.
- Provide own transportation (mileage reimbursed) and willing to travel to Hub Steering committee meetings or participate remotely

Appendix 4: 2014-2015 STEM Hub Steering Committee Members

Updated October 6, 2015

Chair: *Birgitte Ryslinge***,** President, Oregon Coast Community College
Secretary: *Brian Fowler*, Oregon Parks and Recreation Department

Dawn Granger, Superintendent, Coos Bay School District
Kama Almasi, Teacher, Waldport High School
Craig Hoppes, Superintendent, Astoria School District
Birgitte Ryslinge, President, Oregon Coast Community College
Brian Fowler, Oregon Parks and Recreation Department
Shamus Gamache, Central Lincoln PUD
Kris Lachenmeier, Near Space Corporation
Julie Chick, Tillamook Estuaries Partnership
Janice Eisele, National Organization for Women, Central Oregon Coast Chapter
Bruce Rhodes, Administrator, Tillamook School District
Kerry Carlin-Morgan, Education Director, Oregon Coast Aquarium
Kyle Cole, OSU Precollege Programs
Lynn Anderson, Director, Indian Education Program and 21st CCLC, Siuslaw School District

Appendix 5: Steering Committee Members Roles and Responsibilities

Roles and Responsibilities of STEM Hub Steering Committee Members
(Updated June 16, 2015)

Members:
Eligibility to serve on the Oregon Coast STEM Hub Steering Committee is restricted to individuals who:

1. Are affiliated with or employed by an organization that is a Partner with the Oregon Coast STEM Hub;
2. Do not receive direct compensation from the Oregon Coast STEM Hub;
3. Agree to fulfill the responsibilities of the Steering Committee membership (see below); and
4. Recuse themselves from voting on matters about which there may be a perceived or actual conflict of interest.

Guidance, Vision, and Oversight:

1. Contribute to an active Steering Committee;
2. Develop and refine a Common Agenda for change, including problem statements, vision, mission and goals, and guiding principles;
3. Use data to inform strategy development and learning;
4. Track progress of work using agreed-upon indicators at Steering Committee and working group levels;
5. Make connections between working groups to ensure coordination and efficiency;
6. Interact with the backbone entity on strategy, community engagement, and shared measurement;
7. At policy level, ensure adherence to grant outcomes, intentions, guidelines.

Representation and Leadership:

1. Be a communication conduit to ensure information flows between their representative areas (geographic and "sector") and the STEM Hub;
2. Ensure commitments and other key activities are continually communicated to represented areas, ensure continued buy-in and support (no surprises);
3. Consider how own organization or related networks can connect with the STEM Hub Vision;
4. Serve as a vocal champion of the collective impact effort in the community.

Process:

1. Ensure discussions remain at the strategic and policy level (whereas staff will address operational work);
2. Participate in regularly scheduled meetings;

3. Review pre-read materials prior to meetings and come prepared for engaged discussion, active listening, and respectful dialogue;
4. Commit to year-long membership in the Steering Committee.

Appendix 6: Current STEM Hub Sub-Committee Members

Professional Development
Rachael Bashor, Oregon Coast Aquarium
Norie Dimeo-Ediger, Oregon Forestry Resources Institute
Renee O'Neill, Oregon State University
Bruce Rhodes, Tillamook School District
Cait Goodwin, Oregon Sea Grant

STEM Experiences
Martha Kemple, Bandon High School
Sharilyn Brown, Southwestern Oregon Community College
Kyle Cole, OSU Pre-college Programs
Shamus Gamache, Central Lincoln PUD
John Lavrakas, Advanced Research Corporation
Ruby Moon, Northwest National Marine Renewable Energy Center
Sean Bedell, Eddyville Charter School
Melissa Steinman, Waldport High School
Joanne Weatherly, Clatsop Community College
Tracy Crews, Oregon Sea Grant

Sustainability
William Hanshumaker, OSU/OSG
Ruth McDonald, Lincoln County School District
Tracy Crews, Oregon Sea Grant
Itchung Cheung, Oregon State University
Kerry Morgan, Oregon Coast Aquarium

Communications and Marketing
Jenna Kulluson, South Slough National Estuarine Research Reserve
Joseph O'Neil, Oregon Hatchery Research Center
Cait Goodwin, Oregon Sea Grant
Flaxen Conway, Oregon State University
Laura Gallant, NOAA MOC-P
Kris Lachenmeier, Near Space Corporation
Annie Thorp, Hatfield Marine Science Center

Appendix 7: Oregon Coast Regional STEM Hub Activities Proposed Timeline

December 2013- July 2014 Phase 1: Plan

- ☐ Develop and Implement Community Engagement Plan
- ☐ Conduct Needs Assessment, Asset Mapping and Identify Key Strategies
- ☐ Develop STEM Hub Partnership Plan
- ☐ Form Steering Committee and Sub-Committees
- ☐ Sign Partnership Agreements
- ☐ Develop Common Measures
- ☐ Identify Additional Potential Funding Sources
- ☐ Launch STEM Hub Website and Social Media Campaign

August 2014- June 2015 Phase 2: Implement

- ☐ Hold Quarterly Meetings of Steering and Sub-Committees
- ☐ Collect Baseline Data for Common Measures
- ☐ Launch Teacher Professional Development and STEM Experiences Establish
- ☐ Mobile STEM Learning Labs
- ☐ Grow Partnerships and Funding

July 2015 and Onward Phase 3: Refine

- ☐ Showcase Effective Practices and Programs
- ☐ Continue to Deliver STEM Hub Programming
- ☐ Continue Collecting STEM Evaluation Data
- ☐ Revise Programming Based on Assessment
- ☐ Transition to Sustainable Program Partnerships
- ☐ Report Impacts