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STEM Investment Council

October 23, 2015

9:00am – 12:00pm

2 World Trade Center

Mezzanine 3 & 4

121 SW Salmon St., Portland

Call-In Information:

Dial (888) 204 5984

Code 992939

AGENDA

- 1. Welcome & Director Updates**
- 2. Post-Secondary STEM Equity Grants**
Brian Fox, Director of Public University Budget & Finance, HECC
- 3. HECC Strategic Plan**
Brian Fox, Director of Public University Budget & Finance, HECC
- 4. Subcommittee Reports**
- 5. ODE STEM Investments Update**
Donna Brant, Education Program Specialist, ODE
- 6. ODE STEM & CTE Priorities**
Salam Noor, Deputy Superintendent of Public Instruction, ODE
- 7. Coastal STEM Hub Update**
Ruth McDonald, Oregon Coast STEM Hub
- 8. November Council Agenda**
- 9. Public Comment**
*Members of the public wanting to give public testimony must sign in.
There will only be one speaker from each group.
Each individual speaker or group spokesman will have three (3) minutes.*

All meetings of the STEM Investment Council are open to the public and will conform to Oregon public meetings laws. The upcoming meeting schedule and materials from past meetings are posted online. A request for an interpreter for the hearing impaired or for accommodations for people with disabilities should be made to Seth Allen at 503-378-8213 or by email at Seth.Allen@state.or.us. Requests for accommodation should be made at least 48 hours in

advance.

DRAFT OUTLINE
HECC STRATEGIC PLAN 2015-2020
SEPTEMBER 25, 2015

Part 1: The state's higher education goals and our progress towards them

1. A 40-40-20 update
 - a. Progress and trends, with a particular focus on what has occurred since 2013 (HECC's last strategic plan).
 - b. Challenges with the application of 40-40-20 to the adult population
 - c. Feasibility of achieving 40-40-20 by 2025?
2. Our other (ultimate) goals for higher education and training:
 - a. contributions to quality of life and effective citizenship
 - b. production of research and knowledge
 - c. contributions to workforce demands and employment opportunities
 - d. contributions to economic development

Part 2: Key understandings about the current higher education landscape

1. Improving higher education attainment is deeply dependent on improving high school completion rates. While significant progress can be made towards the former without improving the latter, the ceiling for this approach is significantly below 40-40-20.
2. Limitations on public resources, competition for state dollars, and the diminished ability of students to pick up the slack through tuition mean that Oregon higher education will not meet state goals without simultaneously addressing each of the following: (a) cost structures, (b) delivery models, and (c) public funding levels.
3. To meet our goals, Oregon higher education must serve students who are increasingly complex: more diverse, lower income, with greater desire for options and information, a greater need for flexibility, and a greater need for support.
4. Oregon students are increasingly accessing higher education through a variety of institutions, timelines, and delivery systems.
5. Top-down approaches to influencing higher education processes and outcomes are likely to be met with resistance and, ultimately, to fail. Significant and sustainable changes to higher education are only possible with leadership, engagement, and partnership from students, faculty, administrators, board members, and other community members who are most directly responsible for higher education processes and outcomes.
6. While various other state, national, and international organizations exist for the promotion of collaboration between actors at all levels of higher education, the HECC is uniquely and solely focused on meeting Oregon's public goals and needs. As a result, it is responsible for provoking and convening conversations that are unlikely to occur in its absence, including those focused on promoting equitable and efficient progress towards meeting state goals and objectives.

7. Higher education is a critical tool for Oregon industry and the economy through (a) skill development, including abstract and creative thinking; and (b) research and innovation that responds to and drives the Oregon economy.

Part 3: The HECC's roles and responsibilities

1. Review the HECC's (limited) role within the new governance arrangements for Oregon post-secondary education:
 - a. State strategic plan for higher education
 - b. State budget development/recommendations
 - c. State funding allocations
 - d. Mission approvals and annual evaluations (public universities)
 - e. Program approvals (community colleges and public universities)
 - f. Strategies, standards, and convenings for inter-institutional coordination
 - g. State programs, policies, and recommendations for improving access, affordability, and student success
 - h. Higher education data collection, analysis, and reporting.
 - i. In conjunction with the Oregon Workforce Investment Board and Oregon Department of Employment, implementation of the federal Workforce Investment and Opportunity Act
 - j. Licensing, authorization, and oversight of non-exempt private colleges/universities and career schools.
2. Our approach to strategic planning: to describe a "big vision" that the HECC helps to advance through "little actions" and especially, through partnerships.

Part 4: HECC strategies 2016-2020: Goal-setting; Student Supports; Pathways; Affordability

1. **Goal-setting.** Sharpen our state goals
 - a. Background/data/context (mostly covered above under "The state's higher education goals and our progress towards them").
 - b. A discussion of HECC levers
 - i. Data definitions, warehousing, and analysis
 - ii. Data reporting: shining a spotlight (eg KPMs, University Evaluations, VFA, Dashboards)
 - iii. Policy recommendations to Legislature, Governor
 - c. Our strategies
 - i. Propose to the Legislature a new adult educational attainment goal, to be linked with labor market opportunities and economic development strategies.
 - ii. In conjunction with OWIB, consider development of specific goals for dislocated workers, training, GED, etc.
 - iii. Develop interim 40-40-20 targets, both for the aggregate student population as well as subgroups.
 - iv. Conduct public reporting on higher education outcomes, in aggregate and by institution, in a more systematic way and with an equity focus.

- v. Work with colleges and universities to develop stronger mechanisms to capture student intent (ie goals).
- vi. Improve state and institutional capacity for capturing, monitoring, analyzing, and reporting on student data.

2. **Student Support.** Improve campus and community-based support for student access and completion

a. Background/data/context

- i. Student completion, not just enrollment, is our primary challenge and opportunity.
- ii. The most effective interventions to support student success appear to be those that rely on counseling, tutoring, coaching, and mentorship.
- iii. Institutions struggle to bring these interventions to scale.
- iv. Funding pressures have forced institutions to rely increasingly on adjunct faculty. This reduces opportunities for students to receive long-term support, guidance, and mentorship from faculty.
- v. Community engagement (including families, community-based organizations, and others) are critical for fostering and sustaining student success, especially for underrepresented students.

b. How we will measure progress in this area

- i. TBD

c. A discussion of HECC levers

- i. Recommendations to Legislature and Governor on budget and policy.
- ii. Funding allocations to public institutions.
- iii. Strategic funds/grants to incentivize promising practices.
- iv. Convening experts and stakeholders: to share promising practices and build partnerships among community organizations, student organizations, and campus experts.
- v. Engaging the community beyond the campuses, forming business, community/family, workforce, K-12, partnerships and alliances to build a college-going culture. Using data and publicity to help Oregonians understand the value and successful pathways to higher education and the labor market.
- vi. Creating tools and engaging students and families to help them navigate the higher education system more successfully.

d. Our strategies

- i. Implement, monitor, and adjust HECC funding allocation formulas to create incentives for institutions to invest in student success.
- ii. Consider the creation of a strategic fund within the Public University Support Fund (PUSF) for the support of statewide, university-led initiatives to improve student success.
- iii. In partnership with institutions, support the development of technical assistance center(s) to disseminate best practices for student success.

- iv. Work with the Legislature and other partners to ensure that funding proposals focused on tuition/access are complemented by funding dedicated to student success.
 - v. Engage students, families, and community groups as partners in efforts to improve student success.
 - vi. Reduce reliance on adjunct faculty through increased state investments in institutional capacity.
3. **Pathways.** Simplify and coordinate systems and structures for student entry, navigation, completion, and exit/re-entry to career.
- a. Background/data/context
 - i. Higher education today has increasing levels of connection to and responsibility for the larger P-20 education system. Much of that work can effectively occur through partnerships that are developed on a local/regional basis (eg Regional Achievement Collaboratives).
 - ii. Today's colleges and universities cannot be successful as stand-alone, isolated institutions, especially given the increasingly underrepresented, non-traditional, and mobile populations they serve.
 - iii. To effectively serve increasingly complex students who seek to access higher education in relevant and innovative methods, the P-20 system should be structured to enhance the portability, flexibility, coherence, and relevance of post-secondary options and ultimately, the ability of students to pursue successful careers.
 - iv. Flexibility for students must be sustained within an environment of guided pathways that reduces opportunities for student "impulsiveness."
 - b. How we will measure progress:
 - i. completion [including employment data in the future]
 - ii. TBD
 - c. A discussion of HECC levers
 - i. Publishing data
 - ii. Convening faculty, institutions
 - iii. Setting standards, creating transparent public results
 - iv. Budget development and strategic investment
 - d. Our strategies
 - i. Developing the pipeline: support colleges and universities in taking increasing responsibility for improving K-12 (especially high school) outcomes.
 - ii. Alignment: identify general education courses that are truly portable; make CTE courses more transferable; establish common course equivalencies and outcomes; align standards for core lower division courses; support institutions in creating guided pathways for students.

- iii. Access: enhance opportunities of high school students to access meaningful post-secondary opportunities and to transition smoothly to college or career; establish better onramps for adult learners.
 - iv. Promote structures and initiatives that engage students in exploring, deliberating, and declaring their interest/intent earlier.
 - v. Career: Create better connection and alliance of higher education and training with employer needs
4. **Affordability.** Limit student and family cost for all, with a particular focus on ensuring that Oregon middle schoolers (and older) can reasonably expect to have options for a truly affordable higher education experience.
- a. Background/data/context
 - i. Higher education provides high return on investment (ROI) for individuals, for families and communities, and for the state. Just as the benefits of higher education are broadly shared, so should be the costs.
 - ii. The total cost of meeting our higher education goals varies significantly depending on what assumptions we make about what the student experience should be. A pragmatic and student-centered approach should use public funding and policies to promote the availability of diverse options for earning certificates and degrees (eg residential and non-residential, brick-and-mortar and online, full- and part-time).
 - iii. Although the cost of higher education in Oregon remains low compared to that of other state systems, we lag far behind other states in providing need-based financial aid.
 - iv. Policy efforts to improve affordability for students and families have had limited success, partly because we have failed to take a more encompassing view of the subject. For example: increases in grant funding that are offset by tuition increases; focus on access as the primary goal of the affordability agenda without similar levels of attention to student aspiration and success. We have not assessed with sufficient rigor the various components of an affordability agenda (price, cost of living vs. learning, grants, loans, time-to-degree, likelihood of completion) and their contribution to career and lifelong success.
 - b. How we will measure progress
 - i. Development of a more comprehensive affordability benchmark
 - c. A discussion of HECC levers
 - i. Tuition cap (5% at universities)
 - ii. State investment: OOG and institutions
 - iii. Institutional accountability through reporting
 - iv. OOG allocation methodology
 - v. Policy recommendations to Legislature, Governor
 - vi. Improving completion rates, diminishing time-to-degree, improving transitions to well-paying work (see above)

- d. Our strategies
 - i. Develop a better affordability benchmark: publicly acceptable but more nuanced than tuition
 - ii. Connect middle schoolers (and up) to the promise of affordability
 - iii. Support innovations that might lower cost structures consistent with high quality (eg textbook affordability, WGU).
 - iv. Increase state financial aid to the national average per student (while ensuring that this isn't merely offset by tuition increases that result from diminished state support).

Part 5: Conclusion

Missing elements:

- Strategies for research, innovation, and economic development.
- The need for a better inventory of our existing higher education capacity and its relationship to our goals. We should have a position on the extent to which we have a capacity problem.
- The role of regional approaches (eg work through Regional Achievement Collaboratives)

HB3072 HECC STEM RFP Criteria Development



BACKGROUND:

- The 2015 Oregon Legislature's Regular Session provided start-up funding of \$2 million to support effective practices and activities specifically targeted to recruit, retain and support underserved students for programs offered at community colleges and public universities that can lead to high wage and high demand jobs related to science, technology, engineering and mathematics (STEM).

GOALS:

- Increase degree and certificate production in STEM fields at public colleges and public universities.
- Increase participation and successful completion in STEM fields by students of color and women at public colleges and public universities.

ELIGIBLE APPLICANTS

- Oregon public colleges as defined by 341.009, Oregon public universities as listed in ORS 352.002 and Oregon Health & Sciences University.

PROGRAM SCOPE:

- Focus on students of color and women who are underrepresented in STEM fields, where STEM is defined as Health Sciences, Computer Sciences and Analytics, Engineering, Energy, High Tech Manufacturing, Precision Agriculture, and Advanced Food Processing.
- Start-up funding initially 1 year – possible funding continuation as approved by the legislature
- May enhance an existing program; not required.
- Grants vary from a minimum of \$150,000 to a maximum of \$350,000. Grants will be issued in spring 2016 for utilization through June 30, 2017.

MEASUREMENT/REPORTING:

- SHORT TERM - Transitions (#'s):
 - o K-12 to CC (cohort of X students or cohort of X students in Y fields if measurable)
 - o K-12 to Universities (cohort of X students or cohort of X students in Y fields if measurable)
 - o CC to Universities (cohort of X students or cohort of X students in Y fields if measurable)
 - o Career Pathways and One-Year Certificates; Two Year Degrees
- MEDIUM TERM - Retention in Program (rates):
 - o Term x Term (for cohort of X students in Y fields)
 - o Year x Year (for cohort of X students in Y fields)
 - o Career Pathways and One-Year Certificates; Two Year Degrees
- LONG TERM - Completion (#'s): *[we cannot reasonably expect to see an impact on completions within one year unless a program is specifically targeting the final year to assist with program completion]*
 - o Degrees in Y fields by X students

Note: institutions requesting funds will define X students and Y fields.

PROGRAMMATIC REQUIREMENTS:

- Utilize high impact practices including [from Figure 1 (p. 6) in PNWLSAMP 2015 Y1 Evaluation Report and Urban League Report];
 - o Inter-institutional partnerships,
 - o Tutoring, academic and transfer advising,
 - o Undergraduate research and industry connections,
 - o Campus visits and targeted “bridge” programs,
 - o Building communities and connections to peers and place, and
 - o External partnerships, e.g. business/industry, foundations, community partners
- Develop new or extend current programs as outlined above.
- Sustainability plan over long-term.
- Participation in convening of grant recipients and experts in the field on program design and evaluation.
- *Suggested* Collaboration/consortium between institutions (Univ. & K-12 or Univ. & CC or CC & K-12 or all three).
- *Suggested* Campus matching requirement.

DISALLOWED USES:

- Funds may not be used for scholarships or to offset tuition.
- Funds may not be used for “bridge” or pre-collegiate programs other than those focused on students transitioning directly into college or university.

INFORMATION REQUIREMENTS:

- Describe your institution/consortium’s demonstrable commitment to equity, which may include a description of policies and practices addressing issues of equity on your campus; include a letter of institutional support from senior leadership.
- Identify and describe existing institutional efforts and with educational, industry or community organizations and how/if the program will partner with these entities.
- Describe how your program will increase enrollment of students of color and underrepresented women in STEM fields within the institutions primary enrollment area.
- Describe how your program will increase persistence, retention, transfer and completion.
- Describe how your plan will be sustainable over the long-term.
- Describe how your program will lead to, or is focused in educational areas related to high-wage and high demand jobs.
- Identify expected impact on degree and certificate completions and intermediate retention and/or transition measurements as outlined above.
- Describe any feeder/bridging programs currently in place.
- Describe how feeder/bridging programs will be leveraged to support program effectiveness.
- Provide data demonstrating that the target population of the program is underrepresented in the particular STEM fields designated for support.

PROGRAM FUNDING:

- Minimal viable funding level
- Optimal program capacity at increased funding levels

TIMELINE:

- October-November 2015 RFP Development & receive feedback from STEM Council, ODE
- December 2015 Finalized RFP to DOJ for review
- January 2016 RFP issued and proposals solicited by CC & University partners
- February 2016 RFP Closes
- March 2016 Awards determined, funds distributed
- April/May 2016 Program leads participate in Kick-Off event
- December 2016 Mid-program convening, interim outcomes
- May 2017 Lessons learned, outcomes reporting to HECC

DRAFT

Higher Education
Coordinating Commission:
2016-2020 Strategic Plan

Engaging Stakeholders and Communities
in Shaping HECC's Vision and Focus





**Part
1**

**Oregon's
Higher
Education
Goals and our
Progress
Towards Them**



**Part
1**



**Part
2**

Oregon's
Higher
Education
Goals and our
Progress
Towards Them

Current Higher
Education
Landscape



**Part
1**

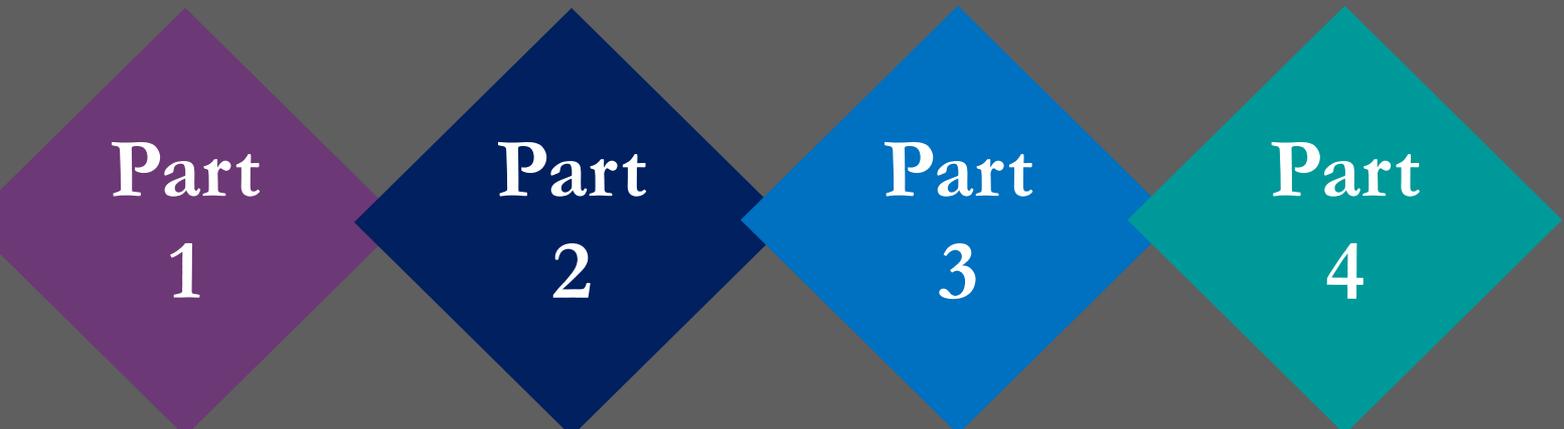
**Part
2**

**Part
3**

Oregon's
Higher
Education
Goals and our
Progress
Towards Them

Current Higher
Education
Landscape

HECC Roles
and
Responsibilities



**Part
1**

**Oregon's
Higher
Education
Goals and our
Progress
Towards Them**

**Part
2**

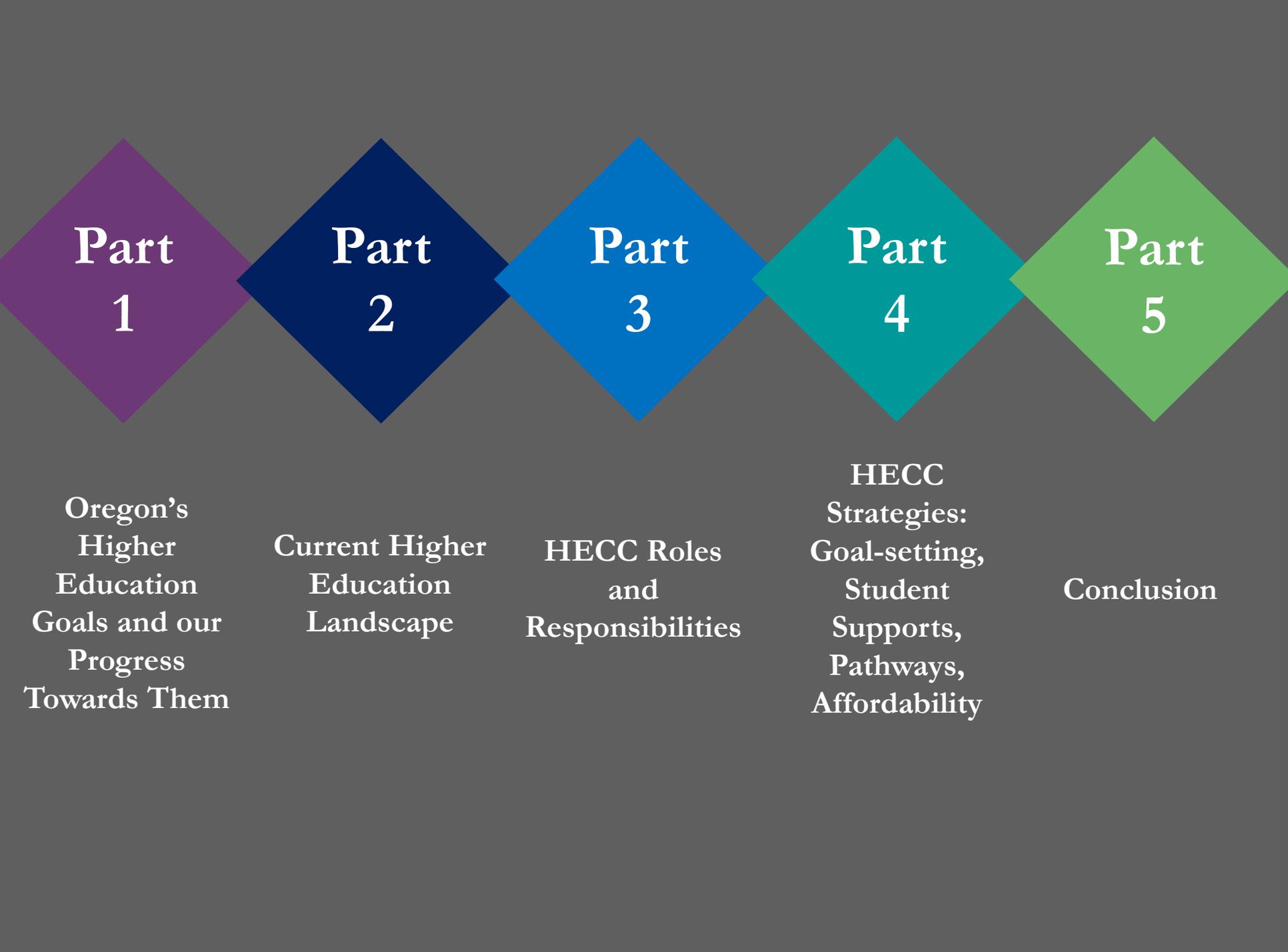
**Current Higher
Education
Landscape**

**Part
3**

**HECC Roles
and
Responsibilities**

**Part
4**

**HECC
Strategies:
Goal-setting,
Student
Supports,
Pathways,
Affordability**



**Part
1**

Oregon's
Higher
Education
Goals and our
Progress
Towards Them

**Part
2**

Current Higher
Education
Landscape

**Part
3**

HECC Roles
and
Responsibilities

**Part
4**

HECC
Strategies:
Goal-setting,
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Supports,
Pathways,
Affordability

**Part
5**

Conclusion

Part 1

Oregon's Higher Education Goals and Our Progress

Update on 40-40-20

- Progress and trends
- Adult population
- Feasibility of achieving 40-40-20

Other Goals for Higher Education and Training

- Quality of life, effective citizenship
- Research and knowledge
- Workforce demands and employment opportunities
- Economic development

Part 2

Current Higher Education Landscape

Key conclusions:

- Higher education attainment is significantly dependent on high school completion rates
- Cost structures, delivery models, and public funding levels cannot all remain static
- Students are increasingly complex
- Students are increasingly served by a variety of institutions, timelines, and delivery systems
- Change must occur in partnership, not top-down
- The HECC is uniquely positioned to convene conversations and promote statewide, coordinated progress towards meeting state goals, including equity
- Higher education is a critical tool for developing Oregon's industry and economy

Part 3

HECC Roles and Responsibilities

HECC Role in Oregon Postsecondary Education

- State strategic plan
- State budget development and recommendations
- State funding allocations
- University mission approvals, annual evaluations
- Program approvals
- Inter-institutional coordination
- Strategies to improve access, affordability, and student success
- Data collection, analysis, and reporting
- Partnering with OWIB and OED to meet workforce needs
- Oversight of private colleges and career schools

Part 3

HECC Roles and Responsibilities

HECC's Approach to Strategic Plan

Describe a “big vision” that will be advanced through “little actions” – especially partnerships – to make progress towards state’s education goals

Part 4

HECC Strategies:

Goal-Setting

Student Supports

Pathways

Affordability

Part 4

HECC Strategies:

Student Supports

Pathways

Affordability

Goal-Setting: Sharpen State Goals

HECC Levers

- Data analysis and reporting
- Policy recommendations to Legislature and Governor

Strategies

- New adult educational attainment goal
- Specific goals for workforce development
- Interim 40-40-20 targets
- Systematic public reporting on higher education outcomes, focused on equity
- Collaborate with institutions to capture student intent
- Improve capacity for capturing, monitoring, analyzing, and reporting student data

Part 4

HECC Strategies: Goal-Setting

Pathways

Affordability

Student Support: Improve campus and Community-Based Support

HECC Levers

- Funding allocations
- Incentivizing promising practices
- Convening experts, stakeholders, communities
- Engaging students and families

Strategies

- Funding allocation formulas as incentive for investments in student success
- Consider creation of public university strategic fund
- Support development of technical assistance centers
- Tuition funding complemented with dedicated student success funding
- Engage students, families, and communities as partners
- Increased state investments in institutional capacity

Part 4

HECC Strategies:

Goal-Setting

Student Supports

Affordability

Pathways: Simplify and Coordinate Systems and Structures

HECC Levers

- Publishing data, setting standards, transparent results
- Convening faculty and institutions
- Budget development, strategic investment

Strategies

- Develop the “pipeline”
- Alignment of courses, standards, and pathways
- Access and smooth transitions
- Encourage student exploration of goals
- Improve connection and alignment with employer needs

Part 4

HECC Strategies:

Goal-Setting

Student Supports

Pathways

Affordability: Limit Student and Family Cost for All

HECC Levers

- Tuition cap, institutional accountability
- State investment, Oregon Opportunity Grant
- Improve completion rates, time-to-degree, and transitions to workforce

Strategies

- Improve affordability benchmark
- Connect students with promise of affordability, beginning with middle school
- Support innovative high quality, lower-cost structures
- Increase state financial aid to national average per student

Part 5

Conclusion

What's missing?

- Strategies for research, innovation, and economic development
- Need for a better inventory of existing higher education capacity in relationship to our goals
- Role of regional approaches
- Other?



STEM Innovation Grants

Implementation Plan



Adaptive Math Learning Pilot \$1.25M	
	Identify 2-5 platforms through RFQ process. Then award \$25K per classroom through RFA for implementation. Emphasis on teams and multi grade level participation.
Target Grade Span	<i>Grade K-8</i>
RFI	November-January
Draft RFP to STEM Council	<i>December 14-16, 2015</i>
Release RFP/RFA	<i>January 25, 2016</i>
Tentative Response Due	<i>March 4, 2016</i>
Awards Anticipated	<i>April 1, 2016</i>
Final Report	<i>June 30, 2017</i>
Project Outcomes	<ol style="list-style-type: none"> 1. Increase student mathematics achievement related to Oregon standards through implementation of adaptive learning technology. (Goal 1) 2. Decrease the mathematics achievement gap between historically underserved students and their peers through implementation of adaptive learning technology. (Goal 2) 3. Increase student interest and enthusiasm in math by providing more opportunities for individualized instruction using adaptive learning technology. (Goal 1) 4. Increase pedagogical preparedness of teachers to successfully implement differentiated instruction and high quality student independent practice using adaptive learning technology. (Goal 3) 5. Improve the effectiveness of student individual practice in mathematics at school and at home using adaptive learning technology. (Goal 1) 6. Increase teacher use of formative assessment practices through adaptive learning technology. (Goal 3) 7. Increase teacher enthusiasm and self-efficacy for individualizing mathematics instruction through the use of adaptive learning technology. (Goal 3)

STEM Innovation Grants

Implementation Plan

Out of School Programming	
\$1.5M	
	Award 5-10 grants up to \$300K to education partner with existing out-of-school time collaboration. Emphasis on providing off-site partnerships.
Target Grade Span	<i>Grade 4-8</i>
Draft RFP to STEM Council	<i>November 2-4, 2015</i>
Release RFP/RFA	<i>November 16, 2015</i>
Tentative Response Due	<i>January 15, 2016</i>
Awards Anticipated	<i>February 15, 2016</i>
Final Report	<i>June 30, 2017</i>
Project Outcomes	<ol style="list-style-type: none"> 1. Measurably increase student achievement and growth in STEM, associated with child reports that they could envision a “future self” that included membership in a STEM profession, as appropriate for students in grades 4-8. (Goal 1) 2. Decrease achievement gaps among underserved and underrepresented populations in science, technology, engineering, and mathematics for STEM related degrees and careers. (Goal 2) 3. Increase student STEM interest, motivation and enthusiasm in STEM-related activities and careers with more opportunities to engage in interactive, student-centered problem solving within instructional time. (Goal 1) 4. Increase student STEM interest, motivation and enthusiasm in STEM-related activities and careers with more opportunities to engage in interactive, student-centered problem solving within instructional time. (Goal 1) 5. Increase high quality inquiry-based instructional practice that relates directly to changes in student STEM Identity and “future self” beliefs. (Goal 3) 6. Support instructor and STEM provider self-efficacy and enthusiasm for applied Out Of School STEM that over time help them to include more challenging open ended activities within instruction, and enhanced interactions with student participants. (Goal 3) 7. Provide professional supports to strengthen youth engagement over multiple sessions that is likely to include scaffolding and teacher modeling of the learning task. (Goal 4) 8. Build quality-focused Out of School culture that continuously improves programming quality and ultimately upgrade the outcomes for their participants. (Goal 4)

STEM Innovation Grants

Implementation Plan

Digital Literacy & Computer Science \$750K	
	Award 1-4 grants that provide professional development to promote digital literacy, increase professional networks and strengthen programs of study.
Target Grade Span	<i>Grade 7-12</i>
Draft RFP to STEM Council	<i>November 2-4, 2015</i>
Release RFP/RFA	<i>November 16, 2015</i>
Tentative Response Due	<i>January 15, 2016</i>
Awards Anticipated	<i>February 15, 2016</i>
Final Report	<i>June 30, 2017</i>
Project Outcomes	<ol style="list-style-type: none"> 1. Increase confidence among computer science teachers to teach coding, design thinking and digital literacy. (Goal 3) 2. Increase applications for new programs of study in computer science at the secondary level. (Goal 4) 3. Increase teacher participation in professional networks that support computer science instruction. (Goal 3) 4. Increase pedagogical preparedness of teachers to successfully implement inquiry-based practices within computer science instruction. (Goal 3) 5. Increase teacher enthusiasm and self-efficacy for applied computer science. (Goal 3) 6. Create teacher awareness of how to include more challenging, open-ended activities within instruction. (Goal 3) 7. Strengthen teacher beliefs that their students are capable of applying computer science to skills that will lead to high wage/high demand occupations. (Goal 3)

Math In Real Life \$1.25M	
	Award 5-10 grants up to \$250K to provide regional professional development in applied mathematics.
Target Grade Span	<i>Grade 7-10</i>
Draft RFP to STEM Council	<i>November 16-18, 2015</i>
Release RFP/RFA	<i>November 23, 2015</i>
Tentative Response Due	<i>January 22, 2016</i>
Awards Anticipated	<i>February 14, 2016</i>
Final Report	<i>June 30, 2017</i>
Project Outcomes	<ol style="list-style-type: none"> 1. Increase student mathematics achievement related to Oregon standards through implementation of applied mathematics problems. (Goal 1) 2. Decrease the mathematics achievement gap between historically underserved students and their peers through implementation of applied mathematics problems. 3. Student attitudes and beliefs that are correlated to higher achievement. (Goal 2) 4. Increase student interest and enthusiasm in math by providing more opportunities to engage in interactive, student-centered problems that are based in applied mathematics. (Goal 1) 5. Increase pedagogical preparedness of teachers to successfully implement inquiry-based practices within applied mathematics instruction. (Goal 3) 6. Increase teacher knowledge of the application of mathematics. (Goal 3) 7. Increase teacher enthusiasm and self-efficacy for mathematics to stimulate inclusion of more challenging open ended applied mathematics activities within instruction. (Goal 3) 8. Increase teacher beliefs that all their students are capable of doing mathematics. (Goal 3)

STEM Innovation Grants



IMPLEMENTATION PLANS

STEM INVESTMENT COUNCIL

OCTOBER 23, 2015

Today



- High level look at the plan for each investment to date
- Ensure the work is aligned with the planned outcomes of the STEM Investment Council
- Gain support to move forward

Purpose



- HB 3072
- Award grants that expand the implementation and effective programs relating to STEM that:
 - Propose innovative approaches to STEM-based education
 - Provide professional development relating to STEM

STEM Innovation Grants - \$4.75 Million



Adaptive Mathematics Pilot

- \$1.25 million
- K-12
- Students and teachers
- Computer based instruction

Out of School STEM

- \$1.5 million
- Grade 4-8
- Historically underserved students
- Offsite partnerships

Digital Literacy and Computer Science

- \$750,000
- Grade 7-12
- Teachers
- Professional development and networking

Math In Real Life

- \$1.25 million
- Grade 7-10
- Teachers
- Professional development and networking

To clarify...



- OARs should be adopted prior to:
 - Releasing official notifications
 - Releasing RFP
 - Releasing funding
 - Proposed pending approval

- OAR adoption yesterday
 - Temporary but effective immediately
 - Second hearing/adoption in December

The Investments



Adaptive Math Learning Pilot - Overview



- Focus –
 - Students and teachers grades K-8
- Provide resources to implement math adaptive learning software that:
 - Personalizes learning opportunities for students
 - Connects school and home
 - Provides data to support formative assessment practices
 - Focuses on both conceptual and procedural understanding of mathematics with application
 - Organizes content into coherent sequences aligned with the Common Core State Standards
 - Provides accommodations for students who are English language learners and for students with disabilities

Adaptive Math Learning Pilot – Implementation



- **Phase 1 – Identify potential adaptive math learning software**
 - November 2015 – January 2016
 - Determine criteria
 - Release Request for Information (RFI)
 - Review responses
- **Phase 2 – Identify K- 8 classrooms for implementation**
 - December 2015 – June 2017
 - Award implementation grants (\approx \$25,000 per classroom)
 - Professional development on use of software
 - Implementation for students
 - Evaluation of effectiveness

Adaptive Math Learning Pilot - Outcomes



- Outcomes focused on:
 - Student mathematics content knowledge
 - Student attitudes and beliefs related to learning mathematics
 - Teacher instructional practices
 - Teacher attitudes and beliefs related to teaching mathematics

Out of School Time - Overview



- **Focus**
 - Students grades -4-8
 - Historically underserved students
- **Includes summer, after school, weekend opportunities**
 - Minimum student duration & intensity: 70 hours per series
 - Linked STEM inquiry, problem-based & active-learning
 - Exposure over multiple sessions promotes skill-building to transfer mastery and achievement in new settings
- **Program Quality Leading Indicators**
 - Collaboration & partnership
 - Staff
 - Intentionality of programming
 - Intentionality in family program offerings

Out of School Time - Implementation



Phase 1: Identify potential providers through request for application

- Partnership and organizational capacity
- Readiness to proceed
- Common agenda
- Mutually reinforcing activities
- Prior history
- Shared measurements
- Proposed scope and scale

● Phase 2: Select top applicants for program implementation

- Scope of project – sites, students, staff
- Partner contributions
- Service level per student – duration and intensity
- System building
- Implementation
- Evaluation – interim and final outcomes

Out of School Time - Outcomes



- Outcomes focused on:
 - Increase student STEM content knowledge
 - Student attitudes & beliefs correlated to higher achievement
 - ✦ The STEM identity of 4th – 8th grade students will increase, associated with the incidence of child/student reports that they can envision a “future self” that includes membership in a STEM profession.
 - Enhance and support Quality STEM instructional strategies
 - Further extend instructor attitudes and beliefs about themselves and their students

Digital Literacy & Computer Science - Overview



- Focus –
 - Teachers grade 7-12
- Create opportunities for innovative approaches that support teacher effectiveness to increase:
 - Student access to courses targeting software design and programming careers
 - Competency in programming, coding, digital literacy, and computer science
 - Computer science CTE programs of study
 - Participation in professional development support networks
 - Teacher buy-in to the importance of teaching coding as a pathway to high wage/high demand career opportunities

Digital Literacy & Computer Science Implementation



- Phase 1 – Identify potential teacher support networks and/or programs
 - November 2015-January 2016
 - Determine criteria
 - Request for application release
 - Review proposals
- Phase 2 – Implement networks and programs
 - December 2015-June 2017
 - Award Grants (1-4 grants; maximum \$750K)
 - Design professional development for coding and digital literacy
 - Develop professional networks
 - Increase program of study start-ups
 - Evaluate effectiveness

Digital Literacy & Computer Science - Outcomes



- Outcomes focused on:
 - Increased student access to computer science courses
 - Improved teacher attitude and beliefs related to teaching programming, coding, digital literacy and computer science.
 - Improved teacher access to and use of professional support networks
 - Increased “start up” CTE Programs of Study in Computer Science

Math in Real Life - Overview



- **Focus**
 - Students grades 7 - 10
- **Create change in math teaching practices through:**
 - Professional development on creating and teaching applied mathematics problems
 - Implementation of applied problems in classrooms
 - Peer collaboration on refinement of instructional practice related to applied mathematics
- **Build a strong community related to applied mathematics by:**
 - Connecting to other networks
 - Sharing resources among projects

Math in Real Life - Implementation



- **Formation of regional teams**
 - K-12 institutions
 - Post-secondary
 - Context expert
 - Regional partner (STEM Hub/ESD/teacher organization)
- **Formation of school-based teacher teams**
 - At least 4 teachers
 - Organized around context or grade level
 - Develop and test applied math activities
- **Share resources and practices**
 - Lessons shared online
 - Common pedagogy

Math in Real Life - Outcomes



- Outcomes focused on:
 - Student mathematics content knowledge
 - Student attitudes and beliefs related to learning mathematics
 - Teacher instructional practices
 - Teacher attitudes and beliefs related to teaching mathematics

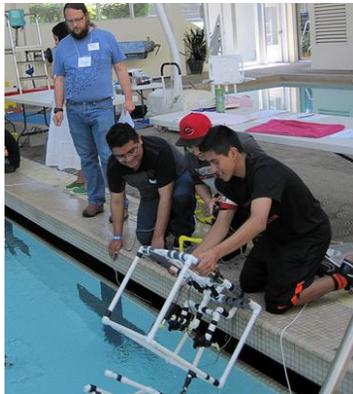
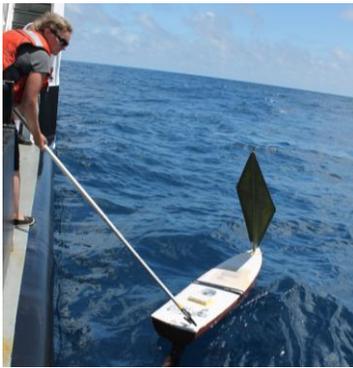
Discussion



- Do the outcomes described here align with the aims of the STEM Investment Council?
- What other input do you have for the staff working on these investments?

Oregon Coast STEM Hub

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



Who We Are

The Oregon Coast STEM Hub is a collaborative effort of more than 50 partners, including coastal school districts, post-secondary institutions, non-profits, government agencies, and businesses. Located at Oregon State University's Hatfield Marine Science Center, the Oregon Coast STEM Hub supports integrated Science, Technology, Engineering and Mathematics (STEM) education. We leverage local and regional resources to promote college and workforce-ready students who are equipped to pursue STEM careers and address real-world challenges. We seek to improve STEM education opportunities for all students along the Oregon Coast by promoting best practices in STEM education, connecting in and out-of-school learning, facilitating communication amongst stakeholders, and mentoring students and educators.

The Oregon Coast STEM Hub is Committed to:

- Promoting STEM literacy
- Inspiring student interest and participation in STEM activities and careers
- Enhancing the local and regional STEM workforce
- Increasing opportunities for all students in the STEM disciplines

Our Approach

- Engage students in hands-on, relevant activities that encourage the integration of problem solving, collaboration, and communication skills
- Provide educators with access to a network of support that includes Professional Development facilitators, STEM mentor teachers, informal educators, scientists, and community mentors
- Connect educators, parents, and partners to STEM resources and opportunities

"It's really exciting to see the breadth and depth of your partnerships, and the wonderful support that you are getting from such diverse sectors."

*—Mark Lewis, Director of STEM,
Oregon Education Investment Board*

Website

<http://OregonCoastSTEM.oregonstate.edu>

Facebook

<https://www.facebook.com/OregonCoastSTEM>

Blog

<http://blogs.oregonstate.edu/OregonCoastSTEM>

Email

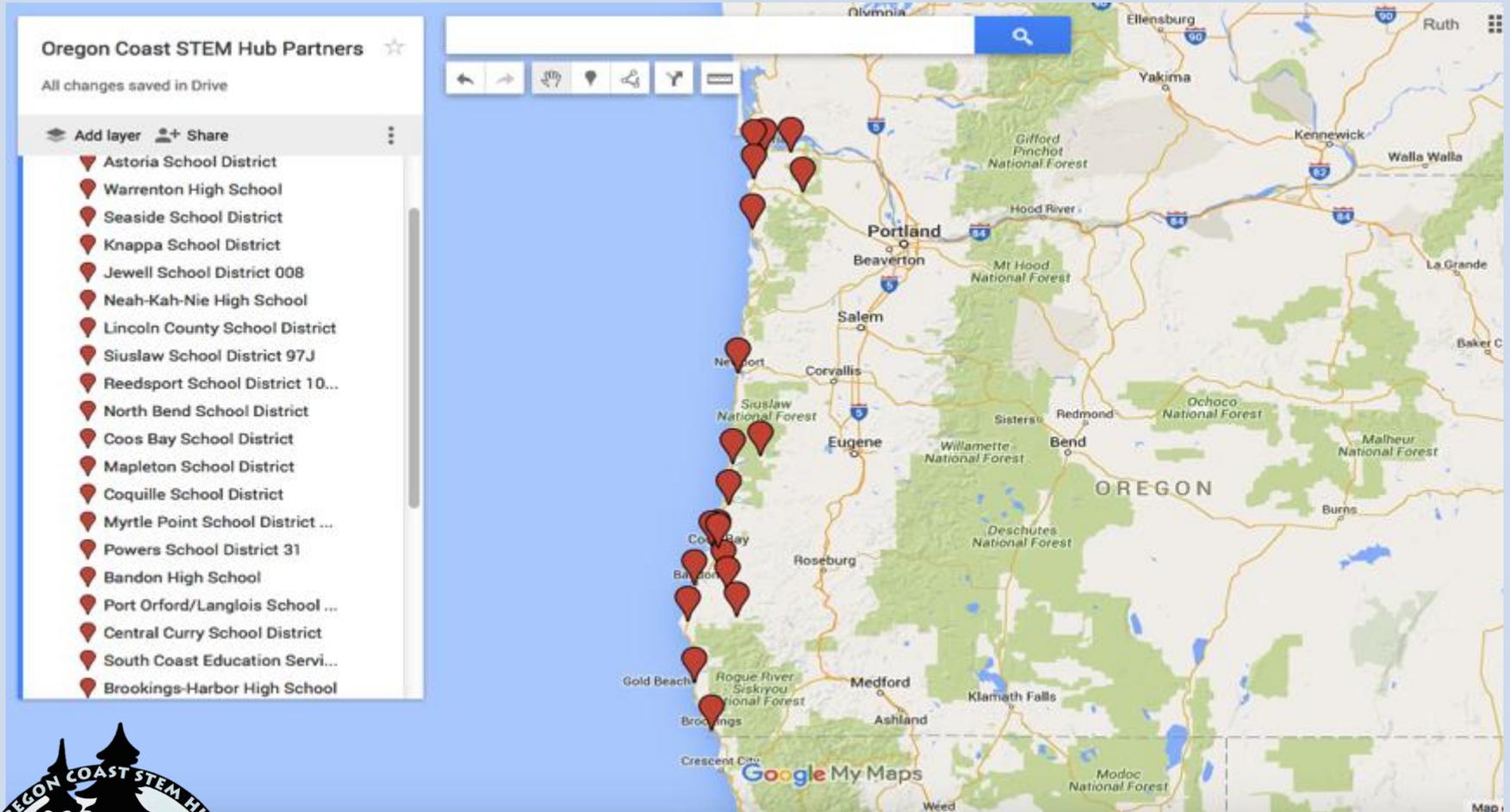
OregonCoastSTEM@oregonstate.edu



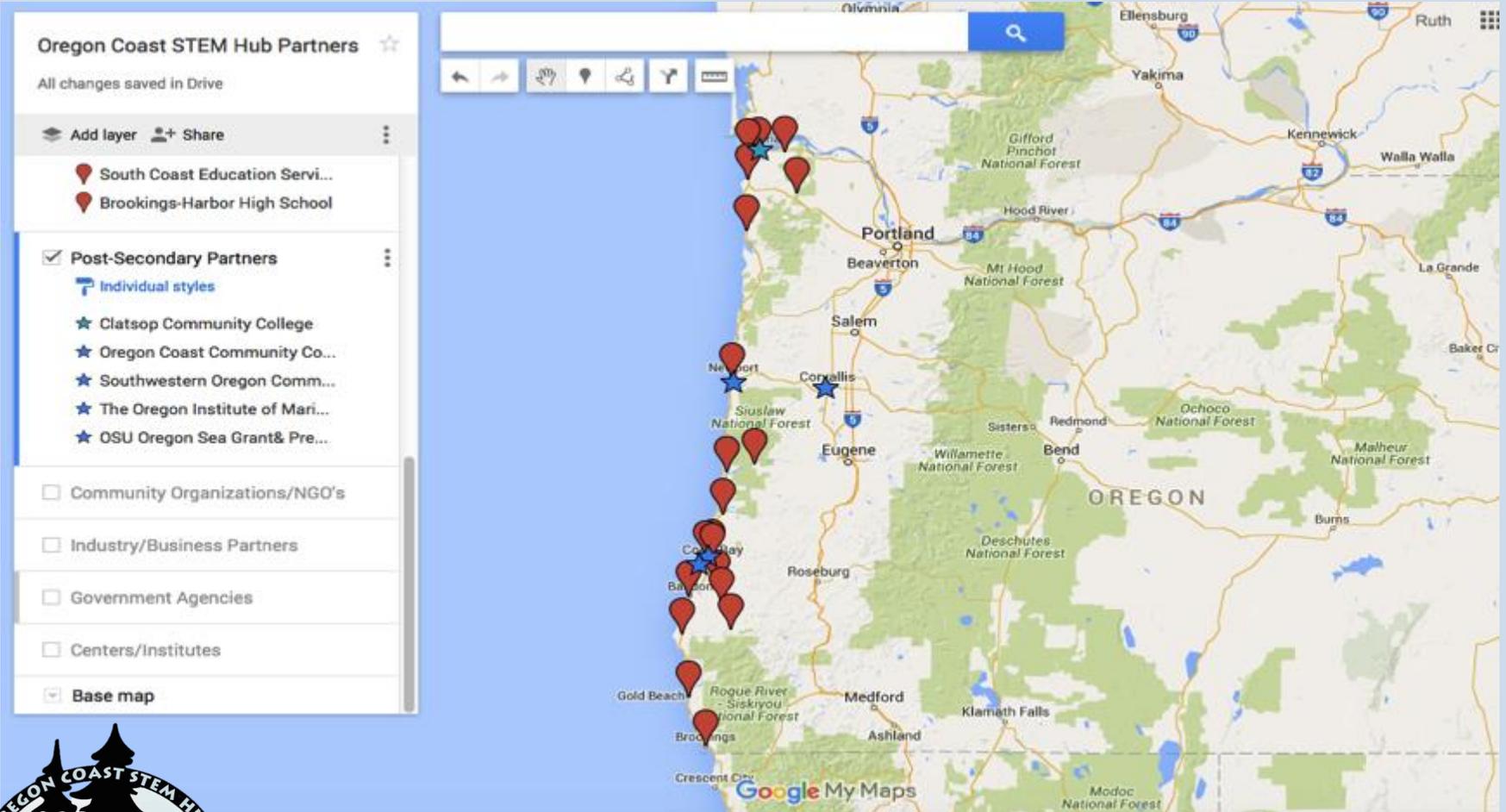
Fostering a culture of STEM innovation by engaging people of all ages to create a vibrant and prosperous region

Ruth McDonald, Partnership Liaison, Lincoln County School District

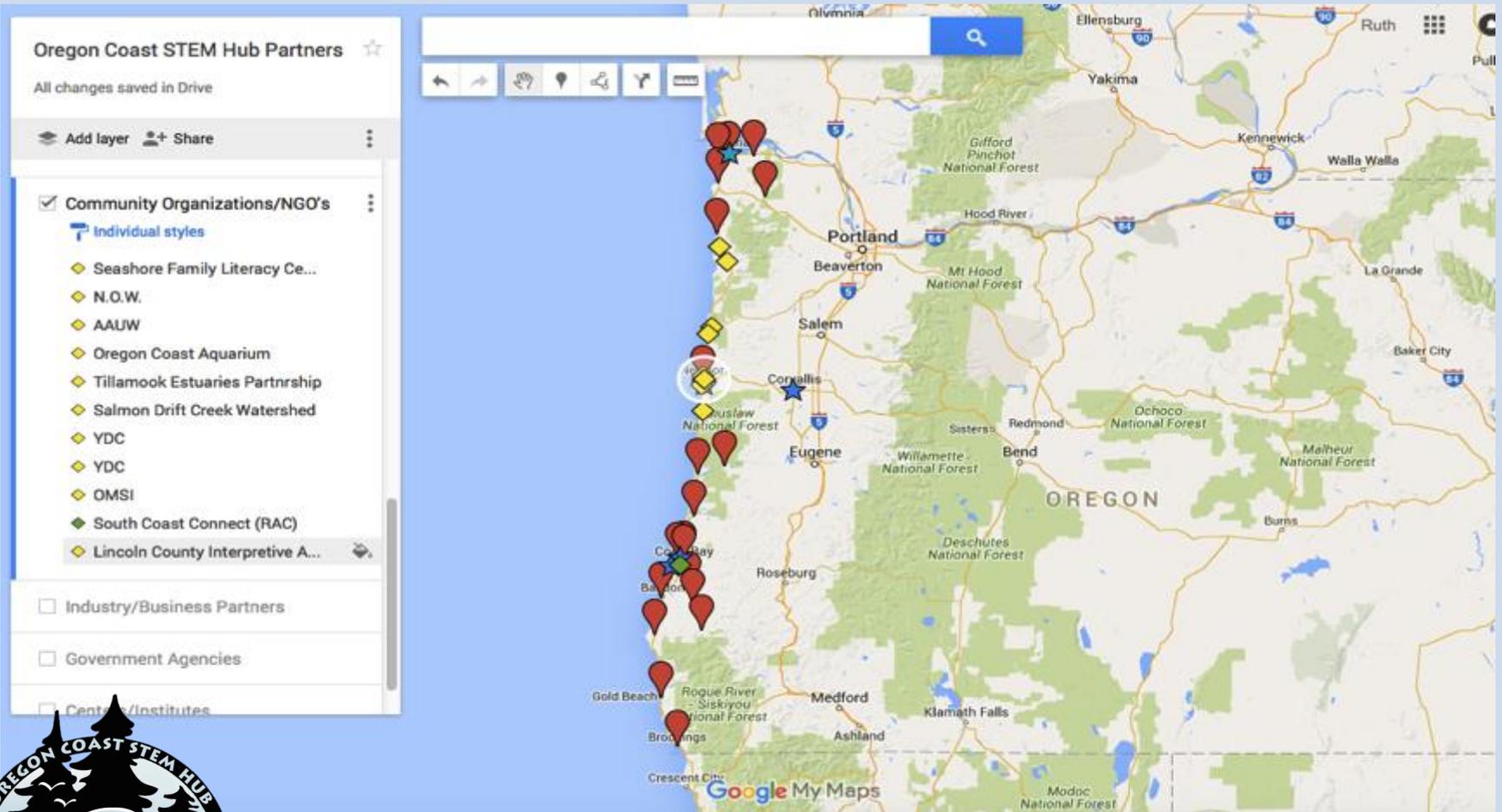
19 School Districts Served



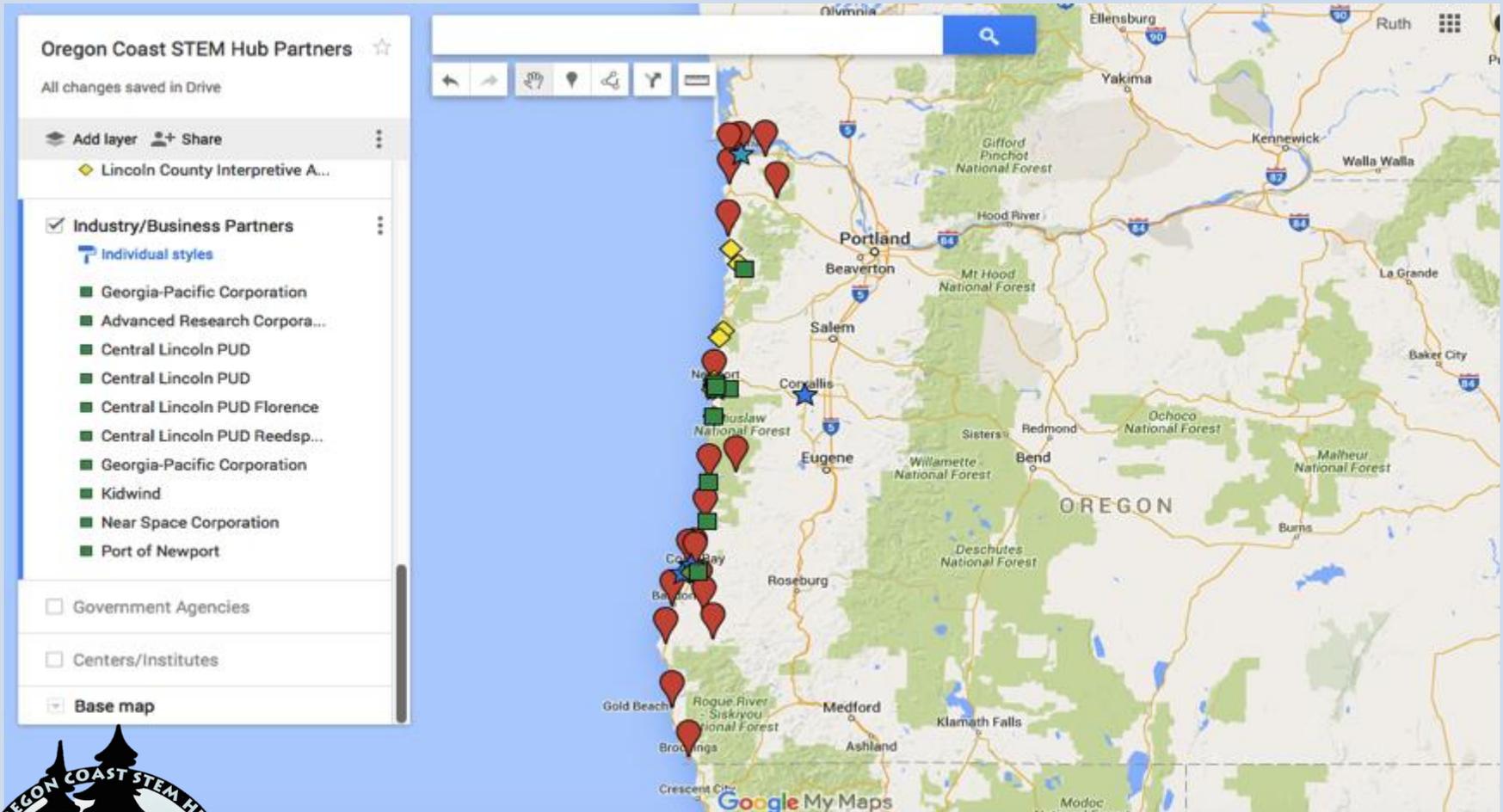
Post-Secondary Partners



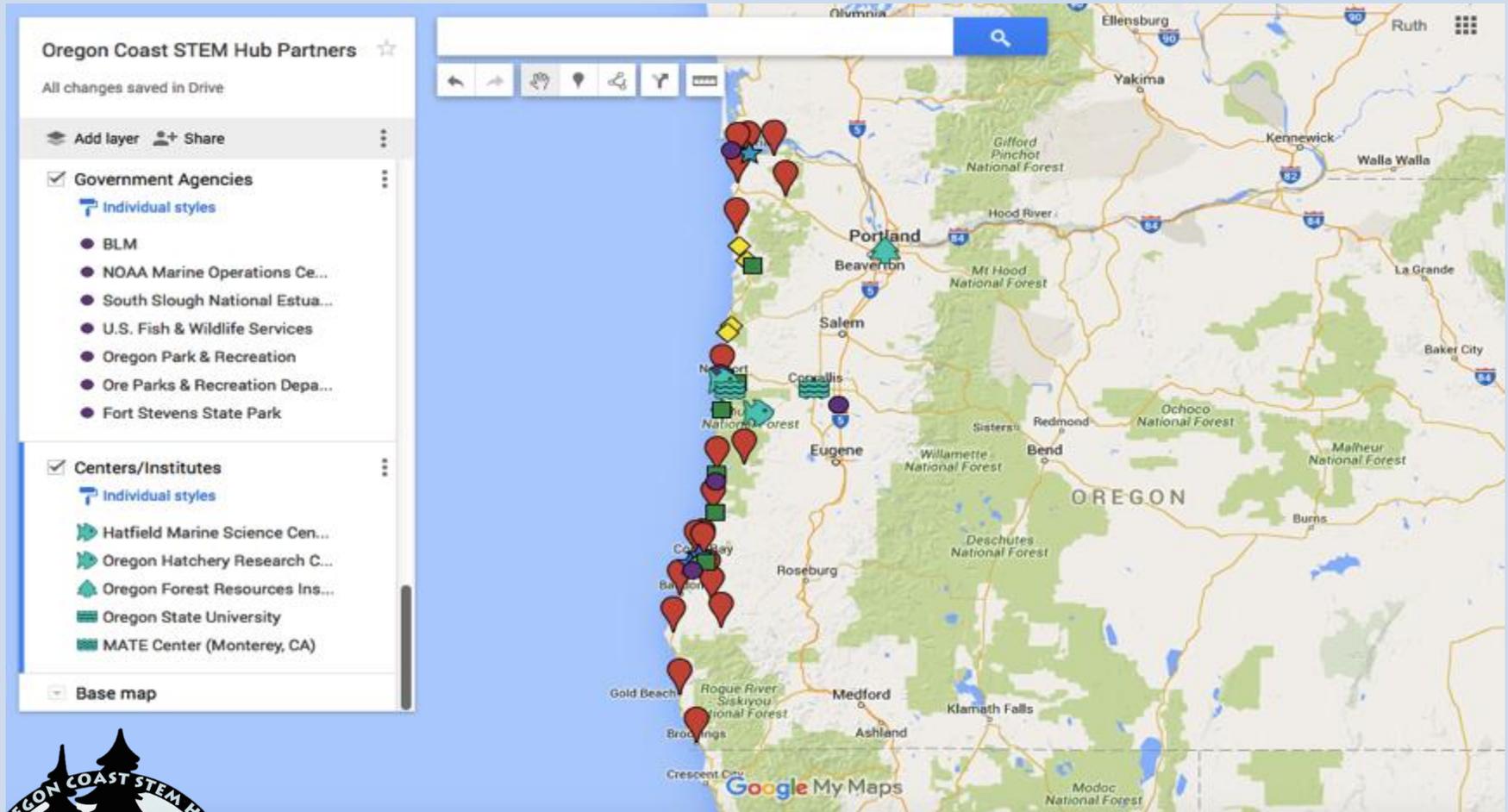
Community Organizations/NGO's



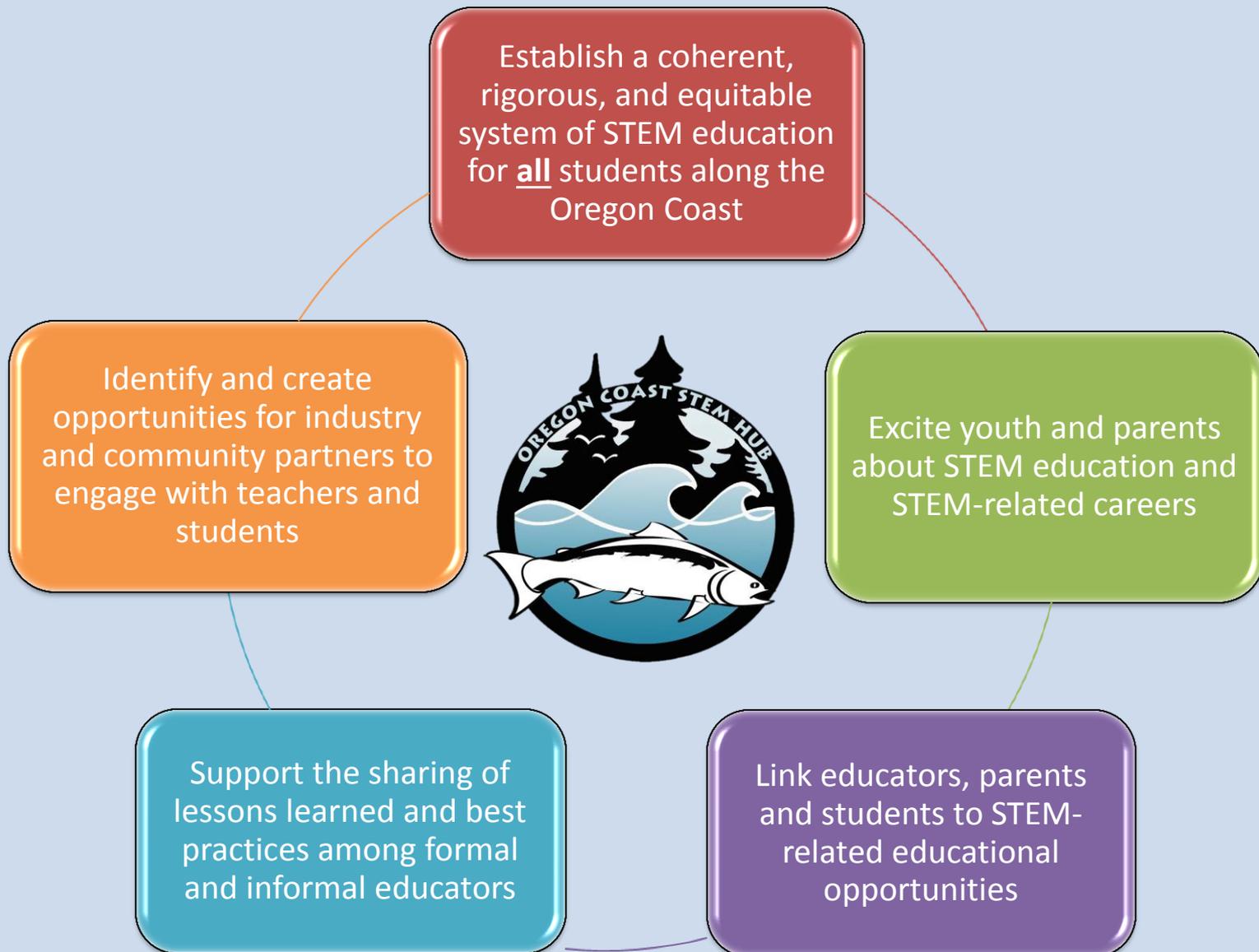
Industry/Business Partners



Centers/Institutes



Short Term Goals



Long Term Goals

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

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

Oregon Coast schools and educators have the tools and support needed to deliver world-class STEM instruction



Measurable Outcomes

Increase STEM interest, participation, retention, and achievement for all coastal students including those from typically under-represented populations in STEM fields

Improve students' 21st Century skills with a focus on critical thinking, communication and collaboration

Increase educators' ability to deliver integrated STEM instruction and student experiences that incorporate Inquiry, Project/Problem, and Field-Based Learning

Increased graduation rates and college readiness of Oregon Coast students



Strategies

Networking

Create a STEM network along the Oregon Coast of resources, programs, and professionals to support STEM learning for students, including a website to serve as a clearinghouse and conduit to connect business and community resources with educators, parents, and students.

Professional Development

Provide formal and informal educators and students with access to a network of support that includes PD Facilitators, STEM mentors, and scientists. Facilitate PD on effective instructional practices focused on inquiry, STEM integration, and Project Based Learning, while meeting NGSS and CCSS.

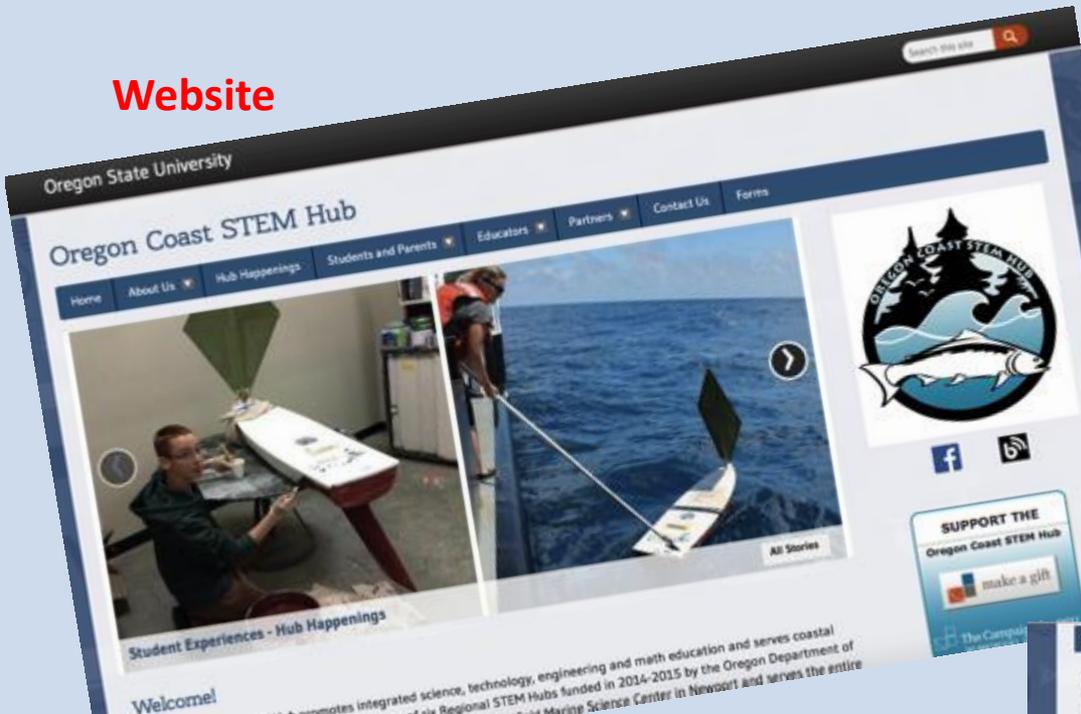
STEM Experiences

Engage students/youth in hands-on, relevant STEM learning that encourages integration of problem solving, collaboration, and communication skills. Provide connections to STEM professionals in the classroom and field, equipment and resources for carrying out STEM related activities, and opportunities to showcase student work.



Success: Network

Website



Facebook Page



Video and Radio PSA's



Blog & Calendar

55 Partners from Astoria to Brookings

School Districts & ESDs

[Astoria School District](#)
[Knappa School District](#)
[Warrenton-Hammond School District](#)
[Seaside School District](#)
[Jewell School District](#)
[Neah-Kah-Nie School District](#)
[Lincoln County School District](#)
[Siuslaw School District](#)
[Mapleton School District](#)
[Reedsport School District](#)
[North Bend School District](#)
[Coos Bay School District](#)
[Coquille School District](#)
[Myrtle Point School District](#)
[Powers School District](#)
[Bandon School District](#)
[Central Curry School District](#)
[Port Orford / Langlois School District](#)
[Brookings-Harbor School District](#)
[South Coast Educational Service District](#)

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](#)
[PreCollege Programs at OSU](#)
[Southwestern Oregon Community College](#)

Community Organizations / NGOs

[American Association of University
Women, Tillamook Chapter](#)
[Central Oregon Coast Chapter, National
Organization for Women](#)
[Lincoln County Interpretive Association](#)
[Northwest Aquatic and Marine Educators](#)
[Oregon Coast Aquarium](#)
[Oregon Museum of Science and Industry](#)
[Salmon Drift Creek Watershed Council](#)
[Seashore Family Literacy Center](#)
[Tillamook Estuaries Partnership](#)
[Youth Development Coalition of Lincoln
County](#)

Industry/Business

[Advanced Research Corporation](#)
[Central Lincoln PUD](#)
[Georgia Pacific](#)
[KidWind](#)
[Near Space Corporation](#)
[Port of Newport](#)
[Marine Technology Society](#)

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](#)
[United States Fish and Wildlife
Service](#)

Centers and Institutes

[Hatfield Marine Science Center](#)
[Marine Advanced Technology
Education Center](#)
[Northwest National Marine
Renewable Energy Center](#)
[Oregon Forestry Resources
Institute](#)
[Oregon Hatchery Research
Center](#)



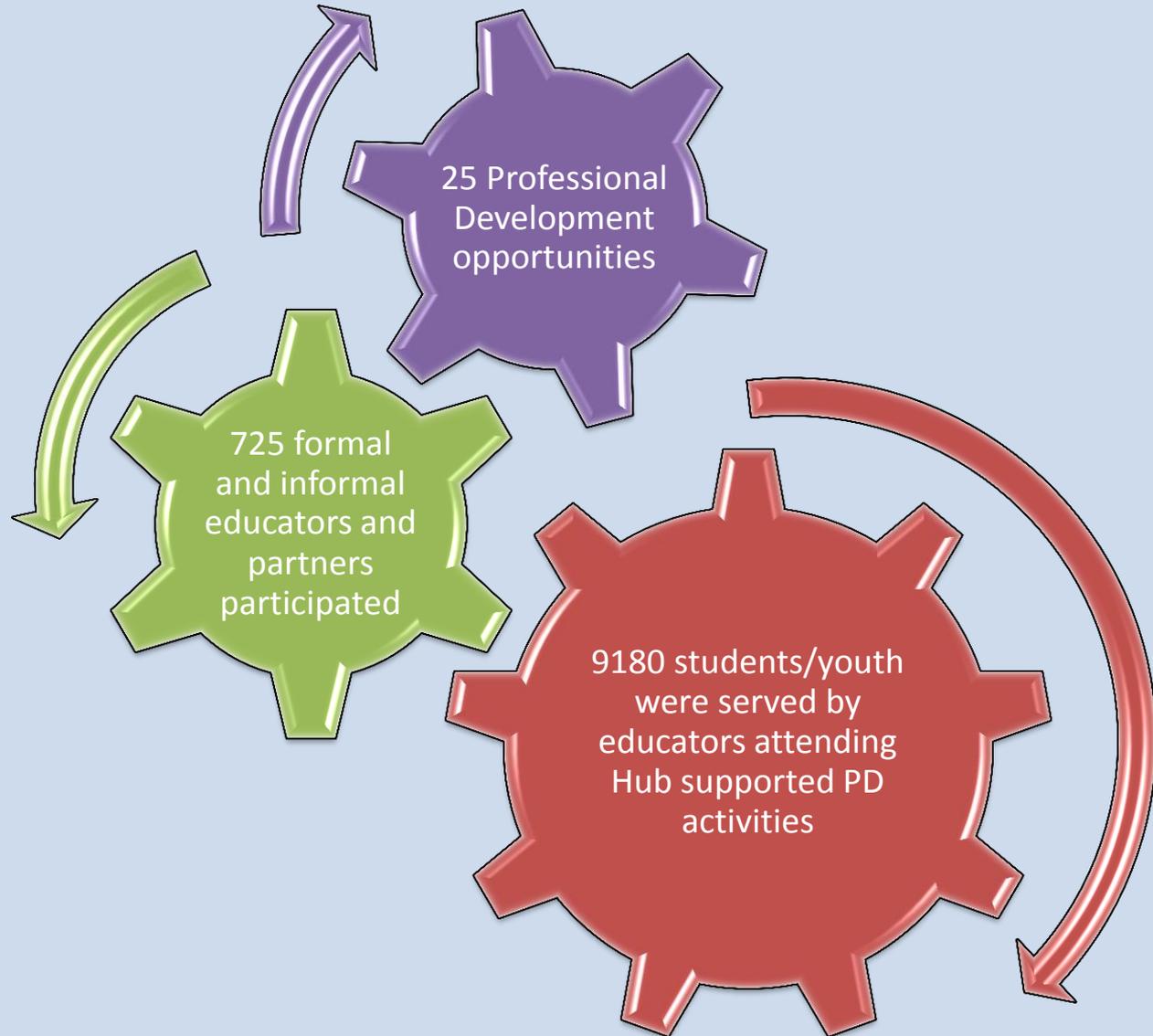
Networking Challenges

- Large geographic scale
- New partners
- Differing visions of Collective Impact Model
- Clarifying governance structure
- Equity and Inclusion
- Funding and timing of funding
- Effective Communication
- Managing expectations- clarity on what we can and cannot do for partners



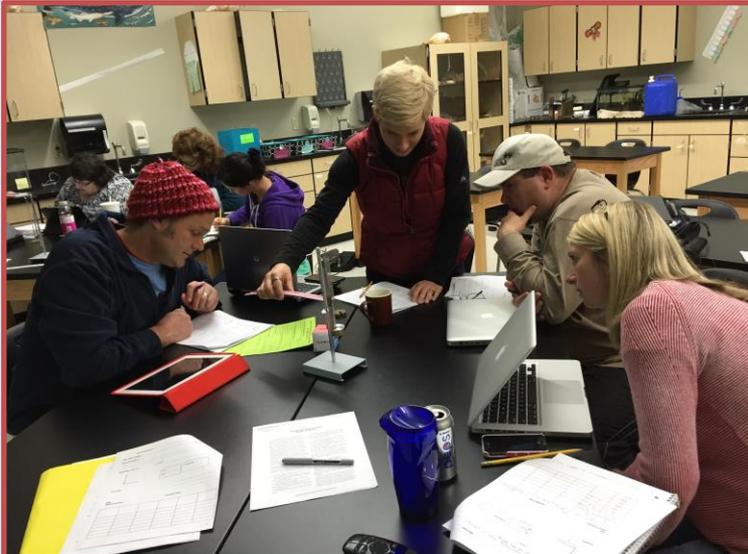
Success: Professional Development

- Motivated and engaged educators
- Offerings based on expressed needs (Survey)
- Follow-up to assess implementation
- Located North, South, Central coast





Adult Learning



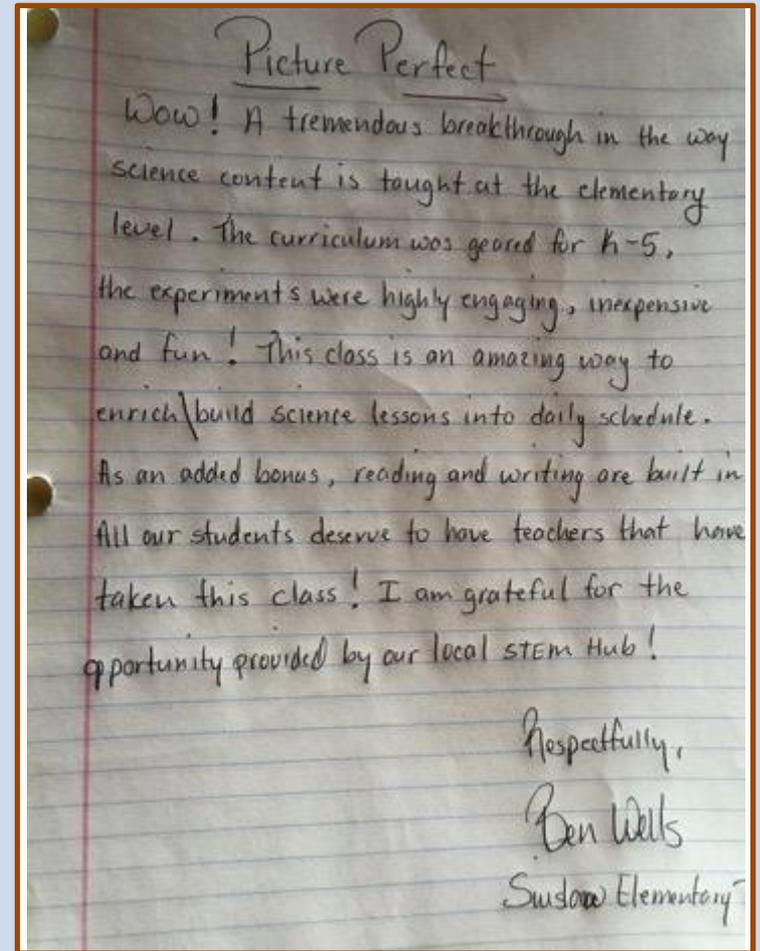
Here's what educators are saying about PD sponsored by the Oregon Coast STEM Hub:

I loved the actual digging of the filtration pits and the conversation around the activity. I also loved the wonderful rich table conversations and lunch conversations centering around STEM and what was happening in other districts. People were making lots of good contacts.

I also like how the offering through "STEM has brought it to the conversation table at the upper levels of administration in our district. Instead of putting science on a back burner we are being asked now to integrate it. Thank you!

We feel invigorated about teaching science, and our enthusiasm is rubbing off on our team members. Students are learning how to talk about science. We now will teach these concepts at the beginning of the year, so that science becomes natural.

Being able to explore the surroundings of this communities and apply it to our school surrounding-hands on is always what students remember the most



Professional Development Challenges

- Funding PD expenses for schools (subs, curriculum pay, materials)
- Time... not enough of it!
- New educators- high turnover, need to repeat PD year after year
- Collecting long term data and evidence of change in instructional practice (research says...)
- Engaging more post-secondary and informal educators in PD offerings
- Getting more providers to come to coast- Hub expected to BE a provider by partners



Success: STEM Experiences

Design Challenges (ROV, Renewable Energy, Robotics, Boat Building)

School Field Experiences, Family Science and Engineering Nights

7,307
students/youth
participated

STEM Camps (GEMS, COSEY, Migrant Summer STEM Camp, Tye Native America Camp)

Career Days, Industry Mentors, Scientists in Schools, Researcher Outreach



Here's what Educators are saying about STEM Experiences sponsored by the Oregon Coast STEM Hub:

"Thank you for supporting our high needs students who do not always have the same access to these activities!!"

- From a SPED high school teacher who brought students to the Oregon Hatchery Research Center to practice job skills. 4/23/15

"It was so wonderful to work with all of you to put together this great event. Seeing park rangers and scientists there, looking at our students' posters, made the event even more meaningful for the students."

"I felt it was a great opportunity for my kids to feel like a college student (the "lecture hall"), a researcher (sharing their work), and a member of something bigger in our community."

-From teachers whose 5th and 6th graders presented at a student STEMposium at Hatfield Marine Science Center. 5/13/15

"Thank you Oregon Coast STEM Hub for providing such an amazing learning experience for our students. This project brought the community into our school and caught the imagination of all the students who saw it, not just the seventh graders who built it. I am proud to be associated with Sunset School and the Oregon Coast STEM Hub."

-From a teacher reflecting on the unmanned boat building experience in Coos Bay. 5/23/15

"I just wanted to thank the Oregon Coast STEM Hub for this funding. This will really help our program support our students and that means the world to us."

- From a community college leader who brought high school students from three coastal school districts to a STEM Career Day event. 3/12/15

"This is one of the best most affordable STEM projects of its kind and the skills that students learn throughout the entire process, from the design phase to the competition, are unmatched." - From a teacher who brought a team to the Oregon Regional MATE ROV Competition in North Bend. 4/26/15





Student Learning



STEM Experiences Challenges

- Backbone Staff delivering STEM Experiences
- Travel costs for students and families
- Engaging more underrepresented groups
- Materials costs
- Engaging more out of school programs
- Training adults (educators, industry mentors, volunteers, graduate students)



Wins

- Engagement
 - 55 Partners/300+ Community Volunteers
 - Educators, students, parents
- Programming
 - STEM Experiences
 - Educator Professional Development
- Network and Communication along Coast
 - Website, Facebook, Blog
 - State NPR, Local Radio, Local Cable TV,
 - Newspapers (Print and Online)
- Resource Trailers Deployed with check-out system



Challenges

- Differing views on Collective Impact Model selected
 - Shared organization model
 - Some new partners have different vision from founding partners
- Long Term data needs to
 - Demonstrate impact and value
 - Show progress toward common goals
- Growing pains and valuing all partners/ contributions
- Funding/Staffing/Programming Sustainability
 - does not align with academic year
- Geography
 - Communicating/connecting across and within partner organizations



Next Steps

- Recruit and hire a Director
- Evaluate structure and governance, expand steering committee, add high level leaders (Leadership Council?)
- Update assets/needs-community meetings
- STEM Resource Trailers- promote, evaluate use and effectiveness
- Continue successes and target expressed needs
- Expand emphasis on informal & post-secondary connections
- Cultural Responsiveness/Equity training
- Seek Programming funds, other funding for sustainability
- Partnership development/engagement
- Align with other regional initiatives

