



JIM PIRO, Chair

AUBREY CLARK

HERB FRICKE

LISA GRAHAM

DWAYNE JOHNSON

ERIC MESLOW

THOMPSON  
MORRISON

Staff:

MARK LEWIS

# STEM Investment Council

February 12, 2016

9:00am – 12:00pm

2 World Trade Center

Plaza Conference Room

121 SW Salmon St., Portland

*Call-In Information:*

*Dial (888) 204 5984*

*Code 992939*

## AGENDA

- 1. Welcome & Introductions**
- 2. Director Update**  
Mark Lewis, STEM Education Director, Chief Education Office (CEdO)
- 3. Prioritization of STEM & CTE**  
Lindsey Capps, Chief Education Officer, CEdO
- 4. Regional Initiative Support and Evaluation**  
Krissi Hewitt, Regional Education Partnership Policy Advisor, CEdO
- 5. STEM Investment Updates**  
Laura Roach, Director Secondary-Post Secondary Transitions, ODE  
Deborah Bailey, Applied Science Specialist, ODE
- 6. CTE Revitalization Grants**  
Laura Roach, Director Secondary-Post Secondary Transitions, ODE
- 7. Strategic Planning Progress and Next Steps**
- 8. Logo and Branding for STEM**  
Jennifer Ruwart, Roger That
- 9. Oregon Talent Council Representative Selection**
- 10. Portland Metro STEM Partnership Update**
- 11. 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 Chief Education Office 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.*

# Transforming STEM Education in Oregon

## *A Strategic Plan*

January 2016

### STEM INVESTMENT COUNCIL VISION

Build an inclusive, sustainable, innovation-based economy by reimagining and transforming how we educate and empower individuals and communities. Oregonians of all races, economic status and locations will develop the fundamental STEM-enabled innovation skills and mindsets necessary to:

- Fully contribute to an increasingly complex and technologically rich global society
- Address high-demand workforce and industry needs
- Improve the prosperity of all individuals and communities across the state
- Become creative, life-long learners who can adapt to changing social and economic conditions

Oregonians have an enterprising history and spirit of innovation. Today, that spirit of innovation drives an economic resurgence infused by emerging technologies in every sector of the business landscape. This is evident, as expected, in electronics, software, clean energy, and cutting edge cancer research. But it's also true in older sectors such as food processing, manufacturing, agriculture, and forest products. In 2013, Oregon companies added more than 220,000 jobs. The majority of these were STEM-related, requiring the skills of Oregonians educated in science, technology, engineering, and mathematics. That number is expected to increase in 2015 as well as the foreseeable future.<sup>1</sup> This year, the state boosted job growth above 3 percent, making it the nation's 8<sup>th</sup> fastest growing economy.<sup>2</sup> One major driver of this job growth is Oregon's high-technology and software sectors, which pay average wages of \$100,000 per year. Additionally, Oregon's small-business innovators and entrepreneurs continue to propel the economies of Portland, the North Coast, the Gorge, and the East Cascades. The state's wages have rebounded too, and are now growing at nearly 8 percent per year.<sup>3</sup> And, every region of the state is experiencing various degrees of recovery in population growth and economic activity, even though many rural regions are still in distress. Highly skilled and educated newcomers are attracted to the state's quality of life and innovative economy.

### RELATIONSHIP OF STEM & CTE

The Oregon STEM Investment Council believes that STEM and CTE are extremely complementary, and are keys to preparing *each* student for success in postsecondary education and beyond. While this report primarily focuses on STEM, the Council acknowledges that both STEM and CTE education are most effective in the context of applied learning.

Against this backdrop, there is a looming and growing disconnect between the demand for skills and talent in Oregon's economy and the number of young Oregonians emerging from our education system who possess such skills and talent, especially in the STEM disciplines. This disconnect represents a threat to the job prospects of our people and the competitive capacity of our economy.

This needn't be so. Each one of Oregon's students has the potential to acquire and apply capabilities in the jobs demanded by a cutting-edge economy. Yet, important performance benchmarks indicate that not enough Oregon students are on the path to be ready for the challenging, high-paying jobs in Oregon's evolving economy. This year, for instance, only 37 percent of Oregon fourth

<sup>1</sup> 2015-2017 Initial Oregon Talent Plan – 11/5/15

<sup>2</sup> Oregon Economic Review and Forecast, September 8, 2015; accessed December 2, 2015: <http://www.oregon.gov/DAS/OEA/docs/economic/oregon.pdf>

<sup>3</sup> Ibid.

graders scored at or above the proficient level for math in the National Assessment of Educational Progress. That's 3 percent fewer than in 2013. NAEP scores were even more problematic for students from communities of color and low-income families. African American students scored an average of 26 points lower than White students; Hispanic students scored an average of 18 points lower than White students; and students of low-socioeconomic status scored an average of 20 points lower than other students.<sup>4</sup>

Oregon cannot afford its growing talent shortages. By 2020, our economy will have almost 40,000 new job openings per year in STEM-related fields, and 94 percent of those will require a postsecondary credential.<sup>5</sup> Today, based on current labor market data, the state's three most in-demand industry clusters are healthcare (with 11,157 job openings), manufacturing (with 6,213 job openings) and information services (with 2,269 job openings). Within these industries, healthcare practitioners (with 3,813 job openings), computers and IT (with 2,171 job openings) and architecture and engineering (with 1,241 job openings) lead the technical and professional occupations.<sup>6</sup>

The bottom line: Oregon's growing economy requires that the state prepare individuals for future high-wage STEM jobs. Although there were still more than 117,000 unemployed workers in August 2015,<sup>7</sup> Oregon companies indicated that they cannot find qualified talent. This mismatch of talent and available jobs will only intensify in the future if the skills and preparation gaps are not addressed.

Oregon must act now. It must strive to help *each* student reach his/her full potential and achieve the individual prosperity necessary to thrive as a citizen of Oregon and of the world. Each student must be equipped with the cross-cutting skills—creative thinking, problem solving, communicating, collaborating, adapting and self-starting—that they will need to succeed in almost every sector of tomorrow's marketplace. Oregon would be selling its students short if it did not help them reach and apply their creative potential.

How can Oregon ensure that it fully prepares each student for success in tomorrow's economy? One answer is STEM and CTE. Both increase the relevance of teaching and learning for both educators and students. Students, in turn, become more engaged in the learning process. Engaged learners succeed and graduate. The state must continue to transform its approach to teaching and learning by amplifying, spreading and scaling STEM education. In its truest form, STEM is a multidisciplinary approach to learning that embeds the arts and humanities and eliminates the walls between academic and applied learning, in-school and out-of-school learning, and educators and employers. STEM education equips Oregon students with the knowledge, skills and mindset that will help them thrive in a rapidly-changing, technologically-rich world. The applied learning of STEM and CTE engages and motivates students, ignites curiosity and creativity, encourages problem solving, and instills strong work habits.

This STEM strategic plan outlines the steps Oregon should take to continue to innovate its STEM future. It recognizes the substantial STEM groundwork the state has already put in place and builds on it to identify

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<sup>4</sup> U.S. Department of Education, *The Nation's Report Card* (2015), accessed on November 24, 2015, <http://nces.ed.gov/nationsreportcard/subject/publications/stt2015/pdf/2016009OR4.pdf>.

<sup>5</sup> Oregon STEM Employer Coalition, *Oregon Learns: Time to Invest Seriously in STEM* (2012)

<sup>6</sup> Ibid.

<sup>7</sup> Oregon Economic Review and Forecast, September 8, 2015; accessed December 2, 2015: <http://www.oregon.gov/DAS/OEA/docs/economic/oregon.pdf>

and prioritize levers, based on key gaps, to drive state investments in STEM initiatives and supports. The beneficiaries of this plan – Oregon’s learners and workers – will shape the state’s economy and future.

**Oregon’s Current STEM Ecosystem: Robust STEM Goals, Policies & Investments, But More Work Remains**

In 2011, Oregon state leaders adopted the bold 40-40-20 goal: By 2025, 100 percent of Oregon’s students will graduate from high school, with 40 percent going on to earn a bachelor’s degree or higher, and 40 percent holding at an associate’s degree or other technical credential. STEM education plays an important role in achieving this statewide goal. Using the 40-40-20 goal as a springboard, the legislature established the STEM Investment Council to 1) double the number of 4<sup>th</sup> and 8<sup>th</sup> grade students proficient in math and science by 2025 and 2) double the number of CTE-STEM degrees and certificates by 2025. The STEM Investment Council is also committed to achieving equity of access, opportunity, and attainment for underserved and underrepresented populations, and has set a goal to increase opportunities and achievement for students from underrepresented groups. These goals, driven by a legislative mandate, were put in place to achieve higher per capita income and reduce poverty. The goals serve as building blocks for this STEM strategic plan.

To reach these goals, Oregon has aggressively identified, implemented, and invested in STEM policies and

**OREGON’S REGIONAL STEM HUBS**

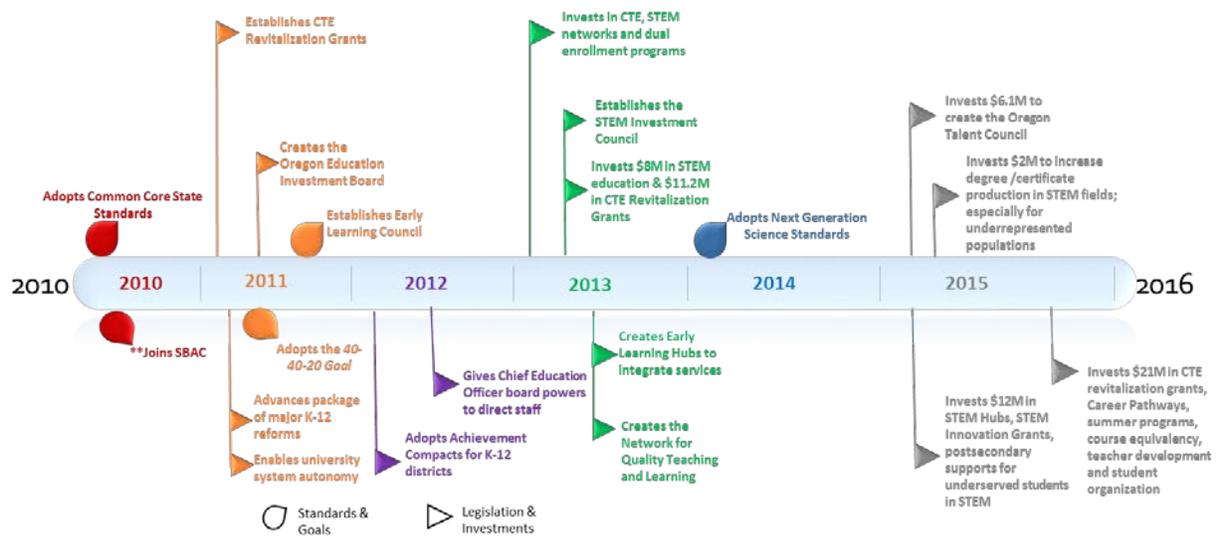
The Oregon Education Investment Board funded several collaborative partnerships including a statewide network of six Regional STEM Hubs. The hubs – organized under STEM Oregon – coordinate regional communication and partnerships, improve key student outcomes, build capacity and sustainability for change and encourage and support local and statewide multisector engagement.

The Hubs are multisector partnerships that link local P-20 educators with representatives from workforce and economic development, community-based organizations and business to transform STEM teaching and learning.

Current Regional STEM Hubs include:

- Oregon Coast Regional STEM Hub
- Portland Metro STEM Partnership
- South Metro-Salem STEM Partnership
- Central Oregon STEM Hub
- GO STEM Collaborative
- Umpqua Valley Regional STEM Hub

**FIGURE 1: OREGON’S STEM GOALS, POLICIES AND INVESTMENTS**



\*\*Offers an "opt-out" provision

initiatives (see Figure 1). In 2012 the state adopted college- and career-readiness standards to increase expectations -- and the quality of teaching and learning -- for Oregon students. This policy ensures that Oregon students master mathematical concepts that are the bedrock of long-term STEM literacy. In 2011, to better serve students and create a seamless system, particularly across institutional transitions, the Oregon legislature created the Oregon Education Investment Board, now restructured as the Chief Education Office.

In 2012, the legislature created the Joint Interim Task Force on STEM Access and Success (HB 4056), which called for the creation of the STEM Investment Council; created a statewide network of regional STEM Hubs; enhanced education and infrastructure improvements; and forged stronger industry partnerships. In 2013, the Legislature established the STEM Investment Council (HB 2636) to advance goals related to STEM. In 2014, Oregon was one of only 17 states, plus the District of Columbia, to adopt and implement the Next Generation Science Standards (NGSS) – another policy that touches the learning experience of every Oregon student. Through the NGSS, students are immersed in the engineering design process, which cuts across the science standards. To bring education and workforce more tightly together, the legislature created the Oregon Talent Council in 2015 and charged it to “advise and be a resource for state agencies and education institutions on issues of talent development and promote the growth and competitiveness of Oregon’s traded sector and high-growth industries.” This coherent set of policies and strategic actions seeks to address the state’s full education and workforce continuum.

In conjunction with its policies and actions, the Oregon Legislature has made considerable investments to increase student learning opportunities in STEM education, to increase degree and certificate production in STEM fields, and to increase participation and degree completion in STEM fields by students of color and women at public colleges and universities. In 2013, in addition to establishing the STEM Investment Council, the Legislature allocated \$8.5M to fund six regional STEM Hubs, model STEM Lab Schools, and a suite of STEM/STEAM/CTE grants focused on underserved and underrepresented students. In 2015 the Legislature (HB 3072) doubled funding for CTE and STEM education, increasing its investment from \$17M to nearly \$35M, including investments for regional STEM Hubs, STEM innovation grants, CTE revitalization grants, Career Pathways, CTE summer programs, teacher development, and post-secondary support for underserved and underrepresented students. It also established the Oregon Talent Council and invested \$6.1M to support start-up programs at post-secondary institutions aligned with high-wage, high-growth sectors. Earlier this year, the Oregon Higher Education Coordinating Council implemented a new funding model, known as the Student Success and Completion Model, which focuses on successful student completion of degrees with special emphasis on historically underserved students and degrees in high-priority fields. The Legislature also invested \$10M to create the Oregon Promise, which offsets tuition payments for Oregon’s recent high school graduates who attend and pursue a certificate or degree at one of the state 17 community colleges.

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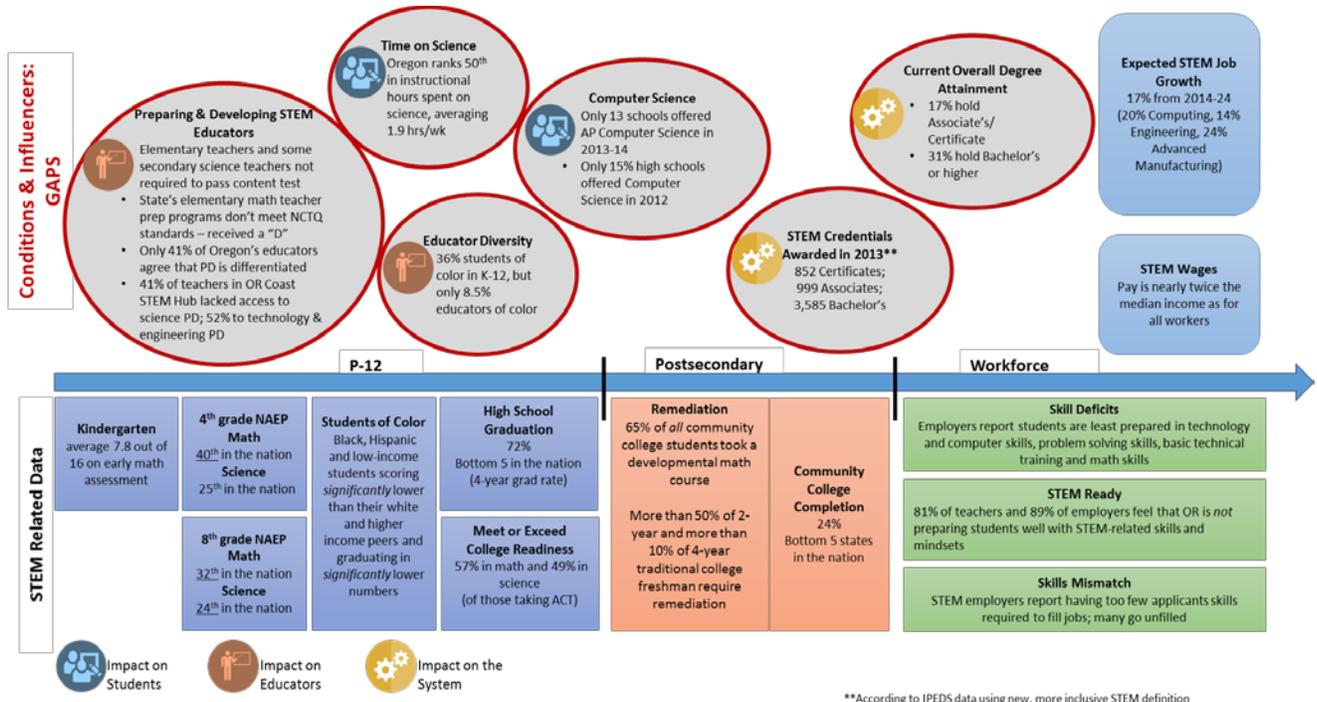
*The Oregon Legislature has made considerable investments to increase student learning opportunities in STEM education, to increase degree and certificate production in STEM fields, and to increase participation and degree completion in STEM fields by students of color and women.*

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Oregon is on the right track with its robust STEM goals, policies, and investments. But, it will take time for them to bear fruit and impact the state’s STEM results, which are currently mediocre. Partners must acknowledge that a systemic commitment to STEM education is a marathon, not a sprint. Legislative investments will likely result in a “hockey stick” growth pattern, where indicators remain flat for four to five years and then increase as investments start to benefit the first cohort coming through.

**System Gaps and Related Results.** Major gaps in Oregon’s STEM education ecosystem are identified in the top half of Figure 2. The bottom half of the figure pinpoints Oregon’s middling STEM results, which correlate with the gaps. Significant gaps affecting students include the amount of time each week that Oregon elementary students spend on science. Currently, the state ranks 50<sup>th</sup>. In addition, only 13 schools in the

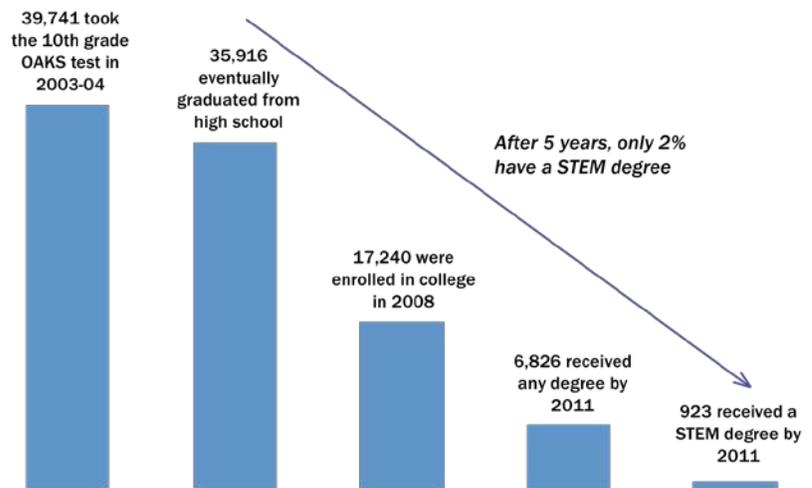
**FIGURE 2: STEM GAPS AND DATA**



state offered the AP Computer Science course in 2013-14.

Gaps that impact educators include Oregon’s low expectations for STEM teacher preparation and low quality professional development. The National Council on Teacher Quality gives Oregon a “D” for preparing its mathematics educators. Although Oregon places a premium on equity for its students, it has a small share of teachers of color (8.5 percent) relative to students of color (36 percent). According to the recently released Oregon Educator Equity Report, the state is almost on track to meet a 2015 goal of increasing the number of diverse teachers by 10 percent compared to the percentage in 2012.<sup>8</sup> National research attributes the lack of diversity in the STEM labor force to a lack of diverse STEM role models in education.

**FIGURE 3: STEM OUTCOMES FOR THE CLASS OF 2005**



Source: ECONorthwest analysis of ODE and National Student Clearinghouse data.

<sup>8</sup> 2015 Oregon Educator Equity Report, accessed on December 8, 2015: <http://www.ode.state.or.us/superintendent/priorities/2015-final-educator-equity-report.7.10.15.pdf>

The state's mediocre STEM outcomes reflect the system gaps cited here. For instance, as shown in Figure 3, outcomes of Oregon's class of 2005 indicate that 39,714 students took the 10<sup>th</sup> grade OAKS test in 2003-04. Of those students, 35,916 students graduated from high school and 17,240 went on to enroll in college. Only 6,826 students earned a degree by 2011, and of those, only 923 students received a STEM degree. This example highlights a gap between the state's STEM degree production and STEM jobs that are available in Oregon.

If Oregon is to reach its laudable statewide 40-40-20 and STEM-specific goals then it must stay the course to advance its previously enacted STEM policies and investments and expand efforts to target and close its gaps.

### **Maximizing the Work of the STEM Investment Council**

Created in 2013, Oregon's STEM Investment Council has a legislative mandate to assist the Chief Education Officer with the development and implementation of a long-term strategy to advance the state's STEM goals.

To jumpstart its work, the STEM Investment Council convened a statewide STEM Leadership Summit in 2014 to determine systemic STEM barriers across the state's P-20 education and workforce system and identify solutions to remove those barriers. The STEM Investment Council used those findings to inform the Governor's STEM budget proposal for fiscal years 2015-16. Over the last 18 months, the Council has been working with educators and other representatives to articulate a vision, belief statements, and driving goals for STEM education in Oregon:

#### **STEM INVESTMENT COUNCIL VISION**

Build an inclusive, sustainable, innovation-based economy by reimagining and transforming how we educate and empower individuals and communities. Oregonians of all races, economic status, and locations will develop the fundamental STEM-enabled skills and mindsets necessary to:

- Fully contribute to an increasingly complex and technologically rich global society
- Address high-demand workforce and industry needs
- Improve the prosperity of all individuals and communities across the state
- Become creative life-long learners who can adapt to changing social and economic conditions

This vision emphasizes equity of opportunity, access, and attainment for every Oregon student.

The Council has also adopted the following belief statements, which have guided the development of goals and how the work should progress:

#### BELIEFS

1. **All people have creative potential.** Our students should not just be consumers of knowledge, they need to be creators of it in a way that unleashes their creative genius, interests and talents.
2. **Each student deserves an opportunity at prosperity.** There continue to be persistent inequities in race, ethnicity, gender, and educational background in high-wage, high-demand professions. Many students in poverty and from rural areas are being left behind. No one's talents should be left behind.
3. **Diversity is our strength.** Differences of gender, ability, race, ethnicity, and culture provide critical and diverse perspectives and voices to address today's complex challenges. Innovation emerges where different ideas and cultures interconnect.
4. **Engaged learners succeed.** How we teach our students is as important as what we teach them. We must create meaningful learning experiences that empower all students to embrace their curiosity, take ownership of, and joy in their learning, and become lifelong learners.
5. **Education is a collective responsibility.** Effective STEM learning takes place both in and outside of classrooms. Everyone in our community is a potential educator and we need to build solutions that develop partnerships with all of the human capital in our communities.
6. **Innovation is the cornerstone of prosperity.** STEM is not just about filling jobs but creating jobs to address challenges and opportunities. Building an innovation-based economy is essential for long-term prosperity resulting in competitive advantage in a global marketplace.
7. **Learning takes courage, persistence, and humility.** Pushing the boundaries of one's understanding requires us to embrace ambiguity and to take intellectual risks. What we do with what we don't know is as important as what we do know. We should prioritize questions over answers.
8. **STEM skills are essential skills.** Advancements in STEM are transforming every industrial and service sector, from agriculture to energy, medicine to manufacturing, forestry to nanotechnology.
9. **All learning is cross disciplinary.** It is the interconnectedness of ideas that enable people to integrate new learning with their prior experiences. STEM by its nature synthesizes analytical and creative thinking. It is a powerful tool that sits at the crossroads of the sciences, arts and humanities.
10. **The best way to learn STEM, is to DO it.** Education is not about retaining facts or disconnected bits of information. Utilizing purpose-driven learning challenges students to pursue deeper questions and to solve problems that are relevant and meaningful.

Finally, the Council has identified four targeted goals for advancing STEM education opportunities in Oregon:

**GOALS**

1.  **Inspire and empower our students** to develop the knowledge, skills, and mindsets necessary to thrive in a rapidly-changing, technologically rich, global society.
2.  **Ensure equitable opportunities and access** for each and every student to become a part of an inclusive innovation economy.
3.  **Continuously improve the effectiveness**, access to resources, and the number of formal and informal **STEM educators**.
4.  **Create sustainable and supportive conditions** to achieve STEM outcomes aligned to Oregon's economic, education, and community goals.

**Legend:**

 Impact on students

 Impact on educators

 Impact on system

### Prioritizing Oregon's STEM Action Steps

The STEM Investment Council has paved the way for Oregon to take a series of targeted actions that will impact STEM teaching and learning and student success. This plan prioritizes goals that will have an impact on educators, students and the system based on 1) an assessment of Oregon's current STEM education gaps and 2) research to identify the most effective levers for change.



**Goal #1: Inspire and empower our students** to develop the knowledge, skills, and mindsets necessary to thrive in a rapidly-changing, technologically rich, global society.

**GOAL #1 PRIORITY OUTCOMES**

1. By 2017, increase the time Oregon elementary students spend on science to exceed the national average of 2.7 hours per week.<sup>9</sup> That same year, Oregon should have fully implemented the Next Generation Science and Engineering Standards.
2. By 2017, follow through on implementing mathematics standards which requires students to solve real-world problems, transforming mathematics instruction across the state.
3. By 2017, adopt computer science standards and ensure that each Oregon student has access to computer science coursework.

*Why must Oregon focus on STEM learning opportunities in the early grades?* The early years are critical for students to develop authentic interest and knowledge in STEM. Through experience, discourse, inquiry, and

<sup>9</sup> Change the Equation, Vital Signs; <http://vitalsigns.changetheequation.org/state/oregon/curriculum>

play, children learn to observe natural phenomena, shape and defend an argument, and use problem-solving tactics.<sup>10</sup> A recent random assignment study by the Center for Research in Educational Policy supports the claim that strong inquiry-based science experiences strengthen K-8 science outcomes, even for students who are typically underrepresented in the STEM fields.<sup>11</sup> A landmark 2007 study also showed that early math skills are one of the best predictors of later academic success in both math and literacy.<sup>12</sup> Early STEM experiences are also vital because students get hooked on STEM early. Recent research suggests that students who ultimately decide to take advanced science classes and pursue postsecondary STEM fields tend to get interested in STEM and make their choices as early as middle school, or even before.<sup>13</sup> For girls and underrepresented minorities, early exposure to STEM experiences proves to be a key factor in deciding to pursue STEM coursework and careers.<sup>14</sup> Providing students with project-based, hands-on, and career-influencing science experiences takes teacher expertise, resources, and time. Oregon must ensure that all of its students receive strong STEM education early so they are prepared for college and career

*Why do Oregon students need access to computer science courses?* The state's fastest growing job clusters are in technology and software. Currently, Oregon has 8,058 open computing jobs, with average salaries of \$81,000 – significantly higher than the average salary in the state. In 2013, Oregon had only 355 computer science graduates (and only 11 percent of those were female). In 2015, Oregon had 290 high school students take the AP Computer Science exam. Of those students, 18 percent were female, 11 students were Hispanic, and four students were African American. Only 15 percent of Oregon's high schools offered at least one coding course in 2012.<sup>15</sup> Only 13 schools offered the AP Computer Science in 2013-14.<sup>16</sup>

Key strategies to achieve Goal #1 include:

- a.  Promoting the development of new teaching approaches that challenge students to be creative, resourceful, persistent, and collaborative in developing knowledge and skills to solve real-world problems
- b.  Increasing the interactions of students with STEM professionals who can help students develop aspirations and personal identities as life-long learners and inspired innovators utilizing STEM skills
- c.  Developing new opportunities for students to enhance their critical thinking and problem-solving skills in afterschool or summer programs that are focused on solving complex challenges
- d.  Increasing the availability of early college credits in STEM courses by strengthening local partnerships and articulation agreements between high schools, community colleges, and 4-year institutions
- e.  Increasing the development and acceptance of industry-recognized credentials based on demonstrated skills, including traditional and nontraditional certifications
- f.  Providing program “start-up” or retooling funds to incentivize postsecondary programs aligned to high-wage, high-demand industry needs

<sup>10</sup> TIES STEM Education Monograph Series: Attributes of STEM Education; Aug 2006;

[http://stemeast.org/pdf/what\\_is\\_stem/National\\_STEM\\_Attributes/TIES\\_STEM\\_Attributes.pdf](http://stemeast.org/pdf/what_is_stem/National_STEM_Attributes/TIES_STEM_Attributes.pdf)

<sup>11</sup> LASER i3 Validation Study by the Center for Research in Educational Policy (CREP) at the University of Memphis; 2015

<sup>12</sup> Duncan, et al. “School Readiness and Later Achievement,” 2007;

<http://eprints.ioe.ac.uk/5971/1/Duckworth2007SchoolReadiness1428.pdf?origin=public>

<sup>13</sup> What Is the Impact of Decline in Science Instructional Time in Elementary School? 2012; <http://www.csss-science.org/downloads/NAEPElementScienceData.pdf>

<sup>14</sup> Generation STEM: What Girls Say About Science, Technology, Engineering and Math; 2012;

[https://www.girlscouts.org/research/pdf/generation\\_stem\\_full\\_report.pdf](https://www.girlscouts.org/research/pdf/generation_stem_full_report.pdf)

<sup>15</sup> Oregon Computer Science Teachers Association, 2012

<sup>16</sup> Code.org, state-facts, OR, 2015: <https://code.org/advocacy/state-facts/OR.pdf>

- g.  Increasing student interest, understanding and success in mathematics through solving real-world problems
- h.  Improving the quality and relevance of postsecondary mathematics placement processes and align course offerings to relevant degree/certificate program needs
- i.  Transforming P-20 STEM teaching and learning by supporting the spread of effective approaches and connecting research to practice



**Goal #2: Ensure equitable opportunities and access** for every student to become a part of an inclusive innovation economy.

#### GOAL #2 PRIORITY OUTCOMES

1. Determine baseline data for and double the number of underserved and underrepresented STEM students who participate in informal, out-of-school STEM learning opportunities.
2. Determine baseline data for and double the number of underserved and underrepresented STEM students who have access to quality P-20 support services and pre-college transition/bridge programs.
3. Determine baseline data for and increase the number of STEM role models and access to professional networks for students who are underrepresented in STEM.

*Why a specific goal on equity?* As noted in the beginning of this report, Oregon faces significant achievement and attainment gaps across its P-20 education ecosystem, particularly among its students of color. The state must constantly keep an eye focused on closing these gaps.

Increasing diversity in the STEM labor force is a national imperative. Persons of color and women account for far fewer of the country's STEM job holders than their percentage of the general population. Nationally, just 2.7 percent of African Americans, 3.3 percent of Native Americans and Alaska Natives and 2.2 percent of Hispanics and Latinos who are 24 years old have earned a first university degree in natural sciences or engineering.<sup>17</sup> Key systemic factors include: access to high-quality learning opportunities in and out of classrooms, limited diversity of STEM role models, and biased social messaging and expectations.

Rural populations, too, often have limited access to STEM opportunities. Over 38 percent of Oregon's school districts are classified as rural. Rural students are also less likely to enroll in and achieve a postsecondary education. In the 2010 ASCD Educational Leadership issue, author James A. Bryant, Jr. reported that over 60 percent of residents in rural areas live below or just above the poverty line and 68 percent of rural schools face significant achievement gaps in mathematics.<sup>18</sup>

*Why is Informal STEM learning important?* Informal STEM learning is just as important as formal STEM learning. It is proven to raise student confidence and classroom achievement in STEM and generate student interest in pursuing STEM studies and careers.<sup>19</sup> Types of informal STEM learning programs include those that provide students after school, weekend and summer activities over multiple years at institutions such as

<sup>17</sup> National Science Foundation, Women, Minorities, and Persons with Disabilities in Science and Engineering (2009)

<sup>18</sup>Bryant, James A. Jr. (2010). "Dismantling Rural Stereotypes." Educational Leadership, November 2010, Vol 68, No 3, pp. 54-58

<sup>19</sup> National Governors Association, The Role of Informal Science in the State Education Agenda, <http://www.nga.org/files/live/sites/NGA/files/pdf/1203INFORMALSCIENCEBRIEF.PDF>.

science museums, zoos, local universities and research centers. Unfortunately, good, objective data that differentiate those programs having the greatest impact do not exist at the state and national levels.<sup>20</sup>

*Why do quality P-20 support services and pre-college transition/bridge programs matter?* Targeted strategies and supports increase the likelihood of success for underrepresented STEM students. At the postsecondary level, those STEM specific strategies include exposure to STEM courses in conjunction with a combination of advising, co-requisite remediation and gateway-course redesign. To persist to a STEM certificate or degree, students must see how their coursework applies to the real world. Research shows that one of the most effective strategies is access to undergraduate research and/or internships during the freshman and sophomore years of postsecondary. To help bridge this gap, postsecondary institutions must forge authentic partnerships with business and industry. Employers can influence programs and curriculum, provide technology and equipment or participate on advisory boards.

*Why are diverse STEM role models important?* One of the most effective ways to encourage students to consider nontraditional careers is to introduce them to diverse role models, particularly role models with whom they are able to relate. Providing diverse role models challenges stereotypes around careers where some groups may traditionally be underrepresented. Women and people of color are underrepresented in most STEM fields, including engineering, physics, and computer science. But when students are introduced to female engineers, or black computer scientists, their perceptions of who “belongs” in STEM are transformed.<sup>21</sup>

Key strategies to achieve Goal #2 include:

- a.  Improving student advising by strengthening career counseling services and tools, increasing access of students to alumni, professional and near-peer networks, and increasing student access to up-to-date market data about high-wage, high-demand jobs
- b.  Increasing STEM internships, work-based and service learning opportunities and undergraduate research opportunities in high-demand fields
- c.  Increasing the number and quality of P-20 support services and pre-college transition/bridge programs for students who are traditionally underserved and underrepresented in STEM
- d.  Increasing the number of STEM role models and access to professional networks for students who are underrepresented in STEM
- e.  Increasing needs-based financial support and access to flexible, micro-loan/funds for first-generation and underrepresented students pursuing high-wage, high-demand credentials

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<sup>20</sup> Ibid.

<sup>21</sup> National Alliance for Partnerships in Equity: <http://www.napequity.org/resources/role-models/>



**Goal #3: Continuously improve the effectiveness,** access to resources, and the number of formal and informal **STEM educators.**

#### GOAL #3 PRIORITY OUTCOME

1. Over the next five years, leverage Oregon’s Regional STEM Hubs to provide high-quality, diverse and industry-led professional development opportunities to at least 50 percent of Oregon’s STEM educators – including P-12 teachers and leaders, postsecondary faculty and staff and quality out-of-school educators.

*Why focus on educators?* Educators have the greatest impact on student success across the education continuum. In P-12, for instance, research indicates that a classroom teacher’s effectiveness is more important—and has more impact on student achievement—than any other factor controlled by school systems, including class size or the school a student attends.<sup>22</sup>

Researchers agree strengthening teacher effectiveness is the most efficient way to boost academic achievement and they believe rigorous, cutting-edge professional development can play a key role in improving teacher practices.<sup>23</sup> This type of professional learning is job-embedded (integrated into the work teachers do on a day-to-day basis), collaborative, incorporates coaching and technology, and takes into account the school context.<sup>24</sup> However, today only 41 percent of Oregon’s educators agree that professional development is differentiated.<sup>25</sup> In addition, access to high-level professional development is often lacking across the state. For instance, 41 percent of surveyed teachers in Oregon’s Coast STEM Hub lacked adequate access to professional development in science teaching. Fifty-two percent lacked adequate access to professional development in technology and engineering education.<sup>26</sup>

Oregon’s Regional STEM Hubs are currently engaging partners from business and higher education to expand and improve professional development offerings. For instance, a STEM-related business might open its laboratories to local teachers and given them an opportunity to work alongside laboratory technicians, helping them better understand the culture of applied STEM disciplines and transfer that back to the classroom. The goal is to leverage STEM Hubs and their partnerships to reach 50 percent more of Oregon’s teachers over the next five years.

Thoughtful, skillful teachers who have contextual knowledge of how STEM knowledge and skills are applied in the workplace are the backbone to delivering innovative STEM instruction across elementary and secondary classrooms. They drive differentiated, integrated STEM learning experiences, and develop and deliver hands-on, project-based instruction for learners of all ages. Teachers must be supported by strong instructional leaders who “get” STEM education. Principals need to establish cultural and environmental conditions to take risks and to shift toward more applied, integrated, and place-based learning.

<sup>22</sup> Rivkin, S.G., Hanushek, E.A., and Kain, J.F. “Teachers, Schools and Academic Achievement,” *Econometrica*, Vol. 73, No. 2 (March 2005)

<sup>23</sup> Nurturing Quality Teachers in Oregon, A Profile of Success and Challenges of Six Oregon Districts; ECONorthwest, 2008

<sup>24</sup> Education First: Common Core State Standards & the Transformation of Professional Development; [http://www.education-first.com/files/CCSS\\_PD\\_Brief\\_1\\_-\\_Essential\\_Elements\\_of\\_PD.pdf](http://www.education-first.com/files/CCSS_PD_Brief_1_-_Essential_Elements_of_PD.pdf)

<sup>25</sup> 2014 TELL Oregon Survey, Spring 2014

<sup>26</sup> Oregon Coast Regional STEM Hub, *Oregon Coast Regional STEM Hub Partnership Plan*, 2014

Key strategies to achieve Goal #3 include:

- a.  Creating opportunities for STEM educators to experience STEM in industry and research as part of their professional development
- b.  Build, strengthen and support statewide partnerships for STEM education through our STEM hubs
- c.  Providing incentives to teacher preparation programs to develop, evaluate and disseminate effective STEM preservice teaching strategies including continued support during the first three years of teaching
- d.  Increase career transitions of STEM professionals into teaching for CTE, math and science
- e.  Providing time and resources for educator-to-educator and educator-industry collaborations around implementation of promising STEM instructional practices and materials



**Goal #4: Create sustainable and supportive conditions** to achieve STEM outcomes aligned to Oregon's economic, education, and community goals.

#### GOAL #4 PRIORITY OUTCOMES

1. In the next biennial budget, increase the state's STEM investment by 50 percent and continue to follow through on STEM structural shifts, including specific program opportunities that provide pathways to grow careers – so that Oregon can benefit from its previous policy moves in the future.
2. By 2017, create a data dashboard that shows Oregon's progress in key STEM indicators that comprise the state's connected STEM, CTE and workforce ecosystem.

Oregon must continue to stay the course and build upon the good work it has done since 2011. This calls for continued strategic investments in STEM. This strategic plan is designed to serve as a guide for targeting future investments in key initiatives.

Additionally, Oregon must continue to identify key metrics and use consistent definitions for STEM across its education ecosystem. The STEM Investment Council believes in holding itself and the system accountable for making progress and using data to spur stakeholder dialogue and continually drive improvement.

State agencies that comprise the education and workforce ecosystem must also fully implement the Brookings definition of STEM. Brookings calls attention to two STEM economies: the professional STEM economy that is linked to graduate school education and the second STEM economy that draws from high schools, workshops, vocational schools, and community colleges. The second STEM economy will hold half of all STEM jobs – and pay 10 percent more than non-STEM jobs with similar education requirements.

With the STEM goals, policies, and investments Oregon has already pursued, the state is poised to move the needle on its STEM results.

Key strategies to achieve Goal #4 include:

- a.  Building public awareness and demand for improved STEM outcomes and programs



## **APPENDIX B**

### **OREGON STEM INVESTMENT COUNCIL**

Jim Piro, Portland General Electric (Council Chair)  
Aubrey Clark, Intel Corp.  
Herb Fricke, Akana  
Lisa Graham, Black Canyon Woodworks  
Dwayne Johnson, ScaleUp Partners  
Eric Meslow, Timbercon, Inc.  
Thompson Morrison, Fuse Insight

### **ADVISORS**

Jim Fong, Rogue Workforce Partnership  
Kristen Harrison, Portland Metro STEM Partnership  
Bradford Hill, Southridge High School, Beaverton School District  
Jessica Howard, Portland Community College, SE Campus  
Kimberly Howard, Portland General Electric  
Jill Hubbard, Tigard-Tualatin School District  
Craig Hudson, Garmin AT  
Leslie Garcia, Oregon Health Sciences University  
Kali Ladd, Kairos PDX  
Andrew McGough, Worksystems Inc.  
Kyle Ritchey-Noll, Oregon Business Council  
Terrel Smith, Oregon Computer Science Teachers Association  
Martin Storksdieck, Center for Research on Lifelong STEM Learning, Oregon State University  
John Tapogna, ECONorthwest  
Tom Thompson, Oregon Department of Education  
Beth Unverzagt, Oregon Afterschool for Kids

### **CHIEF EDUCATION OFFICE**

Lindsey Capps, Chief Education Officer  
Mark Lewis, STEM & CTE Policy Director  
Krissi Hewitt, STEM Research Analyst

### **WITH THANKS**

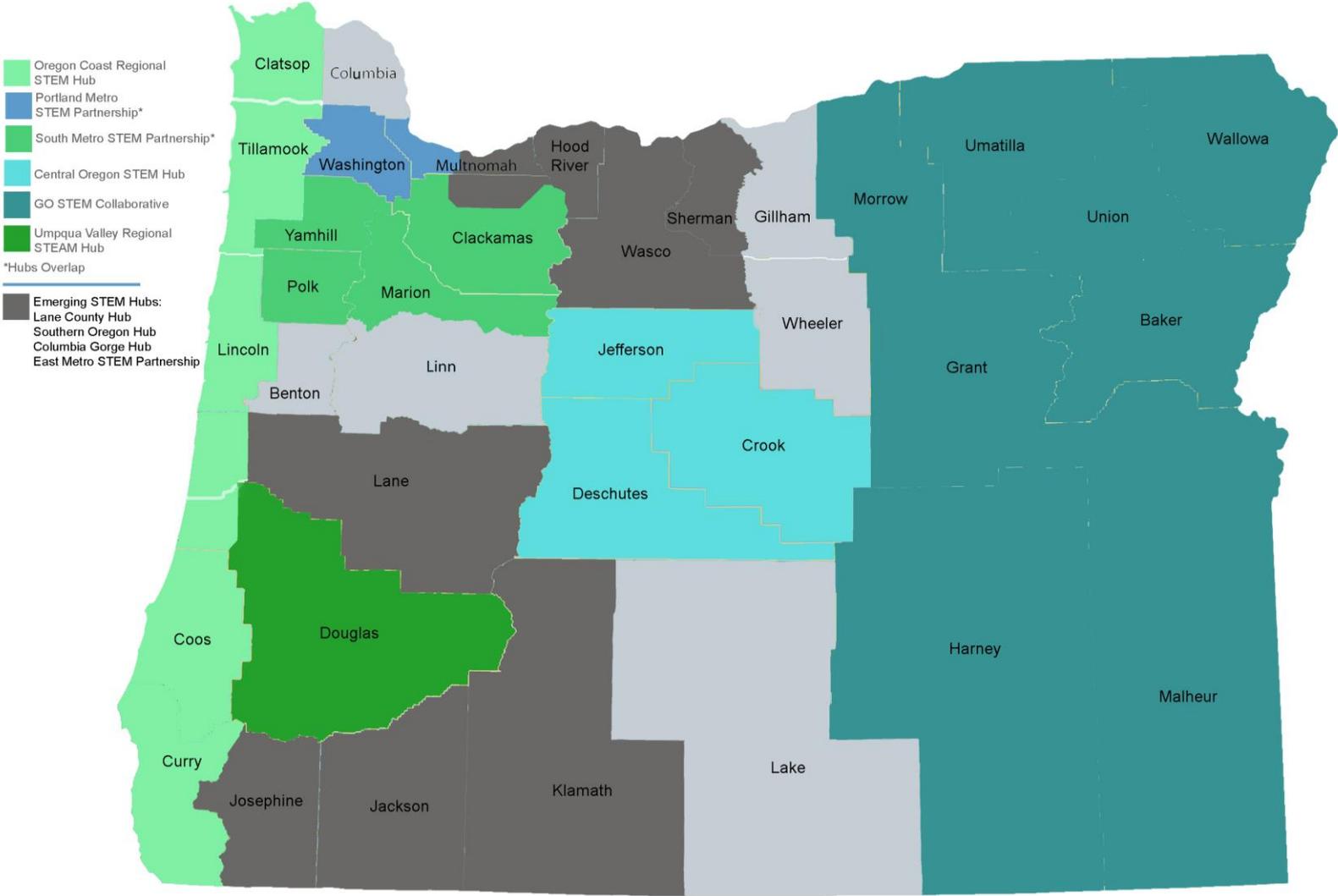
The Oregon STEM Investment Council thanks the Oregon Community Foundation for generously supporting the development of this plan. Thanks also to Oregon Learns and Education First for collaboration on this work.



### STEM Strategic Plan Finalization Timeline

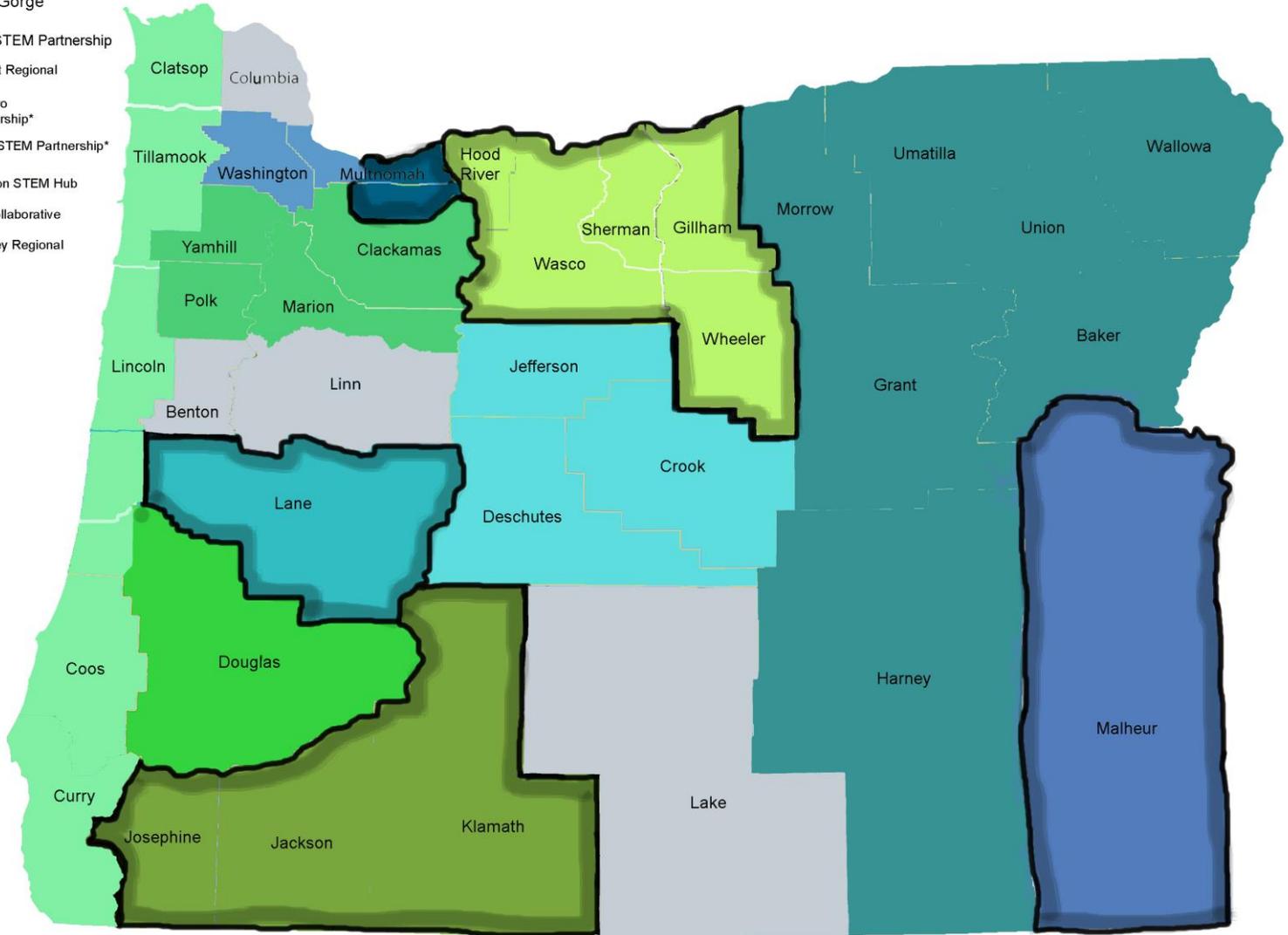
Task	February	March	April	May
Prepare draft for public input				
Subcommittee to create draft action plan				
Cross-agency data team meeting				
Educational leadership workgroup				
Regional Focus Groups				
STEM Hub Convening				
Professional org engagement				
Agency Board engagement				
Communities of color focus groups				
Incorporate feedback				
Final content review				
Finalize design & print				
STEM Week				
<b>Public Launch</b>				
National Out of School Alliance				
STEM Philanthropy Convening				

Oregon's STEM Hubs 2013-2015



# Oregon's STEM Hubs 2015-2017

- Frontier Oregon
  - Lane County
  - Southern Oregon STEM Hub
  - Columbia Gorge
  - East Metro STEM Partnership
  - Oregon Coast Regional STEM Hub
  - Portland Metro STEM Partnership\*
  - South Metro STEM Partnership\*
  - Central Oregon STEM Hub
  - GO STEM Collaborative
  - Umpqua Valley Regional STEAM Hub
- \*Hubs Overlap



## Oregon's STEM Hubs 2015-2017 RAC Overlap

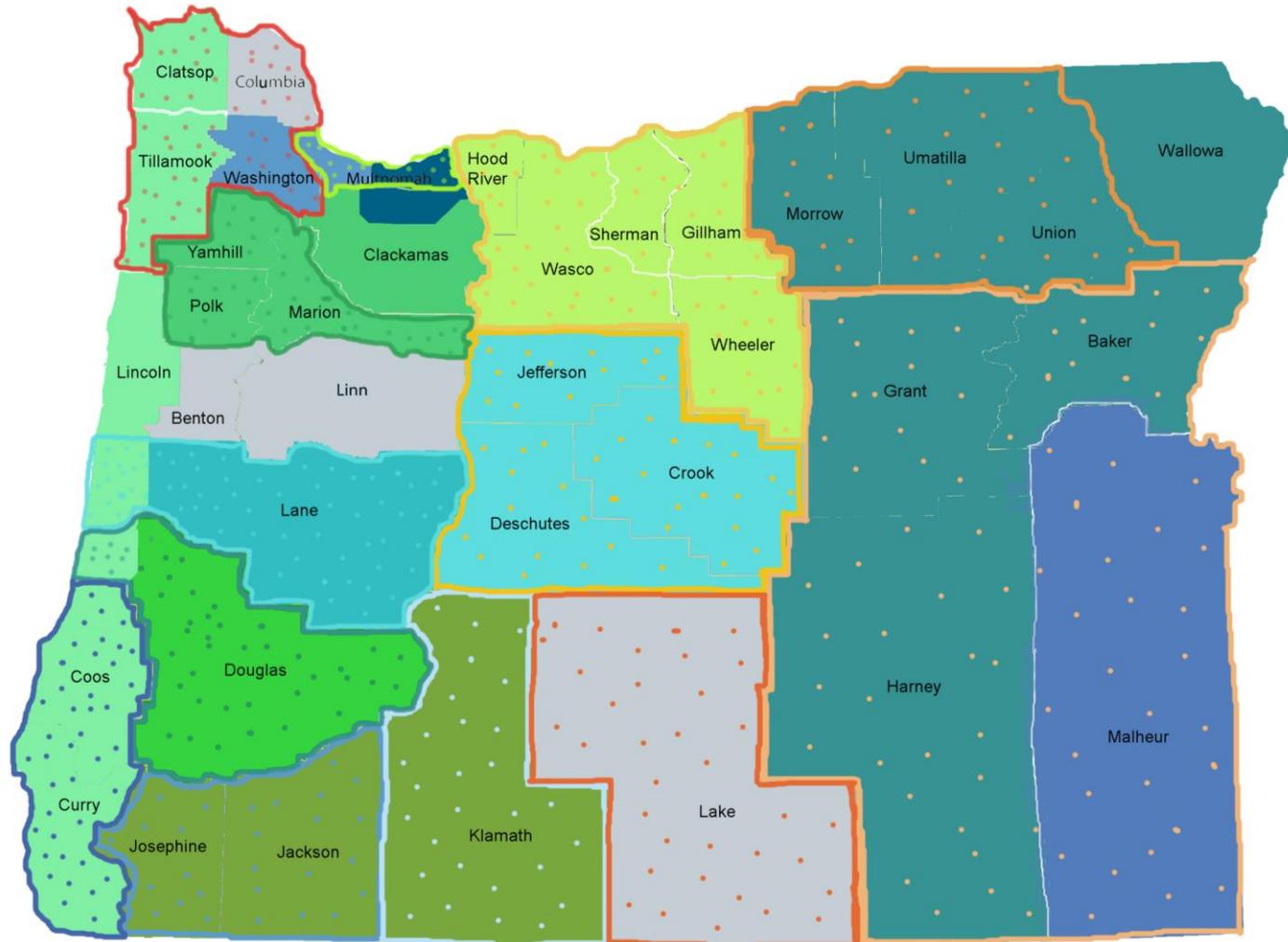
### STEM Hubs

- Frontier Oregon
- Lane County
- Southern Oregon STEM Hub
- Columbia Gorge
- East Metro STEM Partnership
- Oregon Coast Regional STEM Hub
- Portland Metro STEM Partnership\*
- South Metro STEM Partnership\*
- Central Oregon STEM Hub
- GO STEM Collaborative
- Umpqua Valley Regional STEAM Hub

\*Hubs Overlap

### RACs

- Douglas County Partners for Student Success
- Connected Lane County
- Southern Oregon Success
- Klamath Promise Initiative
- South Coast Connect for Success
- Willamette RAC
- The All Hands Raised Partnership
- Columbia Gorge Education and Workforce Collaborative
- Eastern Oregon Collaborative
- Poverty to Prosperity
- Central Oregon Better Together
- Lake County Strong Start
- Northwest Regional Achievement Collaboratives



# STEM Hub Updates



**Deborah Bailey, PhD**

*Education Specialist - Applied Sciences*

*Office of Teaching and Learning, Oregon Department of Education*

# Emerging STEM Hubs Grant Review Process

- ▶ Reviewed January 28<sup>th</sup>, 2016
  - Reviewed on 7 components
    - Vision and Mission
    - History and Content
    - Governance and Backbone
    - Equity
    - Sustainability Plan
    - Participation in the Statewide STEM Hub Network
    - Partnership Plan Development
  - Recommendations based on review scores and geographic distribution of resources

# Regional STEM Hubs (Preliminary Award)

## Emerging Regional STEM Hub

Gorge

Southern Oregon

East Metro STEAM Partnership

Lane

Frontier Oregon

# 1<sup>st</sup> Statewide STEM Hub Convening

- ▶ April 4<sup>th</sup> and 5<sup>th</sup>
- ▶ Corvallis
  
- ▶ Networking
- ▶ Building Community
- ▶ Topics of Concern/Issues of Practice

# RFP STEM Hub Programming

- ▶ 2.6 Million distributed in two phases
- ▶ Eligibility – Approved Partnership Plan
- ▶ Six Hubs eligible this round
- ▶ Timeline

Date	Action
March 3	Applications Due
March 10	Applications reviewed and scored
March 17	Applications notified and preliminary award
March 24th	Awards finalized

# CAREER TECHNICAL EDUCATION

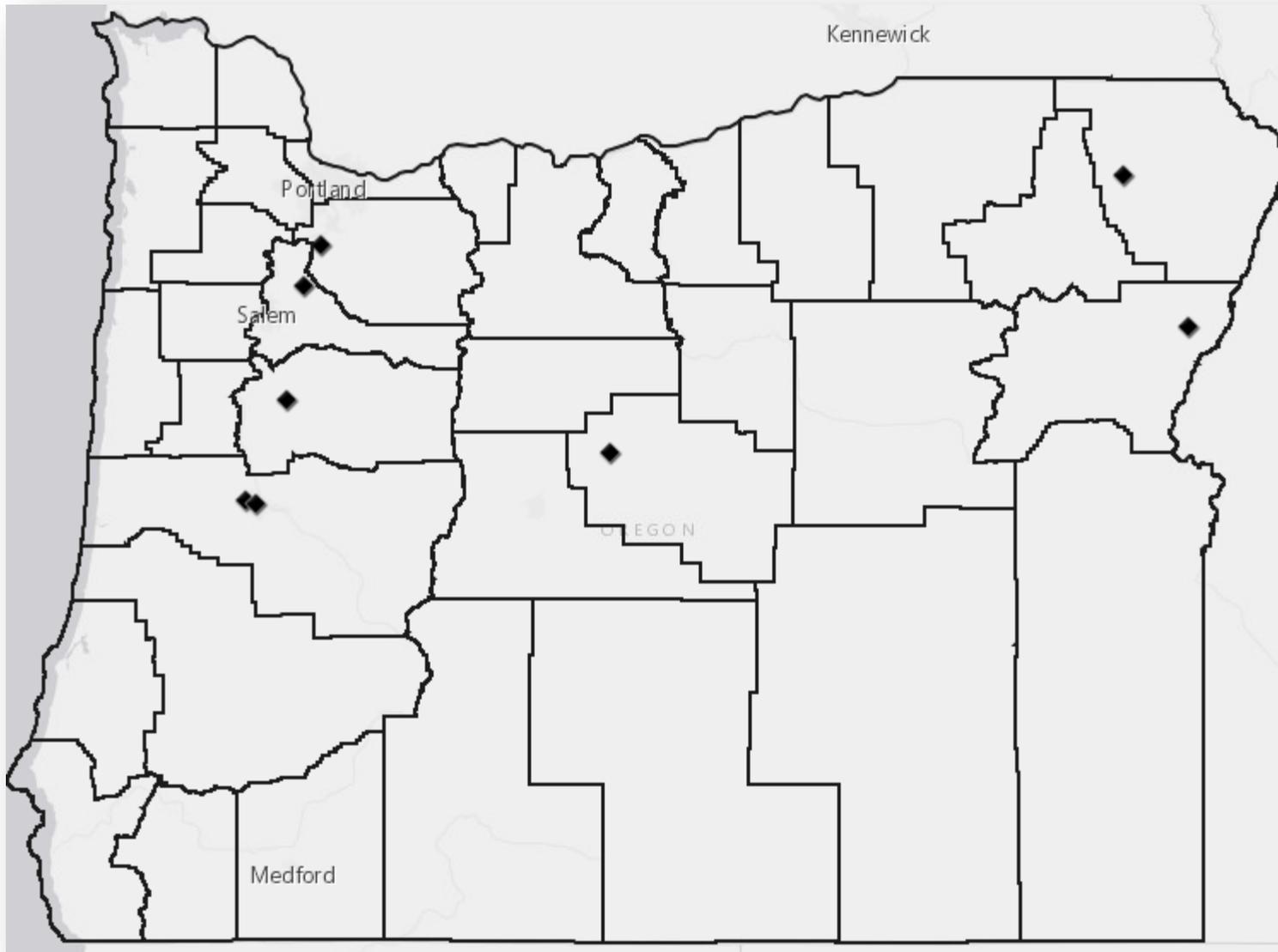
## Revitalization & STEM Grants

**Laura Roach**

*Director, Secondary-Postsecondary Transitions Team, Career & Technical Education  
Office of Learning, Instruction and Standards Unit, Oregon Department of Education*

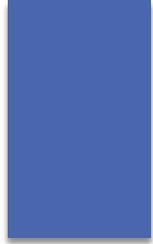
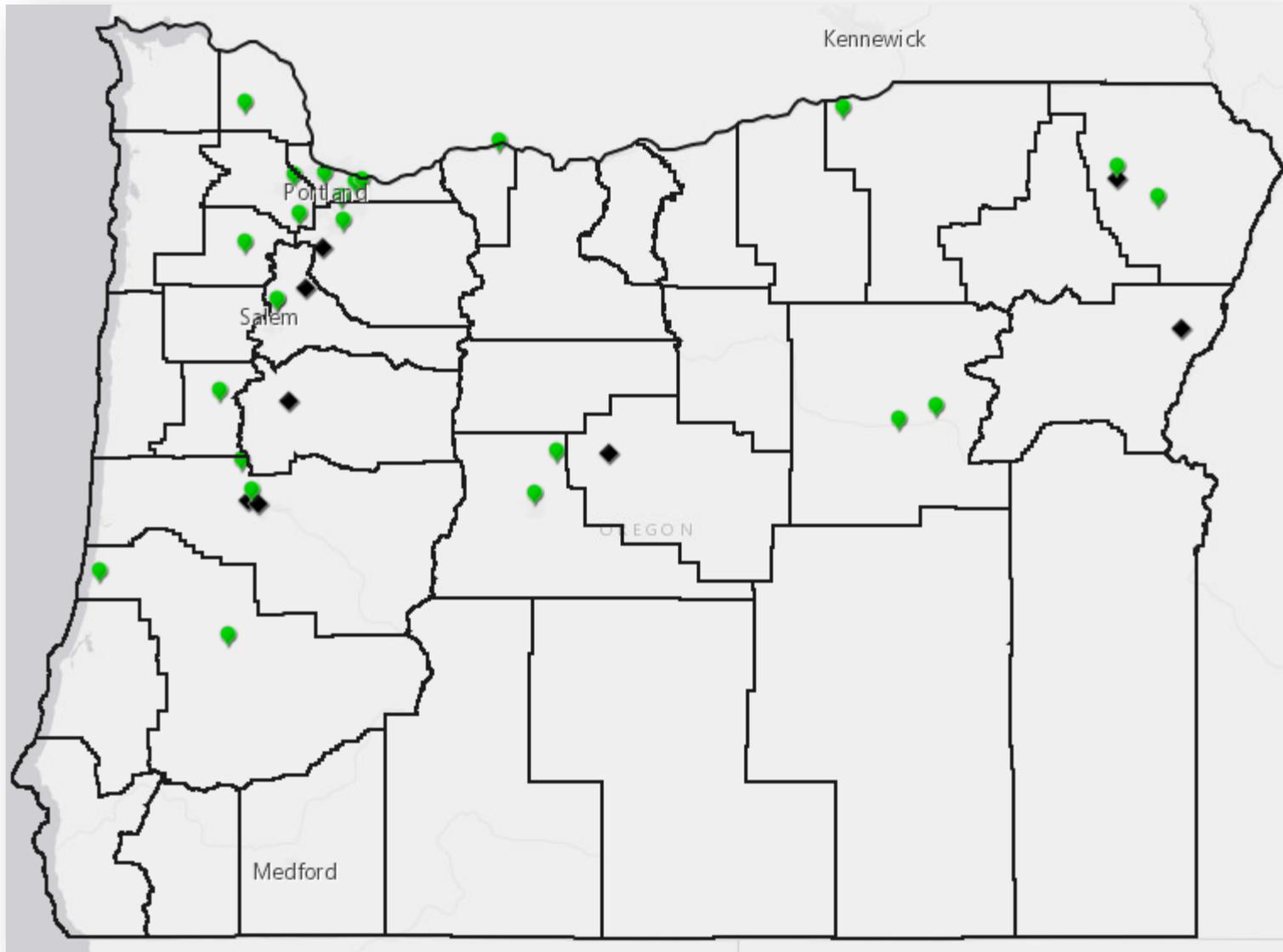
# GRANTS

- ▶ **First Robotics** .50
- ▶ **Career Pathway Funds** 8.75
- ▶ **CTE Revitalization-** 9.0
- ▶ **CTE Summer Programs** 1.75
- ▶ **CTE Student Leadership Organizations (CTSO)** .75
- ▶ **CTE Course Equivalency** .12
- ▶ **Statewide Teacher Development & Mentoring** 1.1
- ▶ **STEM Hubs** 5
- ▶ **4 STEM Innovation Grants: Summer Programs, Computer Science, Out of School & Applied Math**



2011 (8 Grants)



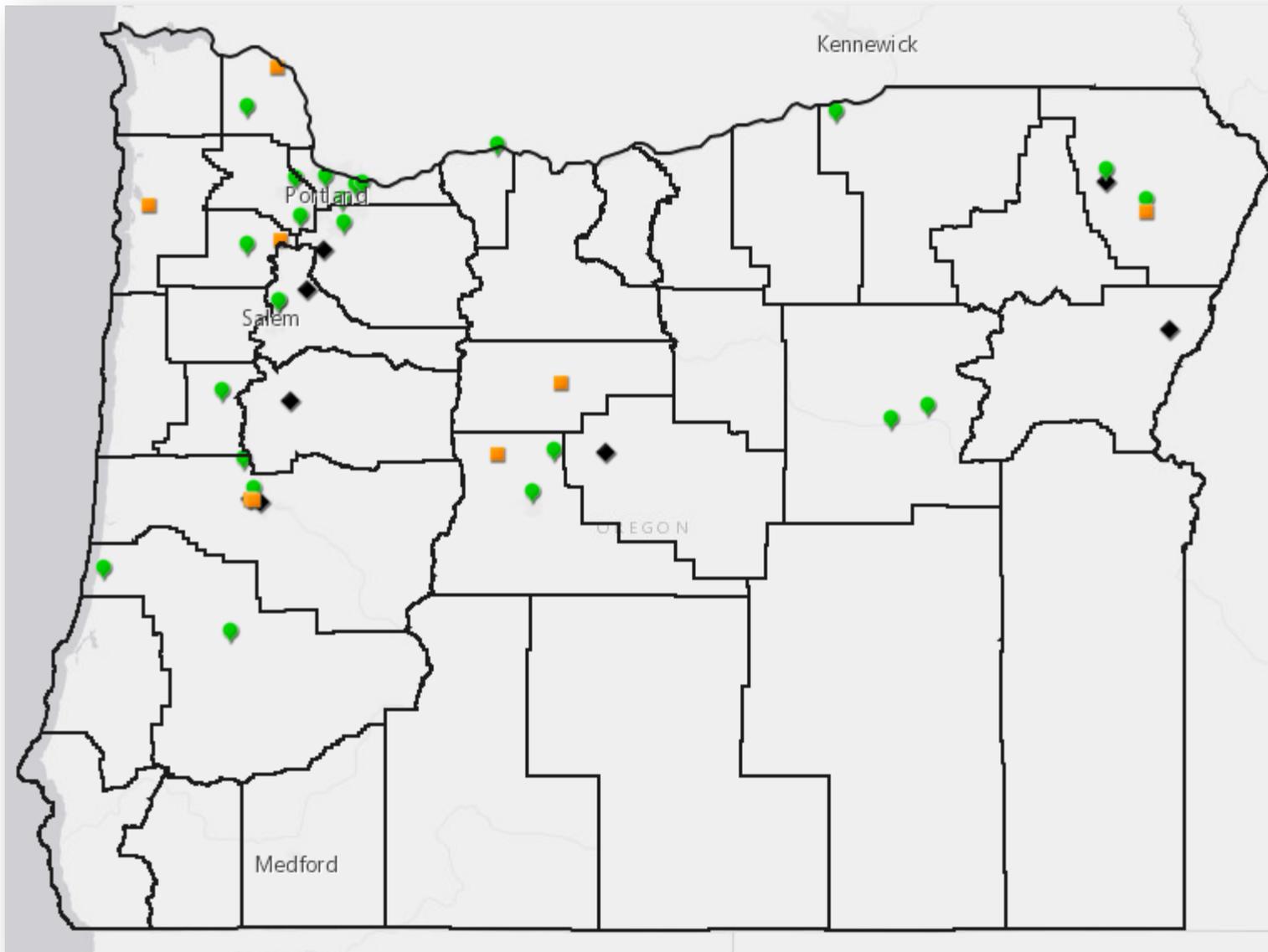


2011 (8 Grants)



2013 (24 Grants)





2011 (8 Grants)

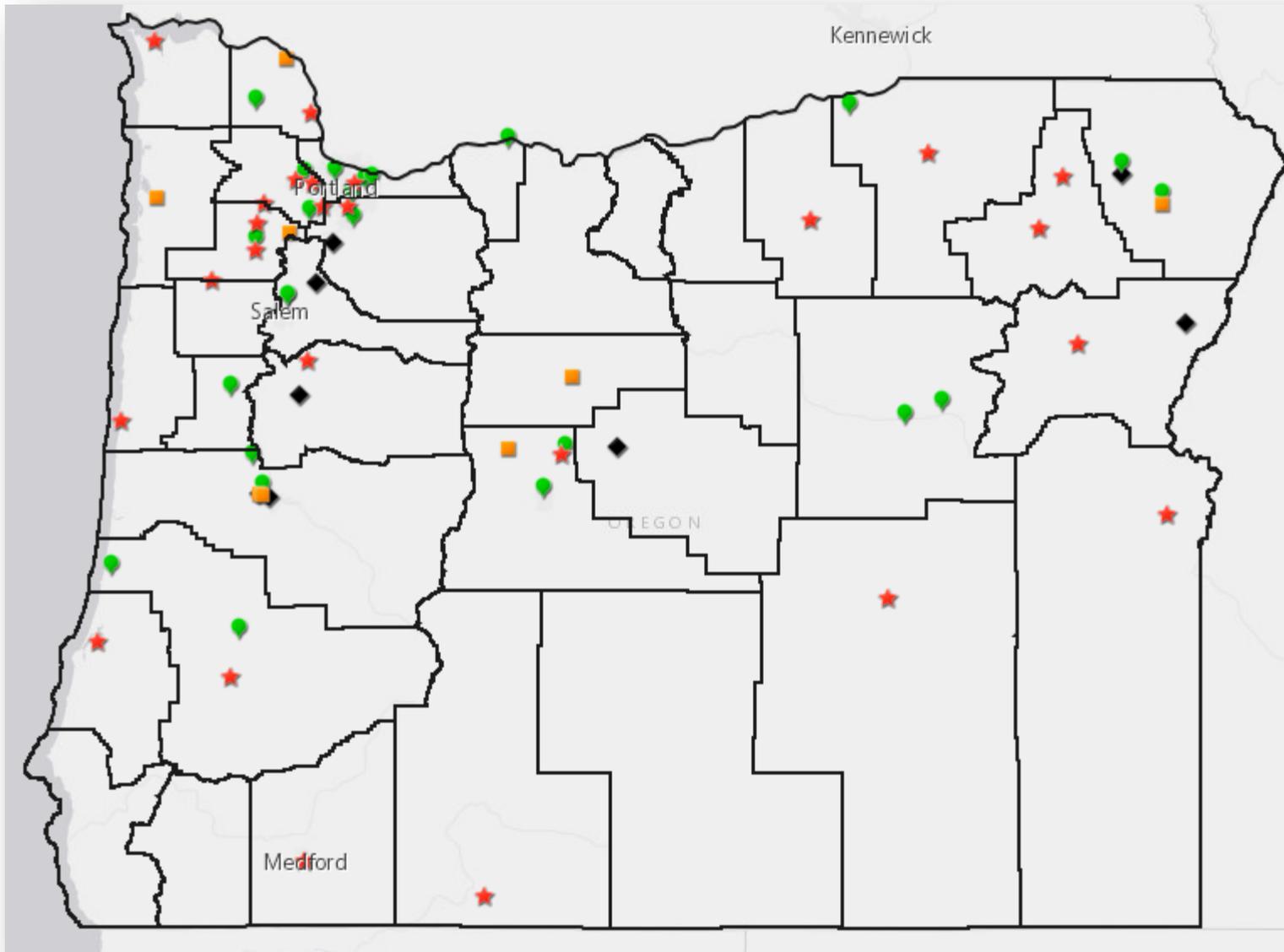


2013 (24 Grants)



2014 (8 Grants)





2011 (8 Grants)



2013 (24 Grants)

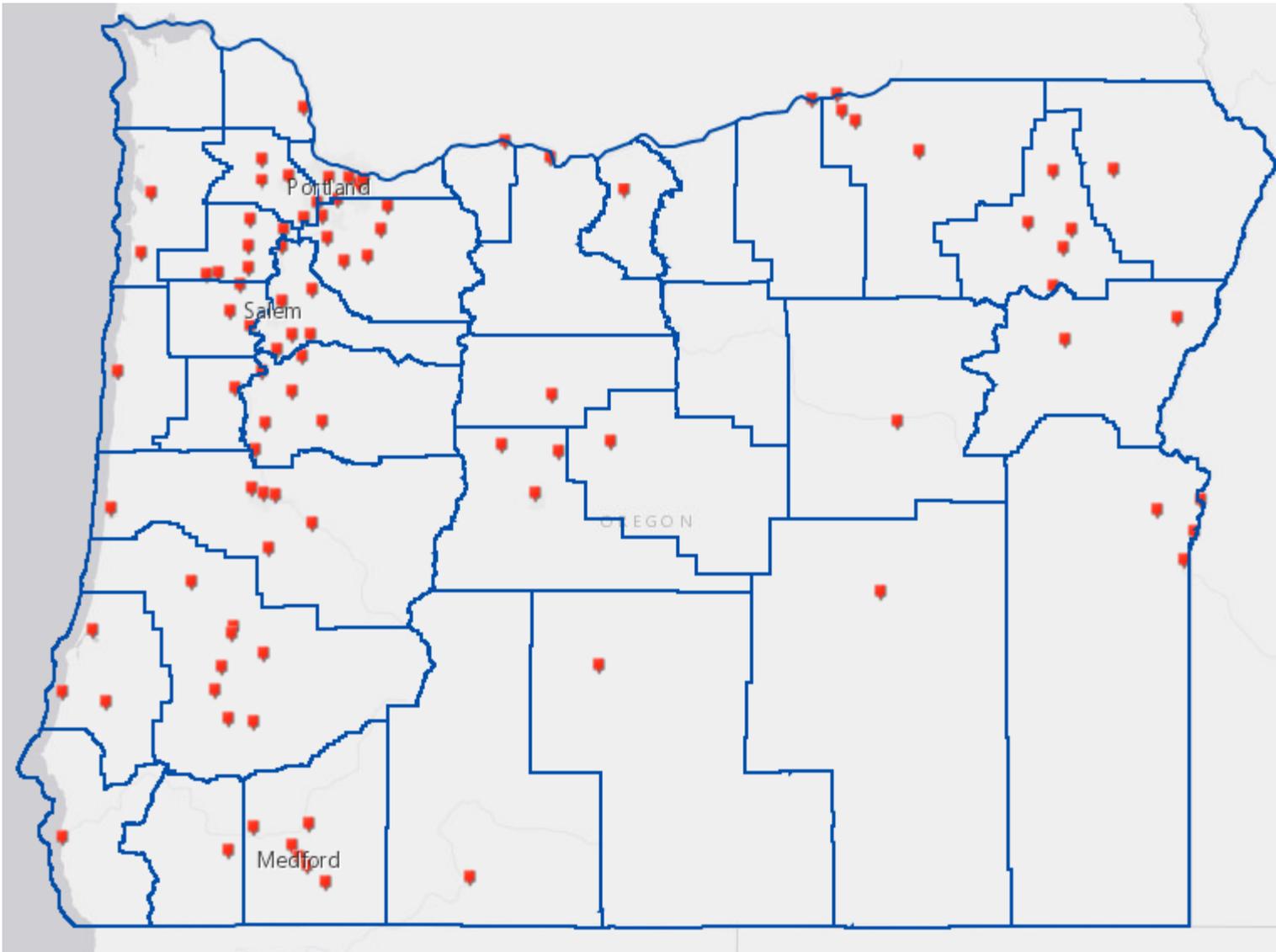


2014 (8 Grants)



2015 (25 Grants)





116 School Districts

283 (43%) of all  
Approved  
Programs of Study  
Qualified for Funding

# FIRST ROBOTICS

## \$500K

- ▶ **First Round- summer 2015:**
- ▶ **Students – 1809 (70%/30%- male/female)**
- ▶ **Minority students 35%**
- ▶ **Students in poverty 37%**
- ▶ **Students new to FIRST programs -74%**
- ▶ **High school seniors planning to pursue further STEM education**
- ▶ **May 2016- second round**

# STEM OUT of SCHOOL PROGRAMS

## \$1.5m

- ▶ 2 Applications
- ▶ March 4
- ▶ Statewide Impact 1500-3000 students
- ▶ Salaries, 17-28%
- ▶ Benefits, 9-7%
- ▶ Instructional Services, 42%
- ▶ Transportation 9-14%
- ▶ Travel 6-15%
- ▶ Other Services Admin Costs 5%

# DIGITAL LITERACY COMPUTER SCIENCE

## \$750k

- ▶ 2 grants submitted
- ▶ April Awards
- ▶ 400 teachers across the state
- ▶ Create more CTE Programs of Study
- ▶ Upgrades
- ▶ Salary
- ▶ Professional Development
- ▶ Other

# STEM-MATH ADAPTATIVE PLATFORMS

## \$1.1 m

- ▶ April 2016
- ▶ 6 awards- 20 applications
- ▶ 10 grants submitted
- ▶ 150 teachers
- ▶ 13,000 students estimated
- ▶ 55 schools- grades k-8

# STEM MATH IN REAL LIFE

## \$1.4 m

- ▶ 6 Awards- 10 submitted
- ▶ April 2016
- ▶ 150 teachers, 13,000 students, 57 schools
- ▶ Personnel 82.6%
- ▶ Travel 7.5%
- ▶ Supplies 5.0%
- ▶ Admin 4.8%
- ▶ Multnomah, Union, Deschutes, Lane, Malheur, all associated with STEM HUBS

# CTE COURSE EQUIVALENCY

\$121,000.

- ▶ Lane ESD Coordination
- ▶ 3 Pilots- 6 teacher teams
- ▶ March Announcement

# CTE SUMMER PROGRAMS

## \$1.75M

- ▶ 16 Applications – 9 Grants
- ▶ Under review
- ▶ February 22 Award
- ▶ Multnomah, Douglas, Washington, Umatilla, Lane, Linn, Marion, Columbia, Josephine, and Malheur Counties. Some counties have multiple applications.
- ▶ 1,000 middle school and high school students over two summers
- ▶ 91 school districts

# CTE Student Organizations

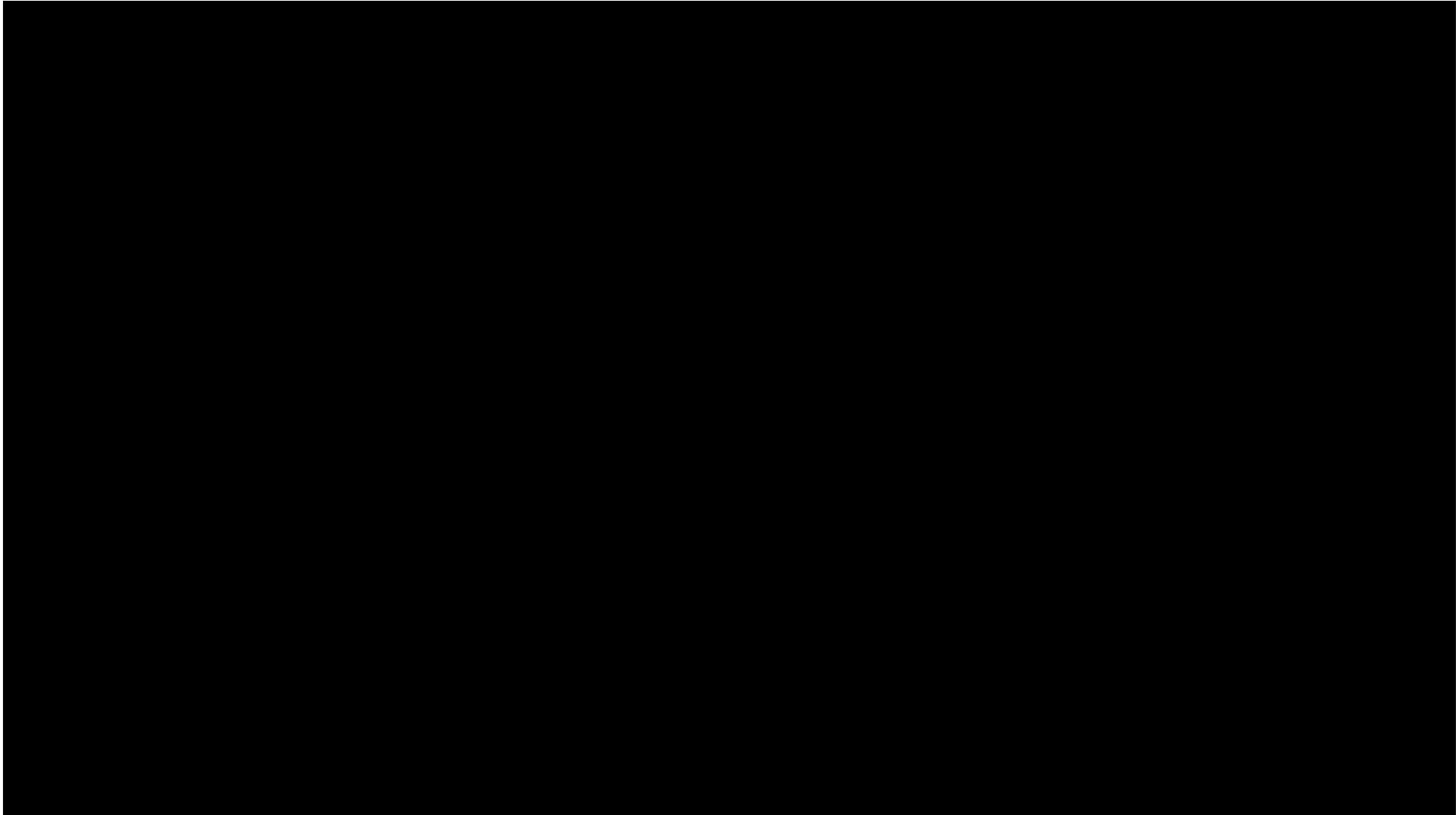
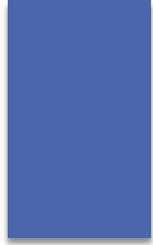
## \$500K

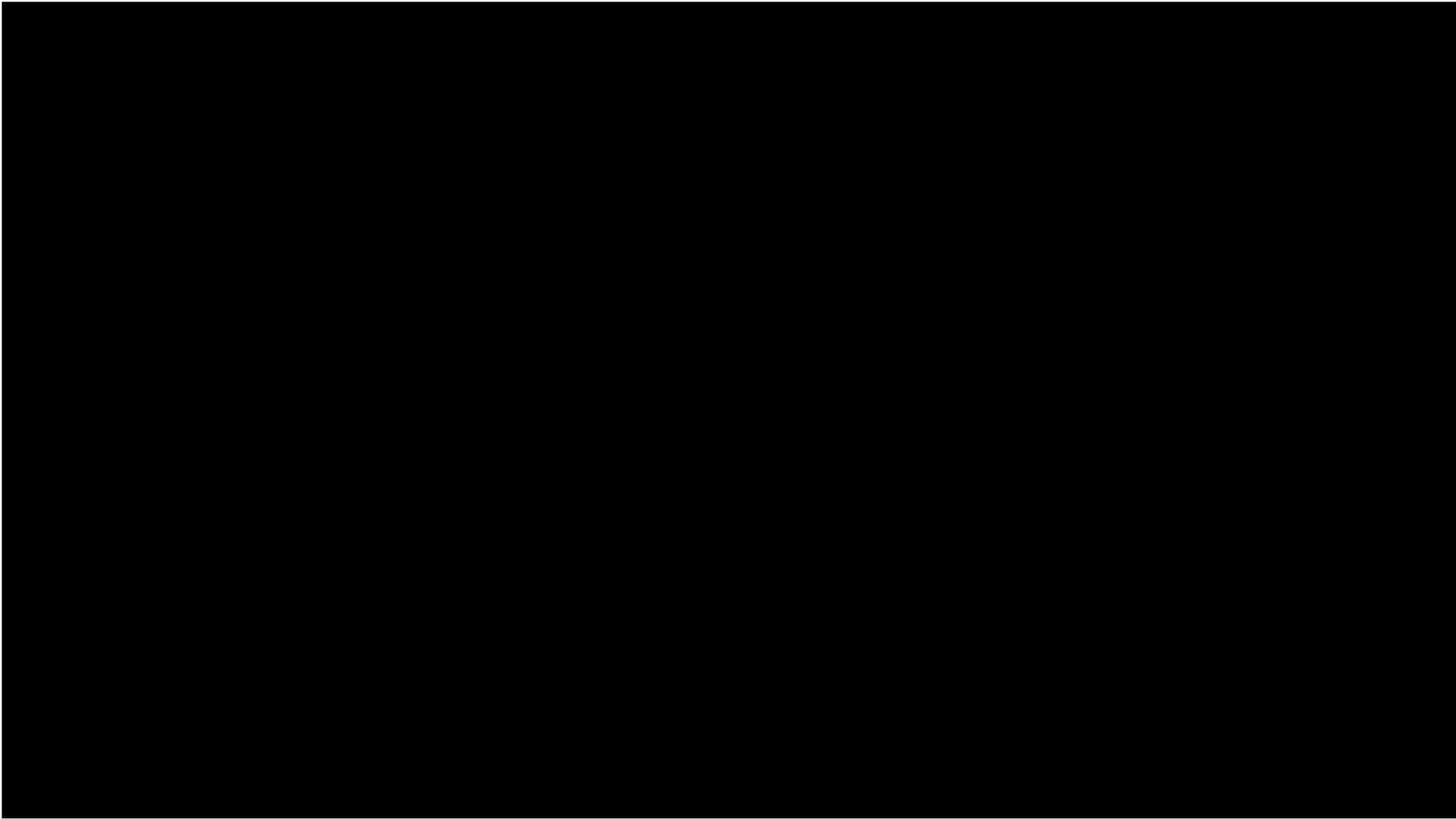
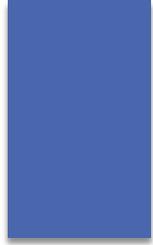
- ▶ 2 rounds
  - ▶ 166 Applications
  - ▶ 162 Grants for \$1050 each
  - ▶ Awarded so far \$223,600
- 
- |                 |                     |
|-----------------|---------------------|
| ▶ 16 DECA       | 51 FBLA             |
| ▶ 6 FFCLA       | 13 HOSA             |
| ▶ 28 Skills USA | 1 joint - all CTSOs |

# CTE TEACHER MENTORING

## \$1.1 m

- ▶ \$1,1000.
- ▶ Fab Labs- Feb. Awards
- ▶ Website-Summer
- ▶ Teacher Preparation and Mentoring-Summer
- ▶ Online course hosting, maintenance and administrative costs-Summer





# Portland Metro STEM Partnership

*Partnering to Improve STEM Education*



# Our Core Partners

- School Districts: **Beaverton, Forest Grove, Hillsboro, Portland,** and Banks
- **PCC, PSU, OHSU, U of P,** and OSU
- **Worksystems Inc., Vernier, Intel, JPMorgan Chase, First Tech, PGE,** and Clean Water Services
- **N/NE STEAM Coalition, Impact NW, Groundwork Portland,** and CDE
- **OMSI, Outdoor School, Oregon Zoo, SOLVE, Girls Inc.**
- City of Portland and Metro



# Areas of Work

- STEM Awareness & Advocacy
- Educator Professional Development
- STEM School Support
- Out-of-School STEM Educator Network (Collaboratory)
- Research & Assessment (Common Measures)

# Highlights of Accomplishments

## STEM Awareness & Advocacy

- Initiated and lead the planning for the first annual **STEM Week Oregon** event to increase public participation in STEM activities around the state
  - Over 2,000 adults and over 10,000 students participated

# Highlights of Accomplishments

## STEM Awareness & Advocacy

- Hosted annual **STEMposium** events since 2011, past sponsors include
  - Intel, Vernier Software & Technology, First Tech Credit Union, PGE, and JPMorgan Chase
- **Legislative Meet & Greet** (January 19, 2015)
  - Hosted by Vernier Software & Technology and JPMorgan Chase
  - Over 40 participants

# Highlights of Accomplishments

## STEM Awareness & Advocacy

- **Participation on regional and state-level committees**
  - STEM Council Strategic Planning Subcommittee
  - STEM Council Data & Metrics Subcommittee
  - Hub Backbone Effectiveness Criteria Workgroup
  - Equity Advisory Council of the Washington County Early Learning Hub

# Highlights of Accomplishments

## STEM Awareness & Advocacy

- **Participation on regional and state-level committees**
  - Conservation Education Leadership Council
  - Oregon ASK Steering Committee
  - Oregon Girls Collaborative
  - CTE Subcommittee
  - N/NE STEAM Coalition
  - Oregon Connections Workgroup

# Highlights of Accomplishments

- **Educator Professional Development** (2013-15)
  - Provided/Connected approximately 875 Oregon educators with quality professional development
  - Participated on the statewide Science Articulation Team
  - Trained 10 teacher leaders to support NGSS alignment with community STEM educators
  - Manufacturing and Healthcare Teacher Externships for Hillsboro High School STEM and CTE teachers, administrators, and school counselors

# Highlights of Accomplishments

- **Support for community-based STEM providers**
  - Student Affective Survey: Academic Identity & Motivational Resilience
  - Student Assessments: Application of Conceptual Knowledge
  - Consulting on program design and evaluation
  - NGSS alignment

# Highlights of Accomplishments

- Provided **current research on critical topics** of concern by district and community partners
  - STEM and Culture
  - Culturally relevant pedagogy in science and math
  - Addressing equity in math
  - Social-Emotional Learning (instruction & assessment)
  - Teachers as peer leaders
  - Evaluating MakerSpaces in libraries
  - High School science sequence & gatekeeper courses
  - Exemplar STEM programs for underserved students

# Highlights of Accomplishments

- Worked with **7 STEM transformation schools**:
  - Joseph Gale Elementary School (Forest Grove)
  - Boise-Eliot/Humbolt K-8 (Portland)
  - George Middle School (Portland)
  - Quatama Elementary School (Hillsboro)
  - Tobias Elementary School (Hillsboro)
  - Chehalem Elementary School (Beaverton)
  - Highland Park Middle School (Beaverton)

# Highlights of Accomplishments

## Two Portland Metro STEM Partnership STEM receive national innOVATION STEAM GRANT AWARDS!

Eight schools from across the country received the awards



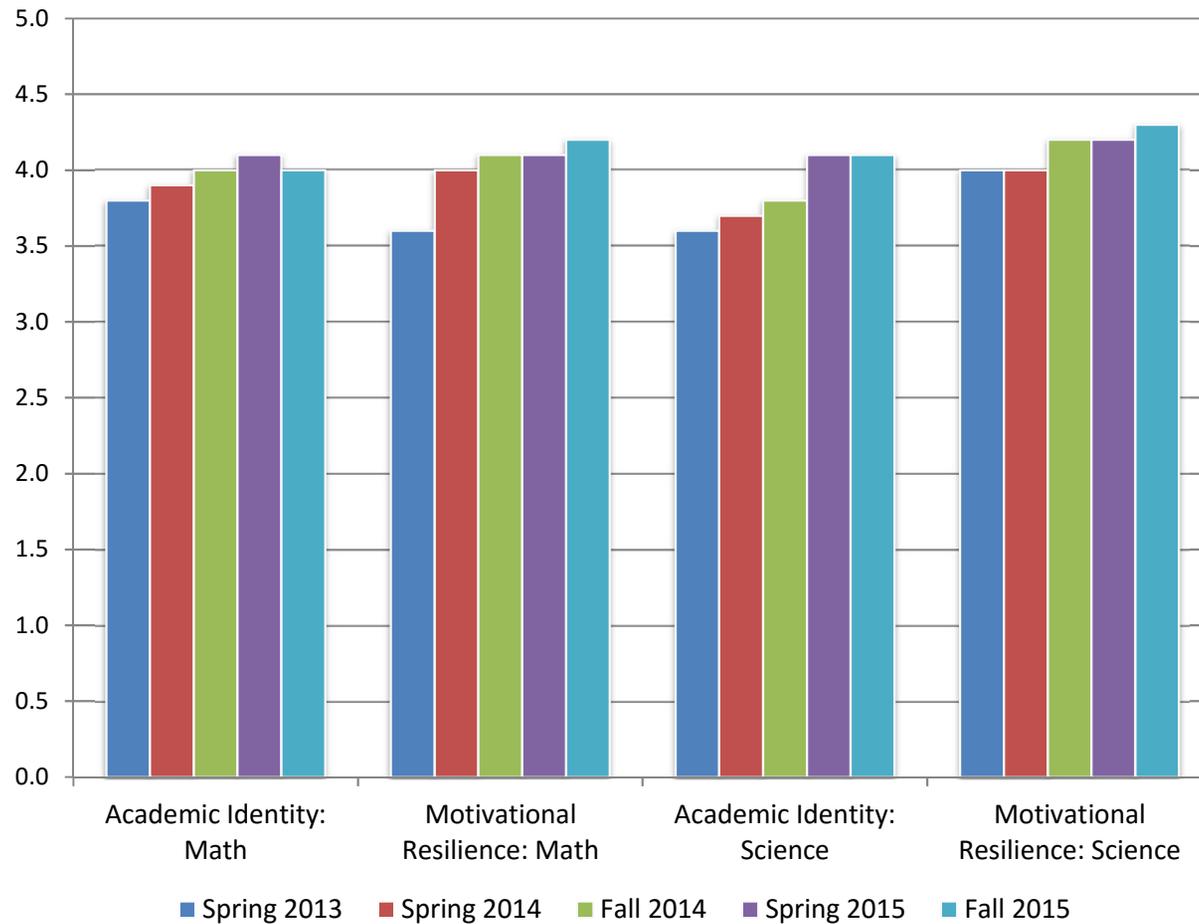
Highland Park principal David Nieslanik (3rd from the left) pictured with Oregon Representative Suzanne Bonamici



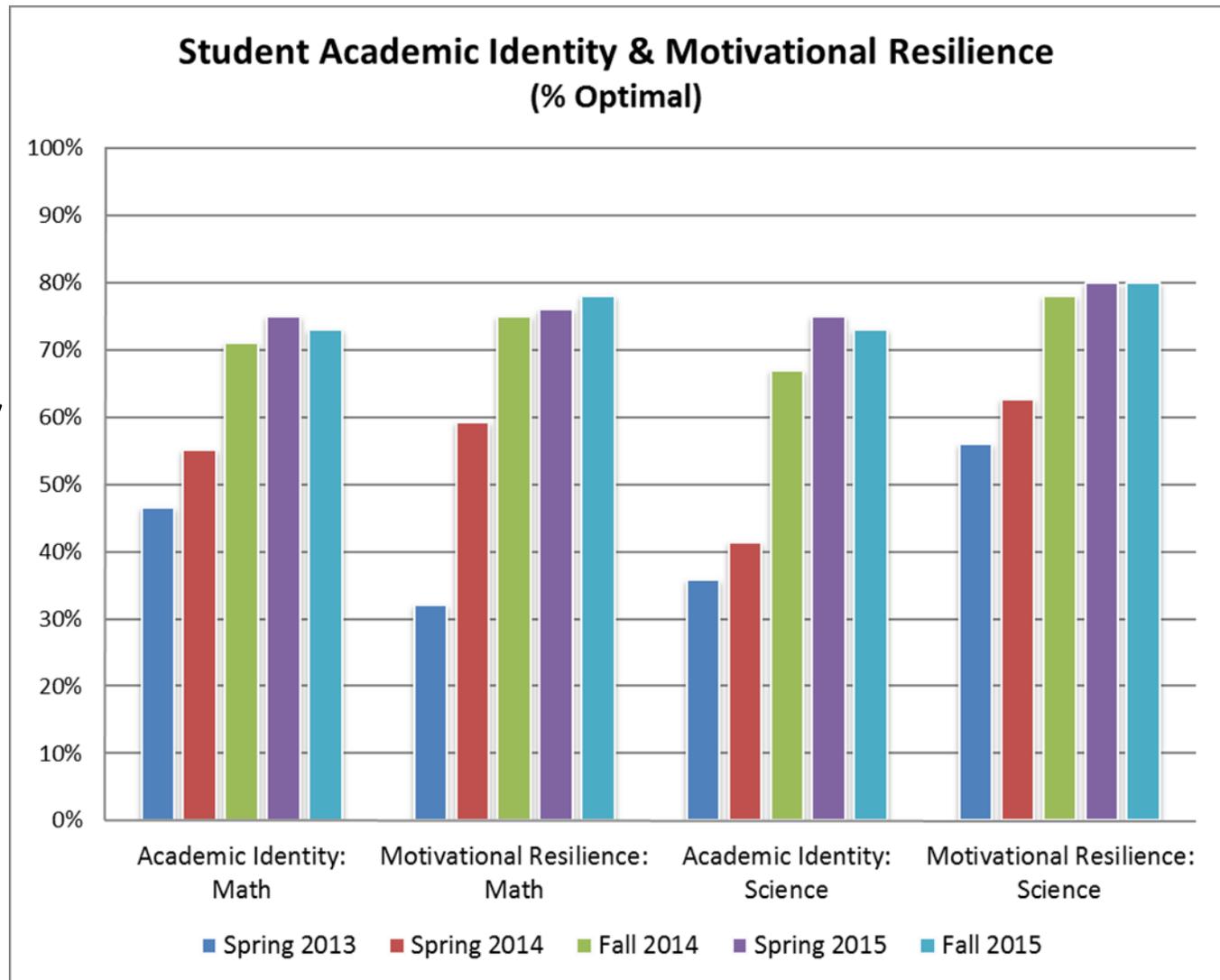
Sharon Angal (STEM TOSA), Janis Hill (Former Principal at Quatama), Congresswoman Suzanne Bonamici, Leslye Gonzalez (Quatama student), Quatama Principal Christy Walters, and Soledad Gonzalez.

# Quatama Elementary School

## Academic Identity & Motivational Resilience (means)



# Quatama Elementary School



# Highlights of Accomplishments

At the high school level, we support the Physics First High School Science redesign

- Beaverton and Forest Grove School District (with PMSP STEM TOSA support) led the development of open source curriculum and PD for three full courses
- Hillsboro school district will begin implementation in the fall of 2016

# Working closely with our district partners – Hillsboro SD



## Historically Underserved Populations

Demographics	Grades K - 12	Statewide K-12
Economically Disadvantaged	60%	39.1% Washington Cnty
Students with Disabilities	14%	
English Learners	27.5%	~10%
Non-White Students	51.5%	36.4%



# Working closely with our district partners – Hillsboro SD



## Boat Building!



# Highlights of Accomplishments Collaboratory

“The work of the Collaboratory in bringing together community-based STEM educators around their common interests, while connecting them to the formal school system is beyond anything that has been observed elsewhere in the nation. It is an exemplar for how partnerships of this nature are developed and sustained.”

- ODE STEM Hub Review Panel



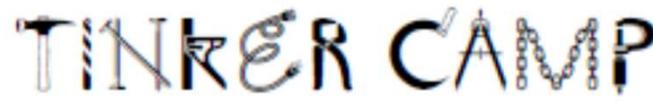
# Highlights of Accomplishments Collaboratory

- Currently over 70 community STEM organizations participate
- Last year, approximately 20 organizations asked to join – we no longer need to recruit!
  - We receive 2-5 inquiries per month

# Highlights of Accomplishments Collaboratory

- During the 2013-15 biennium, community-based STEM organizations worked on projects and/or participated in professional development workshops on:
  - Equity
  - NGSS and CCSS Alignment
  - Science Inquiry and Engineering Design
  - Common Outcomes and Measures
  - Reflecting on and Using Data Effectively
  - STEM Mentor Training

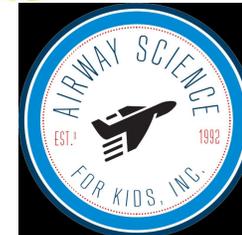
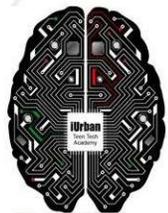
# Highlights of Accomplishments Collaboratory – a few of our Partners



**SOLVE**  
IT'S OUR NATURE TO  
VOLUNTEER



**Pixel Arts**  
Play > Make > Design



# Working closely with our community partners

## N/NE STEAM Coalition

- Coalition of community members dedicated to supporting youth of color with a focus on African American students
- Mission, Vision, and Goals
- Coming together as a community
- Working with the PMSP

# STEM Hub ROI

For the 2013-15 biennium, ODE invested \$600,000 in PMSP which in turn leveraged...

**\$3,395,641**

in partner investments, grants, contracts, sponsorships, and in-kind support.

# STEM Hub ROI

And we're on a good start for the 2015-17  
Biennium:

**\$1,836,481**

in partner investments, grants, contracts,  
sponsorships, and in-kind support... and  
counting!

# STEM Hub ROI

- Four Districts, PSU and Impact NW combined
  - 2013-15: \$5,221,149
  - 2015-17: \$855,836 (projected)
- Donations and grants supporting backbone
  - 2013-15: \$202,100
  - 2015-17: \$63,250\*

*\*as of December 2015*

# STEM Hub ROI

- Grants Supporting Programming
  - 2013-15: \$1,196,128
  - 2015-17: \$855,443
- In-Kind Associated with Programming
  - 2013-15: \$40,264
  - 2015-17: \$60,520\*

*\*as of December 2015*

# STEM Hub ROI

- Contracts for Services
  - 2013-15: \$10,000
  - 2015-17: \$10,000\*
- Sponsorships
  - 2013-15: \$17,500
  - 2015-17: TBD

*\*as of December 2015*

# Transitions and Direction Forward

Since the last biennium,

- Backbone staff reduction from 4.5 FTE to 2.0 FTE
- 10-person Advisory Board moved to a 17 member Steering Committee (with plans to expand further)

# Moving Forward

- **Educator Professional Development**
  - STEM Education Leadership Program
  - STEM Educator Professional Development
- **STEM School Transformation**
  - Resource Kit supporting schools to become STEM-focused

# Moving Forward

- **In-school & Out-of-school STEM Learning**
  - Collaboratory
  - Expanded Learning Opportunities (connecting in- and out-of-school learning)
- **Common Measures & Student Assessments**
  - Scaling the PMSP Common Measures framework
  - Developing a Toolkit of common measures and resources for state-wide application

# What we're excited about

## **Initiatives & Grant Opportunities:**

- STEM Educator Leadership
  - Programming Initiative
- STEM School Resources Toolkit
  - Math in Real Life Grant application submitted
  - Programming Initiative

# What we're excited about

## Initiatives & Grant Opportunities:

- Collaboratory goes state-wide
  - STEM Out of School Innovation Grant application submitted
  - Programming initiative
- Common Measures goes state-wide
  - Hub backbone initiative

# Why are STEM Hubs important?

- **High Return on Investments**
  - For 2013-15, 5.6X times ROI
- **Regional Initiatives tested** for statewide scaling
  - Collaboratory
  - Common Measures
  - STEM Schools Resources Kit
  - STEM Educator Leadership Program
- **Strong Partnerships** working towards common solutions to systemic problems

