Washington STEM (LASER)

1. Purpose: Washington State LASER (Leadership Assistance for Science Education Reform) is a state science-education program led by Washington STEM along with the Office of Superintendent of Public Instruction, Educational Service Districts and school districts. Since 1999, the public/private partnership has worked with 106,300 educators in more than 205 school districts to share and inspire powerful practices in science education–from student notebooks that combine science, literacy, math and art–to strategic planning that creates a shared vision from classroom to school board. The work of Washington State LASER is actualized through ten regional Alliances, geographically aligned with the Educational Service Districts that offer services and strategic planning support within the five components of the LASER model developed by the Smithsonian Science Education Center: professional learning, curriculum, instructional materials, assessment, and school and community support. As Washington further engages in implementation of the Next Generation Science Standards, LASER plays a key role in ensuring state science leaders maintain a learning community and develop evolving leadership skills to support district and school science/STEM implementation.
   Washington State LASER has served as a key network of leaders in science education in Washington for nearly two decades, building collegiality and leadership capacity across the state to improve science learning for K-12 students.

2. Description of services provided: Given the wide range of systems- and district-level needs across Washington, Washington State LASER offers a range of services to participating schools, districts, and educators.

   Regional Alliances

   - In several regions, the regional LASER Alliance serves as a co-operative hub for instructional materials across 20-30 districts—resulting in efficiencies in cost, labor, and professional learning across the districts.
   - Several Alliances provide strategic planning and implementation support at the district and school level.
   - All Alliances contribute to developing regional science education leadership capacity by supporting the work of the AESD Science Fellows and additional teacher leaders.
   - Alliances spent approximately $13,000 on materials and supplies to support the professional development activities in their regions. Materials included books for professional learning communities and consumable supplies for PD events.
   - Provide guidance and resources to schools and districts developing equity-focused science/STEM strategic plans.
   - Four Alliances were awarded extra funds based on a competitive RFP process to develop innovative approaches toward building systemic supports for equitable outcomes for students in science/STEM, in partnership with at least one other Alliance. The North Sound/South Sound/Puget Sound ESD partnership held a full-day workshop for 36 science education leaders to develop foundational skills in facilitating equity-focused work. Following the workshop, 21 science educators,

STEM professionals, and equity advocates converged as "critical friends" to provide feedback and input on the partners' approach and plans to continue this work. The Southwest/Northeast partnership facilitated highly localized one-day workshops for principal-teacher teams to support the integration of equitable teaching practices for students underrepresented in STEM. The workshop built upon existing materials to provide targeted learning and inform the action-planning process.

Collaboration and Professional Learning Support for Alliance Directors

- LASER provides a collaborative learning space for Alliance Directors, who in many cases are also Regional Science Coordinators. In 17-18, Alliance Directors have collectively doubled down efforts to conduct their work through an equity lens—as a result, districts and schools that participate in regional LASER activity can now expect to have increased support and guidance in designing learning environments and systems that better serve students underrepresented in STEM fields.
- Regular communication via email and monthly Alliance Director Webinars.
- Three annual convening's were held in 2017-2018 with the goal of increasing Alliance Director's capacity for leading equity-focused science education efforts in their regions, sharing resources and knowledge, and identifying common goals for 2018-2019.

Statewide Professional Learning Opportunities

- November 2017: Statewide LASER Alliance Meeting – Provided two-day workshop for approximately 50 science/STEM education leaders from around the state to deepen understanding of equity and diversity issues facing communities, develop tools to address equity and diversity in STEM via the NGSS, and learn about ongoing solutions from peers.
- November 2017: LASER PD Workshop—Provided one-day workshop for science educators to learn about and plan for low-cost, equity-focused science and engineering resources including Science Notebooks, Microsoft Hacking STEM resources, and Washington MESA/Washington STEM Engineering Fellows design challenges.
- March 2017: Statewide LASER Alliance Meeting—Provided two-day workshop for approximately 40 educators to continue to deepen understanding of equity and diversity issues in STEM using Targeted Universalism framework, learn about Microsoft Hacking STEM resources, share capacity-building knowledge and resources, and plan for 2018-2019 LASER changes.

3. Criteria for receiving services and/or grants: Each Alliance has set goals that are responsive to local needs, while still aligned with LASER's commitments to OSPI. In order to buffer against a "one size fits all" approach, each Alliance has different criteria for regional participation. In several regions, districts or schools must buy into a regional instructional material cooperative. Beyond instructional materials, all districts and schools are eligible to participate in regional LASER activity.

Beneficiaries in 2017-18 School Year:

# of School Districts: 156 + 4 private schools

# of Students: 67,500* (indirect)
# of educators: 1350+

*Note: Two factors make estimating the number of students benefitting from LASER activity difficult to count given this year's activity—districts were engaged to varying degrees, and educators served include elementary, middle, and high school students. As such it would not be prudent to claim number of students directly benefitting based on district engagement and we did not collect student number counts from benefitting teachers. Estimating the average student load of participating teachers to be 50 students, we can assume 65,000 students indirectly benefitting. This does not account for students attending specific schools that engaged in LASER activity at this time, which would significantly increase the number of students benefitting.

In FY 17 LASER led professional development events totaling over 23,000 hours of contact time with educators, including teachers, principals, science coaches, AESD Science Fellows, and district leaders.

# of OSPI staff associated with this funding (FTEs): 00
# of contractors/other staff associated with this funding: 20 (Select Washington STEM staff and regional Alliance Directors)

FY18 Funding:	State Appropriation:	$356,000
	Federal Appropriation:	$0
	Other fund sources:	$0
	TOTAL (FY18)	$356,000

~~4.~~ Are federal or other funds contingent on state funding? If yes, explain.
Yes. Current state funds are used to leverage other funding sources.

5. State funding history:

Fiscal Year	Amount	Actual Expenditures
FY18	$356,000	$355,965
FY17	$356,000	$356,000
FY16	$356,000	$356,000
FY15	$356,000	$356,000
FY14	$356,000	$356,000
FY13	$356,000	$356,000
FY12	$356,000	$355,922
FY11	$197,000	$197,000
FY10	$1,473,000	$1,183,715

6. Number of beneficiaries (e.g., schools, students, districts) history:

Fiscal Year	# of School Districts	# of Schools	# of Students
FY 18	204	1800	977,841
FY17	204	1800	977,841
FY16	204	1800	977,841
FY15	204	1800*	977,841
FY14	204	1861	960,227
FY13	204	1886	954,287
FY12	204	1886	944,679
FY11	203	1,602	940,326
FY10	203	1,602	940,326

7. Programmatic changes since inception (if any):

Changes between 2002-2017

- Number of LASER school districts grew from 30 to 204, which serve just over 91.3% of students in the state.
- Number of Regional Alliances grew from 4 to 10, so LASER can now serve most of the state with a network able to implement future efforts.
- Services expanded from elementary to include middle school and continue to expand into high school.
- Developed leadership teachers and administrators across the state through our Science Partnership Academy, Strategic Planning Institute, STEM Education Leadership Institute, National Academy for Curriculum Leadership, worked with the Association of Washington School Principals, Washington State School Directors Association, Washington Association of School Administrators, projects to develop Foundational Use Professional Development Providers and professional learning opportunities around *A Framework for K-12 Science Education* and the *Next Generation of Science Standards*.

Summary of 2017-2018 changes

In order to fully tap the capacity of the expertise LASER network, in early 2018 the LASER Executive Director position was eliminated. This change has resulted in distributed leadership and increased resources to the field. Moving forward, the statewide Co-Directorship will be shared by two regions with additional resources. The Co-Directors will provide leadership for continuous improvement efforts across Alliances, and will liaise with the Advisory group. Regional Alliance Directors, with increased annual resources resulting from the change in leadership structure, will share, implement, and refine best practices for improving student learning outcomes by acting at the systems and organizational levels. Washington STEM will provide capacity-building support and technical assistance, including communications and advocacy, regionally and statewide. Between the months of March-June 2018, Washington STEM took on the leadership responsibilities previously held by the Co-Director.

As part of this process, we have worked with Alliance Directors and other known leaders in science & engineering education to identify and pursue the most impactful bodies of work, while also clarifying LASER's role in an increasingly busy science & engineering education landscape. In order to fully tap the capacity of the LASER network, we are exploring ways to more fully distribute leadership and programmatic work to the field. This means that statewide LASER events will be planned and implemented by regional leaders with technical support from the broader LASER community and Washington STEM. In March, Washington STEM began working closely with Alliance Directors and key advisors to articulate LASER's unique contribution—including points of synergy with concurrent initiatives, e.g. Climate Science Education—and collective goals for 18-19. This engagement has continued into Q3 of 2018 and will drive the work of LASER in 18-19.

8. Evaluations of program/major findings**:**

Based on formative evaluation of regional LASER Alliance activity, the Alliances continue to provide a mechanism for districts and schools to reduce costs and maximize efficiency in training teachers in NGSS-aligned instructional practices, designing and implementing strategic plans for science/STEM implementation, and providing instructional materials particularly at K-8. With the increased focus on equity, Alliance Directors reported being better positioned and equipped to lead regional work with an equity focus. As support for science/STEM learning continues to increase, LASER remains a space for key regional leaders to identify and leverage points of synergy across efforts—e.g., curriculum adoption/adaptation, Climate Science education, assessment, strategic planning, and community engagement.

Prior evaluation of LASER has provided the following findings:

- External evaluation of the STEM Education Leadership Institute show that we are providing the framework and technical support to those teams in attendance and STEM education is being implemented in schools, school districts, and regions in attendance.
- External evaluation of our work with critical stakeholders such as Association of Washington School Principals, Washington State School Directors Association, and Washington Association of School Administrators are effective professional learning opportunities for increasing the awareness of NGSS.

The LASER network will continue to leverage these findings by increasing leaders' capacity to support local schools and districts to strategically implement science/STEM education aligned with the WSSLs.

9. Major challenges faced by the program:

Since the 2008-2009 school year the LASER program funding reduction has caused a reduction in or elimination of services which were previously provided. They include:

- Strategic Planning Institutes
- Instructional Materials Showcases
- Evaluation of overall effectiveness of LASER program and student achievement
- Awareness events that built understandings of science education reform and Washington State LASER process

- Facilitation of formation and operation of small school districts consortia

The main challenges faced by LASER are time and capacity to engage in sustained and impactful work. All of the Alliance Directors wear multiple hats—Regional Science Coordinators, STEM Directors, Science Materials Center Managers, Science Specialists. As such, these leaders are willingly tasked with myriad programs, initiatives, and administrative tasks, sometimes making it hard to articulate LASER's unique contribution to the increasingly complex landscape of science/STEM education in our state. Our goal in restructuring the leadership and ways of collaborating is to address this problem. We want LASER to continue to be a place for these invaluable leaders to "fill their cup" with the resources, knowledge, and support they need to effectively lead science/STEM education efforts in their region. Another significant challenge has been understanding the impact of LASER activity, given the variation in structure, function, and reputation of the Alliances and different needs of districts and schools. Our transition work to date has already helped address this challenge by identifying common goals and possible indicators for success moving forward. Multi-level evaluation that would establish impact on student learning has not been a focus, as spending has gone toward programs.

10. Future opportunities: The future holds great promise for Washington State LASER. We have collectively established working goals for 18-19:
    - **Landscape:** Washington State LASER will asset map—by Alliance region—STEM implementation efforts at the district and school level.
    - **Culture:** Washington State LASER will engage in continuous improvement efforts to support STEM implementation in the Alliance regions. LASER will be a space to get inspired, fail forward together, and "fill our cup."
    - **Leadership:** Washington State LASER will develop a set of tools and leadership capacity to support science/STEM implementation. As many districts examine ways to implement STEM education, LASER will provide guidance on how to strengthen STEM through high-quality science education.

    The goals described here are aimed at solving several challenges in ensuring all Washington students—particularly those underserved and underrepresented in science/STEM—have meaningful access to powerful learning. By mapping and analyzing how districts and schools are conceptualizing and implementing science/STEM learning, we'll be able to identify bright spots and gaps that we can target for support. By applying a more coherent structure to collaboration and learning from one another, we'll be able to identify productive variations in practice and tools, and continue to provide professional learning support for those who spend most of their working time providing learning opportunities for others. And by documenting, curating, and refining our process and tools, we'll build leadership capacity within and beyond the LASER community with a focus on equitable outcomes for students.

    We have begun to tap into the potential of aligning the work of Washington State LASER with the Washington STEM Networks. There is interest in identifying points of synergy across the two systems, particularly around career-connected learning via strengthening community engagement and support. In spring 2018, Alliance Directors identified the

community support pillar of the LASER model to be a key area of growth. In some regions, this connection is already leveraged to increase impact for students.

With the onboarding of an Impact Director, Jenée Myers Twitchell, at Washington STEM dedicated to guiding the organization and statewide partners in understanding how systems- and organizational- level work impacts student outcomes, there is great potential for Washington State LASER to increase effectiveness in providing support that encompasses the five components of LASER and complements other efforts. In spring 2018, Dr. Myers Twitchell attended the LASER planning meeting and shared what support her team can offer and began gathering input from Alliance Directors about what systems- and organizational- level data would best support their work. Her team will continue to support LASER work at the state and regional level.

11. Statutory and/or Budget language**:**

Budget Proviso: SSB 5883, Sec. 513 (2) - $356,000 of the general fund--state appropriation for fiscal year 2018 and $356,000 of the general fund--state appropriation for fiscal year 2019 are provided solely for the Washington state leadership and assistance for science education reform (LASER) regional partnership activities coordinated at the Pacific science center, including instructional material purchases, teacher and principal professional development, and school and community engagement events.

12. Other relevant information**:** In 17-18, following a 90-day planning process, it was decided that Washington State LASER would move from the Pacific Science Center to Washington STEM. Given the timing of that decision, the proviso funds remained with PSC, with Washington STEM as a sub-grantee. Beginning in 18-19, the proviso funds will be directly awarded to Washington STEM from OSPI.

13. List of schools/districts receiving assistance**:** See OSPI website**.**

14. Program Contact Information**:**

Ellen K. Ebert, Ph.D.
Director, Learning and Teaching Science/Environment and Sustainability Education
Past President, Council of State Science Supervisors
Office of the Superintendent of Public Instruction (OSPI)
600 Washington Ave. SE 98504-7200
P.O. Box 47200, Olympia, WA 98504-7200
Office: 360-725-4962
ellen.ebert@k12.wa.us
Office of Superintendent of Public Instruction