

Next Generation Science Standards and Climate Science Education

1. **Purpose:** The 2018 Washington State Legislature allocated \$4,000,000 of the general fund in fiscal year 2018-19 to provide grants to school districts and educational service districts (ESDs) and community based organizations (CBOs) for science teaching training in the Washington State Science Learning Standards (WSSLS) (Next Generation Science Standards/NGSS), which include climate science education standards (ClimSciEd).
2. **Description of services provided:**

ESDs and CBOs collaborated to develop and deliver WSSLS/NGSS professional learning workshops and courses for science educators in Washington schools and districts, particularly those historically underserved by science education. Comprehensive schools and targeted comprehensive schools as identified by the Washington School Improvement Framework (WSIF) were given priority for service.

 - All professional learning materials and resources developed by the nine ESDs and seven CBOs were shared as Open Educational Resources (OERs) on the [Washington Commons OER](#) website. Statewide, 16 projects were launched through this funding.
3. **Criteria for receiving services and/or grants:**

Priority service was given to populations of students, schools, districts, and communities historically underserved by science education including but not limited to Tribal Compact Schools), migrant students, schools with high free and reduced lunch populations, rural and remote schools, students in alternative learning environments, students of color, English learner students, and students receiving special education services. Comprehensive schools and targeted comprehensive schools as identified by the WSIF were also given priority. The targeted elementary grade level was fourth grade, although all elementary teachers were invited to participate in any training. In secondary education, the focus was on middle and high school teachers responsible for teaching earth and space science standards and their related performance expectations in life science, physical science, and engineering. High school educators, both general education educators and career and technical education educators whose teaching assignments include forestry, agriculture, environmental science, etc., were also included.
4. **Beneficiaries in 2018-19 School Year:**
 - # of School Districts: >200
 - # of Schools: 00
 - # of Students impacted by proviso via their teachers training: 225,000 (approximately)
 - # of educators: 7500

 - # of OSPI staff associated with this funding (FTEs): 1.6
 - # of contractors/other staff associated with this funding: 2.0 (UW – IAG)

FY19 Funding: State Appropriation: \$4,000,000

Federal Appropriation:	\$0
Other fund sources:	\$0
TOTAL (FY19)	\$4,000,000

5. Are federal or other funds contingent on state funding? If yes, explain. No.

6. State funding history:

Fiscal Year	Amount Funded	Actual Expenditures
FY19	\$4,000,000	\$3,843,391

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

Fiscal Year	# of Districts	# of Educators, Administrators, and Community Stakeholders
FY19	200	7,500

8. Programmatic changes since inception (if any): N/A

9. Evaluations of program/major findings:

- The [ClimeTime](#) website was developed and launched.
- The impact extended far beyond the nine ESDs and seven CBOs; More than 80 state-wide community based organizations collaborated with the sixteen funded projects to conduct science and climate science related workshops and learning experiences.
- Elementary teachers across the state received and participated in standards-aligned science trainings. The trainings represented a diverse range of topics, including: (1) how to use science learning materials in newly obtained science kits, (2) engaging students in productive discourse through scientific argumentation, (3) understanding forest ecology, (4) how to interpret scientific data around climate science research, (5) how to teach science concepts in early childhood classes through play and story-telling, and (6) how to adapt existing lessons to focus on phenomena-based learning which integrate learning content and strategies more inclusive of all students and the communities in which they live.
- A virtual canvas course addressing the WSSLS climate science standards was developed for K12 educators across the state. The course was well received and a new course building on this foundational training is currently under development for school year 2019-2020.
- A climate science board game was also developed and will piloted in the 2019-2020 school year.
- Six ESDs participated in the first year of a three-year middle school open education learning curriculum in a project titled: *OpenSciEd*. Approximately 36 teachers from urban and rural sectors statewide piloted new learning materials developed through a grant project funded by Carnegie Corporation. Proviso funding leveraged the grant funds to support Washington teachers to attend multiple day-long trainings in Camas,

Yakima, and Seattle.

- At the secondary level several projects were developed: (1) *9-12: Everything I need to know about climate science I learned in high school chemistry*. Oceanographers from UW were contracted to develop a 1-day ocean acidification class for HS chemistry teachers; (2) *Collaboration for Ambitious Science Teaching and Learning (CASTL)* continued a three year, formerly federally-funded Mathematics and Science Project (MSP) called PASTL and expanded into new schools using climate science as a theme; (3) an integrated 10th grade science course with a unit dedicated strictly to understanding how eastern Washington native species of Pika are impacted by a changing environment; (4) field studies into the forests in eastern Washington, bringing teachers and middle school students to explore forest ecology and health by focusing on understanding impacts of weather and climate on the Fire Triangle and the Fire Behavior Triangle.
- Several CBOs and ESDs initiated K12 professional learning projects in collaboration with tribal nations to focus on Indigenous ways of knowing and understanding the natural and physical world, specifically focusing on climate science using the *Since Time Immemorial* curriculum.
- Many CBO projects took advantage of community partners including higher education colleagues to develop field experiences for K12 teachers. One extension of this work included visiting schools to provide onsite training for how to use the playground and/or local resources (forests, streams, meadows, etc.) as a way to learn science and engage students in locally relevant learning.
- A CBO project developed a series of trainings called “STEM Seminars” through a partnership with the regional ESD, local agencies (e.g., WSU Storm-water Center, Seattle Public Utilities, Puget Sound Clean Air Agency, Southwest Clean Air Agency, Cowlitz County Public Works, Pacific Northwest National Laboratory, Yakima County, and others), and the University of Washington’s Climate Impacts Group to provide K12 teachers with contemporary learning about climate science and climate impacts in several key Washington sectors such as agriculture and health.

10. **Major challenges faced by the program:**

- The timeline for FY19 was incredibly fast for designing, developing, and deploying a one year project of this scope.
- The short interval between the end of the legislative session and the beginning of the next fiscal year required staffing (including administrative staff to support grants administration) that took time to put in place; OSPI staff were stretched to build and fly the “plane” in the time available.
- The intense external interest in the project created communication challenges to respond quickly to just-in-time requests for information from varying stakeholders and the media.
- Challenges identified by project leads include but are not limited to: (1) rapid timeline; (2) trouble understanding how the iGrants system works; (3) reporting requirements; (4) teacher strikes at the beginning of the school year, which caused scheduled trainings to be canceled; (5) extreme weather in the winter which prevented teachers from participating in training; (6) underspending funds due to canceled trainings; and (6)

communication challenges due to a lack of relationships with schools, teachers, and tribal nations.

- All projects reported issues with teacher recruitment in part due to the unusual winter weather, lack of substitutes, knowledge of school systems and communication protocols, and school districts not allowing teachers release time to attend trainings.
- All projects wished for better ways to engage with tribal nations. One project in particular, Pacific Education Institute, gained experience and engaged in valuable conversations with native communities and professionals about how to engage and include native youth. These lessons were shared at OSPI's Indigenous Collaboration Workshop in June 2019.
- Successful implementation required ESDs to engage many staff from their different departments (e.g., program staff from math, ELA, special education, migrant, and English Language); this collaboration, while valuable, stretched ESD staffing capacity.

11. **Future opportunities:** The FY19 funding opened the door to increased opportunities for teachers to participate in contemporary science learning situated in real world issues such as climate science. The continued FY20 and FY21 funding will build the capacity of Washington teachers and expand the types of programs and training available, engaging more schools and districts across the state.

The need for sustained, contextualized teacher training is urgent and compelling. In the words of one project director:

There was an on-going need to get the teachers themselves into the forest and shrub-steppe...to experience the relationship between healthy ecosystems, fire, and climate. They lack the very basic knowledge that they are trying to impart to their students. Before they can facilitate their classes on any journey, they need to learn the story line of targeted concepts themselves." Many teachers have not had significant science training since they completed their degrees and they, themselves, need content learning.

12. **Statutory and/or Budget language:**
 Budget Proviso: ESSB 6032, Sec. 501 (68) - \$4,000,000 of the general fund--state appropriation for fiscal year 2019 is provided solely for the office of the superintendent of public instruction to provide grants to school districts and educational service districts for science teacher training in the next generation science standards including training in the climate science standards. At a minimum, school districts shall ensure that teachers in one grade level in each elementary, middle, and high school participate in this science training. Of the amount appropriated \$1,000,000 is provided solely for community based nonprofits to partner with public schools for next generation science standards.

13. **Other relevant information:**
 As a result of this proviso funding and the newly developing programs it facilitated, teachers deepened their understanding of the Washington State Science Learning Standards (Next Generation Science Standards) and of the climate science standards embedded within them, providing the genesis for the ClimeTime initiative. Success stories can be found on a newly developed [website](#). Additionally, the [Washington State Open Educational Resources](#) website is now an umbrella for resources developed during the year.

14. List of schools/districts receiving assistance: See OSPI [website](#).

15. Program Contact Information:

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