



Washington Office of Superintendent of **PUBLIC INSTRUCTION**

Science Teacher Training

1. **Purpose:**

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 (ClimeTime).

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. During the 2020 legislative session, the proviso was amended to include Tribal Education Agencies as part of the community based organizations section of the proviso language.

All professional learning materials and resources developed by the nine ESDs and six CBOs are shared as Open Educational Resources (OERs) on the [Washington Commons OER](#) website. In 2019, 15 of the 16 projects launched in the prior year received continuation funding.

3. **Criteria for receiving services and/or grants:**

Priority 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 for 2019-20 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. Other high school educators, both general education educators in other content areas and career and technical education educators whose teaching assignments include forestry, agriculture, environmental science, etc., were also included.

With the long term school closures due to COVID 19, project managers extended the invitation to professional learning events to all interested science/STEM educators and their colleagues.

Beneficiaries in 2019-20 School Year:

Number of School Districts: >200 many school districts participated more than once which makes the exact count difficult.
Number of Schools: 1752
Number of Students: 244, 894 (approximately)
Number of Educators: 6058 (numbers impacted by COVID closures)
Other: TOSAs, Administrators 745 approximately

Number of OSPI staff associated with this funding (FTEs): 1.8 FTE
Number of contractors/other staff associated with this funding: 1 Contract

FY20 Funding: State Appropriation: \$3,000,000
Federal Appropriation: \$0
Other fund sources: \$0
TOTAL (FY20) \$3,000,000

4. **Are federal or other funds contingent on state funding?**

No

Yes, please explain.

If state funds are not available, the state will not be eligible...

5. **State funding history:**

Fiscal Year	Amount Funded	Actual Expenditures
FY20	\$3,000,000	\$2,957,305
FY19	\$4,000,000	\$3,843,391

6. **Number of beneficiaries (e.g., school districts, schools, students, educators, other) history:**

Fiscal Year	Number of School Districts	Number of Schools	Number of Students	Number of Educators	Number of Other
FY20	>200 (many districts participated more than once making the exact count difficult)	1,742	244,894 (estimated)	6,058 (attendance impacted by long term school closure)	Not completely tracked, TOSAS, Administrators Approximately, 745
FY19	200	0	0	7,500	Included in educator total

7. **Programmatic changes since inception (if any):**

N/A

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

- The [ClimeTime](#) website continued to expand its footprint, highlight active professional learning opportunities, showcase open education resources developed in the projects, provide short teacher video vignettes, and share [news articles and media releases](#).
- The impact extended far beyond the nine ESDs and six CBOs. As in 2019, more than 80 state-wide community based organizations collaborated with the fifteen funded projects to conduct [science and climate science related workshops and learning experiences](#).
- When schools went into long-term closure and many face-to-face ClimeTime trainings were cancelled, OPSI helped projects organize 4 day-long events offering more than 35 professional learning sessions and hosting over 1400 teachers.
- Statewide, elementary teachers continued to receive and participate in standards-aligned science trainings, which often included field studies. The trainings represented a diverse range of topics, including:
 - using science learning materials in newly obtained science kits,
 - engaging students in productive discourse through scientific argumentation,
 - understanding forest ecology and ways to use [local resources for field studies and outdoor learning](#).
 - interpreting scientific data around [climate science research](#),
 - teaching [climate science concepts in early childhood](#) classes through play and story-telling,
 - adapting existing lessons [into storylines](#) to focus on phenomena-based learning which [integrates content and strategies](#) more inclusive of all students and the communities in which they live.
 - developing [garden curriculum](#) in partnership with local CBOs.
- With the long-term school closure, one of the regions sent over 20,000 mini-STEM units home to families to do with their students. This highly successful learning strategy fostered positive engagement and focus on elementary science.
- Multiple virtual canvas courses addressing the WSSLS climate science standards were

developed and implemented for K12 educators across the state. The courses were well received and new courses are designed and ready for school year 2020-2021.

- Several projects began translating learning materials into Spanish for use with English Language Learners and within the Migrant Education community.
- Four ESDs participated in the second year of a three-year middle school open education learning curriculum in a project titled: *OpenSciEd*.
 - Statewide, 24 teachers from urban and rural sectors 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 Yakima and Seattle.
 - When COVID 19 closures prevented in-person trainings, the regional science coordinators along with Washington pilot teacher facilitators moved the entire professional learning to a [four day event in June](#) using multiple online learning platforms including Zoom, Canvas, Jam Board, Google, and Word Press.
- For middle and high school teachers, several projects were developed:
 - Virtual professional learning communities were formed and sessions were held after school hours to focus on supporting teacher practice as they implemented new climate science content.
 - After the long-term school closure, 289 teachers were introduced to the study of systems in an *Institute for Systems Biology* (ISB) workshop entitled, "Systems are Everywhere." ISB scientists and education outreach staff interacted with participants providing insights into systems' theory and data analysis.
 - A project titled, "[Climate Justice League](#)" was developed in a partnership between a CBO and an ESD and with the University of Washington's Climate Impact group and research scientists to provide teachers with an opportunity to discuss how to help students understand that climate changes have real world impacts. Teachers participated in monthly seminars and developed collaborative lessons to use in their classrooms. In 2020-2021, Climate Justice League will expand to 4 ESDs.
 - Field studies into the forests in Washington continued this year focusing teacher learning on forest ecology and health by understanding impacts of weather and climate on forest fires.
 - *Climate and Coding* was a new course introduced as a pilot in one of the regions. The course will continue into 2020 – 2021.
 - Incarcerated youth participated in over 31 learning experiences in climate science and environmental science topics.
- Several CBOs and ESDs continued 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. In one project, Elders presented stories and experiences as part of the professional development design.
 - As a result of this initial collaborative effort, a fledgling partnership called, *Braiding Futures*, has emerged to focus on using educational learning experiences to raise tribal youth understanding and voices for their communities as they develop strategies to mitigate environmental and cultural impacts of climate change.
- This year, teachers continued to enjoy "[STEM Seminars](#)," a CBO partnership with the regional ESDs, 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. STEM Seminars provides K12 teachers with contemporary learning about climate science and climate impacts in several key Washington sectors such as air quality and health. One focus this year was on food waste. Teachers were shocked to learn that food waste is a significant contributor to climate-related impacts.

- Over 200 teachers in the Spokane region learned to use game based learning around climate science. This work touches on racial equity and social justice and is supported by the U.S. Department of Education. Project managers were able to attend the ED Game event in Washington DC in January to highlight their work and the game that was built for the climate science proviso.
- In an effort to integrate across content areas, a project is using Computer Science Standards integrated with climate science professional learning. Over 300 teachers participated in the training.
- Formative assessments related to climate concepts were embedded into learning materials and teachers learned strategies for evaluating them during instruction.
- Data collected and reported in the [AESD Climate Science Survey Report](#) found that approximately 90% of teachers expressed that the professional learning events broadened and deepened their knowledge of the topics around climate science and their ability to use their new skills and knowledge with their students.

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

- COVID-19 long-term school closures resulted in the cancellation of all face-to-face professional learning. The loss of four months of planned spring training was difficult, but all projects came together to learn how to effectively use online learning tools. The spirit of collaboration and professionalism was heartening. OSPI provided STEM clock hours for two Climate Science Virtual Conferences in April and May. Teachers were grateful for the opportunity and for the flexibility that was provided in the session formats (8:30 am – 8:30 pm). Additionally,
 - As a result of the long-term closures, teachers were unable to implement new learnings with their students and valuable information about student learning could not be gathered. One project noted in their data analysis that implementation of new instructional materials in schools with free and reduced lunch rates was 13% less than in other schools.
 - Many teachers did not have access to reliable technology.
 - School closures further exacerbated the lack of science instruction in elementary schools. Strategies to support integrated instruction continue to be a need.
 - There is an increased cost in personnel to move professional learning to online formats.
- Even though the costs of substitutes was covered through the grant, prior to school closures, many schools did not permit their teachers to participate in any professional development. Projects offered learning sessions after school and on weekends and provided teacher stipends but this was not as effective as embedded professional learning during the teacher workday.

- Some regions continue to experience teacher reluctance to fully engage in climate science and climate change professional learning. STEM Seminars has been successful in changing teachers' perspectives and avoiding political debates.
- Sustainable educational change requires time and commitment. Contextualized and localized professional development for climate science and science is successful but occurs over time. Infusing climate science career opportunities into CTE in meaningful frameworks takes time, current career-related research, and industry partners.

10. **Future opportunities:**

- The project has expanded throughout the three years of funding and informally launching its own network of educators interested in climate science and the impacts of climate change on communities. Growing a sustainable network is a future priority.
- Partnerships and productive collaborations have formed among formal educators and community based organizations along with state and local agencies.
- Collaborations with the Office of Native Education are emerging with the goal of providing models of native student engagement which strengthens both student knowledge and leadership skills within their respective communities.
- The professional learning opportunity for Career and Technical Education teachers needs further development and design for their respective content areas.
- Several projects initiated professional learning with districts with multilingual and migrant student populations. Continued support for the translation of learning materials and community engagement will expand parental and family support of student learning and classroom instruction.
- Diversifying the invitation to participate in science and climate science events is a continued challenge requiring patience and community input especially as related to environmental racism, impacts to health, etc.
- Remote and virtual learning taught project managers that professional learning has no boundaries and that teachers and presenters from other places in the state are interested in attending and sharing their knowledge and skills. Expanding our technological footprint is a high priority including virtual learning communities and cohorts.
- The development of the Climate Justice League project changed teacher ideas about incorporating social justice issues into their science instruction especially increasing student interest, engagement, and mastery of their content learning. A quote from one teacher participant provides an insight into why continue work should be supported:

"Social justice is deeply connected to human health, biology, weather systems, climate change, and so many other topics within the realm of science education. It is critical that students receive a comprehensive look into issues facing society as a whole, and how those issues disproportionately affect vulnerable populations."
- The need for sustained, contextualized teacher training is urgent and compelling. In the words of a Tacoma science administrator,

"After reading through the evaluations from teachers it is evident that elementary science is an untapped resource to engage students in climate change education and teachers very much are advocating for more inspiring professional development with many teachers asking for ongoing trainings!"

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

ESSB 6168, Sec. 520 (4)(c) - \$3,000,000 of the general fund—state appropriation for fiscal year 2020 and \$3,000,000 of the general fund—state appropriation for fiscal year 2021 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 including tribal education organizations to partner with public schools for next generation science standards.

12. **Other relevant information:**

- As a result of the proviso funding and the program development it facilitated, teachers deepened their understanding of the Washington State Science Learning Standards including its climate science standards.
- The ClimeTime initiative is receiving national recognition for its innovation, structure (partnerships), and its reach (almost 14,000 educators in two years).
 - OSPI Science Director was invited to participate in a panel for the *National Academies of Science Board on Science Education* to explain how the Washington ClimeTime project supports teacher professional learning and instruction on climate science and the impacts of changing climate on the environment through standards-based science instruction.
- OSPI Science and Environmental and Sustainability programs partnered with Career and Technical Education to write a new CTE/Science Equivalency framework entitled, "Climate Science Engineering and Technology."
- [Washington State Open Educational Resources](#) website is the umbrella for all project resources developed during the year.
- In a survey of students, the following response to the query "What is one question about climate change do you have that is important to you" the most frequent response was, "Are there solutions?"

13. **Schools/districts receiving assistance:**

See [OSPI's Grantee List](#)

14. **Program Contact Information:**

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