CLIMATE TIME

CLIMATE SCIENCE LEARNING IN WASHINGTON STATE
Climate Justice: Washington’s ClimeTime Initiative Efforts to Center Equity in Science Education

CLEAN Call
July 7, 2020
Washington State Tribal Acknowledgement

Within the boundaries of Washington state there are numerous Tribal communities that have lived here since time immemorial.

Native Lands Map - https://native-land.ca
ClimeTime Initiative
Who We Are

Dr. Ellen Ebert
Director, Learning and Teaching Science, Environmental and Sustainability Education, OSPI

Elizabeth Schmitz
Environmental & Sustainability Program Supervisor, OSPI

Dr. Deb Morrison
Learning Scientist, University of Washington

Dr. Philip Bell
Learning Scientist, University of Washington
CLIMETIME™
CLIMATE SCIENCE LEARNING

Overview
ClimeTime Initiative Overview

The initiative, the proviso, the funding

2017-18 – Invitation from the Governor
2018-19 – $4 M Legislative Proviso
2019-20 – $3 M Legislative Proviso (continuation funding)
2020-21 – $3 M Legislative Proviso (continuation funding)
The 2018 Washington State Legislature allocated $4,000,000 of the general fund in Fiscal Year 2018 – 2019 to provide grants to educational service districts (ESDs) and community-based organizations (CBOs) for science teacher training in the Washington State Science Learning Standards (WSSLS) (Next Generation Science Standards – NGSS) including climate science education standards. In 2019, the Legislature continued the funding for the next two fiscal years at $3,000,000/year.

(ESSB 6032, Section 501, p. 300 (68))
Funding Objectives

(1) Educational Service Districts (ESDs) to work with school districts to provide teacher training in the WSSLS, including Climate Science Standards.

(2) Nonprofit community-based organizations (CBOs) to participate in providing training to schools and districts for the WSSLS and Climate Science Education using available learning resources.

***All learning materials to be open educational resources (OER).***

***All projects requested to collaborate, coordinate, and not duplicate efforts.***
Priority Audiences

Comprehensive and targeted comprehensive schools, and communities historically underserved by science education, which include but are not limited to Tribal Nations (including 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 Learners, and students with disabilities receiving special education services.
WA Educational System

OSPI and AESD Network of ESDs

Educators

WA Science Fellows

Students

Community-Based Organizations, Universities, Business, Local Governments
<table>
<thead>
<tr>
<th>Community Based Organizations</th>
<th>Educational Service Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>IslandWood</td>
<td>North Central ESD 171</td>
</tr>
<tr>
<td>Pacific Education</td>
<td>Northeast ESD 101</td>
</tr>
<tr>
<td>Institute/Braided Education</td>
<td>Northwest ESD 189</td>
</tr>
<tr>
<td>Washington Green Schools</td>
<td>Central ESD 105</td>
</tr>
<tr>
<td>Nooksack Salmon Enhancement Association</td>
<td>Vancouver ESD 112</td>
</tr>
<tr>
<td>Padilla Bay National Reserve</td>
<td>South Central ESD 123</td>
</tr>
<tr>
<td>Snohomish Conservation District (2018-19)</td>
<td>Puget Sound ESD 121</td>
</tr>
<tr>
<td>Cascadia Conservation District (2018-19)</td>
<td>Olympic ESD 114</td>
</tr>
<tr>
<td>Braided Education (2019-21)</td>
<td>Capital Region ESD 113</td>
</tr>
</tbody>
</table>
Critical Partners

UW Climate Impacts Group
Dr. Heidi Roop

NOAA
Frank Niepold

Dr. Philip Bell
Dr. Deb Morrison
“Instruction that builds on prior interest and identity is likely to be as important as instruction that builds on knowledge alone. All students can profit from this approach, but the benefits are particularly salient for those who would feel disenfranchised or disconnected from science should instruction neglect their personal inclinations.”

— NRC Framework, p. 287
ClimeTime Initiative Design Principles

- **Equity & Justice**: Intentional collaboration with historically marginalized communities and centering of curriculum in local phenomena.
- **System Coherence**: Collaboration across school and community-based organizations; including scientists, educators and community members.
- **Infrastructuring**: Development, testing and refinement of Open Educational Resources (OER) and practice briefs.
- **Equitable Classroom Pedagogy**: Formative assessments & phenomenon anchoring, lifting student voice.
- **Multiple Ways of Learning**: Professional learning in place, virtual learning, learning with data.
CLIMETIME in Practice

Climate Change and Human Health in Southwest Washington

Elementary ClimeTime PLC Meets Again!

Engaging in Argument From Evidence to Understand the Science....in Climate Science!

NGSS Climate Science and the Diverse Classrooms

CLIMATE SCIENCE IN WASHINGTON STATE
Educator Professional Learning within ClimeTime

Teacher PD with Pacific Northwest National Laboratory

Early Learning Climate Science
10/15/2018. NWESD hosted our team of six P-2 teachers.

Dear Governor Inslee,
Thank you for funding this professional development. We are using this opportunity to better align with NGSS & to be a better science teacher!
Empowering Master Teachers to Deliver Professional Learning

More than 400 K-5 teachers in Yakima, WA received training to implement NGSS-aligned elementary instructional materials.
Teachers as Learners - Engaging in Climate Science Data

The number of millions of wildfires has increased dramatically from 1970s to 2000s. Why? What has changed?

I wonder what percentage is human-caused vs. natural.

Has average # of rainfall also changed?

How many wildfires are natural vs. accidental (caused by humans)?

Interested in maintenance of state lands underbrush to help with fighting fires, provide jobs, and keep forests usable.
Teachers as Learners - Investigating Forest Carbon Sequestration
nPower Teachers – Power in Optimizing Partnerships
The Fish Situation: Local people often fish along the [local fish bearing stream name here]. They have noted this same location for years. This year there seems to be a change in the number of fish in the river.

2. What information might you collect from the river to understand the Fish Situation? What methods would you use to get this type of information?

3. Where else might you find information about the Fish Situation? What methods would you use to get this type of information?

4. Design a report on the changing fish populations of the river. Be sure to provide:
   a. Possible research questions
   b. A model of how different aspects of water quality might impact fish health and numbers.
   c. Potential data sources and examples of how you might present such data (images, maps, graphs, charts, text).
   d. Strategies for summarizing and how you might synthesize this data and make recommendations.

---

Guide to Sensing Learning and Activity Through Practical Measures
Deb Morrison1, Heena Lakhani1, Kerri Wingert1, Vanessa Wolbrink3, Neelo Soltanzadeh1, Robin Riedy3, Kristen Bergsman1, Philip Bell1, & William Penuel2
1University of Washington, 2University of Colorado, 3Achieve Science

Educational improvement requires timely strategies for sensing small shifts in learning or activity during improvement to identify opportunities in practice that can be leveraged or resourced further (Bryk, Gomez, Grunow, & LeMahieu, 2015). One way those involved in improvement science engage in such sensing is through the use of practical measures, a way of measuring specific steps and providing timely feedback to inform improvement work while it is in progress (Yssler, Bryk, Muhich, Hausman, & Morales, 2013).

What are practical measures?
Practical measures provide timely feedback that can inform instruction on how learning is occurring in a given context. Practical measures differ from other more traditional forms of educational measurement in that they:
- measure activity, engagement in activity, or identity with activity
- do not measure progress towards conceptual or practice based learning goals

Sections on Project Work

Our group project felt authentic and meaningful to me.

<table>
<thead>
<tr>
<th>Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A lot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In what ways was the work you did within your project role like the work that scientists do?

Your answer.
Lifting Diverse Student Voice

Governor’s STEM Innovation Alliance - Utilize student voice in initial passage year 1 and to show accomplishments year 2
Climate Change and Human Health in Southwest Washington

More than two dozen teachers from Southwest Washington gathered at the STEM Seminar at Vancouver Community Library or connected online to learn about the connections between climate change and human health.

www.climetime.org

https://www.oercommons.org/groups/climetime/4081/

Communication Across and Beyond ClimeTime

Climate Change and Human Health in Southwest Washington

Climate Science Learning WA

April 2019 Newsletter

ClimTime Initiative

Project Updates - A selection of current activity within ClimeTime

The Pacific Education Institute (PEI) hosted workshop: Locally Relevant S-D Climate Science Storytelling, held on March 2nd at the Squaxin Island Tribe Museum, began on a trail next to a lake that the Tribe created to cultivate traditionally-used native plant species. Where traditional educators Cinnamon Bear Eneas, Alita Posta, and Beverly Evans will guide participants in an opportunity to become grounded in the surrounding place.

www.clime-time.org

clim-time.org

https://www.oercommons.org/groups/climetime/4081/
Collaborative Resource Development for Use In and Beyond ClimeTime

Scientific literacy involves understanding global climate change & what people can do about it.

How to avoid possible pitfalls associated with culturally responsive instruction.

How place-based science education strategies can support equity for students, teachers, and communities.

How to build an equitable learning community in your science classroom.

Addressing controversial science topics in the K-12 classroom.

Using science investigations to develop caring practices for social-ecological systems.

www.stemteachingtools.org
ACESSE Resources

stemteachingtools.org/pd
Evidence of Impact

Education Service District

Climate Science Annual Evaluation Report
Much to celebrate!

In year one of the proviso grant...
7,509 Educators participated in some training.
  3,887 were elementary teachers,
  1,468 were middle school teachers,
  1,045 were high school teachers, and
447 were administrators and other participants.
In my first grade classroom, I taught the students that there is one ocean!

The biggest success stories have teacher/scientist partnerships with scientists at PNNL and MCBONES. Nothing is more transformative for them than working alongside scientists and gaining insight into not only the content, but the way scientists use all of the Science and Engineering Practices every day.

“Thanks for making today rigorous! I love engaging in authentic scientific tasks with other science teachers. That makes for enlightening professional development, always. Thanks for honoring us as adult learners!”
Findings

- Collaborations deepened within and across communities
- Multiple ways of knowing and learning were centered
- Innovations in educational design emerged
- Building network activity coherence was essential

 tinyurl.com/climetime-casestudies-2018-1
Lessons Learned

Climate science doesn’t have to only live in the sciences. It can carry over into other disciplines due to its inherent interest and controversy.

One of the most important lessons.... how crucial this work is and how eager teachers are to engage and learn.

Measures of Practice will be powerful tools to drive teacher practice and the professional development program quality because non-conceptual (for the most part) student data is collected and used in a just-in-time manner.
Lessons Learned

I used to think.... taking students into the field to do science was daunting.
Now I think.... taking students into the field to do science is doable.

I used to think... that science was challenging to teach as there is so much that I didn't know about science.
Now I think... that teaching science is a process, that there are methods of teaching it and investigation questions that I can learn with my students.
Takeaways

- Collaboration is essential and must be carefully designed
- Working with historically marginalized communities requires respectful and consistent attention to build trust. Creating long-term place-based collaborations in relation to each other and the environment is critical in any science professional learning efforts.

www.learninginplaces.org
Take Aways

- Administrator support at the school and district level supports educators to innovate and thus these educational leaders also need professional learning opportunities.

- Relevant and authentic topics are of keen interest to educators, students, and the communities we serve more broadly.
Going Forward

- Extending partnerships with Tribal Nations
- Focusing attention on high school
- Continued refining of policy and program implementation
Going Forward

- Collaborative definition of needs for professional learning and capacity building with the network
- Sharing of learning and justice perspective with other state, national, and international systems engaged in climate change education – synergy of efforts at multiple scales

Climateecos.org
Partnerships with Community-Based Organizations
Regional Groups Across the State Collaborating

Washington’s ESDs have developed a network of services for Science:

- Regional Science Coordinators
  - Science Fellows
  - Statewide ClimeTime Project Collaboration
    - Open Educational Resources
    - ClimeTime Online Learning for Teachers
    - Climate Science Assessments for 5th, 8th, HS
    - Communication about ClimeTime work
Thank You!
Dr. Deb Morrison
eddeb@uw.edu