

The FieldSTEM Journal

Spring/Summer 2019



Real-World Science Outdoors

FieldSTEM in Action: Class Study Takes Students to the Capitol!

Never doubt that hands-on FieldSTEM education can have real world impacts. Candy Kristovich, a teacher at the Chewelah Alternative Learning Program, attended a PEI workshop on implementing Next Generation Science Standards in a way that ensures students understand their own role in addressing climate solutions, and the project her class came up with in the fall of 2018 was a superlative FieldSTEM model for all schools.

Their meticulous study of food waste in the school's cafeteria not only taught them to apply the scientific method to a problem they contribute to, it also led them to exchange ideas with adults in their community as respected peers. Besides school staff, they met with representatives from the Chewelah Casino, the School Board, the City administration, Safeway, and the Spokane Tribe, garnering responses from each about real world changes they can make to reduce food waste and the gases that landfills produce. Candy's kids found that about \$500 is lost to waste for one lunch district-wide each day, and across the county 20 tons of food is wasted every ten seconds. The high quality of these young scientists' local presentation resulted in their being invited to take it state-wide.

The Chewelah class was one of five across the state chosen to present their findings at the North American Association of Environmental Education conference in 2018, and this February they were invited to Olympia to show Governor Jay Inslee what they had learned. Unsurprisingly, PEI has asked Candy Kristovich to work with other educators across the state on the Locally Relevant 3-D Climate Science for Drawdown grant. We're lucky to have her here in Washington!

Food Waste Audit at Gess Elementary in Chewelah

Waste Accumulated	Grains	Beef	Veggies	Fruit	Milk	Beans & Pulses
Total Weight in lbs.	3.98	3.09	2.92	3.70	4.02	3.09
Minus Bucket Weight	2.04	2.04	2.04	2.04	2.04	2.04
Weight of Wasted Food	1.94	1.05	.88	1.66	1.98	1.05



Candy and her students presenting at the NAAEE



Governor Inslee impressed with student work

Message from the Executive Director

During the 2018-19 school year PEI launched three new projects to strengthen our base FieldSTEM programming with schools and districts. On the cover of this newsletter you met Candy Kristovich, a remarkable teacher, who with her students from Chewelah, Washington, are part of our climate science project. Last August, Candy attended a workshop offered by PEI designed to strengthen the teaching of the Washington State Science Learning Standards with a focus on climate science. To ensure teachers across the state have professional development opportunities like the one Candy attended, PEI successfully worked this legislative session with our partners in environmental and sustainability education – including IslandWood, E3, Washington Green Schools, the Office of the Superintendent of Public Instruction (OSPI) and the nine Educational Service Districts – to help pass the climate science proviso which allocates six million dollars over the next two school years for this important work. This statewide collaborative effort known collectively as “ClimeTime” has already served thousands of teachers. To read their stories and more, visit www.climetime.org.



Kathryn Kurtz
EXECUTIVE DIRECTOR

The other two projects connect high schools to post-secondary and employment opportunities that support sustainable communities: 1) Our partnership with PacMtn Workforce Development Council to support teachers in implementation of our Career and Technical Education (CTE) Forest Management Framework (see page 5 for more on this project) and 2) Our partnership with E3 Washington and the Governor's Office to launch the Educating for a Green Economy (EGE) project (see page 7 for more about this important work). With all that PEI does, these projects require collaboration with organizations and businesses across the state. A special thank you to the companies that are hosting students and teachers for worksite visits and sending employees to support programming at local schools.

Spring is a busy time at PEI as we finish up our school year initiatives, prepare for summer programming and plan for the next school year. PEI continues to offer outdoor, locally relevant, career-connected education across Washington. This work engages PEI staff, teachers, administrators and community collaborators who invest time, hard work and dedication helping us make FieldSTEM what it is. I want to extend sincere appreciation to all the individuals

This September, PEI will host our first FieldSTEM Awards Celebration.

who help bring FieldSTEM programming alive in communities from Colville to Naselle, from Forks to Quilcene, from Pullman to Skamania, and many points in between. This fall PEI will be honoring a teacher, a school, a district, a community collaborator and a legislator that have demonstrated a commitment to implementation of FieldSTEM at an Awards Celebration in September. FieldSTEM remains the model by which we hope all students in Washington gain an appreciation of their local environment and develop the knowledge and skills to take civic action toward sustainable communities.

Voices from Our Network

Tim Garchow, a long-time educator, administrator and now the Executive Director of the Washington State School Directors' Association (WSSDA) and PEI board member shared that one of the biggest challenges he sees in providing hands-on, field-based integrated science education is “The disparity in resources among districts; and not just funding but also natural resources.” Tim believes **“There needs to be a commitment from the boardroom to the classroom to go after those resource gaps. And PEI can help with that.”**

Another partner of PEI's, Patti Case, is Public Affairs Manager for Green Diamond Resource Company, where she has been for 25 years. A native of Shelton, Washington, and married to a middle school teacher of 30 years, Patti is invested in her community and its schools and has a clear vision for how FieldSTEM can be used to connect education and community. “PEI has helped our teachers create programs that can be adapted and monitored year over year and that also create ownership among students, teachers, and whole schools for their own environments. FieldSTEM improves learning...it bridges the gap between book learning and the real world that is critical to kids who grow up in our communities. FieldSTEM doesn't ‘take more time,’ it's actually just more efficient time.”

Staff Profiles

Introducing the PEI Olympia Office Coordinators!

Nicole George, Program Coordinator

Nicole George was born in Juneau, Alaska. Throughout her life, she has been an advocate and educator for her people and the environment. She is a member of the Deisheetaan (Beaver) Clan, Raven moiety of the Angoon Tlingit Nation, and for several years has worked with many Native organizations in Juneau, Alaska, in a variety of educational capacities. In 2016, she received a BA in environmental studies from Pacific University. She then came to Olympia to earn her Master of Environmental Studies from The Evergreen State College in 2018. Nicole has worked for the Native Lands and Resource Department of Central Council Tlingit and Haida Indian Tribes of Alaska, Douglas Indian Association, Sealaska Heritage Institute, Goldbelt Heritage Foundation, Bureau of Indian Affairs, and Sealaska. In October 2018, she joined PEI as the Program Coordinator and is excited to continue her work as an advocate for the environment and educators in the Pacific Northwest.



Henry Smith, Development Coordinator



An Olympia native, Henry graduated from Pacific Lutheran University's International Honors Program in 2016 with a degree in communications and environmental studies. After graduation, he worked and camped as an AmeriCorps volunteer in backcountry areas in Mount Rainier National Park and spent one year working for the Nisqually Land Trust. When he's not at work, Henry enjoys hiking, doing forage fish surveys, playing basketball, and going to museums. In October 2018, he joined PEI as the Development Coordinator. He's excited to advance equitable environmental education in Washington State to promote a more sustainable future for the land, waterways, and people on both sides of the Cascades.

Jim Burlingame, Communications Coordinator

In a sense, Jim Burlingame was destined to end up at PEI, after being co-President of his high school's Environmental and Animal Rights Organization. The detour was a long one, though, from moving from Oakland, California, to Olympia to study creative writing at The Evergreen State College to spending 10 years as a stay-at-home parent. Throughout his 25 years here, Jim has held leadership positions in numerous community organizations. Recently, the Olympia City Council appointed him to the city Arts Commission. In 2018, he had two poems selected for the city's first anthology, and his book "Building Ghosts," a photo essay on empty commercial properties, continues to be popular in bookstores and libraries. His writing experience also includes eight years as a freelance pop culture journalist. Following five years working in the marketing and development departments at the Hands On Children's Museum, Jim joined PEI in May 2019 as the Communications Coordinator, where he looks forward to putting his broad communications background to work promoting the importance of teaching real-world science outdoors.



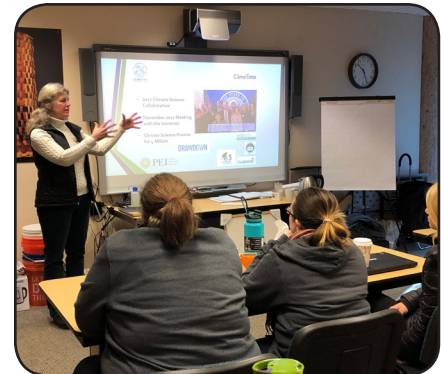
The Washington State Potato Commission (WSPC) works hard to support an economically and environmentally sustainable Washington State potato industry. They succeed in advancing research to improve environmentally sound production and cultural practices. And while doing so, the WSPC is helping to enhance, enrich and extend STEM education in Washington State. They have proudly supported PEI since 2013. THANK YOU!

Their leadership represents 300 Washington State potato farmers who together plant more than 165,000 acres annually. Harvesting averages 31 tons per acre, 50% higher than the average yield in the United States. That's the world's highest potato yield per acre! Way to go!

Thank you, Washington State Potato Commission, for investing in the next generation of farmers, scientists, and engineers!

Climate Science Profile: Squaxin Tribe Partnership

In March 2019, PEI hosted a workshop called "Locally Relevant 3-D Climate Science Storylines" at the Squaxin Island Tribe Museum, and as usual a wide range of topics were integrated to fortify our curriculum. Participants were invited to the workshop to become part of a team of 4th and 5th grade teachers who would go on to pilot the *Erosion* or *Food Waste* storylines that PEI, Braided Education Consulting, Cinnamon Bear Enos and educators from around the state developed as part of the ClimeTime Initiative, with guidance and partnership from the Muckleshoot and Suquamish Indian Tribes, OSPI's Office of Native Education, and ESDs 112, 113, 114, 121 and 101. Before heading inside, participants met Tribal educators on a trail to be guided in opportunities to become grounded in the surrounding place. This included sharing information about the history of the land, and the medicinal, environmental, utilitarian and artistic purposes offered by native plants.



The Squaxin Museum workshop included experts addressing many topics – from Sally Brownfield on the benefits we receive from snow melt, to Cinnamon Bear Enos on the traditional uses for willow and other native plants, to PEI's Kathryn Kurtz on the development of this solutions oriented approach to learning – and of course fun, hands-on activities!



Participants discussed how to implement these storylines in their specific classroom situations, how climate science is central to what they teach and how to anticipate potential challenges and work through possible solutions as a group.

- 100% of participants agreed and 76% strongly agreed that the workshop broadened/deepened their existing knowledge of instructional practices to make learning experiences more inclusive for Native American students.
- 95% of participants left the workshop agreeing they had tools and strategies to more effectively use formative assessment.
- 100% of the participants agreed or strongly agreed they learned how to more effectively implement three-dimensional Next Generation Science Standards (NGSS).

It is our privilege to partner with many of the tribes in Washington. Candace Penn is the Climate Change Ecologist in the Natural Resources Department for the Squaxin Island Tribe and works regularly with local teachers. Candace reflected:

“ Three years ago, our school district had a meeting with the PEI folks, the staff for other school districts, and community partners. It was such an inspirational room to be in—in the presence of other people who found educating kids about science so important. I saw these amazing teachers that had taken so much time to do these awesome activities. I ended up working with most of the age groups and there wasn't one age group that didn't appreciate the experience. All kids deserve this kind of science. ”

Class Spotlight: CTE in Action in Kalama

Chris Stone Implements PEI's Outdoor Career-Oriented Curriculum

In 2017 the PacMtn Workforce Development Council invited PEI to attend a Forest Products Workgroup meeting. PEI listened to the needs and challenges people in the forest products sector faced with respect to employment and combined that understanding with our work in secondary schools across the region. It became clear that there was a need to gather high school and post-secondary educators to align course offerings with employment opportunities and to improve students' knowledge and skills so that they can successfully be employed in a forest-based career. In spring of 2018 PEI, our partner school districts, Grays Harbor College and Forest Products employers with support from PacMtn drafted a Career and Technical Education (CTE) Forest Management Framework. The course has the potential for students in high school to earn college credit toward an Associates Degree at Grays Harbor College and it includes opportunities for students to incorporate worksite visits and learn forest management skills.



Kalama High students plant and thin trees, and attend Fire School, thanks to PacMtn/PEI's CTE curriculum



PEI was successful in partnering with PacMtn, ESD 113 and Capitol STEAM to receive Career Connected Learning funding to support implementation of this new coursework during the 2018-2019 school year. Three districts – Kalama, Shelton and Yelm – all offered forest management as part of their course work. Kalama High School teacher, Chris Stone has been part of this project from the beginning. His students, working with Washington State Department of Natural Resources, and with training from the Oregon Department of Forestry, and Future Natural Resources Leaders' Fire School, have thinned and planted trees on the Kalama Forest – land owned by the school district – using saplings donated by Weyerhaeuser. This summer Chris will attend Trail College with the Pacific Crest Trail Association, where he will be trained in Cardio-Pulmonary Resuscitation, Wilderness First Aid, and certification in chainsaw use. As Chris says, "This is training that I am taking to gain skills to bring back to my natural resources class and possibly provide some level of chainsaw training/certification to my students." Chris's classroom exemplifies PEI's career connected, locally relevant, hands-on, outdoor-based approach to learning.

We'd like to extend a warm THANK YOU to Port Blakely Tree Farms. Port Blakely and its leadership recognize the need for locally relevant, outdoor-based, career connected STEM education and have been contributing to PEI since 2013 to make it happen! THANK YOU, Port Blakely!



To learn more about Sponsorships, contact Kathryn Kurtz, Executive Director, 360-705-9291 or kkurtz@pacifieducationinstitute.org

Regional Spotlight: Field Studies on the Coast

Learning on the Beach with Forks High School's John Hunter

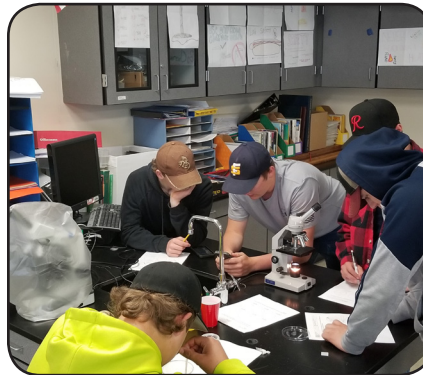
One of the things we pride ourselves on at PEI is the impact we have on the beautiful but farflung corners of our state, and what's happening at Forks High School in the Quillayute Valley is a prime example of that. After attending PEI and the National Oceanic and Atmospheric Administration's "Plankton Close to Home" workshop, John Hunter took his class to a beach on the coast, where they observed intertidal habitats and collected metadata. They assisted in making plankton collections and looked for starfish and evidence of starfish wasting disease.

John's class received key assistance from community partners: The North Pacific Coast Marine Resources Committee provided funding for transportation, and Joel Green of the Hoh Tribe Natural Resources Department and Tommy Moore of the Northwest Indian Fishing Commission met with the students to talk about water quality protocols. And Dave Hahn, from the Pacific Coast Salmon Coalition was a field trip chaperone, helping students find tide pools to study. John reported back that, while of course, "Most student responses

"Many students are fascinated by the diversity of life, where they just saw cloudy water before."

emphasized the attraction of getting out of school on a nice day, they also enjoyed hands on experience with intertidal organisms. They are much more aware of plankton and their

role in the health of the ocean and the safety of our food supply. Many are also fascinated by the diversity of life, where they just saw cloudy water before." Before the end of the school year, he'll be taking them back to the coast to study surf grass, and he looks forward to next year, when he'll have some of these students again for Biology and they can build on the field experience he exposed them to with PEI's training.



Forks High School students collected plankton and algae samples at the ocean, then back at school they studied them, as well as water chemistry, and shared their findings with fellow students.

Thank you to Green Diamond Resource Company for their 2019 sponsorship to PEI! Green Diamond is committed to supporting rigorous, career-connected, outdoor STEM education and have been donating since 2013.



Green Diamond's commitment to supporting PEI's mission is just one way they serve as an active member and supporter of their community. They are committed to protecting water quality, soils, fish, wildlife, sensitive plants, and cultural sites. Thank you for your hard work and support!

EGE: Educating for a Green Economy

Connecting Students to Green Economy Jobs

Kathryn Kurtz, Executive Director

What does the future of work look like in Washington and how do we ensure all students understand and have access to the opportunities for green employment in their community? PEI is excited to engage in these questions with the "Educating for a Green Economy" (EGE) project, a partnership with E3 Washington (E3). With support from Governor Inslee and funding via the Employment Security Department, the project is working to connect students, educators, and employers across Washington to the variety of job opportunities that lead to sustainable communities. A primary goal is to include sustainably managed working forests, farms, aquaculture, renewable energy and outdoor recreation as contributors to implementing solutions in a future green economy, and providing jobs across the state, especially in our rural and remote communities.



EGE Advisory Panel members tour Puget Sound Energy's Wild Horse Renewable Energy Center

PEI has a unique role to play in the project as we continue to align our FieldSTEM® Model with career connected learning and workforce development efforts in the state — and make sure the voices of employers in the natural resource and environmental sectors are heard so they have employees to ensure their success into the future. As with all our work, collaboration is at the heart of it. Our Advisory Panel includes environmental educators, the Governor's office, the Office of the Superintendent of Public Instruction (OSPI), CTE educators, career and technical colleges, and four-year post-secondary schools, workforce development professionals and employers. At every step, the project will identify barriers for students eligible for the Workforce Innovation and Opportunities Act (WIOA) to ensure strategies are in place for inclusive programming for underserved audiences. EGE is accomplishing the following key tasks: 1) Research and analyze existing workforce data on green economy jobs, 2) Convene regional gatherings to identify locally relevant pathways and build connections from high school to employers, 3) Identify a few regionally important green economy pathways and provide a framework for sharing pathway resources with students and educators, and 4) Provide opportunities for student projects and student voice at regional and statewide gatherings to help the project remain relevant to youth.



45 School District CTE Directors, Principals and Superintendents gather in Spokane to hear a panel focused on career opportunities in the energy sector

Thanks to Governor Jay Inslee's leadership, Washington State is a national pacesetter in advancement towards an economy utilizing more renewable resources, encouraging industries that provide ecosystem services such as our energy, agriculture, forestry and outdoor recreation sectors. PEI, in partnership with E3, is accelerating Washington's transition toward a more sustainable future by preparing today's students with the knowledge, skills and 21st century leadership aptitudes they need to drive innovation for building and maintaining tomorrow's green economy.

Upcoming: Workshops & Events

	May 2019	
Workshop Title	Date	Location
Climate Science Storyline Writing	May 30-31, 2019	Kalama, WA
	June 2019	
Workshop Title	Date	Location
Climate Science Storyline Writing	June 3-5, 2019	Grapeview, WA
Forest FieldSTEM Institute	June 18-20, 2019	Chattaroy, WA
Introduction to FieldSTEM for Early Elementary	June 20, 2019	Forks, WA
Indigenous, Solutions Oriented Learning Climate Storylines	June 20-22, 2019	Wenatchee, WA
Forest FieldSTEM Institute	June 24-26, 2019	Cathlamet, WA
Climate Science Storyline Writing	June 24-26, 2019	Spokane, WA
PLT: Forests and Climate Change	June 25, 2019	Bremerton, WA
Project Learning Tree: Outdoor STEM Learning on your School Campus	June 26, 2019	Bush Prairie, WA
PLT: Forests and Climate Change	June 27, 2019	Lacey, WA
PLT: Forests and Climate Change	June 27-28, 2019	Spokane, WA

For more information, please visit our Training and Workshop Event Calendar at pacifieducationinstitute.org. Questions about future workshops may be directed to PEI Program Coordinator, Nicole George at ngeorge@pacifieducationinstitute.org.

We would like to extend a warm thank you to Hancock Natural Resource Group (HNRG) for their sponsorship of PEI's East Sound service region.



As a signatory of the United Nations Environment Program Principles of Responsible Investment, Hancock's support for PEI's work to advance career-connected, outdoor STEM education is evidence of their commitment to sustainability and stewardship in local communities.

Thank you HNRG for your generous support!