



# The FieldSTEM Journal



Winter 2020

Real-World Science Outdoors

## Climate Science in Action: Regenerative Agriculture in Ellensburg

ClimeTime is a state-led network for climate science learning that helps teachers and students understand climate science issues affecting Washington's communities. PEI is one of 15 organizations chosen by OSPI to offer locally relevant, climate focused, professional learning events statewide. At one of these Solutions Oriented Learning (SOL) Regenerative Agriculture workshop in October, participants toured Christina Miller's farm in Ellensburg, where they learned firsthand how climate science informs the future of farming in Washington.



Christina Miller explains the benefits of multi-species rotational grazing

PEI Central Washington FieldSTEM Coordinator Megan Rivard, who co-facilitated this workshop, believes these storylines can have a strong impact on students, industry, and the environment. "In Eastern Washington, we have so much agriculture and so many kids that have limited exposure to regenerative agriculture," she says. "That's really a disservice to our students who are probably going to be entering this industry and carrying on the family business. If we embed the idea that you can farm, make a profit and also do good things for the earth, we're going to move to a better place statewide."

Workshop attendees did experiments like taking soil samples from no-till and conventional till soil and noting which was more prone to erosion and which emitted more CO<sub>2</sub>. "If you can seed a field without plowing it, you keep the soil's microbe population undisturbed and keep the carbon in the soil," says Michelle Townshend, workshop co-facilitator and retired Mead School District high school teacher. Now, back in their classrooms, attendees are using this storyline, teaching their students about climate change via these experiments and others. They will provide data and feedback to PEI. Once the storyline is supported by student work samples, PEI will share it through the ClimeTime Open Education Resources site and through our regional FieldSTEM Coordinators with schools and districts statewide.

Workshop attendees also participated in another valuable in the field experience. Anderson Hay and Grain Sales Manager Brian Thompson led teachers on a trip to a 1000-acre family hay operation just outside of Ellensburg, Washington. With Matt Snell, Anderson Hay and Grain Hay Buyer, they



Participants watch Christina prepare a farm-to-table meal for their lunch

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# Message from the Executive Director

**The language we use to guide our work is critical to the role we play in Washington State's education network.** While PEI's programming has always strived to be culturally responsive and inclusive, PEI is taking active steps to purposefully incorporate social justice, equity, diversity and inclusion into our organization and the work we accomplish in 2020 and beyond.

Building on the cultural competencies and knowledge of participants in our workshops, PEI facilitators model the way we hope teachers will work with their students. This approach of embracing a diversity of perspectives to meet people where they are will deepen everyone's understanding of how to work toward sustainable economic, ecological and social systems. Through FieldSTEM, educators and their students get to know their community, approaching local questions, problems, issues and opportunities through project-based work.



Kathryn Kurtz  
Executive Director

In that work, teachers can facilitate students' concepts of themselves as scientists and citizens by honoring the experiences they, their parents, and community members bring into the work. This opportunity for students to engage in meaningful work in their region is a cornerstone of FieldSTEM and we are bringing it to the climate science education collaborative led by OSPI, ClimeTime, and our partnership with E3 Washington in our Educating for a Green Economy work.

PEI's Board of Directors completed a strategic planning process this fall refreshing PEI's guiding language and setting a new process for identifying strategic initiatives and incorporating them into our programming, research and policy work. We will strengthen PEI's work toward the following goals:

1. Continually improve systems to ensure an effective PEI
2. Generate sustainable income
3. Design, develop and provide integrated, relevant, high-quality K-12 professional learning and educational materials to strengthen FieldSTEM implementation with community collaboration and support
4. Develop strategic initiatives and funding models with key partners to strengthen the implementation of the FieldSTEM model across Washington
5. Ensure PEI's voice is present in State level policy development and implementation.

***To learn more about PEI's initiatives, come meet with me, Board members and long time supporters at a "Leading Environmental and Sustainability Education Reception."***

***February 12th, 4:45 pm - 6:00 pm, at PEI's offices.***

## Voices from Our Network: Steve Ogden

The **Washington State Department of Natural Resources (DNR)** has long been a PEI partner. Steve Ogden, Assistant Region Manager, supported workshops focused on forest fires and the role working forests play in sequestering carbon. He took teachers on a worksite tour to see and learn about DNR's active management near Battleground.

Of PEI's work, Steve says "The opportunity to collaborate with passionate educators about natural resource management was such a rewarding experience. PEI is taking outdoor education opportunities to the next level by providing a platform for educators and natural resource professionals to share knowledge, experience and ideas. Natural Resources are inherently connected to our history, culture and lives. Providing opportunities to connect education and natural resource literacy promotes sustainable resource stewardship for future generations." **We are grateful to have Steve and the DNR as collaborators.**



Steve explaining in Battleground how DNR decides which forests to thin



# PEI Profiles

## Introducing the New PEI FieldSTEM Coordinators!

### **Hattie Osborne**, *South Sound FieldSTEM Coordinator*

With PEI since summer 2019, Hattie holds a BA in Education and Natural Sciences from the Evergreen State College and a Masters in Teaching Elementary Education from the University of Southern California. Hattie began her teaching career in Pasco, Washington, teaching kindergarten and fifth grade at a public STEM school. In addition to classroom teaching, she also worked with ESD 123 as a Science Fellow and Master Trainer of STC Science Kits. Hattie has experience developing, coordinating and facilitating professional learning around the areas of STEM, science assessment, highly capable strategies and science phenomena.



### **Megan Rivard**, *Central WA FieldSTEM Coordinator*



With PEI since mid-2019, Megan earned a Bachelors Degrees in Chemistry and Biology from Central Washington University. As a certified teacher, she has taught in traditional and non-traditional public and private high schools and elementary settings, including helping migrant students graduate and helping K-4 Summer Literacy Camp students improve their reading. As a Science Fellow, Megan worked with ESD 105 to lead workshops on implementing Next Generation Science Standards (NGSS) and provided quality resources and support for local teachers. Megan

also worked in the Pacific Science Center's "Science on Wheels" program where she developed and delivered K-8 STEM curriculum to students across Washington State. She's excited to dig into everything that PEI does to support our educators, communities, and environment!

## Introducing the New PEI Board Members!

### **Cinnamon Bear**, *Education Forester for Hancock Forest Management*

Cinnamon Bear, of the Karuk Tribe, is an educator and traditional medicine herbalist who works for Hancock Forest Management as an Education Forester, implementing traditional ecological knowledge (TEK) and forestry education in the Tomanamus Forest in Washington State for the Muckleshoot tribal community. She helps develop and implement TEK curriculum. She has served as one of three tribal liaisons for the PEI's ClimeTime Project. Prior to her current roles, she worked with the Muckleshoot Culture and Elders programs to provide traditional medicines and teach community classes on harvesting and processing traditional foods and medicines. She started working with the Muckleshoot community as an elementary teacher at the tribal school in 2010. She is excited to join the PEI board and help support the development and offering of hands-on, locally relevant science education that incorporates the knowledge and goals of diverse Washington communities.



### **Ignacio Marquez**, *Eastern/Central WA Regional Assistant to the Director of the Dept. of Agriculture*



Seeing young people succeed is important to Ignacio Marquez. Following seven years at the Washington State Employment Security Department, he has now been at the Washington State Department of Agriculture since 2013, first as Policy Assistant to the Director and now as the Yakima-based Regional Assistant to the Director. Besides serving as the agency liaison to tribes, agricultural employers, and other natural resource stakeholders in the Eastern/Central region, Ignacio also helps resolve farm labor issues such as wages, health, housing, and workforce availability. He is keenly aware of the need to encourage students to aim for STEM-related jobs. He would like PEI to work in Washington's agricultural dependent communities where the children of farmers and farmworkers live to point out agricultural employment is not just harvesting fruit or driving a tractor. While these jobs are necessary and can be a step into agricultural careers, they also provide workers with the experience and basic knowledge of farming. We need to take advantage of early exposure to agriculture and help youth use that experience to move into STEM focused careers as the next chemist, agronomist or robotic engineer in agriculture.

# Regenerative Agriculture

(Continued from page 1) discussed industrial-scale farming techniques and how to keep the soil as healthy as possible. Crop rotation, herbicide use, and irrigation upgrades were discussed as Thompson and Snell talked about farmers getting the most product out of their fields at the highest quality. Anderson Hay ships all over the world (including Saudi Arabia and Japan), and clients purchase Anderson's timothy hay because of the unique growing conditions the Kittitas Valley has to offer. Thompson took teachers on a tour through the packaging facility and quality inspection areas, and discussed the work done to fumigate hay for shipment, which subsequently reduces the amount of pesticide field-application. Grant Mills, Anderson Hay and Grain's HR Director, talked to teachers about the job opportunities at the company, from machinists



Educators tour the Anderson Hay & Grain production and shipping facility



and farmhands to international sales. Mills also offered to visit classrooms and talk to students about anything related to getting and keeping a job -- even the art of the handshake. Workshop participants were impressed with what Anderson Hay and Grain accomplish and how they continually live out their company value of "longstanding relationships with customers, growers, suppliers and employees."

Increasing students' appreciation of how their local natural resources are being used, sustainably and with a benefit to the economy, is at the heart of PEI's Solutions Oriented Storyline workshops and part of the state's ClimeTime project. As Green Bow Farm owner Christina Miller explains of the Regenerative Agriculture storyline, "Having it in schools would be a lot more inclusive. A lot of times this knowledge isn't really available until someone seeks it out at college level or joins 4-H."



**Thank you to our 2019 sponsors!**  
**PEI appreciates the wide variety of**  
**Washington businesses that see the**  
**benefit of teaching students real-world**  
**science outdoors!**





# Class Spotlight: Integrating Topics in Onalaska

## Deborah Richardson Layers PEI Workshops to Benefit her Students

**"My favorite thing about teaching," says Onalaska Middle School teacher Deborah Richardson, "Is watching students enjoy learning and then applying it to their lives."** After 18 years of teaching, she knows what it takes to engage students, and with three PEI workshops under her belt this year, our resources are clearly a valued addition to her teaching tool kit. In addition to three years of elementary school teaching, Deborah has spent 15 years teaching science and ELA to middle schoolers. Currently, besides three grades of science, she is the ASB Advisor and the Leadership, Road Trip USA, and 6th grade enrichment teacher.

In August 2019, Deborah attended PEI's Investigating Invasive Species workshop in Nisqually and the Solutions Oriented Storylines: Forest Ecosystem Benefits – Carbon Sequestration workshop in Battleground. In December, she attended the Solutions Oriented Storylines: Food Waste workshop in Vancouver. In between, she began



Deborah Richardson (on the far right in all photos): learning traditional weaving from Cinnamon Bear at the Battleground workshop, and looking over Food Waste materials and touring the Clark County Food Bank at the Vancouver workshop

introducing her students to concepts from the summer workshops. Highlights from the fall include teaching them how to weed out plants that don't belong on campus and why planting trees is important to the world. Students in her class are working on using less plastic and getting rid of the foam trays in the cafeteria. "There's a lot of freedom offered in the storylines I've used from PEI," she says, "And they all work toward a healthier, more fruitful earth." Because of her cumulative professional learning, she says, "I'm better at enrichment. I use 'claims evidence reasoning' in all of my teaching now. You all are amazing – PEI is like a family!"

**“ Deb is an example of a great teacher who is always growing and learning. In addition to bringing her learning back to the classroom, she brings her colleagues with her to workshops. She gets that all kids deserve these kinds of learning opportunities, not just the students lucky enough to be in her class. ”**

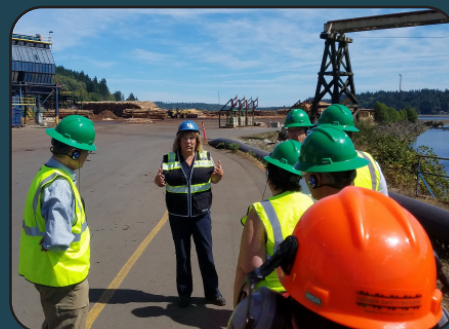
**– PEI Lower Columbia FieldSTEM Coordinator Chad Mullen**



Not only has Sierra Pacific given financial support to PEI since 2013, they're also serious about connecting teachers and students to green jobs.

In August 2019, PEI Board President and Sierra Pacific Community Relations Manager Lisa Perry gave Educating for a Green Economy Advisory Panel members a tour of the mill in Shelton to share the science that is necessary to support sustainable lumber production.

We appreciate SPI's commitment to connecting students to the natural resources that are important to their community.



# Regional Spotlight: Resiliency in Eastern Washington

## Learning Forestry Education in the Riverside School District

*Mike Nepean, Eastern Washington FieldSTEM Coordinator*

In his fourth year as superintendent of the Riverside School District, Dr. Ken Russell's passion for community and education matches his optimism and mindset to face challenge as opportunity. This vision is reflected in the district's Strategic Plan, Forward Together, and fostered by Superintendent Russell's small-town "we can get it done" roots. In response to a 2018 fire that damaged a portion of the 98-acre district-owned forest adjacent to three schools and the administrative building, the district and community came together to develop a plan to mitigate the threat of fire.



Forest FieldSTEM Institute participants bonding with local forest firefighters

In addition to convening a local remediation team, Russell contacted the Pacific Education Institute to explore summer forest-focused professional learning for his teachers. At a June 2019 Forest FieldSTEM Institute in Chattaroy, 25 educators explored the learning opportunities abundant in the outdoor forest lab space. The objective was to provide an introduction to the FieldSTEM model and field investigations specifically designed for the forest and a smaller natural area at Chattaroy Elementary.

The fire and resulting thinning became a feature of PEI's approach to field investigations at the Institute, strategically scheduled in conjunction with DNR's Eastern Washington Wildfire Academy.

Educators, led by PEI Faculty, Randy James, participated in investigations to explore the health and diversity of the forest. Supported by Project Learning Tree's Environmental Education Activity Guide and PEI's Field Investigations Guide, this work generated questions students could use as to launch research to learn more about the site named the Riverside Forest Research Station. Since the workshop, PEI has returned to meet with district educators to learn more about the status of implementation plans and provide additional support.

Moving forward, PEI will continue to work with Riverside to develop authentic opportunities in the forest for student research and propagating native species in the district greenhouse to replant in the forest for ongoing student research.

Summing up the benefit of the Institute, a middle school teacher said, "I used to think our community forest was not useful, but now I think it's the classroom extended."



Teachers engage in forest ecology and tree measuring activities that integrate science and math skills outside the classroom



Thank you to our sponsor Campbell Global!

Pacific West Timber Company and TC & I Chinook, both subsidiaries of Campbell Global, have supported PEI since 2014.

In June 2019, Campbell Global Forester Ryan Kaino (pictured at right) led 25 workshop participants on a worksite tour in Cathlamet to help teachers connect students with green jobs and learn about the 21st

Century practices that drive their community's local economy.

Thank you to Campbell Global for making real-world science a top priority!





# 2019 FieldSTEM Celebration

## Honoring PEI's Strong Community

**In September 2019, The Pacific Education Institute held its first annual FieldSTEM Celebration in Olympia.** This luncheon brought together supporters of PEI's mission. In addition to lauding the work of PEI's Board of Directors and staff, Executive Director Kathryn Kurtz handed out six awards to those who have gone above and beyond to further FieldSTEM across the state.



**Teacher of the Year Candy Kristovich** attended PEI's 2017 FieldSTEM Leadership Institute in Colville, then she helped write a food waste storyline at the launch of PEI's Solutions Oriented Learning Storylines project. Back at Quartzite Learning in the Chewelah School District, she led her class in a remarkable investigation into how much food their school wastes. Her students met with school, business, city and Spokane Tribal officials, garnering responses about real world changes that each institution can make. Then they presented their findings to the North American Association for Environmental Education Conference and the Governor's STEM Innovation Alliance.



**School of the Year, Skamania** – whose motto is "The Gorge is our classroom" – has begun to transform 38 acres of forest near the campus into an outdoor classroom. Teachers will use it for field investigations, engineering challenges and much more. After Principal Dr. Ralph Pruitt appointed K-2 teacher Emily Hopple as the FieldSTEM lead and involved the rest of the staff in the program, Skamania was chosen by OSPI as a STEM Lighthouse School.



**District of the Year, Quillayute Valley, under Superintendent Diana Reaume's direction**, has increased its FieldSTEM implementation across grade bands and between schools over the past four years. This began in 2015, when PEI held a day-long workshop for QVSD to set scope and sequence for 5th through 12th grade teachers. In the following years, PEI returned several times to put on targeted workshops, to keep the District's collaborative plan on track. This cumulative work paid off in June 2019, when all K-3 students participated in a one-day introduction to field investigations.



**Community Partner of the Year Jen Thurman-Williams**, from the Mason Conservation District, has been there every step of the way as Shelton became a model district for FieldSTEM. She meets with representatives from each school and integrates their feedback into that year's plan for field experiences. Jen embodies the deep, longterm engagement necessary to establish a thriving FieldSTEM model in a specific place. Her enthusiasm for local, outdoor education is infectious, whether with the young Shelton students or with the Americore environmental education interns she mentors.



**Legislator of the Year J.T. Wilcox**, a 2nd District Representative, and former PEI Board Member, helped pass the original proviso that strengthened FieldSTEM delivery statewide.



**Directors' Legacy Award - Margaret Tudor** led PEI as its Executive Director from 2010-2016. She continues to be an active advisor to and supporter of the organization.

**Save the Date: Wednesday, September 16th, 2020 will be PEI's next FieldSTEM Celebration!**

# Upcoming: Workshops & Events

	January/February	
FieldSTEM Notebooks: Increasing Engagement for All Learners	January 11	Olympia
5th Grade Professional Learning Community	January 14	Aberdeen
ESD 113 Climate Workshop	January 15	Tumwater
EGE: Emerging Agriculture Pathways Forum	January 17	Spokane
Introduction to Field Investigations	January 17	Pullman
ESD 105 Climate Workshop	January 28	Yakima
Storyline Writing – ClimeTime	February 4-6	Olympia
Hands-On Nature Activities	February 15	Bellevue
EGE: Forest Products Forum	February 25	Vancouver
ESD 105 Climate Workshop	February 26	Yakima
FieldSTEM Leadership Institute	February 27-28	Olympia
	March/April	
FieldSTEM Leadership Institute	March 11-12	Wenatchee
FieldSTEM Notebooks: Increasing Engagement for All Learners	March 21	Vancouver
FieldSTEM and Schoolyard Experiences for Grades K-3	March 28	Spokane
EGE: Emerging Renewable Energy Pathways Panel	April 17	South Sound
FieldSTEM and Schoolyard Experiences for Grades K-3	April 18	Poulsbo
FieldSTEM Notebooks: Increasing Engagement for All Learners	April 18	Spokane

For more information, please visit our Calendar of Events at [pacifieducationinstitute.org](http://pacifieducationinstitute.org). Questions about future workshops may be directed to PEI Program Director, Denise Buck at [dbuck@pacifieducationinstitute.org](mailto:dbuck@pacifieducationinstitute.org).



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**Hancock Natural Resource Group and Hancock Forest Management have been a champion for outdoor STEM education and have supported PEI since 2014.**

Hancock Education Forester Cinnamon Bear, who presents indigenous ways of knowing and forest ecosystems benefits at PEI workshops, regularly takes students into nature to do the same. A Muckleshoot Summer Youth Crew pictured here gathers cattails in Tomanamus Forest.



**Thank you to Hancock for helping students and teachers connect to local questions!**

To learn more about Sponsorships, contact Kathryn Kurtz, Executive Director, 360-705-9291 or [kkurtz@pacifieducationinstitute.org](mailto:kkurtz@pacifieducationinstitute.org)