Forestry for resilience, carbon storage, & wood products in a changing world

June 19-20, 2018 | Olympia, WA

Photos-Main: Matt Freeman-Gleason. Inset: NNRG, Cailin Mackenzie, Miller Hull

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9:45-10:00	BREAK	*Purce Hall lobby*
10:00-12:00	Session #1: Forest management for resilience, sustainability, & carbon storage	*Purce Hall lecture hall 1*
12:00-5:00	Field Tour of the Blue Ridge Unit managed by Washington State Department of Natural Resources	*Capitol State Forest*
5:00-6:00	Networking Reception	*Library Reception Hall*
6:00-8:00	Dinner & Evening Keynote	*Library Reception Hall*

Day 2 – Wednesday, June 20

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Detailed Agenda

Forestry for resilience, carbon storage, & wood products in a changing world

Unless otherwise noted, all sessions take place at Purce Hall, 2725 McCann Plaza NW, Olympia, WA 98505.

The goal of this two-day conference is for participants to develop a better understanding of considerations for Pacific Northwest forest management in a changing climate, how carbon storage is measured and accounted for, and the role of solid wood and engineered wood products in supply chain solutions. Outcomes include a special edition of the journal *Northwest Science* developed around the conference proceedings and a grant proposal to the USDA National Institute of Food and Agriculture research initiative for Resilient Agroecosystems in a Changing Climate.

Day 1 – Tuesday, June 19	
8:00-9:00	**Registration & Coffee + Light Breakfast – Purce Hall lobby**
9:00-9:45	**Welcome & Morning Keynote – Purce Hall lecture hall 1** **Seth Zuckerman**, Northwest Natural Resource Group **Jerry Franklin**, University of Washington, School of Environmental & Forest Sciences, Ecosystem Analysis • *Understanding and managing forests as ecosystems: Refreshing our approach in consideration of 21st century challenges*
9:45-10:00	BREAK
Session #1: Forest management for resilience, sustainability, and carbon storage Purce Hall lecture hall 1	
10:00-12:00	*Moderator:* **David L. Peterson**, University of Washington, School of Environmental & Forest Sciences *Speakers:* **Mike Ryan**, Colorado State College, Natural Resource Ecology Laboratory • *Tree growth, water availability, water use and drought resistance are tightly linked* **Mark Harmon**, Oregon State University, College of Forestry, Forest Ecosystems & Society • *Putting forest carbon management on a productive path: Some recommendations* **Matt Hurteau**, University of New Mexico, Earth Systems Ecology Lab • *Using management to increase carbon stability in fire-prone forests* **Klaus Puettmann**, Oregon State University, College of Forestry, Forest Ecosystems & Society • *What does silviculture for resilient forests in a changing climate look like?* Q&A

Field Tour of the Blue Ridge Unit in Capitol State Forest managed by Washington State Department of Natural Resources	
12:00-5:00	*Boxed lunches, hard hats, and transportation to the field site are provided. Please follow signs to the buses and be ready to load by 12:15 pm.* **Individuals participating in the field tour need to:** • wear sturdy closed-toed shoes • dress for the weather – this tour will happen rain or shine • bring enough water and personal snacks for the afternoon • bring your own hard hat or be prepared to wear a loaner • bring notepad, pencil, and camera if you wish to take notes We will depart from Evergreen State College by 12:20 pm and return to campus around 5:00 pm. We will be gone for ~5 hours, including 2 hours of travel and 3 hours in the woods. There will be outhouses available at 1-2 of the stops. There will be three stops during the field tour in the Blue Ridge Unit of Capitol State Forest. At each stop we will look at a range of harvest treatments from clear-cuts to 100% retention. Presenters will discuss research findings pertaining to stand structure and growth, seedling establishment, carbon storage, and climate adaptation. The final stop will include time for Q&A. During the tour, participants will travel by foot on primitive trails and roads to view treatment units. **There is active logging near the site and logging trucks drive along the roads – while WA DNR field staff will be monitoring the area – all participants need to stay aware!** *Field Tour Speakers:* • **Calvin Ohlson-Kiehn**, Washington State Department of Natural Resources, State Lands Silviculture Program • **Jeff DeBell**, Washington State Department of Natural Resources, Silviculturist & Geneticist • **Timothy Harrington**, US Forest Service, PNW Research Station, Research Scientist • **Derek Churchill**, Washington State Department of Natural Resources, Forest Health Scientist • **Connie Harrington**, US Forest Service, PNW Research Station, Research Forester • **Dylan Fischer**, Evergreen State College, Forest Ecology • **Kirk Hanson**, Northwest Natural Resource Group
5:00-6:00	**Networking Reception – Library Reception Hall** Daniel J. Evans Library, 2700 Evergreen Pkwy NW, Olympia, WA 98505
6:00-8:00	**Dinner & Evening Keynote – Library Reception Hall** Emma Marris, writer & author of *Rambunctious Garden: Saving Nature in a Post-Wild World* • *Forestry in the Anthropocene: The journey from maximum sustained yield to novel ecosystems*

Day 2 – Wednesday, June 20	
8:00-8:30	**Registration & Coffee + Light Breakfast – Purce Hall lobby** *Coffee, tea, water, bagels and pastries.*
Session #2: Supply chain solutions – milling capacity & markets, green building that supports carbon-rich, resilient forestry – Purce Hall lecture hall 1	
8:30-10:30	*Moderator:* **Patti Southard**, King County GreenTools Program, *Speakers:* **Paul Harlan**, Collins Companies, VP Resources • *How we got to 'Not Where We Were Going'* **Skip Swenson**, Forterra, VP Policy & Programming • *The Emerging Mass Timber Market in Washington* **Allison Capen**, International Living Future Institute, Living Building Challenge Technical Director • *Resilient Forests for a Living Future* **Laura Soma**, GLY, Project Manager • *Into The Building – The Wood Path* **Chris Hellstern**, The Miller Hull Partnership, Living Building Challenge Services Director • *A Sustainably Responsible Material* Q&A
10:30-10:45	BREAK
Session #3: Measuring carbon storage & increased climate resilience in the forestry sector Purce Hall lecture hall 1	
10:45-12:45	*Moderator:* **David Diaz**, Ecotrust, Forestry Analytics and Technology *Speakers:* **Rolf Gersonde**, City of Seattle – Watershed Management Division • *Adapting tree species composition to a changing climate – a planting trial for forest resilience* **Dylan Fischer**, Evergreen State College, Forest Ecology • *Measuring carbon in west-side permanent plots; aboveground, belowground, and in-between* **Andrew Gray**, US Forest Service, PNW Research Station, Research Ecologist • *Trends and drivers of carbon storage in westside forests of Oregon and Washington* **Edie Sonne Hall**, Three Trees Consulting, Principal • *Carbon accounting in Washington State's forestry sector* **Maureen Puettmann**, WoodLife Environmental Consultants, Principal & Director of the Consortium for Research and Renewable Industrial Materials • *Life cycle assessment can improve decisions to optimize wood use* Q&A

12:45-1:45	**Working Lunch – Library Reception Hall** Brainstorm ideas to discuss during strategy work sessions
Session #4: Strategy Work Sessions Purce Hall classrooms 5, 6, 7, & 8	
1:45-3:15	Facilitated small group discussions to identify key questions that have surfaced during the conference, and consider potential avenues for future research or demonstration projects in the realm of climate adaptation and carbon storage. *Facilitators:* **Dylan Fischer, Lindsay Malone, Paul Vanderford, and Seth Zuckerman** We will divide into four groups for this discussion. Please join the group that corresponds to the climate-sensitive species printed on your name badge: • **Room 5 – Alaska yellow cedar** • **Room 6 – Cascades frog** • **Room 7 – Fender's blue butterfly** • **Room 8 – Pika**
3:15-3:30	BREAK
Session #5: Sharing resources and streamlining efforts to access tools for climate adaptation – Purce Hall lecture hall 1	
3:30-3:55	**Jerry Krueger**, USDA Northwest Climate Hub, Interim Director • *The NW Climate Hub – The Challenge of Meeting Customer Needs*
3:55-4:30	**Recap and Adjourn** Share recap from the small group discussions and highlight upcoming opportunities to learn and coordinate on projects.

Abstracts

Session #1: Forest management for resilience, sustainability, and carbon storage

Moderator: David L. Peterson
University of Washington, School of Environmental & Forest Sciences

Tree growth, water availability, water use and drought resistance are tightly linked
Mike Ryan, Colorado State College, Natural Resource Ecology Laboratory

We all know that plants need water to grow, and high (but not too high) soil water will promote the best growth as long as the trees also have optimum nutrition, light and temperature. Declining soil water slows tree growth and halts it when it gets too low because the cells that make wood can't divide and expand. Low soil water also lowers photosynthesis and water use. These fundamental physiological trade-offs in trees' carbon and water cycles mean that changes in wood growth (and carbon storage) will be accompanied by changes in water use-high growth = high water use, low growth = low water use. Drought resistant trees or stands are slower growing trees or stands.

Of course, nature doesn't always provide optimum conditions. In the PNW, soil water is optimum when temperatures and light are not, and low when light and temperature are optimum. Silviculture can work with these physiological constraints by thinning to reduce stand density and leaf area. Thinning trades off lower stand growth with concentrating that lower growth on fewer trees. Thinning gives the fewer trees more water, light and nutrients for each tree, extends growth longer into dry season, and increases the drought resistance of the fewer trees. Silviculture can also increase nutrition and reduce competing vegetation. These practices switch carbohydrates from below ground and ephemeral carbon stores to a longer-lasting carbon storage in wood.

Any selection for water use efficiency at leaf level means slower growth at the tree and stand level. Future tree improvement might select for rapid leaf shedding and canopy rebuilding during drought and recovery.

Putting forest carbon management on a productive path: Some recommendations.
Mark Harmon, Oregon State University, College of Forestry, Forest Ecosystems & Society

Although climate mitigation via the management of forest carbon is receiving increasing attention, carbon is generally not the primary objective of most forest management systems. Nonetheless, carbon management is often used as the primary justification for different

management approaches. Unfortunately this creates a dynamic in which the system with the highest carbon value (i.e., store, uptake, or offset) is the "winner". Currently there seems to be multiple winners, suggesting that management either has no meaningful effect on forest carbon, or that some of these conclusions are invalid. Neither is strengthening the view that the forest sector is credible and worthy of investment for climate mitigation. I believe it will be more productive to acknowledge the validity of diverse primary management objectives and then given these management constraints one should try to: 1) store as much carbon as possible, 2) increase the time carbon stays in the system being managed, and 3) minimize losses and when they occur offset them to the degree possible. Since the goal of forest carbon management should largely be meaningful climate mitigation, scientific assessments need to: 1) obey natural laws such as the conservation of mass, 2) use a valid reference scenario, 3) focus on the scale of relevance to mitigation (not the scale needed to prove a point), 4) focus on forms of carbon that can be verified empirically and not ones that might exist theoretically, and 5) recognize trade-offs with other management objectives.

Using management to increase carbon stability in fire-prone forests

Matt Hurteau, University of New Mexico, Earth Systems Ecology Lab

In drier forest types of the western US, fire was an important process for shaping ecosystem structure and maintaining ecosystem function. Fire suppression has homogenized forest structure, increased fuel loads, and selected for large, stand-replacing wildfires. Ongoing climate change is interacting with these homogenized conditions and increasing the potential for vegetation type change. Given the importance of forests in regulating climate, understanding the carbon consequences of wildfire and management options for mitigating high-severity wildfire risk is central to making informed decisions about carbon management. Options for mitigating high-severity wildfire risk in dry forests involve some combination of mechanical thinning and fire use. Both of these activities lead to immediate reductions in ecosystem carbon storage. However, the carbon balance of treatments must be evaluated over a longer period to determine the effect of post-treatment growth on carbon uptake and the potential of treatments to reduce subsequent carbon losses from wildfire. Using empirical and simulation experiments, we evaluated the effects of treatment on carbon dynamics at the stand, watershed, and mountain range scales in the Sierra Nevada. At the stand scale, carbon reductions are proportional to treatment intensity, with treatments removing only smaller trees quickly recovering carbon. At the watershed scale, understanding the contribution of stand conditions and topographic position can be used to limit the proportion of the forest requiring treatment, as long as ecologically-appropriate fire is restored to the landscape. Across the mountain range, widespread treatment application at a faster rate minimizes total carbon losses increases storage.

What does silviculture for resilient forests in a changing climate look like?

Klaus Puettmann, Oregon State University, College of Forestry, Forest Ecosystems & Society

Climate change is predicted to impact forests directly through altered growing environments and indirectly, e.g., through changing disturbance regimes. These trends result in a changing, more variable, and uncertain future. To ensure continued provision of desired ecosystem goods and services, silvicultural practices have to emphasize maintaining or improving the resistance, resilience, and adaptive capacity of forest ecosystems. At the same time, these treatments need to be economically viable in the short-term. This can be accomplished by applying two principles: First, silvicultural treatments should encourage diversity of stand structures and species composition at various spatial scales; from within stands/local neighborhoods to landscapes. This will reduce negative impacts of environmental changes and disturbances. It will also provide landowners with the flexibility to take advantage of naturally occurring variability (rather than spending money to homogenize conditions) and to respond quicker to environmental and social trends. Second, silvicultural treatments should aim to maintain forests below full stocking, at least in parts of the landscape. Lower than full stocking reduces tree stress and leads to improved tree vigor and thus resistance and resilience. In conjunction with increased variability (principle one, see above) it also provides a broader array of growing conditions and associated wildlife habitat. At the same time, lower stocking provides additional opportunities for natural dynamics to play out and thus facilitates forest adaptation to new growing conditions.

Session #2: Supply chain solutions – milling capacity & markets, green building that supports carbon-rich, resilient forestry

Moderator: Patti Southard
King County Green Building Tools, Program Manager

How We Got To 'Not Where We Were Going'
Paul Harlan, Collins Companies, Chief Forester & VP of Resources

Collins was one of the first to adopt the fledgling FSC system in 1993 as a mechanism to be recognized in the market place for their conservative and long term sustainable focus on forest management. Along the way we have learned from this experience and that has shaped both our forest products marketing and to some extent our forestry practices. Paul will explore that history, what we sought to gain by certification and some of the lessons Collins learned along the way including eastern hardwoods and western softwoods.

The Emerging Mass Timber Market in Washington
Skip Swenson, Forterra, VP Policy & Programming

Washington's urban communities are amongst the fastest growing in the nation. Communities along the I-5 corridor represent an international economic hub home to strong industry clusters such as aerospace, information technology, and health sciences. Consequently, Pacific Northwest region is expected to continue to grow in employment and population into the foreseeable future. As a region dependent upon its surroundings for resources, energy, clean water, and natural services such as flood protection, we need to manage future population growth in a manner ensuring economic, social, and environmental resilience. Housing people and jobs within our existing cities and towns will increasingly be an important strategy if the region is to succeed in maintaining its quality of life and high functioning environment. At the same time, the national economic recession hit Washington's forest communities hard, adding to the challenges of decades of declines in the timber industry. Several factors have contributed to the decline of the natural resources sector, notably technological advances and efficiencies and increased global competition. If rural timber communities are to flourish in the future, they need opportunities to rebuild robust economies resilient to economic and political change.

Linking the needs and well-being of these areas would be highly beneficial to communities and ecosystems. Mass timber buildings designed and built in our cities with products sourced or produced in our forest communities represents one opportunity to create this linkage. Mass timber, a collective term for several engineered heavy panel wood products (notably cross-

laminated timber), is a promising building system that, when responsibly sourced and used, offers a variety of benefits in terms of its ability to lower the costs of construction in our cities, support rural economic development, and potentially lessen carbon emissions resulting from new construction. Originally developed in Europe in the 1990's, allowances for mass timber construction are currently limited, but are likely to expand.

This discussion will outline a coalition-based effort to catalyze a mass timber market in Washington, will outline the sizes of the likely market, and will entertain opportunities and challenges that lay ahead.

Resilient Forests for a Living Future
Allison Capen, International Living Future Institute, Living Building Challenge Technical Director

This session will provide a brief overview of the International Living Future Institute's vision for the future of the built environment, focusing on the approach of the Living Building Challenge (LBC) and the requirements for wood products in LBC projects. It will include what that means for project teams and those in the supply chain of responsible forestry. Examples of projects that achieved LBC certification, and resources for meeting the LBC wood product requirements will also be shared.

Into The Building – The Wood Path
Laura Soma, GLY Construction, Project Manager

When it comes to wood in the built environment, we know that it has been used for thousands of years. Over time processes got faster – unfortunately – materials didn't grow any faster and the industrial revolution changed everything. We're suffocating the earth with all of our industry created greenhouse gasses. We need to utilize the materials that can reduce the GHG's and not add to them. How we build today determines our future health and the health of our future.

A Sustainably Responsible Material
Chris Hellstern, The Miller Hull Partnership, Living Building Challenge Services Director

This brief session will make the case for why the building industry should consider wood as a primary structural material for buildings and how to source it sustainably. We will review some case studies to explore how wood is being used today to expand its acceptance in the commercial market.

Session #3: Measuring carbon storage & increased climate resilience in the forestry sector

Moderator: David Diaz, Ecotrust
Director of Forestry Technology & Analytics

Adapting Tree Species Composition to a Changing Climate – A Planting Trial for Forest Resilience

Rolf Gersonde, Seattle Public Utilities, Senior Environmental Analyst

To address resilience management strategies for forest disturbance and increased temperature stress, we installed a planting trial in the Cedar River Municipal Watershed with species that are adapted to warmer climates and dominant disturbance agents. The planting trial was integrated in a forest restoration project in low elevation Douglas-fir forests, designed to increase diversity of tree species that are adapted to warmer, drier climate as predicted for the second half of the 21st Century.

We expect increased mortality of resident Douglas-fir and western hemlock under drought stress, Douglas-fir beetle, and root disease. Lacking natural seed sources of other species, we planted trees and shrubs of the Douglas-fir/Garry Oak association as well as Douglas-fir seedlings from the southern Willamette Valley in Oregon. We expect that these species and seed sources will be better adapted to future climate, but we have little experience in growing them in disturbed sites under current climate conditions. The planting trial provided the opportunity to track survival and performance of a smaller subset of trees with a rigorous sampling design. We present results on survival, growth performance, and phenology of Douglas-fir, western redcedar, Garry oak, western white pine, and shore pine over a three-year period. The planted species showed differences in height growth and spring bud burst and were impacted by ungulate browse. Our experience provides guidance on how to integrate an adaptive management trial for augmenting species composition in our next operational planting projects.

Measuring carbon in west-side permanent plots; aboveground, belowground, and in-between

Dylan Fischer, Evergreen State College, Forest Ecology

While large networks of plots across regions provide an important perspective on forest carbon (C) trends, detailed measurement in local forest plot networks can also be critical for understanding nuances and mechanisms associated with changes in forest C through time. Here, I present data from 10-years of forest C monitoring in a network of permanent plots in an advanced-age second-growth rainforest in western Washington. Since 2005, biometric

measurements in this plot network have been used to continuously measure aboveground forest C, and belowground C flux. Further, this work has been done in a way that integrates undergraduate training in the measurement of forest carbon (a modern take on traditional forestry training). I will detail lessons learned and fundamental assumptions and principles that are key to a successful long-term monitoring program that integrates novices and experts alike. Over time, stand species composition has played a critical role in the forest C storage. Our modeling results generally suggest that not all forest stands are equal, and the natural history of key dominant species plays a critical role in determining long-term C uptake and storage following management. Additionally, our early work has suggested that many stands with high C sequestration rates also have high C release rates via soil respiration. Integrating forest C flux above- and below-ground, individual species natural histories, and variability through time has been key to understanding trends in C in these forests.

Trends and drivers of carbon storage in westside forests of Oregon and Washington
Andrew Gray, U.S. Forest Service, Pacific Northwest Research Station, Research Ecologist

Forest ecosystems are important for understanding carbon flux because of their potential to accumulate large amounts of carbon. Carbon flux from westside forests are determined by the balance of growth, decay, and cutting across millions of acres of land. Ground-based forest inventory measurements are crucial for assessing carbon stocks. The goal of this study was to determine the importance and magnitude of these drivers on carbon flux across the forest lands of Oregon and Washington, USA. We used repeated measurements on 12,000 Forest Inventory and Analysis (FIA) plots and allometric equations of biomass and carbon density to quantify tree carbon flux due to growth, land use change, disturbance, and logging. Forests in Oregon and Washington currently store about 2,100 million metric tons (mmt) of carbon and accumulate carbon at a rate of 7 mmt per year (an increase of 0.3 percent per year). Maturing younger forests and small trees accumulate carbon at a faster rate per acre compared to older forests and large trees, but by age 100 have accumulated only 66% of their maximum potential stores. National forests in Oregon and Washington are storing 63 percent of their maximum carbon storage capacity. Wildfires on national forests resulted in a loss of 0.8 mmt per year, with most of this loss occurring in Wilderness areas. Land use change resulted in an estimated net loss of 2.4 mmt per year of carbon. Management approaches to development, harvest rotations, and natural disturbance can influence the carbon storage and resilience of westside forests.

Carbon accounting in Washington State's forestry sector
Edie Sonne Hall, Three Trees Consulting, Principal

Washington State is over 50% forested and includes 18 million acres of timberland and another 4 million acres of reserved forestland. Washington's climate and soils are uniquely suited for

high tree productivity and Douglas-fir, the most dominant tree species in the state, is valued for its strength as a building material. Washington State plays a globally significant role in the production of sawtimber as the second largest producing state in the US, the global leader in sawtimber production. This presentation will look at past and current trends in Washington State forest inventory and harvested wood product (HWP) carbon storage. It will also look at trends in growth, mortality, fire, removals and land-use change and their carbon impacts. The goal is to put the Washington state forest sector and its impact on the carbon cycle in context in order to set the stage for more detailed discussions on ways to help mitigate global net GHG emissions.

Life cycle assessment can improve decisions to optimize wood use
Maureen Puettmann, WoodLife Environmental Consultants, Principal & Director of the Consortium for Research and Renewable Industrial Materials

Higher expectations for greenhouse gas reductions and public pressure to reduce the use of fossil fuels has led to increasing interests in using wood residues for energy and fuels and brings up the question about the optimal use of wood. For example, the shift of using mill residues for energy, rather than for alternative uses in e.g., long term products, may have unintended consequences such as greater carbon emission in the short-term. The US softwood lumber industry produces an estimated 19 million metric tons per year of chips and residues (bark, sawdust, and shavings) and I present the implications of the choice how to use this material. Historically, about half of these "coproducts" have gone to the pulp and paper industry. Recent surveys from long term wood panel products such as medium density fiberboard, particle board, hardboard, and fiberboard have estimated a softwood residue demand of 7.4 million metric tons per year. In addition, softwood lumber producers use another 3.8 million metric tons per year of wood residues for energy generation for processing facilities; a direct substitution of fossil fuels and a direct carbon emission reduction. Alternatively, structural wood building assemblies can displace 2 – 6 times the carbon emissions compared to non-wood assemblies (steel, concrete). This presentation will focus on comparing carbon storage in short-and long term products and its implication for net carbon emissions and substitution of fossil fuels to determine the best use of wood for maximal carbon mitigation.

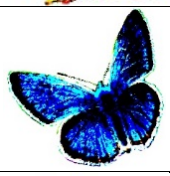
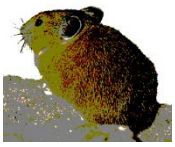
This research in partnership with Bruce Lippke, University of Washington, College of the Environment, Professor Emeritus.

Session #4: Strategy Work Sessions

Facilitators: Dylan Fischer, Lindsay Malone, Paul Vanderford, and Seth Zuckerman

The purpose of this session is to discuss and refine the insights that have risen to the surface for participants during the conference. We will identify key questions and ideas for possible future research, outreach, education, and demonstration projects.

We will divide into four groups for this discussion. Please join the group that corresponds to the climate-sensitive species printed on your name badge:

	Room 5	Alaska yellow cedar, *Cupressus nootkatensis*, is a culturally and economically significant tree in coastal and montane forests. Climate change is likely to reduce snowpack and thermal cover in soils and expose cedar to lethal freezing injury.
	Room 6	Cascades frogs, *Rana cascadae*, found only in the Pacific Northwest, depend on wetlands fed by snow melt. If pools containing embryos or tadpoles dry out too early, the frogs do not become adults.
	Room 7	Fender's blue butterfly, *Icaricia icarioides fender,* cannot survive without its host plant, the threatened Kincaid's lupine. Increased temperatures and changing precipitation alter the growth pattern of lupine.
	Room 8	Pika, *Ochotona princeps*, cannot tolerate high body temperatures, thus their range is guided by climate, warmer temperatures drive pika to higher elevations to cool off in summer, but with less snow cover to insulate their burrows, they can freeze in winter.

Session #5: Sharing resources and streamlining efforts to access tools for climate adaptation

The NW Climate Hub – The Challenge of Meeting Customer Needs

Jerry Krueger, USDA Northwest Climate Hub, Interim Director

In a landscape filled with organizations and agencies working on climate issues – what is the role of the NW Climate Hub? Small staff capacity and challenging budgets require a clearly defined mission and focus on delivery of high quality, customer requested products. Our numerous partners, stakeholders, and customers are anxious to get meaningful information to help them adapt their land management operations to climate challenges. My goal in this presentation is to have a dialog that examines and reflects on our shared challenges in communicating climate science and gain a better understanding of how and where we collectively invest our limited resources and determine customer needs.

Speaker Backgrounds

Allison Capen | International Living Future Institute | Session #2 Speaker
Allison Capen, AIA, LEED BD+C, is Technical Director for the Living Building Challenge at the International Living Future Institute in Seattle where she oversees resources and technical consistency. She is a licensed architect and has been actively involved in the green building movement in the northwest region for more than 20 years, working at firms such as Miller/Hull and Paladino on environmentally focused projects as a designer, a LEED reviewer, a sustainability consultant and a certification administrator. Allison was an early member of the AIA Seattle Committee on the Environment, co-chair of that committee from 2001-2003, a founder of the AIA Seattle What Makes It Green? event, and the chair of the AIA Washington Council's Sustainable Design Resource Group from 2005-2012.

Derek Churchill | Washington State Department of Natural Resources | Field Tour Speaker
Derek Churchill is both a forester and scientist who focuses on applying ecological knowledge and field experience to address on-the-ground forest management challenges across the Pacific Northwest. He recently started a job with the Washington Department of Natural Resources as a forest health scientist implementing Washington's 20 Year Strategic Forest Health Plan. In this position, he is leading cross ownership landscape evaluations across eastern Washington and developing large-scale treatment recommendations to significantly reduce fire risk, enhance resilience to climate change, and increase economic sustainability. Prior to the DNR, he ran a forestry consulting company for 15 years that worked with a wide variety of private and public landowners on forest management, landscape analysis, and educational training projects. In addition to consulting, Derek has been conducting forestry research at the School of Environmental and Forest Sciences at the University of Washington for over 10 years. He completed both a Masters degree and PhD in silviculture and forest ecology at UW and has been a post doc and research scientist since 2013. His research focuses on stand to landscape management of dry forests, variable density thinning in westside forests, and utilizing LiDAR in management applications. He lives on Vashon Island where he works with the Vashon Forest Stewards; a community forestry group that manages several community forests on Vashon as well as forest operations for small private, non-industrial forest landowners. He has 13 acres of his own forestland on Vashon and helps manage 60 acres of family forestland in SW Oregon.

Jeff DeBell | Washington State Department of Natural Resources | Field Tour Speaker

Jeff DeBell is a managing scientist responsible for forest genetics and seed production for the Washington State Department of Natural Resources. In that role, his goal is to ensure that the seedlings planted by WDNR will be adapted to future climates as well as future markets. Prior to his current position, he worked as a field forester in several areas of southwest Washington, including a stint in charge of timber sales on Capitol Forest, where the conference field trip will occur. Jeff holds a dual Ph.D. in Forest Science and Forest Products from Oregon State University, a M.S. in Silviculture from Oregon State University, and a B.S. in Forest Management from Clemson University.

David Diaz | Ecotrust | Session #3 Moderator | Steering Committee

A fifth-generation Texan, David left San Antonio to attend Harvard University, receiving a BA in Environmental History in 2006. David became enchanted by the "tall people" of the Pacific Northwest from 2006-2008 while completing an MS in Soil Science at Oregon State University, and has worked on forest conservation, policy, and management in one way or another ever since. Over the past 10 years, David's work has ranged from being a reporter covering domestic and international climate policies and carbon markets based in Washington, DC, to being a Portfolio Manager in Portland, OR developing carbon certification protocols and originating contracts for carbon offset projects. David joined Ecotrust in 2013 where he now serves as the Director of Forestry Technology and Analytics. At Ecotrust, he has been focused on developing new tools, technologies, and market connections to make ecological forestry more accessible to under-served forest owners across the Pacific Northwest. In 2017, David moved to Seattle to begin his pursuit of a PhD at the University of Washington. Two years in, he is balancing his ongoing work at Ecotrust with research to mine publicly available datasets including state, federal, and academic forest inventory databases, lidar, tree-ring records, and historical climate records to build an improved toolkit for making Climate Smart Forestry decisions.

Dylan Fischer | Evergreen State College | Session #3 Speaker | Steering Committee

Dylan Fischer is a faculty member at the Evergreen State College in Forest Ecology. He received his B.S. at OSU in 1998, his M.S. in Forestry at Northern Arizona University in 2001, and his Ph.D. in Ecosystem Science at Northern Arizona University in 2005. His research addresses linkages between vegetation diversity and ecosystem function, and ecosystem responses to disturbance. He focuses on succession, ecological genetics, community ecology, nutrient cycling, tree physiology, soil carbon, and forest carbon cycling.

http://blogs.evergreen.edu/fischer, e-mail: fischerd@evergreen.edu, 360-359-1426

Jerry Franklin | University of Washington | Morning Keynote Speaker | Steering Committee

Born in Waldport, Oregon in 1936, raised in Camas, Washington. Jerry earned BS & MS degrees in forest management from Oregon State, and a PhD in botany from Washington State. 35 years with the PNW Research Station (detailed to Japanese Forest Experiment Station in 1970 and to National Science Foundation as program officer for Ecology and Ecosystems). 32 years with the University of Washington as a Professor. Activities associated with include Coniferous Forest Biome (USIBP), Long Term Ecological Research (LTER), Mount St. Helens, H. J. Andrews Experimental Forest, Wind River Canopy Crane, Gang of Four, and the Northwest Forest Plan. Areas of special interest: structural development of forests, old growth, landscape ecology, early successional ecosystems, federal forest policy, management of forests based on ecological principles.

Rolf Gersonde | Seattle Public Utilities | Session #3 Speaker

Rolf is a forest ecologist and silviculturist working for the City of Seattle in City's mountain watersheds where he designs and implements forest restoration projects and monitors ecosystem recovery under the Cedar River Habitat Conservation plan. Rolf has a background in forest resource management and silviculture of mixed-species uneven-aged forests. He studied forestry in Germany and California, but considers the forest and mountains of the Pacific Northwest his home.
During the past 14 years of his work in the Cedar River Watershed, Rolf has maintained a close relationship with research and teaching at the University of Washington where he has an affiliate faculty position, engaging with students and faculty in collaborative projects.
Rolf has worked with NNRG on workshops for forest landowners in the PNW, presenting on ecological forest management and forest restoration, and learned about the goals and needs of small forest landowners in this region. More recently, Rolf is working with the Northwest Chapter of the Society for Ecological Restoration to promote the science and practice of ecological restoration and provide continuing education: Such as the regional joint conference of SERNW and SWS in October 2018, Spokane WA with the theme "Restoring Resilient Communities in Changing Landscapes".

Andrew Gray | U.S. Forest Service | Session #3 Speaker

Andrew Gray is a Research Ecologist and team leader with the U.S. Forest Service, PNW Research Station. He completed his M.S. in forest ecosystem analysis at UW in 1990 and his Ph.D. in forest ecology at OSU in 1995. His research focuses on forest disturbance and succession, and on techniques for strategic monitoring of forest resources. Most recent projects assess broad scale changes occurring in western forests, utilizing the extensive network of Forest Inventory and Analysis (FIA) ground measurements. Current studies include: estimation of carbon flux on forestland, determining rates and causes of elevated mortality events in California, improved modeling of

immediate and delayed fire effects, predicting the distribution and abundance of invasive plants, and developing carbon estimates for the boreal forests of interior Alaska. In his free time Andy likes to explore remote western landscapes on foot.

Edie Sonne Hall | Three Trees Consulting | Session #3 Speaker
Edie Sonne Hall is the Founder and Principal of Three Trees Consulting, which specializes in bridging the gap between science and policy and management. She grew up in the Northeast and spent summers hiking around the woods with her family. She majored in environmental biology at Yale and then worked as a research forester for International Paper in Southern Georgia. In 1999 Edie moved to the PNW to pursue a masters and Ph.D. in forestry at the University of Washington. There she became interested in climate change and the role forests and forest products can play in reducing greenhouse gas emissions. She started working for Weyerhaeuser doing sustainable forest policy in 2005. She has worked on regional, national, and international forestry issues related to forest carbon, ecosystem services, green building and life cycle assessment.

Kirk Hanson | Northwest Natural Resource Group | Field Tour Speaker
Kirk is a small woodland owner with ~100 acres of family-owned forestland in western Washington. He's worked on behalf of small woodland owners for more than 20 years, bringing a passion for ecologically-based forestry and simplified hands-on management practices that allows forest owners to take a direct role in the stewardship of their own land. As a member of a three-generation family forest, Kirk understands the issues and opportunities facing small woodland owners and relishes developing new strategies for optimizing the economic and ecological potential of their forests. Kirk has a Bachelor's degree in sustainable resource management from Evergreen State College and worked for six years with the Washington DNR's Small Forest Landowner Office before joining NNRG in 2006.

Paul Harlan | Collins Companies | Session #2 Speaker
Paul has spent the last 32 years with Collins as a Forester, Sawmill Manager, and as Vice President - Resources for The Collins Companies. His duties cover 310,000 acres of Collins land and forestry operations in Pennsylvania, West Virginia, California and Oregon. He is an OSU Forest Engineering graduate, licensed forester in California, and founding member of the Lakeview Stewardship Group and the Lake County Resources Initiative Inc. He spent six years on the FSC-US board, four of them as Board Chair. Collins has operated as an independent forest products company for over 160 years. With the Collins commitment for long term sustainability, Paul has guided these efforts as they became the first private operation in North America to become Forest Stewardship Council certified in 1993.

Mark Harmon | Oregon State University | Session #1 Speaker | Steering Committee

Mark E. Harmon, former Richardson Chair of Forest Science, is now Professor emeritus in the Department of Forest Ecosystems and Society at Oregon State University. Dr. Harmon earned his B.A. at Amherst College in 1975 in Biology, a M.S. in Ecology at the University of Tennessee, Knoxville in 1980 and a PhD in Botany at Oregon State University in 1986. Dr. Harmon has published 140 peer-reviewed journal articles on a topics ranging from tree growth and mortality, decomposition of wood in the natural environment, management of coarse woody debris, carbon dynamics of forests, disturbances, and ecosystem modeling. Course topics he has taught include ecosystem analysis and management as well as landscape ecology and carbon sequestration in forests. He has served on the EPA's Scientific Advisory Board on Biogenic Carbon, Oregon's Greenhouse Gas Commision's Forest Task Force, and the IPCC's Carbon Measurements Group. During his career he was the co-director the Cooperative Chemistry Analytical Laboratory, served as the lead principal investigator for the NSF-sponsored H. J. Andrews LTER and lead OSU scientist for the H. J. Andrews Experimental Forest.

Connie Harrington | U.S. Forest Service | Field Tour Speaker

Connie Harrington is a research forester with the U.S. Forest Service. She researches the responses of multiple species and multiple genotypes within species to their environment, including phenology, germination, flowering, and growth. She develops models to predict plant responses to current and future climates. She also studies the responses of many species to silvicultural practices, such as variable density thinning or species mixtures, or to factors such as bole or root damage, which may affect tree survival and growth. She earned her Ph.D. in Tree Physiology and Soils from the University of Washington and her M.S. in Silviculture and her B.A. in Forest Botany from SUNY College of Environmental Science and Forestry.

Timothy Harrington | U.S. Forest Service | Field Tour Speaker

Timothy B. Harrington received a B.S. degree in botany from LSU and M.S. and Ph.D. degrees in forestry ecology and silviculture from OSU. In the 1980's, he was a researcher in the forest vegetation management cooperative at OSU. In the 1990's, Tim was a professor of silviculture at the University of Georgia in Athens. Since 2002, he has worked as a scientist for the PNW Research Station, U.S. Forest Service in Olympia, WA. Tim has authored over 120 publications on topics of silviculture, vegetation management, and forest ecology. His recent work has focused on nonnative, invasive plants, long-term soil productivity, and silvicultural systems for Douglas-fir. Currently Tim serves as leader for the Insects, Pathogens, and Stressors Team in PNW.

Chris Hellstern | The Miller Hull Partnership | Session #2 Speaker
Chris has dedicated his career to progressing sustainability within the built environment. Having worked with a variety of project types including public and private facilities he has worked with teams to initiate, plan and coordinate the execution of sustainable goals ranging from LEED certification to Living Building Challenge Certified projects. A licensed architect and author, his recent book, Living Building Education, chronicles the story behind his involvement with the Bertschi project, the world's fourth Living Building Challenge certified project. Chris has served as a Cascadia Branch member and Living Building Ambassador for the International Living Future Institute (ILFI) and was awarded the first Living Building Challenge Hero award in 2012. He founded Seattle 2030 Roundtable and co-founded the Healthy Materials Collaborative. A Living Future Accredited professional, Chris has been a speaker at numerous conferences across the country, published articles and volunteers with local school groups mentoring students about sustainable practices and advocacy.

Matt Hurteau | University of New Mexico | Session #1 Speaker
Matthew Hurteau is an Associate Professor of Quantitative Ecology at the University of New Mexico. He has a BS in Forestry from Northern Arizona University and a PhD in Ecology from the University of California, Davis. His research focus is on climate change mitigation and adaptation in forest systems. He uses empirical and simulation data to better understand how changing climate and disturbance influence species distributions, productivity, and carbon dynamics.

Jerry Krueger | U.S. Forest Service | Session #4 Speaker
Dr. Krueger is the Acting Director for the Northwest Climate Hub. The Northwest Climate Hub is part of the Forest Service Pacific Northwest Research Station, and one of 10 regional USDA Climate Hubs.
Jerry's permanent appointment is the Deputy Forest Supervisor of the 1.2 million acre Black Hills National Forest in western South Dakota and northeastern Wyoming. Dr. Krueger helps lead 400 permanent and temporary employees in conserving our public lands and delivering important commodities and recreation opportunities to the American public.

Dr. Krueger has more than 30 years of experience in natural resource management. Prior to joining the Black Hills NF leadership team, he served as Planning Staff Officer on the Bitterroot National Forest in western Montana. He has also served as Science Coordinator for the Everglades and Dry Tortugas National Parks in south Florida, leading the Critical Ecosystem Studies Initiative science program in support of the Everglades ecosystem restoration effort. Jerry served 20 years in the US Air Force, working on a wide range of natural resource management initiatives on DoD lands, conducting research, and serving on the faculty at the

US Air Force Academy. Jerry has also been an Associate Professor at South Dakota State University and an adjunct for the University of Montana – Bitterroot College.
Dr. Krueger completed his PhD in Silviculture at the University of Minnesota, a Masters in Science – in Forestry from the University of Michigan and his undergraduate degree in Forest Resource Management from the University of Minnesota.

Lindsay Malone | Northwest Natural Resource Group | Steering Committee
Lindsay became part of the NNRG team in 2012 on the same day she helped save a northern flying squirrel. She has more than 15 years of experience working on natural resource and conservation issues for local, state and federal agencies and non-profit organizations; including stints as a small mammal field technician, social science data wrangler, and suburban park ranger. Prior to NNRG, Lindsay worked at Forterra where she contributed to the conservation of more than 10,000 acres of working forests, natural areas and recreation lands. She completed her master's degree at the University of Washington's College of Forest Resources, conducting a study to identify the needs and interests of first-time forest owners.

Emma Marris | Writer and Author | Evening Keynote Speaker
Emma Marris is an environmental writer and an Institute Fellow at the UCLA Institute of the Environment and Sustainability. She has written for many magazines and newspapers, including *National Geographic, Wired*, the *New York Times*, *Nature* and *Outside*. She has a Master's in Science Writing from Johns Hopkins University. In 2011, she published her first book, *Rambunctious Garden: Saving Nature in a Post-Wild World*. In 2016, she gave at TED talk about seeing the hidden nature that surrounds us, which has been watched over a million times. She grew up in Seattle, Washington, and lives with her husband and two children in Klamath Falls, Oregon.

Calvin Ohlson-Kiehn | Washington State Department of Natural Resources | Field Tour Speaker
Calvin Ohlson-Kiehn is the Silviculture Program Manager for the Washington Department of Natural Resources. He and his team provide statewide guidance, funding, and operational support for reforestation of DNR forested Trust lands. He oversees Webster Forest Nursery, Meridian Seed Orchard, seed collection and processing, silviculture research and monitoring, as well as forestry training. Calvin's career at DNR includes nine years as a field forester and seven years in the Silviculture program. Prior to coming to DNR, he worked for the Forest Service in Montana and spent four years doing forestry extension and silviculture research in Nicaragua and Bolivia. Calvin earned a Master's degree in Forestry from Yale School of Forestry and Environmental Studies, as well as dual degrees in Spanish and Environmental Studies from Whitman College.

David L. Peterson | University of Washington | Session #1 Moderator | Steering Committee

Dave Peterson is Professor of Forest Ecology at the University of Washington, School of Environmental and Forest Sciences. He is also a Senior Research Biologist (emeritus) with the U.S. Forest Service Pacific Northwest Research Station, following a 36-year career as a research scientist with the Forest Service, National Park Service, and U.S. Geological Survey. He has conducted research on fire science and climate change throughout western North America, has published 230 scientific articles and four books, and as a contributing author for the Intergovernmental Panel on Climate Change was a co-recipient of the Nobel Peace Prize. He recently published the book Climate Change and Rocky Mountain Ecosystems, and currently works on climate change assessment and adaptation on federal lands throughout the western United States. Dave lives on his family's tree farm in Skagit County, Washington.

Klaus Puettmann | Oregon State University | Session #1 Speaker

Prof. Klaus J. Puettmann is the holder of the Edmund Hayes Professorship in Silviculture Alternatives in the Department of Ecosystems and Society at Oregon State University. His research interests include silviculture and stand development of diverse structured forests, spatial dynamics of plant interactions, and density management with a special focus to on managing forests for increased resistance, resilience, and adaptive capacity. He grew up on a forest farm in Germany, received his Diploma (Forest Science) from the Albert-Ludwig University, Freiburg, Germany and his Ph.D. (Silviculture, Forest Modeling) from Oregon State University. He worked as a faculty member at the University of Minnesota from 1992 to 2000 and at OSU since 2001, with sabbatical visits at the University of Freiburg and Harvard Forest. Additional information about Prof. Puettmann's expertise and work can be found under http://www.cof.orst.edu/cof/fs/kpuettmann/group.htm.

Maureen Puettmann | WoodLife Environmental Consultants, LLC | Session #3 Speaker

Dr. Maureen Puettmann has been owner of WoodLife Environmental Consultants, LLC since 2006. Maureen has been involved in over 40 LCAs that document environmental profiles of forestry operations and wood products production in North America and has collaborated on research projects in Norway and Australia. She received her B.S and M.S. in Wood Science from Oregon State University (1987/1990) and her PhD from the University of Minnesota in Forestry/Bio-materials (2000). Recently, Maureen took on the role of Director of Operations for the Consortium for Research on Renewable Industrial Materials. Maureen maintains adjunct appointments with the University of Tennessee, University of Washington, and Oregon State University. In 2017

Maureen spent 6 months at Harvard Forest as a Bullard Fellow where she evaluated the carbon benefit and impacts of a small-scale wood heating system.

Mike Ryan | Colorado State College | Session #1 Speaker

Mike Ryan is a Senior Research Scientist at the Natural Resource Ecology Lab and the Graduate Degree Program in Ecology at Colorado State University and an Emeritus Research Ecologist for the U.S. Forest Service, Rocky Mountain Research Station in Fort Collins, Colorado. His research focuses on whole tree physiology, including the role of respiration in regulating productivity, tree carbon balance, mechanism of size-related productivity decline, mechanisms of drought tolerance and mortality, carbon allocation, the role of source versus sink control of plant carbon balance, and disturbance and the forest carbon cycle.
mike.ryan@colostate.edu; +1 970 217 5798; https://www2.nrel.colostate.edu/ryan-lab/

Laura Soma | GLY Construction | Session #2 Speaker

Laura is a Project Manager with GLY Construction and has 21 years of industry experience. She is part of GLY's Sustainability Focus Group, Co-Chair of the Cascadia Seattle Eastside Collaborative and is one of GLY's leaders in sustainable building and LEED certification/accreditation. Laura is an advocate for environmentally healthy building practices and actively engages with multiple sustainability groups. Her passion for steering the construction industry towards an environmentally-sound future is grounded in her belief that it is our responsibility to care for our planet.

Patti Southard | King County Green Building Tools | Session #2 Moderator | Steering Committee

Patti Southard is the program manager for "GreenTools" green building program in King County Washington. At King County Southard runs the Sustainable Cities Program which focuses on coordinating all of King County's 39 cities on built environment and climate related policies. In addition Southard provides technical assistance for the County's LEED, Living Building Challenge and Built Green initiatives. Southard has led the GreenTools program as a two time Harvard Bright Idea Award winner and recently received Governor Jay Inslee's Solar Community Award for the Regional Code Collaboration which she co-chairs with the Kathleen Petrie, City of Seattle. Southard was raised on her family farm and has focused her sustainable development career on the juxtaposition between rural and urban communities and planning. Southard's personal accolades include the Built Green Pioneer Award, Cascadia Green Building Council Public Sector Leadership Award, Sustainable Cities Inspirational Leadership Award, is a Cascadia Fellow, Living Future Hero and Honorary AIA.

Skip Swenson | Forterra | Session #2 Speaker

Skip Swenson works throughout western Washington to develop the policies, tools, and programs necessary to achieve expansive conservation and sustainability goals. He works across the gradient of landscapes—from wildlands to urban parks—and specializes in conservation markets and incentives creation. He holds a M.P.A. with an environmental policy focus and a M.S. in forest resources from the University of Washington, and a B.B.A. from the University of Wisconsin—Madison.

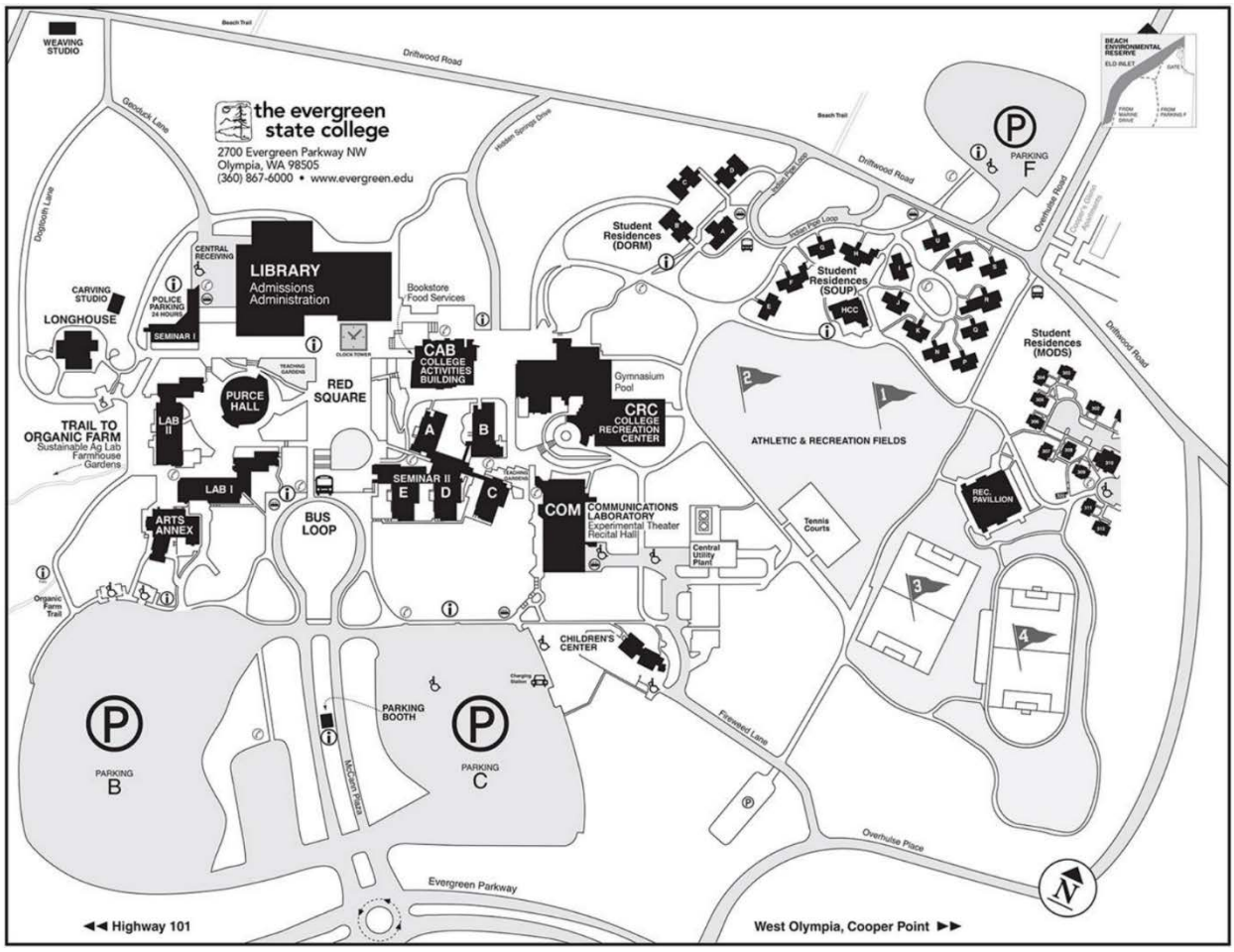
Paul Vanderford | Sustainable Northwest | Steering Committee

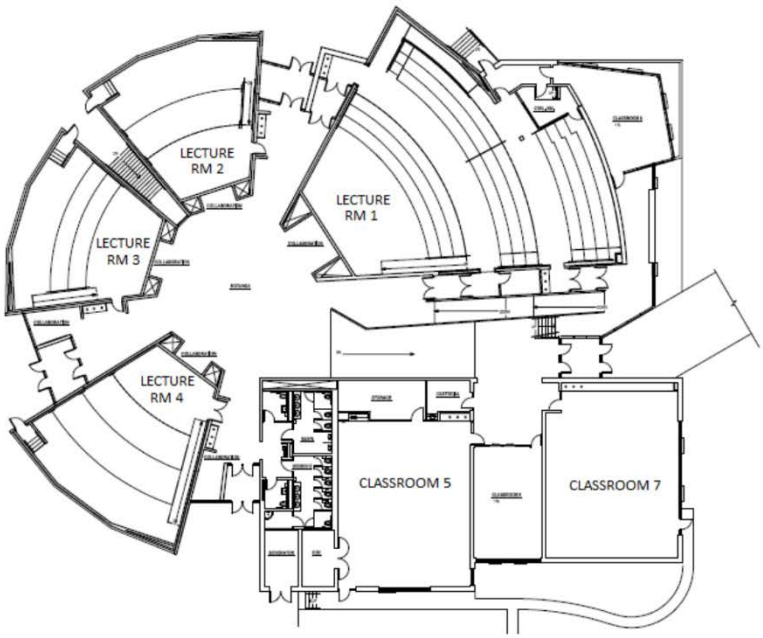
Paul manages Sustainable Northwest's Forest Stewardship Council Group Certification. Paul comes to us from The Rainforest Alliance SmartWood program where he managed over 150 FSC Chain-of-Custody companies in the Western US. He brings with him extensive familiarity with the Forest Stewardship Council standards and experience helping companies walk through the FSC assessment and audit process. Paul earned his B.S. degree in Natural Resource Management from the University of Wisconsin, Stevens Point and his M.S. in the Human Dimensions of Natural Resource Management in a partnership between UWSP and Rhodes University in South Africa. His graduate work focused on the implementation of South Africa's National Water Act in the Kat River Valley, where he facilitated a public involvement process with farmers, foresters, domestic water users, and government agencies. When not at work, Paul can be found in the woods bow hunting, splashing around the Northwest's treasured fly fishing rivers, clamming in Nehalem bay, and bike touring.

Seth Zuckerman | Northwest Natural Resource Group | Steering Committee

Seth has spent the last 25 years as a practitioner in West Coast forests and watersheds, and as a writer, telling the stories of people's relationships with the rest of the natural world. His roots are in northern California, where he directed the Wild and Working Lands program for the Mattole Restoration Council, collaborating with private landowners in realms that included light-touch timber harvest, fire hazard reduction, and invasive species control. He came to the Northwest in 2013 in search of steadier precipitation. He holds an A.B. in Energy Studies from Stanford University and an M.S. in Energy and Resources from the University of California at Berkeley.

Campus & Lecture Hall Maps





PURCE HALL

Conference Meals

Day 1 – Tuesday, June 19

8:00-9:00	Light Breakfast *Coffee, tea, water, bagels & pastries, seasonal fruit.*	*Purce Hall lobby*
12:00-5:00	Boxed Lunches • *Grilled chicken club with bacon and Swiss cheese on whole wheat* • *Turkey, bacon, and garlic aioli on ciabatta* • *Mozzarella, red pepper, balsamic and kale on ciabatta* *Accompanied by potato chips, cookies, and bottled water*	*Capitol State Forest*
5:00-6:00	Networking Reception *Water, ice tea, beer and wine accompanied by veggie crudités, an assortment of cheeses, artichoke dip, and antipasto platter.*	*Library Reception Hall*
6:00-8:00	Dinner *Green salads, lemon artichoke chicken, quinoa cakes with tomato chutney, pan roasted vegetables, mashed potatoes with goat cheese and roasted garlic, and cherry cheesecake tarts.*	*Library Reception Hall*

Day 2 – Wednesday, June 20

8:00-8:30	Light Breakfast *Coffee, tea, water, bagels & pastries, seasonal fruit.*	*Purce Hall lobby*
12:45-1:45	Working Lunch *Taco Del Seoul - create your own tacos or rice bowls with an assortment of herbivore and omnivore proteins, veggies, slaws, salsas, and garnishes.*	*Library Reception Hall*

Steering Committee

We thank our steering committee for their help in developing this conference.

- David Diaz, Ecotrust
- Dylan Fischer, The Evergreen State College
- Jerry Franklin, University of Washington
- Mark Harmon, Oregon State University
- Lindsay Malone, Northwest Natural Resource Group
- David L. Peterson, University of Washington, USDA U.S. Forest Service
- Patti Southard, King County Green Building Tools
- Paul Vanderford, Sustainable Northwest

Thank You!

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United States Department of Agriculture
National Institute of Food and Agriculture

Thank you to our partners for their help in organizing and hosting this conference.

The Evergreen State College and Northwest Natural Resource Group organized this conference.