

9th Annual Northwest Climate Conference



The Riverside Hotel
Boise, Idaho
October 9-11, 2018

2018 Climate Conference Overview

Tuesday, October 9, 2018

7:00 PM Evening Public Plenary and Reception (open to all), *Grand Ballroom*
Kate Gordon, Risky Business Project

Wednesday, October 10, 2018

7:00 AM BREAKFAST (provided), *Grand Ballroom*

8:30 AM OPENING PLENARY SESSION, *Grand Ballroom*

Opening comments, Jeff Hicke, Conference Chair, University of Idaho

Welcome from David Bieter, Mayor of Boise

Welcome/prayer from Councilman Arnold Thomas, Shoshone-Paiute Tribes

9:00 AM Keynote speaker: Dr. Jalonne White-Newsome, The Kresge Foundation

9:45 AM BREAK

10:00 AM CONCURRENT SESSIONS

Terrestrial and Aquatic Ecosystems 1 <i>North Star</i>	Pacific Northwest Climate 1 <i>Liberty</i>	Tribal Communities 1 <i>Aspen</i>	Hydrology and Water Resources 1 <i>Cinnabar</i>
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11:30 AM LUNCH (provided), *Grand Ballroom*

12:30 PM CONCURRENT SESSIONS

Terrestrial and Aquatic Ecosystems 2 <i>North Star</i>	Extreme Events <i>Liberty</i>	Tribal Communities 2 <i>Aspen</i>	Hydrology and Water Resources 2 <i>Cinnabar</i>
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2:00 PM BREAK

2:30 PM CONCURRENT SESSIONS

Terrestrial and Aquatic Ecosystems 3 <i>North Star</i>	Pacific Northwest Climate 2 <i>Liberty</i>	Tribal Communities 3 <i>Aspen</i>	Communication and Policy 1 <i>Cinnabar</i>
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4:00 PM BREAK

4:30 PM AFTERNOON PLENARY, *Grand Ballroom*

Adaptive Rangeland Management for Climate Resilience, facilitated by Gabrielle Roesch-McNally, USDA Northwest Climate Hub

5:45 PM RECEPTION AND POSTER SESSION, *Tamarack*

Special Session: Communication and Policy 2, Laura Satkowski, Future Earth, *Aspen*

2018 Climate Conference Overview

Thursday, October 11, 2018

7:00 AM BREAKFAST (provided), *Grand Ballroom*

8:30 AM MORNING PLENARY, *Grand Ballroom*

State of Pacific Northwest Climate 2018, John Abatzoglou, University of Idaho

9:30 AM BREAK

10:00 AM CONCURRENT SESSIONS

Climate and Society
Liberty

Infrastructure and the
Built Environment 1 *North Star*

Agriculture
Cinnabar

Collaboration and Working
Across Boundaries 1 *Aspen*

11:30 AM LUNCH PLENARY (provided), *Grand Ballroom*

State and Local Government Action on Climate Change Adaptation and Mitigation, Rep. Chris Lee, State of Hawaii, and Steve Burgos, City of Boise

1:00 PM CONCURRENT SESSIONS

Tribal Communities 4
Aspen

Infrastructure and the
Built Environment 2 *Cinnabar*

Coastal and
Marine Systems *Liberty*

Collaboration and
Working Built
Environment 2 *North Star*

2:30 PM BREAK

3:00 PM CLOSING PLENARY

Safeguarding the Northwest's Economy and Environment in a Changing Climate: Opportunities and Risks in Building a Sustainable Business Future
Facilitated by Julie Grant, Micron Inc.

4:30 PM CLOSING COMMENTS

Abstracts for all sessions available at pnwclimateconference.com

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University of Idaho

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Northwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE



BOISE STATE UNIVERSITY



DEPARTMENT OF ECOLOGY
State of Washington



Northwest Climate Adaptation Science Center



Plenary Speakers



Tuesday (Oct 9), 7:00 pm - Grand Ballroom

Kate Gordon, Founding Director of the Risky Business Project

“Risks and Opportunities for Idaho in a Changing Climate”

Evidence of a changing climate is all around us, from flooding in Houston and Florida to excessive heat and wildfires in the West. These physical climate impacts have real economic costs to Idaho businesses and communities. But there is also economic opportunity to be found in adapting to, and mitigating, these risks. This talk will focus on quantifying the risks to Idaho, and identifying the real growth and competitiveness opportunities facing this state as the rest of the world moves toward a carbon-constrained economy.

Kate Gordon is a lawyer, urban planner, non-profit advisor, and leader in the “green jobs” and climate risk movement in the U.S. She is currently an independent consultant and senior advisor at the Paulson Institute,

where she provides strategic support on issues related to climate change and sustainable economic growth. Before joining the Paulson Institute, she was the founding director of the Risky Business Project, co-chaired by NYC Mayor Michael Bloomberg, former U.S. Secretary of the Treasury Hank Paulson, and business leader and philanthropist Tom Steyer, and focused on the economic risks the U.S. faces from unmitigated climate change.



Wednesday (Oct 10), 9:00 am - Grand Ballroom

Dr. Jalonne White-Newsome, The Kresge Foundation

Equity, Engagement & Intersectionality: What it takes to build climate resilient, healthy communities

Dr. Jalonne L. White-Newsome is Senior Program Officer at The Kresge Foundation, responsible for the Environment Program’s grant portfolio on Climate Resilient & Equitable Water Systems (CREWS), addressing the intersection of climate change and public health, and is a member of the Kresge Operationalizing Racial Equity Team working to address institutional racism in the foundation and beyond. Before joining Kresge in early 2016, Jalonne served as director of federal policy at West Harlem Environmental Action Inc. (WE ACT), where she helped ensure that the concerns of low-income communities of color were integrated into federal policy, particularly on clean air, climate change and health issues. Jalonne’s career has spanned state government, academia,

environmental and science-based advocacy organizations, non-profit and private industry, where she spent over 10 years working as a production engineer in facilities across the U.S. She is a lead author for the human health chapter for the 4th National Climate Assessment. She is most known for her research uncovering the disproportionate health impacts of climate change on the elderly and the response and preparation of local health departments to handle extreme heat. A native of Detroit, Jalonne earned a Ph.D. in environmental health sciences from the University of Michigan School of Public Health.

Plenary Speakers



Thursday (Oct 11), 8:30 am - Grand Ballroom

Dr. John Abatzoglou, University of Idaho

“State of the Northwest Climate in 2018”

Dr. Abatzoglou has been at the University of Idaho since 2009, after receiving his bachelor’s degree in Atmospheric Science from UC Davis and doctorate in Earth Systems Science from UC Irvine. John’s academic interests are centered around climate and weather of the American West and their impacts to people and natural resources of the West. John and his Climatology Lab at the University of Idaho have published over 100 papers and book chapters on climate science, meteorology, and applied climate science connecting climate to water resources, wildfire and agriculture. The research group also develops web-based climate

services that connect climate data with decision makers to help improve climate readiness of societies and ecosystems.



Thursday (Oct 11), lunch- Grand Ballroom

Rep. Chris Lee, Hawaii State Legislature

“The Science and Strategies That Enabled Hawaii’s Aggressive Climate Policies And Why Success Is Possible In The Pacific Northwest”

Hawaii has successfully passed a 100% Renewable Portfolio Standard by 2045, and a mandate for utility business model transformation in the electric sector, a statewide commitment and progress to achieve zero-emissions ground transportation by 2045, and this year’s new law tying these efforts together under a single directive to achieve a zero-emissions clean economy and statewide carbon neutrality by 2045. These successes were passed with bipartisan support and with the backing of the Chamber of Commerce and business community. This success can be replicated in northwest states by translating science into actionable policy using the same strategies Hawaii did. I will cover

the strategies employed, lessons learned, and outcomes of Hawaii’s effort to localize and translate climate science into policy, and explain how elected officials and policy makers from Hawaii and PNW states are already coordinating behind the scenes and demonstrate that Hawaii’s success can be replicated in every state.

Christopher Lee is an American politician and a Democratic member of the Hawaii House of Representatives. He was the youngest member and only millennial serving in the Hawaii State Legislature when elected in November, 2008. He currently serves as Majority Whip and Chairman of the House Committee on Energy and Environmental Protection. He also serves on the boards of several non-profit organizations and commissions. Lee is a supporter of addressing climate change and has authored laws making Hawaii the first state to mandate 100 percent renewable energy by 2045, the first state to commit to economy-wide carbon neutrality by 2045, and the first state requiring all public schools and universities to upgrade and become net-zero facilities by 2035.

Plenary Speakers



Thursday (Oct 11), lunch - Grand Ballroom

Steve Burgos, Director of City of Boise Department of Public Works

“How Cities are Leading the Way: Urban Climate Adaptation”

Steve’s experience includes over 20 years in the environmental industry as a private consultant and now public sector director. As Director, Steve is responsible for overseeing an \$88.2 million annual budget and more than 250 employees. His department’s responsibilities include wastewater collection and treatment; trash collection, recycling and composting; management of sustainability planning; management of the city’s geothermal heating system; water resources planning, and providing engineering support for public streetlights, storm water drainage, hillside protection, flood plain review, construction management. Prior to joining the city, Steve was an environmental consultant for Brown and Caldwell Environmental Engineers and Scientists, where he served as a vice

president. Steve is a graduate of Duke University with a degree in civil and environmental engineering and a veteran of the U.S. Navy.

2018 Northwest Climate Conference Committee

Conference Organization

Jeff Hicke, University of Idaho, Conference Chair; Courtney Cooper, University of Idaho, Conference Coordinator; Kristy Mayer, University of Idaho, Conference Management Services; Jen Hinds, University of Idaho, web site

Special thanks to Katherine Himes, University of Idaho, and the many volunteers

Program Committee Members (Name, Affiliation):

John Abatzoglou, University of Idaho
Jennifer Adam, Washington State University
Marnie Boardman, Washington Department of Health
Joe Casola, University of Washington Climate Impacts Group
Nicole DeCrappeo, Alaska Climate Adaptation Science Center
Sean Finn, U.S. Fish and Wildlife Service
Eliza Ghitis, Northwest Indian Fisheries Commission
Scott Hauser, Upper Snake River Tribes
Amelia Marchand, Colville Tribes
Phil Mote, Oregon State University
Jen Pierce, Boise State University
Jen Pouliotte, State of Washington

Holly Prendeville, USDA Northwest Climate Hub
Crystal Raymond, University of Washington Climate Impacts Group
Gabrielle Roesch-McNally, USDA Northwest Climate Hub
Andrew Shirk, University of Washington Climate Impacts Group
Dan Siemann, Washington Department of Natural Resources
Diana Six, University of Montana
Mark Solomon, Idaho Water Resources Research Institute
Bobbak Talebi, Washington State Department of Ecology
Lara Whitely Binder, King County
Amber Ziegler, Nez Perce Tribe

2018 NORTHWEST CLIMATE CONFERENCE DETAIL

Tuesday, October 9, 2018

7:00 PM	Evening Public Plenary and Reception (open to all), Presenter: Kate Gordon, <i>Risky Business Project</i> , Grand Ballroom
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Wednesday, October 10, 2018

7:00 AM	BREAKFAST (provided), Grand Ballroom
8:30 AM	OPENING PLENARY SESSION, Grand Ballroom
9:00 AM	Opening comments, Jeff Hicke, <i>Conference Chair, University of Idaho</i> Welcome from David Bieter, <i>Mayor of Boise</i> Welcome and prayer from Councilman Arnold Thomas, <i>Shoshone-Paiute Tribes</i>
9:45 AM	Keynote speaker: Dr. Jalonne White-Newsome, <i>The Kresge Foundation</i>

BREAK

CONCURRENT SESSIONS			
	Terrestrial and Aquatic Ecosystem 1 North Star (second floor)	Pacific Northwest Climate 1 Liberty (second floor)	Tribal Communities 1 Aspen (first floor)
10:00 AM	Global Warming of Salmon and Trout Rivers in the Northwestern U.S.: Road to Ruin or Path Through Purgatory? Dan Isaak, <i>USDA Forest Service</i> , Charlie Luce, Dona Horan, Gwynne Chandler, Sherry Wollrab, & Dave Nagel	<u>Special session</u> Beyond Climate Impacts: Reflections on Process and Knowledge Gaps in Preparing the Northwest Regional Chapter of the Fourth National Climate Assessment <i>Format: Oral Presentations and Group Discussion</i> Organizer: Gabrielle Roesch-McNally, <i>USDA Northwest Climate Hub</i> Presenters: Kris May, Sascha Petersen, Emily York, Mike Chang, Gary Morishima, Charlie Luce, Jen Cuhacyan, Phil Mote, & Scott Lowe	<u>Special session</u> Facing Climate Change on the Frontlines: Tribal Climate Assessment and Adaptation Strategies <i>Format: Oral presentations</i> Organizer: Scott Hauser, <i>Upper Snake River Tribes Foundation</i> Presenters: Colleen Sanders, Wayne Crue, & Haley Kennard,
10:20 AM	Assessing the Response of Sagebrush Ecosystem to Disturbance and Management: Actions Coupled with Climate Change at a Regional Scale in Great Basin, USA Karun Pandit, <i>Boise State University</i> , Hamid Dashti, Nancy Glenn, Alejandro N. Flores, Kaitlin C. Maguire, & Douglas J. Shinneman		Hydrology and Water Resources 1 Cinnabar (second floor) Climate Change Adaptation in the Henry's Fork Snake River to Sustain Agriculture, Fish and Wildlife, and Recreation Rob Van Kirk, <i>Henry's Fork Foundation</i> , Jamie Laatsch, Jack McLaren, Christina Morrisett, Melissa Muradian, & Bryce Oldemeyer Effects of Forecasted Climate Change on Hydrology and Stream Temperature in the North Fork of the Stillaguamish River Basin Kyra Freeman, <i>Western Washington University</i> , Robert Mitchell, & John Yearley

10:40 AM	<p>Large Variation in Hydraulic Functional Traits in Douglas-Fir Approaching Lower Treeline Suggests Possible Tolerance to Expected Droughts Under Future Climate Scenarios</p> <p>Keith Reinhardt, <i>Idaho State University</i>, & Theresa Condo</p>			<p>When Should Irrigators Invest in More Water-Efficient Technologies as an Adaptation to Climate Change?</p> <p>Keyvan Malek, <i>Washington State University</i>, Jennifer Adam, Claudio Stockle, Michael Brady, & Kirti Rajagopalan</p>
11:00 AM	<p>Timber, Carbon, and Cash: FSC Versus Business-as-Usual in Pacific Northwest Douglas-Fir</p> <p>David Diaz, <i>University of Washington</i>, Sara Lorenzo, Greg Ettl, & Brent Davies</p>			<p>Climate Change Adaptation: Idaho's Rural and Urban Differences in Acceptance of Idaho Water Resource Management Strategies</p> <p>Monica Hubbard, <i>Boise State University</i></p>
11:30 AM	LUNCH (provided), Grand Ballroom			
12:30 PM	CONCURRENT SESSIONS			
12:30 PM	<p>Terrestrial and Aquatic Ecosystems 2 North Star (second floor)</p> <p><i>Special session:</i> Bringing Climate Change into Sections 7 and 10 of the Endangered Species Act: Climate Informed Biological Opinions and Habitat Conservation Plans</p> <p><i>Format: Oral presentations and panel discussion</i></p> <p>Organizer: Jennifer Hoffman, <i>Adaptation/Insight</i></p> <p>Presenters: Michael Hudson & Katherine Fitzgerald</p>	<p>Extreme Events Liberty (second floor)</p> <p>Climate Amplifies the Effects of Dwarf Mistletoe on Tree Growth and Mortality in a Temperate Coniferous Forest in Western Washington, USA</p> <p>David M. Bell, <i>USDA Forest Service</i>, Robert Pabst, & David Shaw</p> <p>Developing a Drought Metric for the Pacific Northwest</p> <p>Danielle Moruzzi, <i>Oregon State University</i>, Philip Mote, & Kathie Dello</p>	<p>Tribal Communities 2 Aspen (first floor)</p> <p><i>Special session:</i> Charting a Course to Resilience: Guidebooks, Tools, and Resources to Support Tribal Adaptation Efforts</p> <p><i>Format: Community discussion, oral presentations, panel discussion, and tools café</i></p> <p>Organizer: Sascha Petersen, <i>Adaptation International</i></p> <p>Presenters: Meghan Dalton, Meade Krosby, Haley Case-Scott, Joe Hostler, Jamie Donatuto, Holly Penderville, & Chas Jones</p>	<p>Hydrology and Water Resources 2 Cinnabar (second floor)</p> <p><i>Special session:</i> Resilience-Based Approaches to Sustainable Futures in the Columbia River Basin</p> <p><i>Format: Oral Presentations and Panel Discussion</i></p> <p>Organizer: Kristin Sleeper, <i>University of Montana</i></p> <p>Presenters: Stefanie Krantz, Chris Frissel, Dan Issak, Alexa Maine, & Meghna Babbar-Sebens</p>
12:50 PM				

1:10 PM		Effects of Fire Suppression and Climate Change on Wildfire Activity in the Inland Northwest Jianning Ren, <i>Washington State University</i> , Erin Hanan, Naomi Tague, Ryan Bart, Maureen Kennedy, Mingliang Liu, Crystal Kolden, John Abatzoglou, & Jennifer Adam		
1:30 PM		Reduced Precipitation During Fire Season Exacerbates Western US Forest Fire Extent Charles Luce, <i>USDA Forest Service</i> , Zachary Holden, Alan Swanson, Matt Jolly, Marco Maneta, Jared Oyler, Dyer Warren, Russell Parsons, & David Affleck		
2:00 PM	BREAK			
2:30 PM	CONCURRENT SESSIONS			
2:30 PM	Terrestrial and Aquatic Ecosystems 3 North Star (second floor)	Pacific Northwest Climate 2 Liberty (second floor)	Tribal Communities 3 Aspen (first floor)	Communication and Policy 1 Cinnabar (second floor)
2:30 PM	<u>Special session</u> Lessons Learned from Science-Management Partnerships for Climate Change Adaptation: A Forest Service Perspective <i>Format: Oral Presentations and Panel Discussion</i> Organizer: Holly Prendeville, <i>USDA Northwest Climate Hub</i> Presenters: Jessica Halofsky, Charlie Luce, Dan Isaak, Natalie Little, & Linh Hoang	Towards Understanding the Impact of Climate Change on Water Quality and Quantity in Oregon's Clackamas River Watershed Arielle J. Catalano, <i>Portland State University</i> , Christina Aragon & Paul C. Loikith	Makah Cultural and Traditional Resource Assessment: A Preliminary Framework to Utilize Traditional Knowledge into Climate Change Planning Michael Chang, <i>Makah Tribe</i> , Katie Wrubel, Haley Kennard, Rebekah Monette, & Janine Ledford	"Tag, You're It!" Engaging K-6 Students to Close the Climate Science-Public Knowledge Gap Jennifer Pierce, <i>Boise State University</i> , Jessica Bean, Kerrie Weppner, & Chris Taylor
2:50 PM		An Empirical Prediction Model for Summer Temperatures in Washington State Nick Bond, <i>University of Washington</i> , Karin Bumbaco & Joe Casola	Changing Ranges and Phenology of Culturally Important Shrubs of the Pacific Northwest Janet S. Prevéy, <i>USDA Forest Service</i> , Constance A. Harrington, & Lauren E. Parker	Our Changing Climate: Making Climate Science and Impacts of a Changing Climate on Our Natural Resources Relatable to the General Public

					J. Michael Hudson, <i>U.S. Fish and Wildlife Service</i> , Leah Schrodt, & Meghan Kearney
3:10 PM		Characterizing the Drivers of Extreme Changes in Watershed-Scale SWE in the Context of Climate Change Christina Aragon, <i>Portland State University</i> , Paul Loikith, & Arielle Catalano	Learning to Braid: Incorporating Traditional Knowledge and Western Science in a Climate-Smart Wetland and Riparian Restoration Toolkit Stefanie L Krantz, <i>Nez Perce Tribe</i> , Rue Hoover, Amber Ziegler, Eric Walsh, Alan Marshall, & Josiah Pinkham	The Convergence of Climate Change and Big Data in an Urban and Regional Context: A Policy Perspective Eric Lindquist, <i>Boise State University</i>	
3:30 PM		Large-Scale Meteorological Patterns Associated with Heavy Precipitation and Storm Water Impacts in Portland, Oregon in Observations and Climate Models Paul Loikith, <i>Portland State University</i> , Christina Aragon, Nick McCullar, Arnel Mandilag, Beth Gilden, & Arielle Catalano	Untangling Climate Change: CTUIR Climate Planning and Community Outreach Colleen Sanders, <i>Confederated Tribes of the Umatilla Indian Reservation</i>	Culturally Relevant Climate Communications in Immigrant and Refugee Communities Jamie Stroble & Zoe Van Duivenbode, <i>King County Climate Action Team</i>	
4:00 PM		BREAK			
4:30 PM		AFTERNOON PLENARY, Grand Ballroom			
		Adaptive Rangeland Management for Climate Resilience Facilitator: Gabrielle Roesch-McNally, <i>USDA Northwest Climate Hub</i> Presenters: Hannah Gosnell, <i>Oregon State University</i> Heidi Schmalz, <i>The Nature Conservancy</i> Mike Hale, <i>The Nature Conservancy</i> Bill Hazen, <i>Rancher from Gooding, Idaho</i>			
5:45 PM		RECEPTION AND POSTER SESSION, Tamarack Also: Special Session, Aspen (first floor) Communication and Policy 2: Incorporating Data into Your Decision Making: Building Dashboards Format: <i>Demo and Training on how to find data and create dashboards</i> Organizer: Laura Satkowski, <i>Future Earth</i>			

POSTER SESSION & NETWORKING RECEPTION

Wednesday, October 11, 2018, 5:45-7:45 PM

Posters will be on display for the duration of the conference. Poster presenters (bolded below) will be available for discussion during the poster session.

Posters are listed in alphabetical order (with few exceptions) by topic and presenter's last name.

Agriculture

1. The Effect of Biofuels on Biodiversity and Soil Organic Carbon Stabilization in Midwest Agricultural Fields, **Jennifer Butt**, *Boise State University*, Megan Kelly-Slatten, & Marie-Anne de Graaff
2. Perceptions, Knowledge, and Behaviors of the Yakima River Basin Agricultural Community: Adapting to Changing Water Availability Linked to Climate Change in the Pacific Northwest, **Sarah Cox**, *University of Virginia*, Kelly Ewing, & Pamela McMullin-Messier
3. Narrowing the Gene Pool: Assessing Resistance to Nutrient and Drought Stress in Crop Sunflowers, **Hanan Farah**, *University of Minnesota-Twin Cities*, & Jennifer Dechaine
4. Climate Change Attitudes and Adaptations Among Pacific Northwest Farmers: The Case of the Dry Farming Collaborative, **Melissa Parks**, *Oregon State University* & Gabrielle Roesch-McNally
5. Integrated Adaptive Scenarios for Agriculture: Synergies and Tradeoffs, **Kirti Rajagopalan**, *Washington State University*, Jennifer Adam, Keyvan Malek, Mingliang Liu, Claudio Stockle, & Michael Brady
6. Decision Tree Modeling of Agricultural Insurance Loss in Relationship to Climate for the Palouse Region of the Pacific Northwest, **Erich Seamon**, *University of Idaho*, Paul E. Gessler, John Abatzoglou, & Philip Mote
7. Investigating Stomatal Density as a Drought Resistant Trait in Crop Sunflowers, **Bridget Smith**, *Central Washington University*, & Jennifer Dechaine
8. Effects of Nutrient Stress on Leaf Nitrogen Content in Crop Sunflowers. **Mira Smith**, *South Puget Sound Community College*, & Jennifer Dechaine
9. Agclimate.Net – Helping Share Climate Change Science with Agricultural Professionals, **Sonia A. Hall**, *Washington State University*, Brooke Saari, Gabrielle Roesch-McNally, Doug Finkelburg, Chris Schnepf, Laurie Houston, Georgine G. Yorgey, Elizabeth Allen, Chad E. Kruger, & Tara J. Zimmerman

Climate and Society

10. Case Studies on Building Rangeland Resilience to Climate Change in the Pacific Northwest, **Sonia A. Hall**, *Washington State University*, Tipton D. Hudson, Georgine Yorgey, Shannon Neibergs, & Matt Reeves
11. A Longitudinal Assessment of Land Cover Impacts on Urban Warming, **Chao Fan**, *University of Idaho*
12. Settler Indigenous Alliances Combating Fossil Fuels: A Case Study of the Shell No! Movement in the Pacific Northwest, **Matthew Fuller**, *University of Victoria*
13. Enhancing Adaptive Capacity Through a Community-Based Rangeland Monitoring System, **Kyle R. Hogrefe**, *Oregon State University*, & Hannah Gosnell
14. Large-Scale Urban Development and the Implications on Microclimates: Opportunities for Improving Thermal Comfort Through Alternative Building Designs, **Joey Williams**, *Portland State University*, & Vivek Shandas
15. Downscaling Land-Use/Cover Change Scenarios from the Global Change Assessment Model to the Columbia River Basin, **Matthew Yourek**, *Washington State University*, Jennifer Adam, Jan Boll, Kirti Rajagopalan, & Mingliang Liu

Collaboration and Working Across Boundaries

16. A Water Vulnerability Assessment for the Columbia River Basin: Tools for Targeted, Community-Based Adaptation, **Paris Edwards**, *University of Idaho*
17. Mitigation of Climate Impacts by Carbon Pricing: Costs, Benefits and Possibilities, **Linda Engle**, **Nancy Basinger**, *Citizen's Climate Lobby-Idaho Chapter*, Peter Joseph, Steve Ghan, & Louise Stonington

Extreme Events

18. A Multi-Century Perspective of Fire-Climate Interactions Across the Salmon-Challis National Forest, Idaho, **Grant L. Harley**, *University of Idaho*, Emily K. Heyerdahl, John Sloan, & Doug Basford
19. The NW Climate Toolbox's US Water Watcher, **Katherine Hegewisch**, *University of Idaho*, & John Abatzoglou
20. Reconstructing Fire History in the Teanaway Community Forest, Washington, **Sophie Johnson**, *Willamette University*, Emily Deardorff, Luke Telfer, & Megan Walsh
21. Quantifying the Sensitivity of Forest Productivity to Annual Variation in Snowpack in the Northern Rocky Mountains, **Dayne Lubenow**, *Idaho State University*, & Keith Reinhardt
22. From Extremes to Ex-Streams: Ecological Drought Adaptation Synthesis Project, **Rachel M. Gregg**, *EcoAdapt*, & Jessi Kershner
23. Assessing Method Repeatability for Charcoal-Based Lake Sediment Core Paleofire Reconstruction, **Luke Telfer**, *Boise State University*, Sophie Johnson, Emily Deardorff, & Megan Walsh
24. Applying Cloud Based Computing and Emerging Remote Sensing Technologies to Inform Vegetation Management Decisions, **Monica Vermillion**, *Boise State University*, Josh Enterkine, Lucas Spaete, & Nancy Glenn

Hydrology and Water Resources

25. Projections of Urban Growth in the American West to 2100 Based on Different Scenarios of Population Growth and Density, **Jodi Brandt**, *Boise State University*, Michail Fragkias, Christian Sprague, Jenna Narducci, Jen Schneider, Jillian Moroney, & Shawn Benner
26. An Online Toolbox for Near Real-Time Analysis of Hydrologic States and Forecasts Across the Pacific Northwest, **Oriana Chegwidan**, *University of Washington*, Bart Nijssen, Katherine Hegewisch, & John Abatzoglou
27. The Influence of Climate-Induced Flow Regime Changes on Critical Salmonid Habitat Availability and Connectivity, **Jenna Duffin**, *University of Idaho*, Daniele Tonina, & Elowyn Yager
28. Potential for Streamflow Reconstructions Using Species-, and Site-Specific Tree Rings Models, **Meghan Foard**, *University of Idaho*, Andrew Nelson, & Grant L. Harley
29. Additional Methods for Conducting Year-Round, in-Situ Stream Temperature Monitoring, **Kip Killebrew**, *Slippery Rock University of Pennsylvania* & Kyra Freeman
30. Consequence of the 1976/1977 Climate Shift on Fostering Sustainable Use of Water Resources, **Margaret Matter**, *Oregon Department of Agriculture*
31. Initial Results of Modeling Climate Induced Flow Variability on the Umatilla River, **Scott O'Daniel**, *Umatilla Tribes*, & Bethy Rogers-Pachico
32. The Required Flow Volumes to Move a Grain Size May Increase with Bed Slope Due to Boulder Emergence Through the Flow's Surface, **Heidi E. J. Smith**, *University of Idaho*, & Elowyn M. Yager

Pacific Northwest Climate

33. Miocene Rewilding: A Paleontological Approach to Terrestrial Ecosystem Adaptation, **Kyle Chamberlain**, *Resilient Land Care*
34. Advancing Methods to Obtain Reflectance of Light Absorbing Particles in Snow Using a Hyperspectral Imaging Microscope Spectrometer (HIMS), **Celia Laporta**, *Slippery Rock University of Pennsylvania*, Susan Kaspari, & Melanie Swick
35. Light Absorbing Particles (LAP) in Snow on Mt. Rainier: Variations with Elevation and LAP Composition, **Riley Keister**, *Western Washington University*, Susan Kaspari, & Celia LaPorta
36. Ensembles and Stormwater: Quantifying Uncertainties in Changes in Extreme Statistics, **David Rupp**, *Oregon State University*, Guillaume Mauger, & Linnia Hawkins

Terrestrial and Aquatic Ecosystems

37. Forecasting post-fire sagebrush recovery given interactions between sagebrush, exotic annual grasses, and perennial grasses under different climate scenarios, **Cara Applestein**, *Boise State University*, Matthew Germino, & Trevor Caughlin
38. The American Pika and Climate Change: Revisiting Sites to Determine Changes in Pika Occupancy at Different Elevations, **Julia Brabo Santos**, *California State University-East Bay*, & Kristina Ernest
39. Drought, Bark Beetles, and Their Interactions: Causes of Widespread Tree Mortality in the Western US, **Jeffrey A. Hicke**, *University of Idaho*, William R. L. Anderegg, Craig D. Allen, & Nathan L. Stephenson
40. Assessing Impacts of Submerging and Emerging Shorelines on Benthic Species, **Linda E. Kruger**, *USDA Forest Service*, Adelaide C. Johnson, James Noel, & David Gregovich
41. Introducing the Recovering America's Wildlife Act: A Game-changing Opportunity to Safeguard Fish, Wildlife, and Their Habitats, **Davia M. Palmeri**, *Oregon Department of Fish and Wildlife*
42. Fine-Scale Vegetation Monitoring in Shrublands with Unpiloted Aerial Systems, **Anna Roser**, *Boise State University*, & Pat Clark
43. Genetic Based Selection of Trees by Mountain Pine Beetle During a Climate-Driven Outbreak in a High Elevation Forest, **Diana Six**, *University of Montana* & Jeffrey Hicke
44. Forecasting Phenological Responses of American Kestrels to Climate Change: An Individual-Based Modeling Approach, **Jason M. Winiarski**, *Boise State University*
45. Boundaries and Relationships: Integrated Framework for Sustainable Ecosystem-Based Planning, Monitoring, and Adaptive Management, **Sue Wolf**, *Four Corners Environmental Planning*
46. The Integrated Effects of Spatial Timber Harvest Configurations and Climate Change on Hydrologically Sensitive Areas, **Mengqi Zhao**, *Washington State University*, Jan Boll, & Erin S. Brooks
47. Spatial prediction of old-growth forest fire refugia in the US Pacific Northwest, **Garrett W. Meigs**, *Oregon State University*, Meg A. Krawchuk, David Bell, Ray Davis, & Matt Gregory

Thursday, October 11, 2018

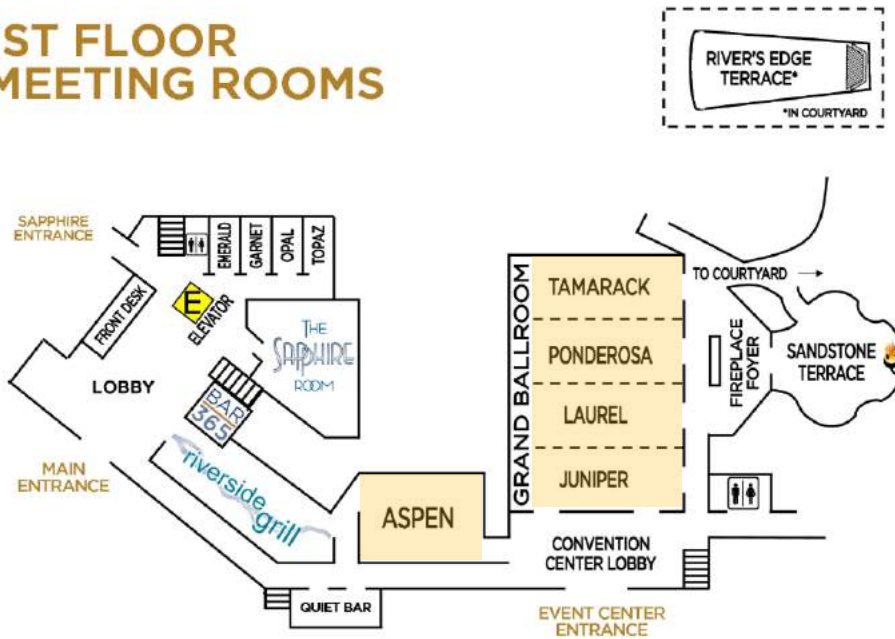
7:00 AM	BREAKFAST (provided), Grand Ballroom			
8:30 AM	MORNING PLENARY, Grand Ballroom			
	State of Pacific Northwest Climate 2018 Presenter: John Abatzoglou, <i>University of Idaho</i>			
9:30 AM	BREAK			
10:00 AM	CONCURRENT SESSIONS			
	Climate and Society Liberty (second floor)	Infrastructure and the Built Environment 1 North Star (second floor)	Agriculture Cinnabar (second floor)	Collaboration and Working Across Boundaries 1 Aspen (first floor)
10:00 AM	Social Resilience: Measuring and Strengthening the "Soft" Stuff Emily York, <i>State of Oregon</i> , Sandi Phibbs, & Margaret Braun	<u>Special Session</u> Data and Tools for Climate Challenges in the Northwest Electricity Sector <i>Format: Oral Presentations & Panel Discussion</i> Organizer: Crystal Raymond, <i>University of Washington</i> Presenters: Nathalie Voisin, Sean Turner, Oriana Chegwidden, & Chris Frans, Shaun Seaman, & Ronda Strauch	Characterizing and Forecasting Hazardous Climatic Events Across the Snake River Valley American Viticultural Area Charles Becker, <i>Boise State University</i> , & Alejandro Flores	Strengthening Climate Resilience Through Regional Collaboration: The Puget Sound Climate Preparedness Collaborative Lara Whitely Binder, <i>King County</i> , Anna Marandi, Steve Adams, & Annie Bennett
10:20 AM	Climate Change Beliefs and Ethical Perceptions Across the United States Victoria DePalma, <i>University of Idaho</i>		Farmer Vulnerability to Managed Aquifer Recharge Requirements in Southeast Idaho Vicken Hillis, <i>Boise State University</i> , Katrina Running, Morey Burnham, & Meg du Bray	Climate Impacts Research Consortium: Lessons Learned from the Evaluation of Co-Production Projects Jessica Lee Andrepont, <i>Oregon State University</i> , Iva Sokolovska, & Denise Lach
10:40 AM	State of the Art in Stating Risk: Vulnerability Assessments for Cultural Resources in the Northwest and Beyond Pei-Lin Yu, <i>Boise State University</i> , & Marcy Rockman		Talking Climate Change with the Agricultural Sector – What We've Learned Sonia Hall, <i>Washington State University</i> , Georgine G. Yorgey, Chad E. Kruger, Elizabeth Allen, & Kirti Rajagopalan	Fired Up: Improving Washington Wildland Fire Outcomes Through Cross-Boundary Collaboration Patricia Tillmann, <i>Cascadia Consulting Group</i> , & Marc Daudon

11:00 AM	Climate Impacts on Agricultural Productivity in the Fruitful Rim Nicholas Potter, <i>Washington State University</i> , Michael Brady, & Kirti Rajnagopalan		Agricultural Risk in a Changing Climate: Assessing and Delivering Cause of Loss Information Using Crop Insurance Data Julian Reyes, <i>USDA Southwest Climate Hub</i> , Andrew Eischens, Mark Shilts, Jeb Williamson, & Emile Elias	Best Practices for Collaborative Research Between Tribal and Non-Tribal Partners Chas Jones & Amelia Marchand, <i>Affiliated Tribes of NW Indians & Colville Confederated Tribes</i>
11:30 AM	LUNCH PLENARY (provided), Grand Ballroom			
	State and Local Government Action on Climate Change Adaptation and Mitigation Presenters: Rep. Chris Lee, <i>State of Hawaii</i> Steve Burgos, <i>City of Boise</i>			
1:00 PM	CONCURRENT SESSIONS			
	Tribal Communities 4 Aspen (first floor)	Infrastructure and the Built Environment 2 Cinnabar (second floor)	Coastal and Marine Systems Liberty (first floor)	Collaboration and Working Across Boundaries 2 North Star (second floor)
1:00 PM	<u>Special Session</u> Working Outside City Limits: Climate Change Impacts and Adaptation for Remote Rural and Indigenous Communities <i>Format: Oral Presentations</i> Organizer: Nicole DeCrappeo, <i>USGS Northwest Climate Adaptation Science Center</i> Presenters: Jeremy Littell, Erin Trochim, Malinda Chase, Meade Krosby, Chas Jones, & Hannah Gosnell	Preparing Stormwater Infrastructure for Climate Change Impacts in King County Jessica Engel, <i>King County</i>	Ameliorating Ocean Acidification: Towards a Model Relating pCO ₂ , Irradiance, and Leaf Area Index of <i>Zostera Marina</i> (Eelgrass) in Padilla Bay, WA Tyler Tran, <i>Western Washington University</i> , Brooke Love, Sylvia Yang, & Cinde Donoghue	<u>Special Session</u> Mainstreaming Climate into Organizations: The Good, the Bad, the Ugly <i>Format: Oral Presentations and Panel Discussion</i> Organizer: Dan Siemann, <i>Washington Department of Natural Resources</i> Presenters: Lara Whitely Binder, Lynn Helbrecht, & Crystal Raymond
1:20 PM		Adapting for Increases in Urban Heat and Development Density: Designing the Built Environment for Climate Change Dana Hellman, <i>Portland State University</i> , Jackson Voelkel, & Vivek Shandas	Monitoring the Vital Trophic Triad of the Salish Sea: How Climate Change Impacts the Dynamics of Larval Crab, Forage Fish, and Juvenile Salmon Evelyn Brown, <i>Lummi Natural Resources</i> , Nicholas T. Jefferson, Paul McElhany, & Julie Keister	
1:40 PM		Adapting Energy Efficient Building Design to Future Climate	City of Olympia Sea Level Rise Response Plan Andy Haub, <i>City of Olympia</i>	

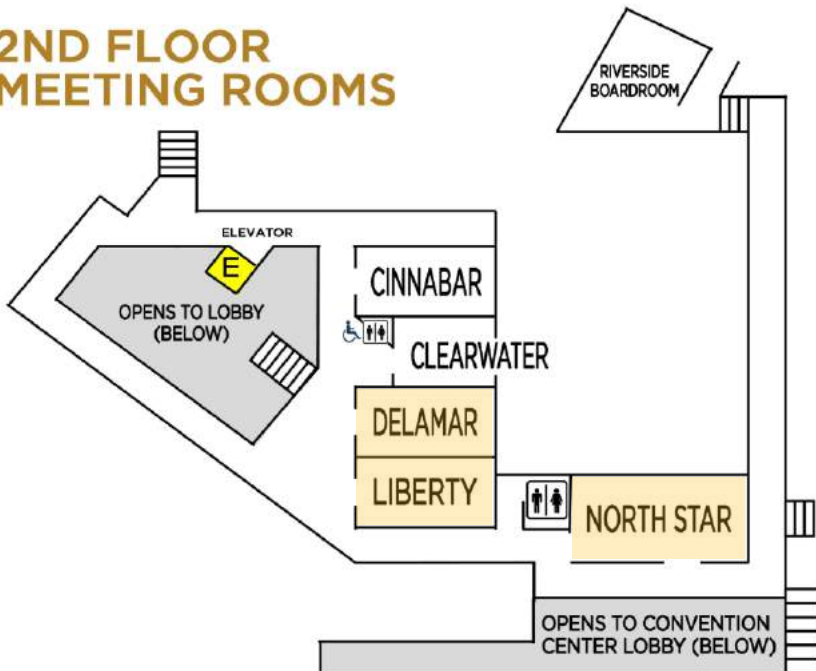
		Trevor Murdock, <i>Pacific Climate Impacts Consortium</i> , Steve Sobie, Ralph Wells, Malin Ek, Brittany Coughlin, & Guido Wimmers	Resilience Taking Shape: Green Infrastructure Networks for the Ecoregion	
2:00 PM		Daniel Cronan, <i>University of Idaho</i>	Effect of Climate Change on Stream Flow and Flushing Time in Western Puget Sound – A Model Study	Zhaoqing Yang, <i>Pacific Northwest National Laboratory</i> , Ning Sun & Taiping Wang
2:30 PM	BREAK			
3:00 PM	CLOSING PLENARY, Grand Ballroom			
	<p>Safeguarding the Northwest's Economy and Environment in a Changing Climate: Opportunities and Risks in Building a Sustainable Business Future</p> <p>Moderator: Julia Grant, <i>Micron Inc</i></p> <p>Format: <i>Panel Discussion</i></p> <p>Presenters:</p> <p>Erin Mader, <i>Idaho Forest Group</i></p> <p>Karl Kupers, <i>Columbia Plateau Producers</i></p> <p>John Bernardo, <i>Idaho Power</i></p>			
4:30 PM	CLOSING COMMENTS			

Wayfinding at The Riverside Hotel for NWCC

1ST FLOOR MEETING ROOMS



2ND FLOOR MEETING ROOMS



Registration
 Convention Center Lobby:
 Tuesday 3:00pm-8:00pm
 Wednesday 7:30am-5:00pm
 Thursday 7:30am-2:00pm

Plenary Sessions, Keynotes, and Meals
 Grand Ballroom

Poster Session and Reception
 Tamarack

Concurrent Sessions:
 Aspen (first floor)
 Liberty, Cinnabar, North Star (second floor)

Complementary WiFi available
 select the Riverside Conference Network - no password required

Tweeting about the conference?
 Use #NWCC2018

Front Cover: "Climate change impacts"

Hazy Seattle from wildfire smoke, August 14, 2018 (credit: Jennifer Vanderhoof)
 Debris flow following wildfire in 2016 (credit: Jennifer Pierce)
 Detroit Lake, OR during drought, August 2015 (credit: WikiCommons, Twelvizm)

Back Cover: "Climate change action"

Wind farm in Oregon (credit: WikiCommons, Steve Wilson)
 High school students learning about snow measurements, Lookout Mountain, MT, February 2016 (credit: Jim Ekins)
 King Co. signing climate action plan, November 2015 (credit: King County DNRP)

Program Cover Photo Credits

Thank you for working to build a resilient Northwest



See you in 2019!