The annual NW Climate Conference is the region’s premier opportunity for a cross-disciplinary exchange of knowledge and ideas relating to climate impacts and adaptation. The conference brings together researchers, resource managers and policy makers from academia, public agencies, sovereign tribal nations, non-governmental organizations, and the private sector, to share the latest climate science, challenges to infrastructure, industry, environment and communities, and adaptive solutions.

November 14–16, 2016
Skamania Lodge
Skamania, WA
Keynote Speakers

**Jeremy Jones**
Protect our Winters

Jeremy Jones is the founder and CEO of Protect Our Winters, a passionate crew of diehards, professional athletes and industry brands mobilizing the outdoor sports community to lead the charge towards positive climate action. Jones has been a professional snowboarder for over 18 years and is widely regarded as one of the best big mountain snowboarders in the world. In 2013, Jeremy was nominated by National Geographic as an “Adventurer of The Year” and a “Champion of Change” by President Obama for his work fighting climate change.

**Micah Ragland**
US EPA

Micah Ragland serves as EPA’s Associate Administrator for Public Engagement and Environmental Education, where he manages our constituency outreach programs and external affairs initiatives. Before joining the EPA, Ragland worked as the Deputy Director of Congressional and Intergovernmental Relations of the U.S. Department of Housing and Urban Development’s Hurricane Sandy Federal Rebuilding Task Force. Previously, Ragland served as President Barack Obama’s Northeast Political Director. Ragland received his bachelor’s degree from Morehouse College and his law degree from North Carolina Central University.

**David Titley**
Center for Solutions to Weather and Climate Risk

David Titley is a Professor of Practice in Meteorology at the Pennsylvania State University and the founding director of Penn State’s Center for Solutions to Weather and Climate Risk. He served as a naval officer for 32 years and rose to the rank of rear admiral. Dr. Titley’s career included duties as commander of the Naval Meteorology and Oceanography Command; oceanographer and navigator of the Navy; and deputy assistant chief of naval operations for information dominance. Dr. Titley is a fellow of the American Meteorological Society and was awarded an honorary doctorate from the University of Alaska, Fairbanks.
Schedule Summary

**Monday, November 14, 2016**
7:00p.–8:30p. Public Keynote

**Tuesday, November 15, 2016**
7:00–8:00 Continental Breakfast
8:00–8:30 Welcome
8:30–9:40 Plenary: Conversations about our climate challenges
9:40–10:10 BREAK
11:15–11:30 Plenary: Tools Café mini-pitches
11:30–12:40 Lunch (provided)
12:45–2:15 Concurrent sessions
   Climate 1
   Planning
   Tribes
2:15–2:40 BREAK
2:45–4:15 Concurrent Sessions
   Hydrology 1
   Collaboration and Co-Production
   Special Session
4:20–5:20 Plenary Session
5:20–5:35 Plenary Session: 4th US National Climate Assessment
5:35–7:30 Posters and Tools Café

**Wednesday, November 16, 2016**
7:00–8:00 Continental Breakfast
8:00–8:05 Welcome
8:05–8:55 Conference Keynote
9:00–10:30 Concurrent sessions
   Climate 2
   Human Dimensions
   Forests and Land Use
10:30–10:55 BREAK
11:00–12:30 Concurrent Sessions
   Hydrology 2
   Terrestrial Ecosystems
   Special Session
12:30–1:40 LUNCH (provided)
1:45–3:15 Concurrent Sessions
   Agriculture
   Coasts and waterways
   Special Session
3:15–3:30 BREAK
3:30–4:30 Closing Plenary
4:30–4:45 Wrap-up, plans for Washington 2017
4:45–6:30 Post-conference networking reception
Schedule Details

November 14, 2016
7:00p.-8:30p.  Public Keynote

Jeremy Jones (Protect our Winters) and Micah Ragland (US EPA)

November 15, 2016

7:00-8:00  Continental Breakfast (provided)

8:00-8:30  Welcome

Kathie Dello and Anne Nolin
Oregon State University (2016 co-chairs)

8:30-9:40  Plenary: Conversations about our climate challenges

Moderated by Matt Zaffino
Chief Meteorologist
KGW News Portland

Charlie Luce
US Forest Service

Crystal Raymond
Seattle City Light

Justin Wettstein
Oregon State University

Sarah Myhre
University of Washington

9:40-10:10  BREAK
10:15–11:15  Plenary: Beyond Paris

Ron Mitchell  
Professor, University of Oregon

Angus Duncan  
Chair, Oregon Global Warming Commission

Bill Drumheller  
Washington Department of Ecology

11:15–11:30  Plenary: Tools Café mini-pitches

11:30–12:40  Lunch (provided)

Special Session

Adaptation Speed Dating

Meade Krosby  
UW Climate Impacts Group

12:45–2:15  Concurrent sessions

Climate 1  

Sihan Li  
Projected changes of extreme precipitation into mid-21st century across the Northwest  
Oregon State University

Paul Loikith  
Characterizing Large-Scale Meteorological Patterns and Associated Temperature and Precipitation Extremes over the PNW  
Portland State University

Naomi Goldenson  
Characterizing regional climate model uncertainty  
University of Washington
**Planning**

- **Raquel Lorente-Plazas**
  - Large-Scale Climate Influences on Local Extreme Precipitation
  - University of Washington

- **Meredith Jagger**
  - Using Hazard Vulnerability Assessments to Inform Planning and Foster Climate Resilience in a Public Health Context
  - Oregon Health Authority

- **Marnie Boardman**
  - Using the Ten Essential Services of Public Health Framework to Enhance Climate Adaptation Planning
  - Washington Department of Health

- **Crystal Raymond**
  - From Planning to Implementation: Mainstreaming Climate Change Preparation at Seattle City Light
  - Seattle City Light

- **Beth Gibbons**
  - Adaptation in practice: Puget Sound and Eugene
  - American Society of Adaptation Professionals

**Tribes**

- **Arwen Bird**
  - Tribal Climate Camp
  - NW Climate Science Center & Staff from arm Springs Tribe

- **Verner Wilson**
  - Regional Impacts and Potential Strategies to Address Climate Change in Bristol Bay, Alaska.
  - Bristol Bay Native Association

- **Scott Hauser**
  - From Sagebrush to Salmon – A Collaborative Climate Vulnerability Assessment for the Upper Snake River Tribes
  - Upper Snake River Tribes
Ron Figlar-Barnes  
Skokomish Climate Change 2050  
Skokomish Tribe

2:15–2:40  BREAK (provided)

2:45–4:15  Concurrent Sessions

Hydrology 1  
Oriana Chegwidden  
Hydrologic projections of climate change for the Columbia River Basin through the end of the 21st century  
University of Washington

Chas Jones  
Using hydrologic landscape classification to assess streamflow vulnerability to changes in climate  
US EPA

Lumas Helaire  
Modeling flood risk in the Portland, OR Metro Area due to sea-level rise and increased discharge  
Portland State University

David Judi  
Integrated Modeling Approach for the Development of Climate-Informed, Actionable Information  
Pacific Northwest National Laboratory
Collaboration and Co-Production

**Trevor Murdock**
An engineer, a climate scientist, and an adaptation expert walk into a coffee shop...
Pacific Climate Impacts Consortium

**Kathie Dello**
An approach to developing drought triggers in the PNW using lessons learned from CO
Oregon Climate Change Research Institute

**Janan Evans-Wilent**
Co-producing Climate Change Adaptation Plans in the Pacific Northwest: Exploring Alternative Coastal Futures with Local Decision-makers
Oregon State University

**Kavita Heyn**
Planning for uncertainty in Portland’s drinking water system
Portland Water Bureau

Special Session

Developing a Comprehensive Strategy for Sea Level Rise: Local and State Government Perspectives

**Moderated by Lara Whitely Binder**
University of Washington

**Andy Haub**
City of Olympia

**Bobbak Talebi**
Washington Department of Ecology

**Jessica Engel**
King County Department of Natural Resources and Parks
4:20–5:20  Plenary Session

**Josh Halofsky**
*Western Washington forests: An examination of the past, present and (possible) future*
*Washington State Department of Natural Resources*

**Andrew Shirk**
*Population viability and climate change: case studies from the Pacific Northwest*
*University of Washington*

**Jason Kreitler**
*Changes to watershed vulnerability under future climates, fire regimes, and population pressures*
*Western Geographic Science Center, USGS*

5:20–5:35  Plenary Session: 4th US National Climate Assessment

**David Reidmiller**
*US Global Change Research Program*
## 5:35–7:30  Posters and Tools Café

### Tools Café

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katherine Hegewisch</td>
<td>University of Idaho</td>
</tr>
<tr>
<td></td>
<td><em>NW Climate Toolbox</em></td>
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<tr>
<td>Julie Vano</td>
<td>National Center for Atmospheric Research</td>
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<td><em>New tools and datasets to support climate risk planning in the Northwest</em></td>
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<tr>
<td>Erich Seamon</td>
<td>University of Idaho</td>
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<td></td>
<td><em>Data mining to identify areas of water scarcity in the Pacific Northwest</em></td>
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<tr>
<td>Melissa Rosa</td>
<td>NOAA Digital Coast</td>
</tr>
<tr>
<td></td>
<td><em>New tools and datasets to support climate risk planning in the Northwest</em></td>
</tr>
</tbody>
</table>

### Posters

1. William Templeton  | Portland State University |
|                      | *Changing tides and storm surge: implications for nuisance flooding in the Pacific Northwest*

2. Josh Foster        | American Society of Adaptation Professionals    |
|                      | *The American Society of Adaptation Professionals (ASAP): An Emerging Community of Practice for Northwest Climate Partnerships*

3. Brooke Saari       | Washington State University                     |
|                      | *AgClimate.net – A New Model for Climate Change Extension*

4. Rick Steed         | University of Washington                        |
|                      | *Creating an Ensemble of Regional Climate Models*

5. Alexis Cooley      | Portland State University                        |
|                      | *Observing Change to Precipitation Intensity from Different Temporal Scales in Portland, Oregon*

6. Laurie Houston     | Oregon State University                          |
|                      | *What Does Climate Change Mean for Specialty Fruit Crops in the Northwest?*

7. Claire L Phillips  | USDA-ARS                                          |
|                      | *Assessment of soil water conservation with biochar in Oregon cropping systems*

8. Stephen Machado    | Oregon State University                          |
|                      | *Biochar Effects on Wheat and Pea Productivity Persist*

9. Tina Karimi        | Washington State University                      |
|                      | *Projected regional shifts in Pacific North West dryland agriculture in response to climate change considering low and high atmospheric CO2 concentration*
<table>
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</thead>
<tbody>
<tr>
<td>10.</td>
<td>Katherine Hegewisch</td>
<td>University of Idaho</td>
<td>The ‘Integrated Scenarios of the Future Northwest Environment’ Project Website</td>
</tr>
<tr>
<td>13.</td>
<td>Philip Mote</td>
<td>Oregon Climate Change Research Institute, OSU</td>
<td>Northwest Climate Science Center: Six-year retrospective</td>
</tr>
<tr>
<td>15.</td>
<td>Keyvan Malek</td>
<td>Washington State University</td>
<td>What are the agricultural productivity and downstream water availability consequences of different deficit irrigation scenarios over the Yakima River Basin?</td>
</tr>
<tr>
<td>16.</td>
<td>Michael Shumlich</td>
<td>The Pacific Climate Impacts Consortium</td>
<td>Approaches to communicating climate science that work for users</td>
</tr>
<tr>
<td>17.</td>
<td>Jill Hardiman</td>
<td>US Geological Survey, Western Fisheries Research Center</td>
<td>Columbia Basin Partner Forum: Information Sharing, Collaboration, and Discussion on How to Address Landscape-Scale Stressors within the Columbia River Basin</td>
</tr>
<tr>
<td>18.</td>
<td>Ryan J. Niemeyer</td>
<td>University of Washington</td>
<td>Indicators of Climate Change in Idaho</td>
</tr>
<tr>
<td>19.</td>
<td>Michael Chang</td>
<td>Makah Tribe</td>
<td>Climate Adaptation for the Makah Tribe</td>
</tr>
<tr>
<td>20.</td>
<td>Brittni Brown</td>
<td>University of Idaho</td>
<td>Consecutive Years of Drought and High Temperatures Responsible for Extensive Blue Oak Dieback</td>
</tr>
<tr>
<td>21.</td>
<td>Trina Bayard</td>
<td>Audubon Washington</td>
<td>A collaborative, community-based initiative towards a climate resilient sagebrush steppe</td>
</tr>
<tr>
<td>22.</td>
<td>Janet Prevey</td>
<td>US Forest Service Pacific Northwest Research Station</td>
<td>How do trees know when to flower?</td>
</tr>
<tr>
<td>23.</td>
<td>Andrea M. Allan</td>
<td>Oregon State University</td>
<td>Simulated Future Climate and Vegetation Changes for Washington State Wildlife Areas</td>
</tr>
</tbody>
</table>
24. John Campbell  
Oregon State University  
Potential influence of wildfire in modulating climate-induced forest redistribution in a central Rocky Mountain landscape

25. Linnia Hawkins  
Oregon Climate Change Research Institute  
Variability, covariability, and change in climate controls on forest carbon uptake in western North America

26. Crystal Kolden  
University of Idaho  
Spatial and temporal patterns of unburned areas within fire perimeters in the northwestern United States from 1984 to 2014

27. Austin Phillips  
University of Washington  
How Will Transient Dynamics Affect Species During Climate Change?

28. Jen Syrowitz  
Audubon Washington  
Audubon in Action: Mitigating the Effects of Climate Change on Birds and People

29. Emily York  
Oregon Health Authority  
Oregon’s new Climate and Health Resilience Plan: An All-Hazards, Strengths-Based Approach

30. Jackson Voelkel  
Portland State University  
Assessing Techniques for High Resolution Descriptions of Urban Heat Islands

31. Towsif Bhuiyan  
Washington State University  
THE Spokane Valley–Rathdrum Prairie Groundwater Flow Model, A Tool To Update The Head and Boundary Flow Package

32. Eric A. Sproles  
Oregon State University  
Future Snow? A Spatial-Probabilistic Assessment of the Extraordinarily Low Snowpacks of 2014 and 2015 in the Oregon Cascades

33. John Phillips  
Pacific Northwest Clean Water Association  
The PNCWA Climate Change Position Paper

34. Ryan Crumley  
Oregon State University  
High Resolution Modeling of Historic Glacier and Snowmelt Contributions to Freshwater Runoff into Glacier Bay, Alaska

35. Guillaume Mauger  
Climate Impacts Group, University of Washington  
Changing Streamflow in the Chehalis River Basin: Working to Support Flood Management

36. Stacy Schumacher  
CTUIR  
Disseminating climate information to a Tribal community
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Susan McIlroy</td>
<td>US Geological Survey</td>
<td>Identifying key climate and environmental factors affecting rates of postfire big sagebrush recovery in the northern Columbia Basin</td>
</tr>
<tr>
<td>38</td>
<td>Jamie Jarolimek</td>
<td>University of Idaho</td>
<td>Aspen Stand Vulnerability and Understory Composition Along Environmental Gradients</td>
</tr>
<tr>
<td>39</td>
<td>Chase Freeman</td>
<td>US Geological Survey</td>
<td>A latitudinal approach to assess sea-level rise vulnerability for Pacific Northwest coast tidal wetlands</td>
</tr>
<tr>
<td>40</td>
<td>Erda Celer</td>
<td>Oregon State University</td>
<td>Douglas-fir Seedlings in the Pacific Northwest: The Genetics of Drought Hardiness</td>
</tr>
<tr>
<td>41</td>
<td>Bruce T. Anderson</td>
<td>Boston University</td>
<td>The Pacific Decadal Precession and climate disturbances in the Northwest</td>
</tr>
<tr>
<td>42</td>
<td>Paul Dye</td>
<td>Washington Sea Grant</td>
<td>Building capacity to enhance resilience in Washington’s coastal communities</td>
</tr>
<tr>
<td>43</td>
<td>Karin Bumbaco</td>
<td>Office of the Washington State Climatologist</td>
<td>Historical Trends in the Characteristics of Heat Events in the Pacific Northwest</td>
</tr>
<tr>
<td>44</td>
<td>Lindsey L. Thurman</td>
<td>Oregon State University</td>
<td>Asymmetric competition shapes amphibian response to rapid environmental change</td>
</tr>
<tr>
<td>45</td>
<td>Tess Carter</td>
<td>US Global Change Research Program</td>
<td>Engage with the 4th US National Climate Assessment</td>
</tr>
<tr>
<td>46</td>
<td>Meade Krosby</td>
<td>UW Climate Impacts Group</td>
<td>Building Tribal Capacity For Climate Change Vulnerability Assessment</td>
</tr>
<tr>
<td>47</td>
<td>Jill MacIntyre Witt</td>
<td>Western Washington University</td>
<td>Building the Climate Justice Movement</td>
</tr>
<tr>
<td>48</td>
<td>Len Coop</td>
<td>Oregon State University</td>
<td>Medium- &amp; Extended-Range Weather and Climate Forecasts Scaled and Tested for Improved Agricultural and Pest Management Decision Support</td>
</tr>
</tbody>
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November 16, 2016

7:00–8:00 Continental Breakfast

8:00–8:05 Welcome

8:05–8:55 Conference Keynote

David Titley
Center for Solutions to Weather and Climate Risk

9:00–10:30 Concurrent sessions

Climate 2

Cliff Mass
Regional Climate Modeling Consortium
University of Washington

Eric Salathé
Microclimates and Climate Feedbacks
University of Washington

Faron Anslow
Developing and Delivering PRISM Uncertainty Estimates for BC
Pacific Climate Impacts Consortium

Nick Bond
On the occasional rains east of the Cascade crest during summer
Office of the Washington State Climatologist

Human Dimensions

Sarah Myhre
Academic boundary partnerships in a future of abrupt climate warming
University of Washington

Sierra Dymond-Smith
Perceived Risk of Climate Change in the Pacific Northwest; a Geographic Look at Public Perceptions
University of Idaho
Lara Whitely Binder
The potential for climate change-driven migration to the Northwest: What we’ve learned and what’s next
UW Climate Impacts Group

Clark F. Seavert
Making Climate Projections Useful for Growers
Oregon State University

Forests and Land Use

Benjamin Sleeter
The importance of land use data in modeling changes in carbon storage and flux in the Pacific Northwest
US Geological Survey

Constance Harrington
Can Douglas-fir shift its timing of spring growth initiation to track climate change?
PNW Research Station

John Abatzoglou
How much has human-caused climate change influenced wildfire extent across northwestern US forests?
University of Idaho

Matthew Sloggy
Modeling the Adaptation of the Forest Sector to Climate Change: A Coupled Approach
Oregon State University

10:30–10:55 BREAK
11:00–12:30 Concurrent Sessions

Hydrology 2

Gordon Grant
No snow no flow?: New insights from a year without snow in the Cascade Mountains of Oregon
US Forest Service

David Rupp
New Metrics for Characterizing Snow in a Warming World
Oregon State University

Susan Dickerson–Lange
A Framework for Predicting Forest Effects on Mountain Snow Storage in a Warming Climate
Natural Systems Design

Charlie Luce
Climate Sensitivity of Western U.S. Snowpacks from Empirical Analysis of Western U.S. SNOTEL Data
US Forest Service

Terrestrial Ecosystems

Se-Yeun Lee
Projecting Climate Change Impacts on Wetlands in the Columbia Plateau
University of Washington

Trina Bayard
Safeguarding birds of Washington in a changing climate
Audobon Washington

Karl Dickman
Taking the Next Step: Translating Downscaled Climate Change Projections into Useful Information for Watershed Management
ICF

Michael Case
A novel approach of using mechanistically-informed projections to model bird range and density
University of Washington
Special Session

The Regional Climate Enterprise - where do we go from here?

Moderated by: Guillaume Mauger
UW Climate Impacts Group
and
Kathie Dello
Oregon Climate Change Research Institute

12:30-1:40 LUNCH (provided)

Special Session

Statistics in Practice for Analysis of Climate Impacts, Adaptations, and Mitigations

Moderated by Robert Brigantic
Pacific Northwest National Laboratory

David Rupp
Quantifying, and separating the sources of, uncertainty in climate and hydrological projections.
Oregon State University

Lisa Bramer
Statistical Models for Predicting Electric Grid Stress Events and Evaluating Future Risk
Pacific Northwest National Laboratory

Yonas K. Demissie
1) Multivariate regional frequency analysis on droughts and 2) Uncertainty and propagation in integrated earth system models
WSU Tri-Cities

Guillaume Mauger
Improved climate monitoring: Maximizing the bang for your buck
University of Washington
1:45–3:15  Concurrent Sessions

**Agriculture**

*Lauren Parker*
Estimating the climatological niche for perennial fruit and nut crops under climate change
University of Idaho

*Gabrielle Roesch-McNally*
Wheat producers’ perceptions of climate change, risk perceptions, and adaptive and mitigative strategies
NW Climate Hub

*Isabel Guerrero*
Prioritizing conservation efforts under a changing climate
Oregon State University

*Brooke Saari*
Agriculture in a Changing Climate: Priorities and Next Steps for the Pacific Northwest
Washington State University

**Coasts and waterways**

*Stefan Talke*
Changing water level and water temperature on the lower Columbia River, 1853–present
Portland State University

*Oliver Grah*
Climate Change Adaptation: Moving From Plans to Action on the Nooksack River, WA
Nooksack Indian Tribe

*Tina Whitman*
Engaging local communities in sea level rise adaptation
Friends of the San Juans

*Laura Brophy*
Conserving tidal wetlands for the future: Mapping and prioritizing landward migration zones for Oregon’s tidal wetlands
Institute for Applied Ecology
Special Session

Climate change research and policy/planning/management applications in the Skagit River basin

*Moderated by Alan Hamlet*
Skagit Climate Science Consortium

3:15–3:30 BREAK (provided)

3:30–4:30 Closing Plenary

*Anne Nolin*
Willamette Water 2100: Water Scarcity Amidst Abundance
Oregon State University

*Kathleen Moore*
Adaption trade-offs: Mitigating climate change at multiple use reservoirs in the Pacific Northwest
Oregon State University

*Philip Mote*
The Future of Climate Research
Oregon Climate Change Research Institute

4:30–4:45 Wrap-up, Plans for Washington 2017

4:45–6:30 Post-conference networking reception Light snacks and cash bar
Thanks to our sponsors