



The Columbia River, Basin and Treaty



September 11-13, 2012
Central Washington University, Ellensburg, Washington

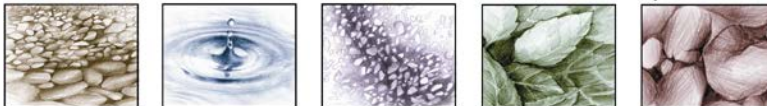
Basin-Level Sponsors



Thank You!

Watershed-Level Sponsor

Associated Earth Sciences, Inc.



Stream-Level Sponsors



Thank You!

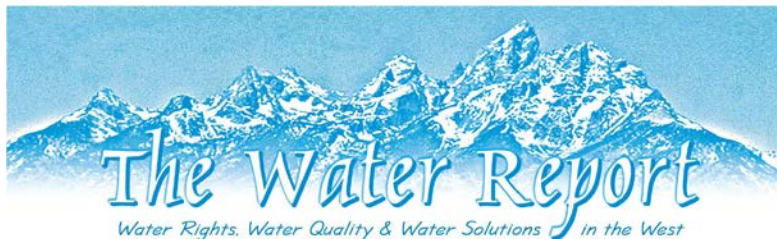
2012 AWRA Washington Section Board Members

*Scott Kindred, Aspect Consulting (President)
Dustin Atchison, CH2M HILL (Vice President)
Megan Kogut, AMEC (Treasurer)
Colleen Rust, Hart Crowser (Secretary)
Jennifer Saltonstall, Associated Earth Sciences (Editor)
Beth Peterson, HDR (Past President)
Tyson Carlson, Aspect Consulting (Director)
Steve Hughes, Hart Crowser (Director)
*Tyler Jantzen, CH2M HILL (Director)
*Felix Kristanovich, ENVIRON (Director)
*Stan Miller, Northwest Water Resources (Director)
*Tom Ring, Yakama Nation (Director)
Matt Stumbaugh, University of Washington (Director)
Bailey Theriault, Golder Associates (Director)
Stephen Thomas, Shannon & Wilson (Director)
*Kristina Westbrook, King County (Director)
Brian Henn, University of Washington (UW Student Rep.)
Bob Edmunds, University of Washington (UW Faculty Advisor)

*Member of the 2012 Conference Committee.

Mike Homza with GeoEngineers, Allison MacEwan with Shannon & Wilson, Jason McCormick with Washington Water Trust, Rachael Paschal Osborn with the Center for Environmental Law & Policy, and Peter Sturtevant with CH2M HILL, general members, also served on the Conference Committee.

Media Sponsor



Cover Photographs Courtesy of Tom Ring

Table of Contents

Program Summary	1
Conference Welcome	6
2012 Outstanding Service Award	7
Student Fellowships.....	8
Conference Program and Abstracts.....	9
Session Speaker Biographies	22
AWRA Washington Section List of Past Presidents	31
AWRA Washington Section List of Past Conferences	32
BBQ and Reception Information.....	33

PROGRAM SUMMARY

September 11 – Field Trip to Key Columbia River Treaty Sites

Includes visits to the Waterville Plateau, Grand Coulee Dam, Banks Lake, Bacon Siphon and Tunnel, Quincy Canal, Soap Lake, and the USBR Field Office in Ephrata, WA. Departs from and returns to Ellensburg. Includes **Lunch**. See page 9 for details.

September 12 – The Columbia River Treaty

Morning Program

7:00 - 9:00 am	Check-in for CWU Dorms (Vantage Room of Munson Hall) available for registrants staying on campus.
7:00 am – 4:00 pm	Parking and Meal Ticket Pickup (Vantage Room of Munson Hall)
7:00 am – 4:00 pm	Conference Registration (Lombard Room Foyer)
7:15 - 8:15 am	Breakfast (Tunstall Dining Room) provided for all conference registrants.

8:15	Convocation (Lombard Room) <u>Gerald Lewis</u> , Yakama Nation Elder
8:25	Opening Remarks Conference Chairman: <u>Tyler Jantzen</u> , CH2M HILL Agenda Co-Chair: <u>Rachael Paschal Osborn</u> , Center for Environmental Law & Policy

SESSION 1 (Lombard Room)
Moderator: Rachael Paschal Osborn,
Center for Environmental Law & Policy

8:30	The Columbia River Treaty (CRT) in Context <u>Professor Barbara Cosens</u> , University of Idaho and Universities Consortium on Columbia River Governance
9:15	Native American Tribal Roles in CRT Review <u>Paul Lumley</u> , Columbia River Inter-Tribal Fish Commission

9:45 **Treaty Review in the U.S. and Canada**
Matt Rea, United States Army Corps of Engineers;
Kathy Eichenberger, British Columbia Ministry of Energy and Mines

10:15 **Morning Break** (Lombard Room and Foyer)
Exhibit Tables

10:30 **Treaty Review in the U.S. and Canada, continued** (Lombard Room)

SESSION 2 (Lombard Room)

Moderator: Stan Miller, *Northwest Water Resources*

11:15 **Post-2024 Expectations for Tributary Headwaters Management**
Dr. John Tracy, Idaho Water Resources Research Institute;
Dr. Michael Barber, State of Washington Water Research Center.

Lunch Program

12:15 **Lunch** (Tunstall Dining Room) provided for all conference registrants.

12:30 **Announcement:** Molly Smith, *Universities Consortium on Columbia River Governance Conference*

12:45 **KEYNOTE ADDRESS: A World Prematurely Dammed - Improving on the CRT and Other Hydrological Anachronisms**
Robert W. Sandford, Canada Forum on Leadership for Water, Canada Water for Life Decade, and Western Watersheds Climate Research Collaborative

1:30 **Break**

Afternoon Program

SESSION 3 (Lombard Room)

Moderator: Chris Pitre, *Golder Associates*

1:45 Treaty Perspectives Panel

Fish, Wildlife and Recreation

Suzanne Skinner, *Center for Environmental Law & Policy*

Social-Cultural Impacts in British Columbia

Eileen Delehanty Pearkes, author of *The Geography of Memory*

Hydro Power

Andrew Grassell, *Chelan PUD and Columbia River Treaty Power Group*

Local Government

Paul Jewell, *Kittitas County Commissioner and Columbia River County Commissioners Policy Advisory Group*

3:15 SESSION 3 Q&A

3:45 – 4:00 Afternoon Break (Lombard Room and Foyer)

Exhibit Tables

SESSION 4 (Lombard Room)

Moderator: Rachael Paschal Osborn,
Center for Environmental Law & Policy

4:00 Climate Change and the Columbia River Treaty

Deborah Harford, *Simon Fraser ACT*;
Dr. Alan Hamlet, *University of Washington*

4:45 SESSION 4 Q&A

5:00 – 5:15 Good of the Order

6:00 – 10:00 BBQ Dinner at Springwood Ranch

See Page 33 for map, directions and other details. Please wear your name tag – it's your ticket in!

September 13 – The Columbia River Basin

7:00 am – 12:00 pm	Checkout for CWU dorms (Munson Hall). Return keys to Vantage room by noon. Secure storage for luggage is available
7:00 am – 12:00 pm	Parking and Meal Ticket Pickup (Vantage Room of Munson Hall)
7:00 am – 12:00 pm	Conference Registration (Sue Lombard Foyer)
7:00 am – 8:00 am	Breakfast (Tunstall Dining Room) provided for all conference registrants.

8:15 **SESSION 5: WATER AND RESTORATION** (Lombard Room)
 Moderator: Dustin Atchinson, CH2M HILL

8:20 **Restoration in the White Salmon and Klickitat Basins**
Bill Sharp, Yakama Nation Fisheries

8:45 **Instream Flows for Restoration in the Columbia Basin**
Jason McCormick, Washington Water Trust;
Jason Hatch, Trout Unlimited-Washington Water Project

9:10 **Restoration in the Methow and Wenatchee Basins**
Brandon Rogers, Yakama Nation Fisheries

9:35 **Columbia River Instream Atlas Project**
Jonathan Kohr, Washington Department of Fish and Wildlife

10:00 **Morning Break** (Lombard Room Foyer)
Exhibit Tables

10:20 **SESSION 6: FISH, AGRICULTURE, AND WATER RESOURCES**
 (Lombard Room)
 Moderator: Beth Peterson, HDR

10:25 **Yakima Integrated Water Resources Management Plan Panel**
Urban Eberhart, Kittitas Reclamation District;
Dr. David Fast, Yakama Nation;
Michael Garrity, American Rivers;
Paul Jewell, Kittitas County Commissioner and Columbia River County
Commissioners Policy Advisory Group

11:05 **Office of the Columbia River Projects**
Derek Sandison, Office of the Columbia River

11:30 **Columbia River Water Rights in Oregon**
Ruben Ochoa, Oregon Water Resources Department

11:55 **Aquatic Invasive Species Control**
David Conlin, GeoEngineers;
Carson Keeler, PUD No. 2 of Grant County, WA

Lunch Program

12:20 pm **Lunch** (Tunstall Dining Room) provided for all conference registrants

Washington Section Update
J. Scott Kindred, AWRA–Washington Section President
Outstanding Service Award
Stan Miller, AWRA–Washington Section Board Member

Afternoon Program

1:20 **SESSION 7: WATER RESOURCES MANAGEMENT** (Lombard Room)
Moderator: *Carl Einberger, Golder Associates*

1:25 **Hydro and Wind Power Issues**
Adam Price, United States Army Corps of Engineers

1:50 **Water Banking: Yakima and Dungeness Rivers**
Susan Adams, Washington Water Trust

2:15 **Model Development to Support Assessment of Flood Risk for the
Columbia Treaty Review**
Sara Marxen, United States Army Corps of Engineers

2:40 **Hydrologic Sensitivity to Climate Change**
Julie Vano, University of Washington

3:05 - 3:15 **Closing Remarks**

3:15 – 3:45 **Afternoon Refreshments**

The right to resort to the fishing places in controversy was a part of larger rights possessed by the Indians, upon the exercise of which there was not a shadow of impediment, and which were not much less necessary to the existence of the Indians than the atmosphere they breathed.

Justice Joseph McKenna, U.S. Supreme Court, United States v. Winans, 1905

CONFERENCE WELCOME



Colleagues,

On behalf of the Washington Section of the American Water Resources Association (AWRA), I welcome you to our 2012 Annual Conference. I'm excited to hold this year's conference in Ellensburg, within the boundaries of the Columbia River Basin. This is the first time in many years that the organization has held the state conference east of the Cascades, and is an effort to fulfill the organization's mission of advancing water resources management in Washington and the Pacific Northwest region.

The section is pleased to hold this year's conference on the campus of Central Washington University. I wish to acknowledge the help of Dr. Carey Gazis, faculty member in the Department of Geological Sciences at Central Washington University, who was instrumental in securing this venue. I'd also like to thankfully recognize the help of the Central Washington University conferences staff, and the countless hours of volunteer work by the entire AWRA Washington Section conference planning committee.

The Columbia River and its associated basin are of vital importance to the State of Washington, and to the Pacific Northwest region as a whole. The river provides enormous economic value in the form of irrigated agriculture, hydropower, flood control, freight navigation, ecological resources, recreation and cultural resources. These diverse interests and values for water in the basin drive equally diverse viewpoints and plans for water management across the seven states and one Canadian province covered by the basin. The basin is ultimately governed by the Columbia River Treaty between the United States and Canada, which took effect in 1964, and may be drastically altered as early as 2024 with notice to do so permitted as early as 2014.

In addition to changes in the treaty and operation of the river, climate change and population growth are anticipated to compound existing water use and land use stresses on basin management. Numerous projects in the basin have been completed and are being considered in an effort to increase water reliability and instream habitat to meet the recovery goals of ESA Listed salmon and steelhead as well as the needs of water users.

The conference will explore these topics, provide an overview of the treaty renegotiation process, and offer perspectives from stakeholders from both inside and outside Washington's borders. A pre-conference field trip on Tuesday, September 11 set the stage for our discussions, with an up-close look at some of the key features of the central Washington portion of the Columbia, including Grand Coulee Dam, the Columbia Basin Project, Quincy Canal, and Wanapum Dam. Wednesday's September 12 sessions will focus on the Columbia River Treaty, with representatives from both U.S. and Canadian Entities, as well as numerous stakeholders from the U.S. and Canada. Thursday's September 13 sessions will focus on many of the projects currently in development or recently completed within the Columbia River Basin.

I invite you to listen carefully to presentations, actively participate in discussions, and to be open to differing and potentially conflicting view points. It's our hope that attendees will leave the conference with new knowledge and a fresh perspective on the complex water resource issues inherent in The Columbia River, Basin, and Treaty.

Tyler Jantzen, P.E.
AWRA Washington Section 2012 Conference Chairman

2012 OUTSTANDING SERVICE AWARD

Steve Foley receives this year's WA-AWRA award for "Outstanding Contribution to Washington's Water Resources."

Steve Foley's varied history was part of what made him an exceptional asset to both King County and the State of Washington. Steve has a Bachelor's in Geophysics from Western Washington University, Master's in Geological Engineering from University of Arizona; and P.E. in Arizona and Washington. He is a world traveler, was a consultant for 10 years and spent most of the last two decades with King County's Water and Land Resources Division, and has now retired to the southwest. He held a Senior Engineer position responsible for managing the Surface Water Design Manual program (updates, errata, interpretations, website, training, building department support, and user support on stormwater regulations for new development and redevelopment), the Engineering Studies program (addressing complex drainage and regulatory problems), and the Stormwater Structural Controls program (stormwater capital planning). He was also the King County Water and Land Resources Division's liaison to the County building department on stormwater issues involving new development and redevelopment. In addition, he was recognized as the County's leading expert on stormwater low impact development techniques (LID) and stormwater-related regulations in general. For the past several decades, the County's stormwater management program has frequently been at the forefront in this state and Steve's leadership during his career has been a positive influence for the region.

We applaud Steve Foley for his accomplishments.

STUDENT FELLOWSHIPS

2012-2013 Student Fellowship Awards

WA-AWRA is seeking nominations for 2012–2013 Fellowship Awards of \$2,000 each. Two fellowships are offered. One, the Rod Sakrison Memorial Fellowship Award will be to a member of an AWRA Student Chapter at a Washington school. In 2007 the Section board of directors dedicated this award to the memory of Rod Sakrison in recognition of his effort to increase student involvement in AWRA. Rod was a two-time board president and was instrumental in establishing the University of Washington AWRA Student Chapter. The other award will go to a student enrolled in a graduate program at a college or university in Washington State. Both fellowships are for a full-time graduate student completing an advanced degree in an interdisciplinary water resources subject. In addition to \$2,000 in cash, each award includes a one-year membership in both the State and National AWRA, a one-year subscription to the Journal of the American Water Resources Association, and admission to the Washington State Section Annual Conference.

Applications will be accepted at any time between the date of this posting and October 30, 2012. Students are encouraged to submit application early. The Board will approve the selections no later than the December 2012 Board meeting. Special recognition will be given to the fellowship recipients at a Washington Student section function following announcement of the award.

Further information about the fellowship and an application form are available on the section website (www.waawra.org) or by contacting Stan Miller, Fellowship Committee Chair: samillerh2o@comcast.net.

CONFERENCE PROGRAM AND ABSTRACTS

September 11 – Field Trip to Key Columbia River Treaty Sites

Includes visits to the Waterville Plateau, Grand Coulee Dam, Banks Lake, Bacon Siphon and Tunnel, Quincy Canal and Soap Lake, and the USBR Field Office in Ephrata, WA. Departs from and returns to Ellensburg, WA. Includes **Lunch**.

- 8:00 am Check-in for CWU Dorms (Vantage Room of Munson Hall)
Available for registrants staying on campus.
- 8:45 Bus pick-up at CWU Parking Lot G-16**
Located just west of the Starbucks on E. University Way and E. 10th
Ave. Parking is included in registration- see the Conference Programs
desk in the Vantage Room of Munson Hall for parking pass.
- 9:00 Bus pick-up at Hampton Inn**
Parking at Hampton Inn for Hampton Inn customers only. Additional
parking available at the lot behind Perkins and Love's Truck Stop,
walking distance from Hampton Inn.
- 6:00 pm Bus returns to Hampton Inn**
- 6:15 Bus returns to CWU Parking Lot G-16**
- 6:00 - 8:00 Check-in for CWU Dorms (Vantage Room of Munson Hall)
Available for registrants staying on campus.

September 12 – The Columbia River Treaty

Morning Program

7:00 - 9:00 am	Check-in for CWU Dorms (Vantage Room of Munson Hall) available for registrants staying on campus.
7:00 am – 4:00 pm	Parking and Meal Ticket Pickup (Vantage Room of Munson Hall)
7:00 am – 4:00 pm	Conference Registration (Lombard Room Foyer)
7:15 - 8:15 am	Breakfast (Tunstall Dining Room) provided for all conference registrants.

8:15 **Convocation** (Lombard Room)
Gerald Lewis, Yakama Nation Elder

8:25 **Opening Remarks**

Conference Chairman: Tyler Jantzen, CH2M HILL

Agenda Co-Chair: Rachael Paschal Osborn, Center for Environmental Law & Policy

SESSION 1 (Lombard Room)

Moderator: Rachael Paschal Osborn,
Center for Environmental Law & Policy

8:30 **The Columbia River Treaty (CRT) in Context**

Professor Barbara Cosens, University of Idaho and Universities Consortium on Columbia River Governance

The United States and Canada have cooperatively shared the management of the Columbia River under the Columbia River Treaty, which was concluded in 1961, and entered into force in 1964. The Treaty addresses the cooperative management of the Columbia River, but only for flood control and power purposes. The Treaty has provided both parties with significant direct benefits from flood control and power generation and indirect benefits of economic growth in the Pacific Northwest. The Treaty has been hailed as a leading example of a transboundary water treaty based on equitable sharing of benefits.

The Universities Consortium on Columbia River Governance (UCCRG) formed in 2009, after an initial symposium with participants from the basin and academia to develop an understanding of the 1964 Columbia River Treaty and relevant changes that have

occurred in the basin since 1964. The UCCRG is composed of representatives of: the Universities of British Columbia, Calgary, Idaho, and Washington, and Oregon and Washington State Universities. The initial symposium indicated that changes in the following areas may warrant a broad review of the Treaty: (1) energy markets; (2) climate; (3) legal changes in both Canada and the U.S. to the status of Native American tribes and First Nations in the basin in relation to the water resource; (4) demand and legal requirements for public input to natural resource management decisions; and (5) the health of and public values concerning the Columbia River ecosystem. Subsequent symposia have provided a facilitated forum for an informal cross-border dialogue on the future of the Columbia River. In addition, the UCCRG serves to facilitate study of the review process by university graduate students and to connect university research to stakeholders in the basin. This presentation will provide a basic review of the Treaty and the work of the universities in the basin.

9:15 Native American Tribal Roles in CRT Review

Paul Lumley, *Columbia River Inter-Tribal Fish Commission*

The Columbia Basin tribes were not consulted during the negotiation and implementation of the Columbia River Treaty and, as a result, ecosystem based functions are not a management consideration under the Treaty. To address this major shortcoming of the Treaty, the Columbia Basin tribes worked with the U.S. Entity to establish a tribal-state-federal Sovereign Participation Process to oversee the Columbia River Treaty 2014/2024 Review. The ultimate goal of the Sovereign Participation Process is to develop a regional, consensus based recommendation to the U.S. Department of State regarding the future of the Treaty. The Columbia Basin tribes are working to restore and enhance ecosystem-based functions, including the reestablishment of fish passage at all historic locations, as a third function under the Treaty, equal to hydropower operations and flood risk management.

9:45 Treaty Review in the U.S. and Canada

Matt Rea, *United States Army Corps of Engineers*;
Kathy Eichenberger, *British Columbia Ministry of Energy and Mines*

The Columbia River Treaty 2014/2024 review is a series of studies being undertaken by Bonneville Power Administration and the United States Army Corps of Engineers on behalf of the U.S. Entity, the body that implements the Treaty on behalf of the U.S. Government. The purpose of the Treaty Review is to conduct technical analyses necessary to understand whether it is in the best interest of the U.S. to continue, to notify Canada of intent to terminate the Treaty, or to seek modification or amendment of the Treaty after 2024. The Treaty Review, being conducted in collaboration with other regional sovereign interests and with stakeholders, will form the basis for a regionally-vetted recommendation to the U.S. Department of State. The studies are being conducted in three steps, or "iterations". Each iteration consists of computer simulations of alternative Columbia River reservoir operations based on different future Treaty scenarios. The first iteration, completed in July 2012, evaluated a "reference case and four alternatives with different possible future flood control operations under Treaty continuation and termination scenarios. This presentation will provide an update on the current status of the Treaty Review process,

with an emphasis on the recent iteration 1 study results and efforts to formulate and evaluate iteration 2 alternatives.

The Province of British Columbia is undertaking the review of the Columbia River Treaty leading to recommendations to the provincial government in September 2013. The presentation will summarize the review process in Canada and the studies that are being conducted. The public engagement process will be described along with key issues and interests from the Canadian basin residents heard to date. The importance of consultation with First Nations and preliminary interests will be highlighted. Finally, the presentation will explore preliminary perspectives on key issues emerging from the CRT review.

10:15 **Morning Break** (Lombard Room and Foyer)
Exhibit Tables

10:30 **Treaty Review in the U.S. and Canada, continued** (Lombard Room)

SESSION 2 (Lombard Room)
Moderator: Stan Miller, *Northwest Water Resources*

11:15 **Post-2024 Expectations for Tributary Headwaters Management**

Dr. John Tracy, *Idaho Water Resources Research Institute*

Management of river systems within the western United States entails the collaborative management of water resources infrastructure owned by private, local and federal entities, but regulated by a mixture of both state and federal agencies, with the cognizant regulatory agency dependent on the river ecosystem services being provided. Thus, management of large river systems is a complex process that necessitates the collaborative participation of a wide variety of interests, at multiple levels of government. The Columbia River Basin is no exception, with the added complexity of requiring an international treaty.

This talk focuses on how river operations in the Snake River Tributary could be potentially impacted by changes in the operation of Columbia River dams resulting from the impending changes to the flood management rules that are part of the Columbia River Treaty. In particular, a conceptual analysis is performed to predict how operations to large reservoirs in the Snake River watershed could be necessitated to provide flood protection for communities on the main stem of the Columbia River if changes in the operating rules of the treaty reservoirs occurred.

Dr. Michael Barber, State of Washington Water Research Center

Provisions for the construction of Libby Dam and the subsequent flooding of parts of Montana and British Columbia creating Lake Koocanusa are key elements of the Columbia River Treaty. A number of issues have emerged from the dam's construction. These include: flooding of agricultural land and wildlife habitat, alteration of the Kootenay River's flow regime downstream of the dam and water quality impacts. Dr. Barber will discuss some of these issues with an emphasis on how recent modeling work at WSU may help address them.

Lunch Program

12:15 **Lunch** (Tunstall Dining Room) provided for all conference registrants

12:30 **Announcement:** Molly Smith, Universities Consortium on Columbia River Governance Conference

12:45 **KEYNOTE ADDRESS: A World Prematurely Dammed - Improving on the CRT and Other Hydrological Anachronisms**

Robert W. Sandford, Canada Forum on Leadership for Water, Canada Water for Life Decade, and Western Watersheds Climate Research Collaborative

While international water treaties have been in existence for more than 600 years, exploding populations, growing water scarcity globally and eco-climatic change are testing all preconceptions about how such agreements need to be constructed in order to serve the common good and reduce the potential for conflict in periods of rapid and persistent change. The Columbia River Treaty is not the only major transboundary agreement presently under critical scrutiny. By learning from others, it may be possible to prevent the Columbia River Treaty from becoming yet another anachronism that dooms everyone living under its terms and conditions to remaining frozen in the space and time in which it was crafted.

1:30 **Break**

Unregulated surface water supply (in the Columbia River) at Bonneville will decrease an average of 14.3 (± 1.2)% between June and October by 2030, and increase an average of 17.5 (± 1.9 %) between November and May. *Columbia River Basin Long Term Water Supply and Demand Forecast, Ecology Publication 11-12-011*

Afternoon Program

SESSION 3: TREATY PERSPECTIVES PANEL (Lombard Room)

Moderator: Chris Pitre, *Golder Associates*

1:45 TREATY PERSPECTIVES PANEL

Fish, Wildlife and Recreation

Suzanne Skinner, *Center for Environmental Law & Policy*

At the time the Columbia River Treaty was implemented, little thought was given to fisheries impacts, as salmonids had already been extirpated above Grand Coulee, and no thought was given to the impacts on First Nations and United States Tribal interests. Consequently, the CRT's dual focus on hydropower and flood control further flattened the flows of the Columbia and further damaged the already struggling salmon runs, water quality, and the ecosystems of the Columbia basin.

The 1964 Treaty set a global standard for shared benefits in the management of the Columbia between the two nations. Times have changed. Tribal interests are finally being considered. In acknowledgement of those interests, and environmental concerns, the BPA and the United States Army Corps of Engineers have added restoration of ecosystem function to flood control and power as third purpose of the Treaty. But what does restoring the Columbia's ecosystem mean? Neither the BPA nor the Corps has a clear definition—yet, their recommendations will inform the position that the State Department takes in negotiations on the future of the CRT and the Columbia River basin.

A new treaty must attempt to compensate the loss to fish, wildlife and recreation that resulted from flattening the Columbia to maximize hydropower generation and flood control. To date, tweaks to CRT protocols have enabled the United States to provide much needed spill for endangered and threatened Columbia River salmon. To restore Columbia River salmonids, and ecosystem function in general, in the face of climate change, much more than tweaks will be required.

Social-Cultural Impacts in British Columbia

Eileen Delehanty Pearkes, author of *The Geography of Memory*

Storage reservoirs dominate the upper Columbia basin. Storing water for power and flood control is the primary role played by British Columbia under the Columbia River Treaty. What are the local impacts - both historical and contemporary - on the ecology and human culture north of the international boundary?

Hydro Power

Andrew Grassell, *Chelan PUD and Columbia River Treaty Power Group*

The Columbia Treaty Power Group provides a forum for 20-plus private and public electrical utilities, industry associations, and other entities that depend upon power produced by Columbia River generating plants to engage in the U.S. evaluation of whether to continue or terminate the Columbia River Treaty with Canada.

Local Government

Paul Jewell, *Kittitas County Commissioner and Columbia River County Commissioners Policy Advisory Group*

The Columbia River Counties Policy Advisory Group is a subgroup of the Washington State Association of Counties, and is composed of elected officials of eastern Washington who are interested in a strong and sustained water supply for the Columbia River basin and seek to broaden the dialogue around re-negotiation of the Columbia River Treaty to include water supply issues.

3:15 SESSION 3 Q&A

3:45 Afternoon Break (Lombard Room and Foyer)
Exhibit Tables

SESSION 4 (Lombard Room)
Moderator: Rachael Paschal Osborn,
Center for Environmental Law & Policy

4:00 CLIMATE CHANGE AND THE COLUMBIA RIVER TREATY

Deborah Harford, *Simon Fraser ACT*

BC is moving ahead with policy designed to address adaptation to climate change at both provincial and municipal levels of government. ACT is helping to develop policy approaches and identify opportunities that can further this process, in particular water governance. These developments will be a crucial factor in the upcoming deliberations around the Columbia River Treaty. ACT Executive Director Deborah Harford will present key elements of adaptation policy and provide current and projected examples of both climate impacts and measures that can help decision-makers respond.

Dr. Alan Hamlet, *University of Washington*

The Columbia Basin Climate Change Scenarios Project (CBCCCSP) was conceived as a comprehensive hydrologic database to support climate change planning, impacts assessment, and adaptation in the Pacific Northwest by a diverse user community with varying technical capacity over a wide range of spatial scales. The study has constructed a state-of-the-art, end-to-end data processing sequence from “raw” global climate model

(GCM) output to a suite of hydrologic modeling products which are served to the user community from a web-accessible database.

Key products from the study include summary data for about 300 river locations in the PNW, and monthly GIS products for 21 hydrologic variables over the entire study domain. Results from the study show profound changes in spring snowpack and fundamental shifts from snow and mixed-rain-and-snow to rain-dominant behavior across most of the domain. Associated shifts in streamflow timing from spring and summer to winter are also evident in basins with significant snow accumulation in winter. Potential evaporation increases over most of the PNW in summer due to rising temperatures, however actual evaporation is reduced in all but a few areas of the domain because evapotranspiration is mostly water limited in summer and summer precipitation decreases in the simulations. Simulated wide-spread increases in soil moisture recharge in fall and winter in areas with significant snow accumulation in winter (for the current climate) support hypotheses of increased landslide risk and sediment transport in winter in the future. Simulations of floods (Q100) and extreme low flows (7Q10) increase in intensity for most of the river sites included in the study. The largest increases in flooding are in mixed rain and snow basins whose current mid-winter temperatures are within a few degrees of freezing.

The CBCCSPP database has been a valuable resource which has dramatically reduced costs in a number of high-visibility studies in the Pacific Northwest and western U.S. focused on technical coordination and planning.

4:45

SESSION 4 Q&A

5:00 – 5:15

Good of the Order

6:00 – 10:00

BBQ Dinner at Springwood Ranch

See Page 33 for map, directions and other details. Please wear your name tag – it's your ticket in!

September 13 – The Columbia River Basin

7:00 am – 12:00 pm	Checkout for CWU dorms (Munson Hall). Return keys to Vantage room by noon. Secure storage for luggage is available
7:00 am – 12:00 pm	Parking and Meal Ticket Pickup (Vantage Room of Munson Hall)
7:00 am – 12:00 pm	Conference Registration (Sue Lombard Foyer)
7:00 am – 8:00 am	Breakfast (Tunstall Dining Room) provided for all conference registrants.

8:15 **SESSION 5: WATER AND RESTORATION** (Lombard Room)
 Moderator: Dustin Atchinson, CH2M HILL

8:20 **Restoration in the White Salmon and Klickitat Basins**

Bill Sharp, *Yakama Nation Fisheries*

Over the last several decades, Yakama Nation Fisheries has been actively engaged in fisheries and habitat restoration in the Klickitat and White Salmon basins. Habitat and fisheries assessments in the Klickitat Basin have been used to guide a prioritized effort to preserve and restore key habitats important for all salmonid life stages. Extensive work has been completed throughout the basin to remove passage barriers.

Under the Bonneville Power Administration-funded Yakima/Klickitat Fisheries Project (YKFP), the Yakama Nation Fisheries, along with WA Department of Fish and Wildlife, have led in the effort to reform hatchery practices in the Yakima and Klickitat basins. Research being conducted at the Cle Elum Research and Supplementation Facility is advancing hatchery practices throughout the Columbia Basin.

Within the last decade, similar fisheries assessments and tributary habitat restoration actions have been conducted in the White Salmon Basin by the Yakama Nation Fisheries and our regional partners. Efforts have focused on gathering baseline fish and habitat information and beginning to restore habitats in advance of salmon recolonization, post-Condit Dam removal.

As with all fisheries restoration work, it takes a village to raise a salmon. This talk will highlight a few of those recent milestones and the strength of partnerships that are so important in this field...and stream.

8:45 **Instream Flows for Restoration in the Columbia Basin**

Jason McCormick, *Washington Water Trust* ;
Jason Hatch, *Trout Unlimited-Washington Water Project*

Washington Water Trust (WWT) and Trout Unlimited-Washington Water Project (TU-WWP) are independent non-governmental organizations, utilizing market-based resources to work collaboratively and confidentially with individual landowners to provide instream flow restoration in tributaries. WWT and TU-WWP will provide an overview of what instream flow means to fish in the Columbia Basin, highlight different strategies, focus on key projects, and discuss achieving instream flow goals.

WWT and TU-WWP are designated organizations conducting instream flow restoration for the Columbia Basin Water Transactions Program (CBWTP) in Washington State. CBWTP supports instream flow work in Washington, Oregon, Idaho and Montana.

9:10 Restoration in Methow and Wenatchee Basins

Brandon Rogers, *Yakama Nation Fisheries*

The Yakama Nation is working in the Upper Columbia to restore salmon habitat in the Wenatchee, Entiat and Methow Rivers. Our work focuses mostly in areas of critical habitat for steelhead and spring Chinook. We focus our energy into reach-based restoration, working as intensively in a given segment of stream as possible before moving on. Projects are selected after intensive reach assessments have been conducted and this adds significantly to the probability of project success. Our projects strive to address limiting factors such as lack of channel complexity and need for increased side channel connection. During the summer of 2012 we have completed 5 such projects, and these will be discussed during the presentation.

9:35 Columbia River Instream Atlas Project

Jonathan Kohr, *Washington Department of Fish and Wildlife*

The Columbia River Instream Atlas (CRIA) is a compilation of existing data products and best professional knowledge that provides tools (workbooks, maps, reports, and GIS data) to aid in prioritizing stream reaches for flow restoration and augmentation. CRIA brings together data on fish status, distribution, and life history utilization with information on salmonid habitat and flow conditions. An important objective is to make salmonid species and habitat information available through interactive map products. CRIA provides detailed information for 189 stream reaches in eight fish- and flow-critical watersheds in eastern Washington: Okanogan, Methow, Wenatchee, Upper Yakima, Naches, Lower Yakima, Walla Walla, and Middle Snake Rivers.

As directed in 90.90 RCW, the Washington Department of Ecology Office of Columbia River (OCR) is developing a 2011 Columbia Basin Long-term Water Supply and Demand Forecast that includes information developed through CRIA. OCR will also use CRIA to aid project funding decisions and water rights determinations as called for in statute.

10:00 Morning Break (Lombard Room Foyer)

10:20 SESSION 6: FISH, AGRICULTURE, AND WATER RESOURCES
(Lombard Room)

Moderator: Beth Peterson, HDR

10:25 Yakima Integrated Water Resources Management Plan Panel

Urban Eberhart, Kittitas Reclamation District;

Dr. David Fast, Yakama Nation;

Michael Garrity, American Rivers;

Paul Jewell, Kittitas County Commissioner and Columbia River County Commissioners Policy Advisory Group

The Yakima Basin Integrated Water Resource Management Plan represents an unprecedented level of consensus among the Yakama Nation, major irrigation districts, state and federal fish and water resource agencies, local government, and numerous environmental groups. The Yakima Plan consists of seven elements intended to address the major problems facing fisheries, irrigated agriculture, and drinking water supply in the basin. Components of the package include: enhanced water conservation, surface water storage, fish habitat restoration including restoration of flow and fish passage in tributaries, water markets, fish passage at all five Yakima Basin Reservoirs, modification of existing structures and operations, and groundwater storage. The Yakima Plan panel will discuss individual and collective participation in this planning process.

11:05 Office of the Columbia River Projects

Derek Sandison, Office of the Columbia River

11:30 Columbia River Water Rights in Oregon

Ruben Ochoa, Oregon Water Resources Department

This presentation will include a review of several key developments, beginning in the early 1990's, that were instrumental in shaping Oregon's current approach to the appropriation of water from the Columbia River including Oregon's perspective on the 2014-2024 Columbia River Treaty Review, and Oregon's Columbia River-Umatilla Solutions Taskforce.

11:55 Aquatic Invasive Species Control

David Conlin, GeoEngineers;

Carson Keeler, Public Utility District No. 2 of Grant County, WA

Co-Authors: Ross Hendrick, Public Utility District No. 2 of Grant County,
John T. Monahan, GeoEngineers, and Terry McNabb, Aquatechnex™

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates the Wanapum and Priest Rapids hydroelectric dams on the mid-Columbia River in central Washington State. Known collectively as the Priest Rapids Hydroelectric Project (Project), these two dams are operated under the terms and conditions of a license from the Federal Energy Regulatory Commission (FERC). Grant PUD developed an Aquatic

Invasive Species Control and Prevention Plan (AISP), the first of its kind within the mid-Columbia River, to ensure compliance with the FERC license. The AISP includes education and monitoring activities designed to help manage, regulate, and potentially prevent introduction and spread of new and/or existing aquatic invasive species (AIS) within the Project.

Results from the first year of data collection indicate extensive distribution of AIS and confirmed the presence of one species of AIS not previously known to occur within the Priest Rapids Reservoir. Mapping results were also used to develop plans and permit applications for a targeted treatment of submergent AIS within The Cove, a public recreation facility near Wanapum Dam. The combined ASA and field assessment methods proved an accurate and efficient method for monitoring AIS within the mid-Columbia River.

Lunch Program

12:20 pm **Lunch** (Tunstall Dining Room) provided for all conference registrants

Washington Section Update: J. Scott Kindred, AWRA–Washington Section President

Outstanding Service Award: Stan Miller, AWRA–Washington Section Board Member

Afternoon Program

1:20 **SESSION 7: WATER RESOURCES MANAGEMENT** (Lombard Room)

Moderator: Carl Einberger, Golder Associates

1:25 **Hydro and Wind Power Issues**

Adam Price, United States Army Corps of Engineers

1:50 **Water Banking: Yakima and Dungeness Rivers**

Susan Adams, Washington Water Trust

As demands for surface and ground water in Washington increase to sustain residential growth, agriculture and industry, streams and aquifers become stressed--unable to support many aquatic and riparian species. Washington Water Trust (WWT) is a nonprofit organization that has been restoring stream flows in Washington state since 1998. Working cooperatively with irrigators, conservation districts, municipalities, agencies, tribes and other entities they use voluntary, market-based approaches to restore and conserve freshwater resources. Susan will describe restoration, mitigation and water

banking strategies that help to achieve a balance between agricultural production, sustainable economic development and environmental goals. Using examples from the Dungeness, Walla Walla and Kittitas, she will touch on design and implementation details of water transactions (lease, purchase, recharge, source substitution) that support water banking and water conservation.

**2:15 Model Development to Support Assessment of Flood Risk for the
Columbia Treaty Review**

Sara Marxen, *United States Army Corps of Engineers*

As part of the CRT 2014/2024 review, the USACE-NWD is currently developing a comprehensive, systems approach to evaluating the current and future flood risk in the Columbia Basin. This analysis will use the HEC-WAT (Watershed Analysis Tool) software which includes the FRM (Flood Risk Management) option currently under development at HEC.

This presentation will focus on the data and models that have been developed to better understand this system and how they are incorporated into HEC-WAT including hydrology of the entire basin, 2 reservoir models with 70+ reservoirs, 3,000 square miles of LiDAR, 1,600 miles of HEC-RAS models, fragility curves for 160 levee systems, and a 180,000 structure database to calculate flood consequences.

2:40 Hydrologic Sensitivity to Climate Change

Julie Vano, *University of Washington*

This presentation presents an approach to characterizing uncertainty in future water supply that examines the spatial character of streamflow changes to changing temperature and precipitation using sub-basin level (eight digit Hydrologic Unit Code scale, or cataloging unit) responses in the United States and similar sub-basin level (National Hydro Network Work Unit) in Canada. Within the Columbia River basin and coastal drainages, there are 226 of these watershed units, with an average area of 3000 km², and these watershed units have a great diversity of hydroclimatology, vegetation, soils, and topography. To better understand the spatially varying response of the Columbia River basin to future changes in temperature and precipitation, this work contrasts the range of hydrologic sensitivities across the watershed units with that of the Columbia River basin as a whole.

3:05 - 3:15 Closing Remarks

3:15 – 3:45 Afternoon Refreshments

A river is not just an amenity, it is a treasure.
Justice O.W. Holmes, *New Jersey v. New York*, 283 U.S. 336, 342 (1931)

SESSION SPEAKER BIOGRAPHIES

Susan Adams, Speaker

Susan Adams is the Executive Director of Washington Water Trust and has 25 years of experience in management and policy development for natural resource issues in private, public and nonprofit organizations. Her work has included regional water supply planning in the Portland metropolitan area, water acquisitions for environmental flows and implementing water banking/mitigation programs throughout Washington. She is a graduate of Michigan State University.

Dr. Michael Barber, Speaker

Dr. Michael Barber is the Director of the State of Washington Water Research Center and a Professor in the Department of Civil and Environmental Engineering at Washington State University in Pullman, Washington. He has over 25 years of experience in hydrology and water resources, working in academics and in private consulting. His responsibilities include administering the State Water Research Institute, teaching undergraduate and graduate classes, developing externally funded research proposals and budgets, mentoring faculty, advising and supervising undergraduate and graduate students, publishing and reviewing technical papers, and serving on graduate committees. He is currently working on investigation of climate change impacts on water quantity and quality, and groundwater modeling of aquifer storage and recovery for increasing water availability. As Director of the USGS-funded Water Research Center, Michael is very involved in multi-stakeholder projects where consensus building and information transfer are vital components of the research.

David Conlin, Speaker

David is a biologist with GeoEngineers, Inc. He has 10 years of experience working with protected species and habitats in Washington State and throughout the American West. David holds a Bachelor's degree in Biology from Colorado College, a Master's degree in Ecology and Evolutionary Biology from the University of Colorado – Boulder, and a Professional Wetland Scientist (PWS) certification from the Society of Wetland Scientists. He has broad experience in wetland science, fisheries science, animal/plant ecology, habitat restoration, and Geographic Information Systems (GIS). David's previous employment has included work with the U.S. Fish & Wildlife Service, National Marine Fisheries Service, the University of California's Sierra Nevada Aquatic Research Laboratory, the University of Minnesota's Natural Resources Research Institute, and the Rocky Mountain Field Institute. Since joining GeoEngineers in 2007, his professional focus has been assisting clients in the preparation of environmental documentation, species/habitat mapping and assessment, and restoration planning in support of environmental permitting, Endangered Species Act consultation, and aquatic resource management. During the course of this work, David has worked extensively on energy, transportation, development, and natural resource projects for public agencies and private-sector clients.

Professor Barbara Cosens, Speaker

Barbara is a Professor with the University of Idaho College of Law and a member of the faculty of the Waters of the West Program. She teaches Water Law, Water Policy, Law and Science, and leads a team taught course in Interdisciplinary Methods in Water Resources. She was a PI on development of the new Water Resources graduate degree program at UI which includes options for concurrent J.D./M.S. and J.D./Ph.D. degrees. She represents the University of Idaho on the Universities Consortium on Columbia River Governance. Her research interests include the integration of law and science in water resource management and dispute resolution, water management and resilience, and the recognition and settlement of Native American water rights.

Urban Eberhart, Speaker

Urban Eberhart is an orchardist and Board Member of the Kittitas Reclamation District, a large irrigation district with junior water rights in the Kittitas Valley. He has been working on proposals to increase water supply in the Yakima Basin for 30 years.

Kathy Eichenberger, Speaker

Kathy Eichenberger is the executive director of the Ministry of Energy and Mines' Columbia River Treaty Review Team, leading the Treaty review on behalf of the province of British Columbia. She is a river engineer by training and has worked for the Province since 1996. Her responsibilities include regulation of industrial and municipal activities, leading environmental assessments of major projects in BC, and managing regional environmental data collection and watershed restoration programs.

Dr. David Fast, Speaker

Dr. David Fast is Research Manager for the Yakima-Klickitat Fisheries Project for the Yakama Nation in Toppenish, Washington. Dr. Fast has developed and implemented research programs for restoration of spring and fall Chinook, coho, and steelhead in the Yakama and Klickitat basins. Dr. Fast holds a Bachelor of Science in Zoology from St. John's University, a Masters of Science in Marine Fisheries from the University of Puerto Rico, and a Ph.D. in Fisheries Science from the University of Washington.

Michael Garrity, Speaker

Michael Garrity is Washington State Conservation Director for American Rivers. He works on protecting and restoring the rivers and salmon of Washington state, with a particular focus on the Columbia and its tributaries. Garrity is the environmental stakeholder on the Yakima Basin Integrated Plan workgroup. He holds a B.A. in History from the University of Washington and a J.D. with Environmental Law specialization certificate from UC Berkeley School of Law (Boalt Hall). In his spare time, Garrity likes to ski, hike, kayak, and play guitar.

Andrew Grassell, Speaker

Andrew has worked in a variety of capacities since joining Chelan PUD in 1999. Since that time he has worked as a Fisheries Biologist responsible for R&D studies on fish survival at the Chelan's hydro-facilities. Results were used to assess the success of Chelan's fish passage programs in the context of meeting standards defined in the Habitat

Conservation Plans for Rocky Reach and Rock Island dams. He also worked as a Water Resource Program Manager where he was responsible for water resource development programs relating to Chelan PUD's fish hatchery needs. After receiving his MBA in 2009, Andrew worked as a Portfolio Risk Advisor where he was a primary participant in the development and implementation of Chelan PUD's risk management standard. He also conducted risk analysis and business case analysis for Chelan PUD's Energy Resources group. Andrew currently manages the Energy Development and Conservation Department at Chelan PUD. Duties include ensuring compliance with Washington State's Energy Independence Act conservation requirements while meeting internal financial targets. He also is the lead for Energy Resources business and strategic planning processes. Finally, he manages special projects such as Chelan PUD's Columbia River Treaty review process. Andrew holds a B.S. in Biology, from Linfield College and an MBA from Portland State University.

Dr. Alan Hamlet, Speaker

Dr. Alan F. Hamlet is a Research Associate Professor in the Department of Civil and Environmental Engineering at the University of Washington, with joint affiliation with the inter-disciplinary Climate Impacts Group. His research over the last 15 years has focused on the impacts of climate variability and change on rivers, ecosystems, and water resources systems in the western U.S., with a particular emphasis on the Columbia River basin in the Pacific Northwest.

Dr. Hamlet's interest in climate and water also extends to energy systems in the western U.S. He was the lead researcher for the energy chapter of the Washington State Climate Change Impacts Assessment completed by the Climate Impacts Group in 2009 and has published several papers on the impacts of climate on hydropower systems in the West.

Deborah Harford, Speaker

As executive director of the Adaptation to Climate Change Team (ACT), Deborah Harford is responsible for development of the initiative's vision and its unique partnerships with the public and private sectors, as well as overall coordination and management of the program. She also directs and produces ACT's policy recommendations for effective adaptation strategies at all levels of government, as well as communication and promotion of the program's outcomes. Through Deborah's efforts, ACT has created networks between local, national and international climate change research practitioners, NGOs, industry representatives, all levels of government, First Nations groups and local communities. Deborah's work with ACT has gained her national recognition as a resource for those seeking information on climate change adaptation and practical coping strategies.

Jason Hatch, Speaker

Jason began working for Trout Unlimited's Washington Water Project (TU) in January of 2011. He received a B.A. in Political Science from the University of California at Santa Barbara and a M.S. in Water Resource Policy and Management from Oregon State University where he examined the social impacts of small dam removal on the Sprague River, Klamath County, Oregon. He brings to TU more than 20 years of public interest experience, including work with the California League of California Voters, Friends of the

River and other organizations. For TU, he works with landowners and irrigation districts on instream flow projects utilizing Washington's Trust Water Rights Program. His work projects are primarily located in the Wenatchee, Entiat and Yakima basins. These projects include: fish barrier assessment, beaver reintroduction and identifying irrigation alternatives to protect more water instream in tributaries. He was raised in the Six Rivers region of northern California.

Paul Jewell, Speaker

Paul Jewell is from Ellensburg, Washington. He was elected in November 2008 as a County Commissioner in Kittitas County and is currently serving the fourth year of his first term. Prior to his election, Paul's career was spent entirely in the private sector business community. He spent over 15 years in the home furnishings industry and was a partner in a successful local furniture store which continues to operate today. He has experience in marketing and management, and also operates his own consulting business for small business marketing and advertising, On Point Consulting. He received his bachelor's degree in business administration from Central Washington University in 1996.

Paul serves as the primary lead on all water issues for the Kittitas County Board of Commissioners. He is also the Chairman of the Washington State Association of Counties Columbia River Policy Advisory Group.

Carson Keeler, Speaker

Carson Keeler (B.S.) is a Biologist III in the Department of Fish, Wildlife, and Water Quality at the Public Utility District No. 2 of Grant County, Washington (Grant PUD). Carson has been employed at Grant PUD for over six years. Carson oversees various programs at Grant PUD required under the Federal Energy Regulatory Commission's License to operate the Priest Rapids Hydroelectric Project including the fixed-site water quality monitoring program, aquatic invasive species control and prevention program, fish ladder water supply temperature monitoring program, and the short-term monitoring in shallow water habitats plan. Carson's range of roles and responsibilities at Grant PUD are varied but include assisting in the collection, analysis, and management of rare, threatened, and endangered plant and wildlife information and providing GIS support for the Natural Resources Division at Grant PUD. Carson also assists in the development of biological assessments, the permit review processes, and in project support and coordination for various fisheries and wildlife programs and studies.

Jonathan Kohr, Speaker

Jonathan joined the Water Team in May of 2004 and is a member of the team stationed in eastern Washington. He is involved in the Water Acquisition Program to restore instream flow in streams where water is a significant limiting factor to salmonid production. Jonathan monitors statewide trust water rights acquired through the Acquisition Program and/or the Irrigation Efficiencies Grant Program. His work involves developing a biological monitoring program to assess benefits to salmonid recovery and to monitor the effectiveness of various instream flow augmentations. Jonathan graduated in 1996 from Central Washington University with a B.S. in Biology with a fisheries ecology emphasis. He then started working for the National Marine Fisheries Service conducting salmonid

survival studies in Idaho and the Snake/Columbia River systems. He also worked in scientific technician positions with WDFW's Fish Program and the Northern Pikeminnow Sport Reward Fishery. He worked three years conducting redd/carcass surveys on the Yakima and Columbia Rivers. In 2001, Jonathan landed a biologist job working out of Yakima assessing fish densities and population compositions for the Yakima River Floodplain Mining study. The following year he was hired as the lead biologist in eastern Washington for the TAPPS (Technical Applications) stream passage and screening inventory crew. Jonathan performed inventories within the Okanogan, Methow, and Ahtanum Creek watersheds until being hired on the Water Science Team out of Yakima Washington.

Paul Lumley, Speaker

Baptist "Paul" Lumley is the Executive Director for the Columbia River Inter-Tribal Fish Commission (CRITFC) and a citizen of the Yakama Nation in central Washington State. Mr. Lumley returned to CRITFC after 5 years in Washington DC to begin his tenure as executive director on July 1, 2009. The CRITFC mission is to ensure a unified voice in the overall management of the fishery resources, and as managers, to protect reserved treaty rights through the exercise of inherent sovereign powers of the tribes. CRITFC's member tribes are the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon and the Nez Perce Tribe.

Mr. Lumley has an extensive history working with Northwest Tribes on salmon issues, particularly in the Columbia River Basin. He spent 17 years with the CRITFC working on biological issues relating to US v. Oregon and the Pacific Northwest Electric Power Planning and Conservation Act. He also assisted in fund raising and establishing a grant program for the four Columbia River treaty tribes.

Mr. Lumley received his Bachelor of Science degree in Mathematics from Western Washington University in 1986.

Sara Marxen, Speaker

Sara Marxen, P.E., currently works as a Hydraulic Engineer in the Water Management section of the Seattle District of the United States Army Corps of Engineers. In this position Sara is responsible for studying and managing the operations of reservoirs and river systems within the Seattle District. For approximately the past two years she has worked primarily on the project delivery team for the Columbia River Treaty Review studies becoming the Hydrology and Hydraulics technical lead in the last year. In this role she is responsible for implementing studies to investigate how operations of the Columbia River System may change after 2024 and how those changes can impact flood risk. Prior to working for the Corps, Sara worked for 8 years as a Senior Project Engineer in consulting on a variety of projects including integrated groundwater and surface water modeling, hydrologic investigations, reclaimed water, water supply studies, and GIS software development. She holds a M.S. in Civil Engineering from the University of Washington and an undergraduate degree from Ohio University.

Jason McCormick, Speaker

Jason D. McCormick is a native of eastern Washington with roots in the towns of Brewster, Tonasket, Yakima and Zillah. He joined the Washington Water Trust in 2008 and works from the Ellensburg office as a Project Manager. Prior to joining Washington Water Trust, Jason worked as a permit writer for the newly formed Office of Columbia River with Washington State Department of Ecology. Jason holds a B.A. in Geography and Land Studies from Central Washington University where he graduated Cum Laude.

Ruben Ochoa, Speaker

Mr. Ochoa attended Texas A&M University and the University of Texas School of Law. He served as Legislative Aide for several Texas State Senators. Prior to coming to Oregon to work for the Oregon Water Resources Department in late 2007 he served as the Manager of Legislative Affairs for the Texas Department of Economic Development, as legislative coordinator for the Texas Water Development Board (TWDB) Planning Division, and as TWDB coordinator for the development of the 2007 Texas State Water Plan.

Since 2008, Ochoa has worked in the Director's Office of the Oregon Water Resources Department as a Water Policy Analyst and Intergovernmental Relations coordinator. In these capacities, he serves as the Department's primary liaison with Oregon's nine federally recognized Tribes, as a policy/technical advisor for Oregon in the 2014-2024 Columbia River Treaty Review, and as a technical advisor in the Governor's Columbia River-Umatilla Solutions Taskforce.

Eileen Delehanty Pearkes, Speaker

Eileen Delehanty Pearkes explores landscape and the human imagination in her writing and public speaking, with a focus on the history of the upper Columbia River and its tributaries. *The Geography of Memory* uncovers the story of an unrecognized, trans-boundary First Nation of the upper Columbia in Canada, the Sinixt, or, Arrow Lakes Indians. In *River of Memory*, edited by William D. Layman, she imagines the upper Columbia prior to dams. She writes a column on the Canadian landscape and Columbia River history for *The North Columbia Monthly* and is currently completing a book on the upper Columbia River in Canada titled *A River Captured: Betrayal and the Politics of Power in the Columbia Basin*. As a result of her research, she offers wide-ranging knowledge of the social and cultural aspects of the Columbia River Treaty.

Born in the United States, educated at Stanford University and the University of British Columbia, Eileen has been a resident of Canada since 1985. Her personal biography, education and academic interests inform a perspective that is uniquely bi-national and passionately grounded in the mountainous place where she lives, Nelson, B.C.

Adam Price, Speaker

Adam Price has been a hydrologic engineer with the Seattle District of the United States Army Corps of Engineers since earning his Master's degree in Water Resources at the University of Washington in December of 2010. Before that round of academic work, he

taught elementary school in Bellevue, Washington; Providence, Rhode Island; and Quito, Ecuador. He lives in Seattle with his wife, daughter, dog, and 20,000 honeybees.

Matt Rea, Speaker

Mr. Rea is a Program Manager with the United States Army Corps of Engineers, Portland District, in Portland Oregon. He is currently the Corps' Manager of the of the Columbia River Treaty 2014/2024 Review Program. The Treaty Review is a series of studies intended to lead to a recommendation by September 2014 regarding the future of Treaty with Canada for Joint Development and Operation of the Columbia River. The Treaty Review is a joint effort of the Corps and Bonneville Power Administration being conducted on behalf of the United States Treaty Entity. As the Program Manager, Mr. Rea leads an interdisciplinary team representing the Corps' Portland, Seattle and Walla Walla District and the Northwestern Division office evaluating flood risk management opportunities and issues under the Treaty.

Mr. Rea has a B.S. in Forest Resource Management from Oregon State University (1979). He has been with the Corps for 32 years, the last two with Portland District and including other assignments with the Corps' Northwestern Division office and Headquarters in Washington D.C. For the majority of that time Mr. Rea worked as a planning project manager, conducting multiple purpose water resource studies throughout the Columbia River Basin. From 2000 to 2007 he served as the Willamette Basin Coordinator, involved in Corps' activities in that watershed, including Endangered Species Act Section 7 consultation and interagency coordination of reservoir system operations.

Brandon Rogers, Speaker

Brandon Rogers has been working on habitat restoration projects for the Yakama Nation Fisheries Program since 2001. He is particularly interested in instream restoration involving Large Woody Debris. He is a Bellingham, Washington native and has a B.A. in Physical Geography from Central Washington University. In his spare time he enjoys sportfishing for salmon throughout the Columbia Basin and along the west coast of Vancouver Island.

Robert Sandford, Keynote Speaker

Bob Sandford is the EPCOR Chair of the Canadian Partnership Initiative in support of United Nations "Water for Life" Decade. This national partnership initiative aims to inform the public on water issues and translate scientific research outcomes into language decision-makers can use to craft timely and meaningful public policy. Bob also sits on the Advisory Committee for the Rosenberg International Forum on Water Policy. In this capacity Bob works to bring broad international example to bear on Canadian water issues.

Bob is also the Director of the Western Watersheds Climate Research Collaborative and an associate of the Centre for Hydrology which is part of the Global Water Institute at the University of Saskatchewan. Bob is also a Fellow of the Biogeoscience Institute at the University of Calgary. He sits on the Advisory Board of Living Lakes Canada, the Canadian chapter of Living Lakes International and is also co-chair of the Forum for Leadership on Water (FLOW), a national water policy research group centered in Toronto. He is also a member of the Advisory Panel for the RBC Blue Water Project. In

2011, Bob was invited to be an advisor on water issues by the Interaction Council, a global public policy forum composed of more than twenty former Heads of State including Canadian Prime Minister Jean Chretien, U.S. President Bill Clinton and the former President of Mexico, Vincente Fox.

Bob's third book on water issues in Canada, *Restoring the Flow: Confronting the World's Water Woes*, was published by Rocky Mountain Books in the fall of 2009. His fourth book on water policy, *Ethical Water: Valuing What Really Matters*, was co-authored with Merrell-Ann Phare and was published by Rocky Mountain Books in the fall of 2011. Bob's next book, *Cold Matters: The State and Fate of Canada's Snow and Ice*, will be available in the fall of 2012. Bob lives with his family in Canmore, Alberta.

Derek Sandison, Speaker

Derek Sandison is Director of the State of Washington's Office of Columbia River, which oversees water supply development efforts within Washington's portion of the Columbia River Basin. He also represents the state of Washington on the Columbia River Treaty Sovereign Technical Team. He served the previous five years as Central Regional Director of the Washington State Department of Ecology. His 37 years of combined public and private sector professional experience include 14 years as the Senior Vice-President of a private consulting firm and 12 years in local government.

Bill Sharp, Speaker

Bill Sharp is a Research Scientist with the Yakama Nation Fisheries Program. He has been with the Yakama Nation for over 23 years. In his position he manages a team that is involved in habitat restoration, fisheries research/monitoring, and hatchery reform efforts in the Southern Ceded Lands of the Yakama Nation (Washington State tributaries flowing into the Columbia River between Bonneville and McNary Dams). Prior to coming to the Yakama Nation, Bill worked in the fisheries field throughout the Columbia Basin from the Idaho headwaters with Idaho Department of Fish and Game, to work with the United States Army Corps of Engineers evaluating mainstem passage at each mainstem dam, to conducting IFIM research with US Fish and Wildlife Service throughout Oregon and Washington.

Suzanne Skinner, Speaker

Suzanne Skinner recently joined the Center for Environmental Law & Policy (CELP) as its Executive Director. Prior to joining CELP, she served as the Civil Director of the Seattle City Attorney's Office, an ALJ for the (former) Environmental Hearings Office, an attorney for American Rivers, and an assistant US attorney in New York. She is a 1984 graduate of Northeastern University Law School.

Dr. John Tracy, Speaker

Dr. Tracy is Director of the Idaho Water Resources Research Institute at the University of Idaho. Dr. Tracy also served as the Vice President for Research at the University of Idaho in 2007 and 2008. He received his B.S. degree in Civil Engineering at Colorado State University in 1980, and his M.S. and Ph.D. degrees in Civil Engineering at the University of California at Davis in 1986 and 1989 respectively. He has held academic positions at

Kansas State University (Civil Engineering from 1989 to 1992), South Dakota State University (Civil Engineering from 1992 to 1996) and the Desert Research Institute (Hydrologic Sciences 1997 to 2004). Dr. Tracy is currently serves as a Board member for the American Water Resources Association and is the Executive Secretary/Treasurer for the National Institute of Water Resources. Dr. Tracy has worked on numerous research projects and authored or co-authored over 70 technical publications in the areas of watershed planning, watershed restoration, the development of modeling tools for environmental systems, the role of science in watershed management and the development of adaptive management systems.

Julie Vano, Speaker

Julie Vano is a Ph.D Candidate in the Department of Civil and Environmental Engineering at the University of Washington. She is working to assess climate change impacts on water resources in the Columbia and Colorado River basins. She was involved in The Washington State Climate Change Impacts Assessment report by the Climate Impacts Group, where she focused on impacts to water management in the Yakima River Basin and Puget Sound. Before coming to the University of Washington, she received her M.S. at the University of Wisconsin's Center for Sustainability and the Global Environment and was a Science and Policy Fellow at the National Academy of Sciences in Washington, DC.

Eventually, all things merge into one, and a river runs through it. The river was cut by the world's great flood and runs over rocks from the basement of time. On some of the rocks are timeless raindrops. Under the rocks are the words, and some of the words are theirs. I am haunted by waters.

Norman Maclean, A River Runs Through It

AWRA WASHINGTON SECTION LIST OF PAST PRESIDENTS

2011	Beth Peterson	1995	Jackie Hightower
2010	Felix Kristanovich	1994	Paul Korsmo
2009	Jamie Morin	1993	Peter Willing
2008	Jacque Klug	1992	Stan Miller
2007	Cleve Steward	1991	Rachel Friedman-Thomas
2006	Mona Thomason	1990	Joan Lee
2005	Tom Martin	1989	Bill Eckel
2004	Joe Mentor Jr.	1988	David Brown
2003	Anne Savery	1987	Alan Ward
2002	Stephen Hirschey	1986	Dale Anderson
2001	Fran Solomon	1984	George Wannamaker
2000	Pete Sturtevant	1982	Nancy Nelson
1999	Teresa Platin	1981	Chuck Mosher
1998	Adam Gravley	1980	Kris Kaufman
1997	Rod Sakrison	1979	Gary Minton
1996	Rod Sakrison		

Under the Treaty, the assured annual flood control procedures will end in 2024, whether or not the treaty is terminated, replaced by on-call flood control, in which the U.S. would ask Canada to store water after using available flood control space in U.S. reservoirs.

John Harrison, Information Officer, Northwest Power and Conservation Council

AWRA WASHINGTON SECTION LIST OF PAST CONFERENCES

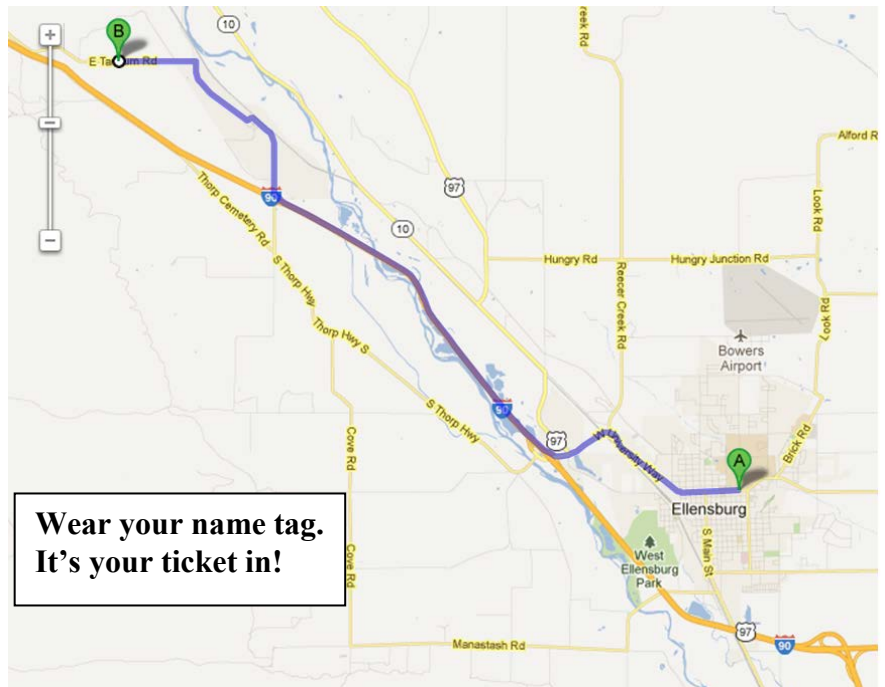
- 2011 A Perspective on Water Quality Issues Across Washington State
- 2010 Water Rights: Investing in 21st Century Water Management
- 2009 AWRA National Conference, hosted by WA-AWRA
- 2008 The Future of Water Storage in Washington State
- 2007 Transboundary Water Resources of Washington State and British Columbia
- 2006 Water Resource Disasters in Washington: Risk and Recovery
- 2005 AWRA National Conference, hosted by WA-AWRA
- 2004 The Impact of Climate Change on Pacific Northwest Water Resources
- 2003 Water's Woven Web: Land Use Planning and Water Resource Management in Washington
- 2002 Beyond Watershed Planning
- 2001 The Impact of Drought on Water Resources and Energy Management in the Northwest
- 2000 Water Marketing in Washington: Negotiating for a Future
- 1999 Impressions of 1999 State Water Legislation-Including ESA Update and Pending 4(d) Rules
- 1998 ESA, Economy, Salmon and Agriculture...Where is the Water?
- 1997 Balancing Instream Needs with Out-of-Stream Demands
- 1996 The Water 'Crisis'- Myth, Reality, and Opportunities
- 1995 Water Quality/Water Quantity: An Artificial Distinction
- 1994 Fluvial Geomorphology: What We've learned in 20 Years, and where do we go from here? Interactions: River Dynamics, Land Forms and Land Use.
- 1993 Good Science, Good Decisions: The Role of Technical Analysis in Water Policy
- 1992 Reconciling Water and Growth
- 1991 State Water Policy and Growth Management
- 1990 Construction and Streams, Lakes and Wetlands: Closing the Gap between Planning and Doing
- 1989 New Developments in Floodplain Management
- 1988 Hydrology and Erosion Aspects of Timberland-Urban Conversions
- 1987 Attaining Compliance: Realities of Water Quality Regulation
- 1986 Off-site Impacts of Eroding Soils
- 1984 Groundwater Protection in Washington State, Preventing Aquifer Contamination and Depletion
- 1983 Small Streams and Lakes in the Urbanizing Environment-Will They Survive? Washington and Idaho Lakes and Their Future
- 1981 Water Resources Implications for Small Hydro Power Generation.

All water has a perfect memory and is forever trying to get back to where it was.
Toni Morrison

BBQ & Reception Information

Dinner options include top sirloin, wild salmon or a vegetarian option. We will also serve beer and wine. Activities include horseshoes and mini golf on a lighted course as well as plenty of room to walk and explore. There is no set agenda other than the meal. This will be a great time to meet people and discuss the conference in a beautiful setting.

Carpooling from Ellensburg and back is encouraged. The drive takes approximately 20 minutes.



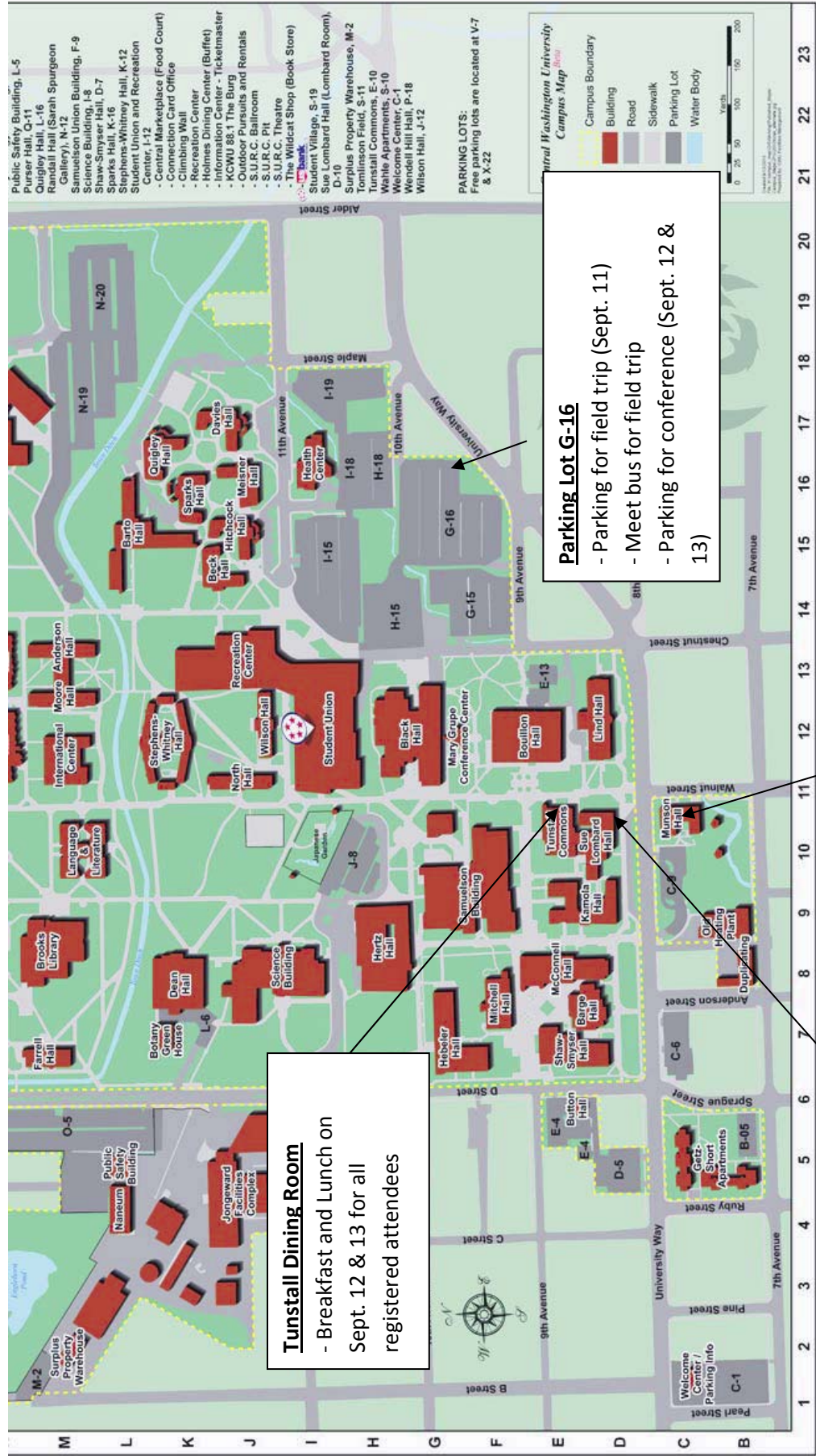
Directions from CWU to Springwood Ranch:

415 East Taneum Road, Thorp, WA 98946; 10 miles from the University

1. **Head west on E University Way (go 2.6 miles)**
2. **Merge onto I-90 W via the ramp to Seattle (go 4.9 miles)**
3. **Take exit 101 for Thorp Highway toward Thorp (go 0.2 miles)**
4. **Turn right onto S. Thorp Hwy (go 2.2 miles)**
5. **Turn left onto E Taneum Rd and the ranch will be on the right (go 1.0 mile)**
6. **Turn right at Springwood Ranch sign onto Springwood Ranch driveway (go 0.6 miles)**



Conference Location at Central Washington University - South End of Campus Map



Tunstall Dining Room
 - Breakfast and Lunch on Sept. 12 & 13 for all registered attendees

Parking Lot G-16
 - Parking for field trip (Sept. 11)
 - Meet bus for field trip
 - Parking for conference (Sept. 12 & 13)

Lombard Room
 - Conference Registration (Foyer)
 - Conference (Sept. 12 & 13)

Munson Hall (Vantage Room)
 - Check-in for dorm lodging
 - Pick up CWU meal tickets (all attendees)
 - Pick up CWU parking pass (all attendees)

- Public Safety Building, L-5
- Purser Hall, O-11
- Copley Hall, L-16
- Randall Hall (Sarah Spurgeon Gallery), N-12
- Samuelson Union Building, F-9
- Science Building, I-8
- Shaw-Smyser Hall, D-7
- Sparks Hall, K-16
- Stephens-Whitney Hall, K-12
- Student Union and Recreation Center, I-12
- Central Marketplace (Food Court)
- Conference Card Office
- Climbing Wall
- Recreation Center
- Holmes Dining Center (Buffet)
- Information Center - Ticketmaster
- KCWU 88.1 The Burg
- Outdoor Pursuits and Rentals
- S.U.R.C. Ballroom
- S.U.R.C. Pit
- The Wildcat Shop (Book Store)
- Student Village, S-19
- Surplus Property Warehouse, M-2
- Tomlinson Field, S-11
- Tunstall Commons, E-10
- Wahle Apartments, S-10
- Welcome Center, C-1
- Wendell Hill Hall, P-18
- Wilson Hall, J-12

PARKING LOTS:
 Free parking lots are located at V-7 & X-22

Central Washington University Campus Map

- Campus Boundary
- Building
- Road
- Sidewalk
- Parking Lot
- Water Body

Scale: 0 25 50 100 150 200 Yards

M 21 22 23
 L 18 19 20
 K 15 16 17
 J 12 13 14
 I 9 10 11
 H 6 7 8
 G 3 4 5
 F 1 2
 E
 D
 C
 B



WA-AWRA 2012 Annual Conference