



## **A Note From Our President**

Winter has finally (at least partially) arrived on the southern Oregon coast. We're getting some much-needed rain and a bit of a chilly stretch as we approach the midpoint of the academic year. I am into the dwindling months of my role as president of the section. We are currently at 83 members. That's better than this time last year, but not where we should be as a section. It doesn't match with the vibrant geology programs offered in Pacific Northwest colleges. If you know of people that would benefit from NAGT, be sure to make the pitch!

This summer in Wenatchee we will be having elections and we are primed for Vice President Cassie Strickland to take over the reins as section President! In addition, I have confirmation that Scott Linneman is willing to continue as Treasurer. With two extremely capable individuals at the helm, we continue to look for interested members to begin assuming new leadership roles. Obviously, we need someone to step forward and assume the responsibilities of VP, but we are also looking for individuals that are willing to contribute as State/Province Councilors. The councilors serve the important role of getting information regarding events taking place throughout the northwest to our newsletter editor. Additionally, they are the face of the section in generating relationships between current and potential members in our region. So, if you've been contemplating getting more involved but have been putting it off....now is the perfect time to step forward.

In the coming days I plan on getting paperwork in for the Annual Meeting in Wenatchee. Hard to believe we were last there a decade ago! Last time I followed Ralph & Cheryl Dawes by hosting the meeting in Coos Bay the following year. This time I look forward to seeing Wenatchee through new eyes and not worrying about how to host the following year! If you have questions about the Vice President position or on being a State Councilor, Cassie and I would be glad to discuss these with you. Hope to see all of you in June!

---- Ron

## **2014 Elections - How to Run/Where to Vote!**

*Submitted by: Cassie Strickland*

This year is an election year for the PNW Section. Positions open for election include: Vice-President, Treasurer/Secretary, Outstanding Earth Science Teachers Coordinators, Newsletter Editor, and State Councilors (2 per state).

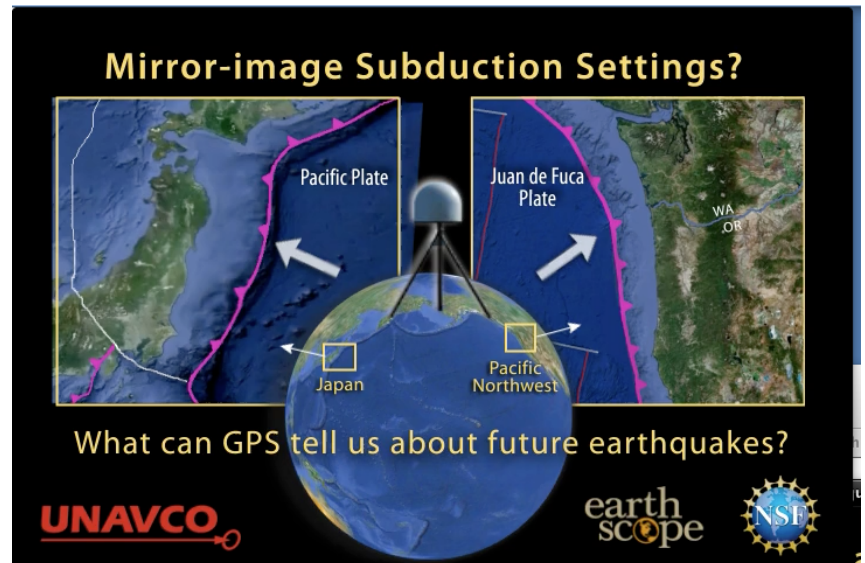
A heart-felt thank you goes to Ron Metzger, our outgoing President. The organization has benefited from and appreciates your dedication and we hope that you will continue to lend your expertise. Thanks also to Scott, Carla, Jodie, Lynda, Cathy, Michael, Shawn, Dean, Frank, Jeff, Beth, Brett and Tark! Your participation has helped to make our section a success and we hope you will accept a nomination again.

Interested in running for a position? To nominate yourself or someone else, please go to our section website at: [www.nagtpnw.com/Elections.html](http://www.nagtpnw.com/Elections.html). You will find a complete description of each position's responsibilities. The deadline for election nominations is April 15<sup>th</sup>. Voting online will begin April 16<sup>th</sup>. You can also vote in person at the Annual Meeting in Wenatchee on June 20<sup>th</sup>!

### Understanding Pacific Northwest (PNW) Megathrust Earthquake Potential

Submitted by: Jenda Johnson, Incorporated Research Institutes for Seismology

In light of the devastation in Sumatra 2004, Chile 2010, and Japan 2011, we in the Pacific Northwest (PNW) must be aware of our active continental-margin geologic setting and the potential for a subduction zone megathrust earthquake. Geologists know that such an event will happen here, but most citizens are either unaware of the hazard or simply hope it won't occur. Earth science educators at all levels must help their learners understand Cascadia regional tectonics and geologic hazards. However many K-12 teachers of Earth Science have little background in geology. And the forces, faults, and friction involved in subduction zone megathrust earthquakes include complex geologic processes that can be difficult to translate for novice learners.



Dr. Robert Butler<sup>1</sup> and Jenda Johnson<sup>2</sup> have created over 100 animations using clear images of earthquake and seismological processes. These animations both assist teachers in their own learning and also become educational resources for their classroom teaching. Many animations were created in response to questions from teachers at earthquake and tsunami education workshops held in the PNW over the past eight years ([wordpress.up.edu/totle/](http://wordpress.up.edu/totle/) & [ceetep.oregonstate.edu](http://ceetep.oregonstate.edu)).

There is an ancient Japanese proverb that says, “*The most recent disaster fades from memory just before the next one strikes.*” The message is: If it has happened before, it will happen again. With a concerted effort across the Earth-science education spectrum, we can help PNW citizens become aware of and prepare for the next great Cascadia megathrust earthquake.

Here are three animations that are specific to the Northwest, and below them is a link to the entire collection.

#### ***Orphan Tsunami—Evidence for the Great PNW earthquake of 1700***

[www.iris.edu/hq/programs/education\\_and\\_outreach/animations/22](http://www.iris.edu/hq/programs/education_and_outreach/animations/22)

#### ***GPS - Understanding Future Earthquakes in the PNW***

[www.iris.edu/hq/programs/education\\_and\\_outreach/animations/29](http://www.iris.edu/hq/programs/education_and_outreach/animations/29)

#### ***Earthquake Early Warning—Implications for the PNW***

[www.iris.edu/hq/programs/education\\_and\\_outreach/animations/32](http://www.iris.edu/hq/programs/education_and_outreach/animations/32)

The entire collection of animations on diverse Earth processes can be found on IRIS' Animations page: [www.iris.edu/hq/programs/education\\_and\\_outreach/animations](http://www.iris.edu/hq/programs/education_and_outreach/animations) and on YouTube: [www.youtube.com/playlist?list=PL8FDF28B8FD0C2E56](http://www.youtube.com/playlist?list=PL8FDF28B8FD0C2E56)

<sup>1</sup> Geophysicist, University of Portland (mailto:[butler@up.edu](mailto:butler@up.edu))

<sup>2</sup> Geologist/ animator for Incorporated Research Institutes for Seismology (mailto:[jendaj@gmail.com](mailto:jendaj@gmail.com))



**Pacific Northwest Section  
2014 Summer Conference  
Wenatchee Valley College  
June 18 - 22, 2014**

The tradition of annual field conferences for the PNW Section of NAGT continues this year in Wenatchee in the center of the state of Washington. Field trips will take advantage of the diverse array of geology in the area, from the Cascade Mountains to the Columbia Plateau and from accreted terranes to glacial and ice-age flood landforms. The conference day will feature a broad array of contributions from researchers and geoscience educators of all type.

## Conference Schedule

- Wednesday, June 18: Field Trip – Blewett Pass and Ingalls Ophiolite
- Thursday, June 19: Field Trip – Periglacial Geology of the Wenatchee Valley
- Friday, June 20: Conference Day at Wenatchee Valley College Dinner with guest speaker
- Saturday, June 21: Field Trip – Glacial Geology of Lake Chelan Area Dinner at private residence in Trinidad overlooking West Bar
- Sunday, June 22: Field Trip – Ice-Age Floods and Flood Basalts of the Soap Lake to Odessa Area

## Call for Abstracts

2014 Summer Conference  
Wenatchee Valley College

Conference Day - Friday, June 20, 2014  
Deadline for abstracts - May 16, 2014

If you would like to present a talk (20 minutes) or poster (geology research, undergraduate research, teaching techniques, etc.) submit your abstract to Ralph Dawes at [rdawes@wvc.edu](mailto:rdawes@wvc.edu). Some invited talks may be given 30 minutes for oral presentation. Please include “NAGT Conference Abstract” in the subject heading of your email.

Make sure that your abstract includes:

- Whether an oral presentation or poster will be submitted
- Title
- Author(s) name, affiliation, and contact email addresses
- Abstract length 1 full page (8.5 x 11”) in Times Roman, 12-point font. You may include legible line diagrams, graphs or tables. Must maintain at least 1.0” margin on all four sides.
- Deadline - May 16, 2014

*Due to the limited amount of time during conference day, acceptance for oral presentations will be based on first submitted, first granted basis. If time slots for oral presentations fill before the deadline date, you'll be contacted in regards to a poster option.*

## Conference Day – Friday, June 20, 2014

### Featured Speaker: Dave Tucker, Western Washington University

Dave Tucker is a research associate in the Geology Department of Western Washington University is a founder and board member of the nonprofit Mount Baker Volcano Research Center ([mbvrc.wordpress.com](http://mbvrc.wordpress.com)). He also runs the Northwest Geology Field Trips blog ([nwgeology.wordpress.com/](http://nwgeology.wordpress.com/)) and leads field trips coordinated via the blog. He is author of *Geology Underfoot in Western Washington* (Mountain Press) in bookstores this coming Autumn 2014.

Dave will be telling us how his blogging, field tripping, teaching, and geology research have come together in the writing of his new book.

## Schedule

Check-in, talks, posters, and coffee breaks at Campus Theater  
(northeast end of Wells Hall, Building C on Campus Map)

8:00 am	Conference Check-in
8:30 am	Talk Session 1
10:00 am	Coffee Break
10:20 am	Talk Session 2
12:00 pm	Lunch in WVC Café
1:00 pm	Poster Session
1:30 pm	Talk Session 3
3:00 pm	Coffee Break
3:20 pm	Talk Session 4
4:30 pm	NAGT Business Meeting

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6:00 pm	Pre-dinner no-host bar in WVC Café
6:30 pm	Dinner in WVC Café
7:30 pm	Dessert and Evening Talk by Dave Tucker

### Need Information about Hotels? Camping? Directions to Wenatchee Valley College or a Campus Map?

There is lots of information about hotels and camping available at the conference. In addition, you can get directions to campus or print a campus map to guide your path to the correct door that day. Please visit the 2014 Annual Conference Website:

[www.wvc.edu/directory/departments/earthsciences/](http://www.wvc.edu/directory/departments/earthsciences/)



# National Association of Geoscience Teachers

National Association of Geoscience Teachers - Pacific Northwest Section  
2014 Summer Conference - Wenatchee Valley College June 18-22, 2014

## Field Trips

*The weather in late June in Wenatchee is usually hot and sunny, with the rare possibility of thunderstorms. Be prepared for heat and sun with appropriate clothing, hats with brims, sunscreen, and bottles of water. We will occasionally traverse rocky, dusty, and brushy ground, and go up and down moderately steep slopes. Wear appropriate footwear. Lunches, including beverages, will be provided.*

*All field trips depart from the Smith Gymnasium parking lot at 8 AM. Arrive well before 8:00 to get your seat and be prepared to depart on time.*

**Wednesday, June 18**

**Blewett Pass and Ingalls Ophiolite**

**Trip leaders: Jeff Tepper and Ralph Dawes**

This field trip looks closely at several rock types of the Triassic Ingalls ophiolite, the Eocene Swauk formation intruded by basaltic dikes of the Teanaway formation, and thick beds of fluvial sandstone from formations younger than the Teanaway. We will examine a thick, diabasic sill of the Teanaway formation; a monolithologic diamictite of the Swauk formation that may represent a long-runout avalanche shed from the rapidly uplifted Mount Stuart batholith during fast-moving tectonic structural development of the area in the Eocene epoch; and the Camas Land sill, which has been proposed to be an intrusion of Columbia River Basalt that invaded down into beds of Eocene arkose.



**Thursday, June 19**

**Periglacial Geology of the Wenatchee Valley**

**Trip leaders: Nick Zentner and Ralph Dawes**

The Wenatchee Valley and the Columbia River Valley nearby, feature slopes planted in apple, pear, and cherry orchards, and vineyards. Most of the arable land is on depositional landforms from late Pleistocene megafloods along with Holocene alluvial fans and stream terraces representing Quaternary evolution of the Wenatchee River floodplain.

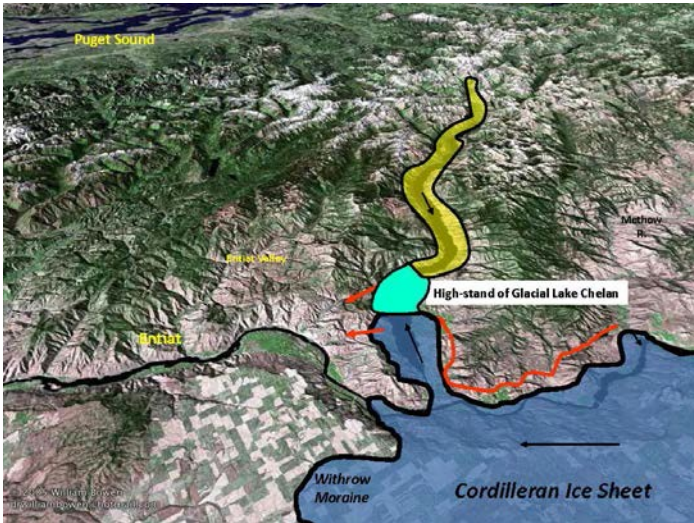


Underlying the fruits and Quaternary sediments are beds of Eocene sandstone that add up to miles of stratigraphic thickness, juxtaposed against a terrane of metamorphic and plutonic rock along a major fault. We will compare flood-transported boulders up to nearly 10 meters long on the valley floor with smaller, iceberg-rafted boulders higher up on the valley sides, look for layers of clay and silt that may have accumulated in a periglacial lake, and see if we can agree that there are also rhythmites deposited by repeated Late Pleistocene megafloods. We will also look at the Swakane Biotite Gneiss, an accreted terrane with an unclear age and origin that contains zircons with cores over a billion years old.

**Saturday, June 21**

**Glacial Geology of Lake Chelan Area**

**Trip leaders: Jon Reidel, Brent Cunderla, and Ralph Dawes**



The Lake Chelan basin results from a combination of mountain building processes in the deep crust, uplift and erosion of the Cascades, and a combination of alpine glaciation and continental ice sheet glaciation. On this field trip we will examine the features these processes created in the southern end of the basin.

The Cordilleran ice sheet sent tongues of ice into the lake from opposite ends at least once, and the glaciation scoured the bedrock bottom of the basin down below sea level. Geomorphic features around the southern end of Lake Chelan include water gaps from temporary lake outlets, kame terraces recording successive

stages of glacial recession, erratic boulders of Columbia River Basalt brought from the Columbia Plateau by the ice sheet, kettles, and sedimentary beds recording a higher stand of Lake Chelan when it was glacially dammed.

The geology and climatology of Lake Chelan led it to be officially designated an American Viticultural Area by the USDA, a wine-growing zone with unique attributes to its terroir. Our consideration of the wine and terroir will include a stop at a winery with the option to taste and buy some wine and a discussion on wine and soil from one of the wine-makers.

**Sunday, June 22**

**Ice-Age Floods and Flood Basalts of the Soap Lake to Odessa Area**

**Trip leaders: Karl Lillquist and Jack Powell**

This field trip starts in a basin that received megaflood discharges triggered by Pleistocene glaciation and channeled via Grand Coulee and Crab Creek. J Harlan Bretz was drawn back to the geomorphic puzzles in this area during his return to the Channeled Scablands late in his career. We will go on to examine Columbia River Basalt flows in light of the latest thinking about how the magma originated, erupted, flowed, and cooled. A short side trip will visit a lake that recently dried up due either to climate change, groundwater mining, or both. The field trip will culminate with an examination of two sets of Odessa ring dikes, which are self-intrusive features of Columbia River Basalt with no consensus on their exact origin; similar ring dikes have been seen on Mars.





# National Association of Geoscience Teachers

## 2014 Summer Conference Registration National Association of Geoscience Teachers Pacific Northwest Section Early Registration Deadline is May 16<sup>th</sup>

NAME: \_\_\_\_\_  
 STREET ADDRESS: \_\_\_\_\_  
 CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_  
 PHONE NUMBER: \_\_\_\_\_  
 E-MAIL: \_\_\_\_\_ NAGT Member? YES/NO \_\_\_\_\_  
 NAME & AFFILIATION (for name tag): \_\_\_\_\_

		After May 15 <sup>th</sup>	Students
<b>EVENTS</b>			
<b>June 18</b> Field Trip – Geology of Blewett Pass, Ingalls ophiolite Includes transportation, guidebook, and lunch	Fee = \$30 _____	\$40 _____	\$25 _____
<b>June 19</b> Field Trip – Geology of Wenatchee Valley Includes transportation, guidebook, and lunch.	Fee = \$30 _____	\$40 _____	\$25 _____
<b>June 20</b> Conference Day @ @WVC with evening banquet/speaker. Includes abstracts, coffee breaks, lunch, evening banquet (no host bar) Extra people for evening event. <b>Fee = \$20 each</b> _____	Fee = \$30 _____	\$40 _____	\$25 _____
<b>June 21</b> Field Trip – Geology of Lake Chelan Includes transportation, field guide, and lunch Optional dinner at private residence overlooking giant current ripples of West Bar <b>Fee = \$20 each</b> _____	Fee = \$30 _____	\$40 _____	\$25 _____
<b>June 22</b> Field Trip – Geology of Upper Crab Creek, Odessa area Includes transportation, field guide, and lunch	Fee = \$30 _____	\$40 _____	\$25 _____

**TOTAL AMOUNT ENCLOSED \$** \_\_\_\_\_

Please **make checks payable to** Wenatchee Valley College. If you wish to pay by credit card, email me at [rdawes@wvc.edu](mailto:rdawes@wvc.edu) for information about credit card payment.

Mail check and registration form to:  
Ralph Dawes  
Wenatchee Valley College  
1300 Fifth Street  
Wenatchee, WA 98801

## OREGON

### Ness of Brodgar Archaeological Field School

*Submitted by: Scott Pike, Willamette University*

Willamette University has just a few spots remaining for its 4-week archaeology field school in one of the world's premier archaeology projects in The Heart of Neolithic Orkney (a UNESCO World Heritage Site). Through Willamette's exclusive relationship with the University of the Highlands and Islands, students will work with the Orkney Research Centre for Archaeology and Orkney College as they unearth a unique and immense Neolithic ritual complex on the Ness of Brodgar. This award winning and internationally recognized excavation is redefining our understanding of the Neolithic world. The field school provides intensive, on-site training in archaeological methods and techniques and emphasizes a holistic approach to archaeological inquiry. In addition to daily instruction on excavation theory, technique and recovery, course lectures and fieldwork will emphasize a variety of topics including topographical and geophysical survey techniques, stratigraphy, ceramic typology, geomorphology, paleobotany, and the archaeology and geoarchaeology of the Orkney Islands. Visits to regional archaeological sites, museums and geologic features give students a broad cultural, physical, and historical background of the region. The Willamette field school is the only opportunity for American students to participate in this world-class excavation.

Information regarding the field school can be found at [www.willamette.edu/dept/oie/postsessions/scotland.html](http://www.willamette.edu/dept/oie/postsessions/scotland.html). Note that the non-Willamette University deadline for applications is March 14. Students seeking more information are urged to contact Prof. Scott Pike at [spike@willamette.edu](mailto:spike@willamette.edu). Applications will be reviewed as they are received.

### Geology Lecture Series at SWOCC, Coos Bay

*Submitted by: Ron Metzger, Southwestern Oregon Community College*

In case you're on the Oregon Coast-Join the Geology lecture series at SWOCC in Coos Bay, or view via LiveStream at the college website: [www.socc.edu](http://www.socc.edu). Or check out archived talks (including Pat Pringle) from the SWOCC geology website: [www.socc.edu/faculty/rmetzger/pgs/lecture-series/index.shtml](http://www.socc.edu/faculty/rmetzger/pgs/lecture-series/index.shtml).

**Saturday, March 1, 2014 at 7:00 pm**

**Dr. Peter Clark**

Oregon State University

"The IPCC Assessment of Future Sea Level Rise"

**Saturday, May 17, 2014 at 7:00 pm**

**Dr. Giora Proskurowski**

University of Washington

"Plastic in the Global Ocean"

**Saturday, June 7, 2014 at 7:00 pm**

**Dr. Gregory Retallack**

University of Oregon

"Precambrian Life on Land"

### IDQHO

*Submitted by Shawn Willsey, College of Southern Idaho*

**Snake River Plain Workshop: Late Cenozoic to Recent Geologic and Biotic History of the Snake River**

Dates: March 24-26, 2014

Location: Red Lion Hotel, Pocatello, Idaho

Website: [geology.isu.edu/SnakeRiver/](http://geology.isu.edu/SnakeRiver/)



## **WASHINGTON**

### **Earthquake-Tsunami Science & Preparedness Workshops for Coastal Educators**

*Submitted by: Robert J. Lillie, Oregon State University*

Cascadia EarthScope Earthquake and Tsunami Education Program (CEETEP) is a professional development program for Earth science, natural history, and preparedness educations in Oregon and Washington. CEETEP trains K-12 teachers, park and museum interpreters, and emergency management educators on plate tectonics and community response to coastal hazards. The workshops are free!

The 2014 workshops: Learning to tell the “Beauty and the Beast” story of the Pacific Northwest -- will be held Aug 11-14 in Aberdeen, WA and Oct. 10-13 in Forks, WA. Additional workshops in 2015 will focus on the southern Oregon coast.

Detailed information at: <http://ceetep.oregonstate.edu>.

## **CALLING FOR HOSTS FOR PNW NAGT CONFERENCE GREATER SEATTLE AREA OR ALASKA NEEDED!**



The PNW NAGT hosts one major event each year: the Annual Field Conference. This conference includes multiple regional field trips and a day of talks/workshops, and is the main outreach endeavor for our section.

The conference however, really is a product of our host institution. Each year the meeting is planned, executed and hosted by a volunteer or team of volunteers, and then helped as needed by our section officers.

We have hosts for 2015 (Camosun College, British Columbia), 2016 (Spokane CC – Hell’s Canyon Field-based meeting), 2017 (Craters of the Moon National Park, Arco, Idaho). We still need a 2018 volunteer, preferable in 1) the greater Seattle area or 2) Alaska. If you would like to host (or for more information), please email [cstrickland@columbiabasin.edu](mailto:cstrickland@columbiabasin.edu).

If you have yet to attend one of our fabulously entertaining and educational conferences, please try and make Wenatchee 2014.

“Invigorating”, “fun”, “learned so much”, “great time”, “fantastic”, “best conference of the year” – are all adjectives/phrases used by attendees to describe our previous meetings. Don’t miss out on another one!

### President

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### NAGT President (national)

Susan Buhr  
Environmental Sciences  
University of Colorado at Boulder

Check Out our section on-line:

Facebook:

[www.facebook.com/groups/150216048427579/](http://www.facebook.com/groups/150216048427579/)

Website:

[www.nagtpnw.org](http://www.nagtpnw.org)

## Outstanding Earth Science Teacher Award Nominations for K-12 due by March 15th!

"OEST" awards recognize teachers that have worked hard to instill & foster a love of all the Earth Sciences. To be eligible, you must be a K-12 educator who covers a significant amount of earth science material, including any combination of geology, geography, oceanography, geomorphology and hydrology.

Each year, the PNW NAGT presents 6 winners (one from each state/province in our section) with a host of prizes. In addition, one of our exceptional state winners is also chosen as the 'overall' Sectional winner.

More information on the award is located at our website: <http://www.nagtpnw.org/Grants---Awards.html> or contact **Jody Harnden** or **Lynda Sanders** (see Officers contact page). Nominations are accepted at the website. Self-nominations are accepted!