For five days this August, eighteen middle school girls with four high school mentors from Oregon and Washington explored and investigated the geology of Mount St. Helens. A group of female scientists and educators from the U.S. Geological Survey (USGS) Cascades Volcano Observatory, Mount St. Helens Institute, UNAVCO, local middle schools, and several universities led the girls in their exploration of the volcanic landscape and field-based science research.

Continued on page 3
Roche Harbor Homestead Field School & Upcoming Volunteer Archaeology Opportunity

By
Brandy Rinck
AWG – PNW Vice President

On August 22-24, 2015, Geoarchaeologist Brandy Rinck volunteered at the Roche Harbor Homestead Field School where 12 archaeology students investigated the historic Smith Homestead near English Camp. The Field School provided survey and excavation experience for students that hope to have careers in archaeology or related fields. The project was a community collaboration led by Dr. Amanda Taylor of Pacific Lutheran University and Archaeologist Jack Johnson of the Burke Museum. Sponsors included Roche Harbor Resort, Roche Harbor Water Systems, and Saltchuk. The group photograph, taken by Brandy, shows most of the field crew bookended by Amanda and Jack (Photo 1). Brandy is shown in the next image at a shovel probe with the daughter of a local San Juan Island resident (Photo 2). If this project sounds interesting and you would like to learn more about Puget Sound archaeology there is an opportunity to volunteer your time at an investigation of the Hori Bathhouse (built in 1930) at Neely Mansion near Auburn on September 26 (10 AM – 4 PM). Contact Brandy at brinck@swca.com for additional details.

Archaeology Volunteer Opportunity

Hori Bathhouse @ Neely Mansion
Auburn, WA
Sept. 26, 2015 (10 am to 4 pm)

Contact Brandy Rinck:
brinck@swca.com

Photo 1. Roche Harbor Homestead Field School Participants. Photo by Brandy Rinck.

Photo 2. Brandy Rinck and Joss Anderson in shovel probe. Photo by Phoebe Anderson.
The GeoGirls enjoyed spectacular views of the crater and lava dome as they hiked on the Pumice Plain to their field site, Photo credit: Sonja Melander, Mount St. Helens Institute

GeoGirls Rock Mount St. Helens (continued from page 1)

The 2015 pilot program of GeoGirls was created by Kate Allstadt, a graduate of University of Washington (UW), now a Research Geophysicist with the USGS. GeoGirls was conceived and partially funded as the outreach component of her National Science Foundation Postdoctoral Fellowship at the USGS. The original plan was a short day camp with a field trip, but upon partnering with the Mount St. Helens Institute and receiving additional funding, it quickly grew into a multi-day, overnight, immersive geology and technology experience. GeoGirls is the nation’s only program that gives teenage girls the opportunity to explore the science of volcanoes through hands-on experience with cutting-edge technology, field expeditions, and personal interaction with female geoscientists.

On the second day of the program, the GeoGirls trekked over 9 miles on the Pumice Plain to decipher and interpret volcanic deposits from the 1980 eruption and the smaller eruptions that followed. To do so, they applied their knowledge from the first day of the program about stratigraphy and how to identify deposits from different types of volcanic flows. In the field, they studied the deposits both above and below ground, gathering information from outcrops and imaging the subsurface using Ground Penetrating Radar.

Continued on Page 6
Remembrance of Grant Knadle

By Marcia Knadle
AWG-PNW Past President

My dad, Grant Knadle, passed away peacefully on Sept. 6, 2015 at the age of 92 after a long battle with heart disease. Normally, the passing of the parent of an AWG member wouldn’t be of particular interest to the chapter, but my dad attended at least three chapter field trips over the years, so several of our members have met him at one time or another. The most recent trip he attended was the June 2012 trip to tour the City of Seattle’s Cedar River Watershed, where he worked for nearly 30 years (and offered quite a bit of additional commentary!). My dad also attended a chapter hiking trip to look for fossils near Tatie Peak south of Harts Pass near Mazama and a chapter trip to the Ellensburg area, both back in the 1990s.

When I took my first geology course at Green River Community College in fall of my sophomore year, I was planning to major in math and German. However, by halfway through the course I decided to major in geology because I suddenly couldn’t imagine myself doing anything else. When I told my dad, he just sighed – not because he had any doubt in my abilities, but because back in 1972, male-dominated fields were still very difficult for women, and he couldn’t see how I could make a living at geology. Despite his misgivings, he supported my education through my BS at the University of Puget Sound and, thanks to the women’s movement, by the time I was done with my MS, many of the barriers for women in geology were coming down. It turned out to be a much better career choice than he could have imagined when I started my studies.

Continued on Page 5
Grant Knadle, Alan, and Pat Reed enjoying the “stenkusten” (“the stone coast” – successive strand lines formed by rising land levels due to post-glacial isostatic rebound) on Fårö, Sweden in 2009.

Remembrance of Grant Knadle (continued from page 5)

Before he died, I did manage to thank my dad for his support, both financial and moral, of my geologic education. Besides supporting me financially through my BS degree, he came out to Montana to help me with field mapping for my Masters thesis. It was wonderful having a very active father who loved to travel and hike and look at rocks with my sister (who also studied geology) and me when he was younger. In his later years, we took several trips to the Baltic island of Gotland in Sweden where, besides visiting relatives, we spent many happy hours beachcombing for fossils weathering out of the Silurian limestone cliffs. In 2009, we even managed to meet up with Pat Reed (our chapter Scholarship Committee Chair) and her husband Alan to tour the island of Fårö, just off the north end of Gotland.

Marcia Knadle
AWG-PNW Past President
Out on the Pumice Plain, the GeoGirls gathered and prepared samples to compare the different types of particles in deposits from the 1980 eruption and those that came after. They also made observations of the various signs of life returning, such as small fish in the streams. Photo credit: Sonja Melander, Mount St. Helens Institute

GeoGirls Rock Mount St. Helens (continued from page 3)

In small research groups led by volunteer scientists, the eager budding scientists learned geologic field techniques and technologies in real-world projects which included: correlating and mapping airfall deposits from past eruptions, a study of ecological succession in the volcanic blast zone, Global Positioning System (GPS) measurements of volcano deformation, building 3D models of volcanic features using photographs, and imaging rapidly eroding stream channels using lasers (LiDAR), a study of the story written in the sediments and water quality in lakes created by the 1980 eruption, and measuring ground vibrations from small volcanic earthquakes and rockfalls, and even counting passing cars on the road to Johnston Ridge Observatory using seismometers.

Continued on Page 8

Share Pacific NW Geology!

Invite your friends to join AWG-PNW for field trips, talks, and adventure!

Click “Join AWG-PNW” on upper left of website page: http://www.awg-ps.org/

It’s just

- $30/year for a regular membership
- $15/year for a student membership, and
- $60/year for a sustaining membership

Members gain wonderful opportunities for geoscience and friendship. Also there are fabulous lectures and get-togethers, and great field trips!
Remote Sensing and Mechanical Archaeological Excavation at Washington Portland Cement Company Facility

By
Brandy Rinck
AWG – PNW Vice President

In March of 2015, Brandy Rinck presented a poster about the Washington Portland Cement Company (WPCC) at the Northwest Anthropological Association Conference in Eugene, OR. The WPCC was a cement manufacturing facility that operated at what is now Puget Sound Energy’s (PSE) Lower Baker Compound (LBC) in Concrete, WA between 1905 and 1918. The WPCC Historic District occupies an approximately 3.8-acre site on a terrace near the confluence of Baker and Skagit Rivers. Portions of the WPCC are exposed at the surface, but older remnants are buried below landslide debris. Archaeological investigation at the WPCC combined remote sensing with mechanical excavation to identify structural remains at the former WPCC factory. Two undergraduate students from the University of Washington, Deanna deBoer and Cheyenne Galindo, learned how to use a gradiometer and then conducted survey (Photo 3). They identified several anomalies that were then ground truthed with backhoe test pits (Figure 4). Archaeological materials related to the WPCC factory as it existed between 1912 and 1925 were identified, including concrete pads and slabs representing a clay storage room and a rotary dryer room, brick features, foundation walls, machine mounts, a metal cylinder, and wooden structural wall supports. The archaeological materials were recorded as part of the LBC and WPCC Historic District.
Before heading out for fieldwork, the GeoGirls listen in as Cascades Volcano Observatory scientist Heather Wright explains how tephra is dispersed by the wind. Photo credit: Beth Bartel, UNAVCO

Through working with different techniques and technologies used in the geosciences and closely interacting with professionals and graduate students, the GeoGirls were exposed to a wide range of career opportunities available to them and gained first-hand knowledge of the actual process of science. “I learned that geology isn’t just about rocks,” one GeoGirl said, “I learned that there are a huge variety of jobs and that it is good to try new things.” An evening career panel, which included teachers, geologists, university students, and NASA astronaut and UW geologist Dottie Metcalf-Lindenburger, provided a forum to share the triumphs and struggles these successful professionals experience in their careers and how they overcame unforeseen and unexpected challenges.

Continued on Page 9
GeoGirls Rock Mount St. Helens (continued from page 8)

This year’s pilot GeoGirls program was offered free of charge to participants supported in part by a grant from the Association of Women Geoscientists - Pacific Northwest Chapter. By offering the program free of charge, girls from a variety of economic and social backgrounds were able to participate allowing for a unique team of GeoGirls. In the pilot year, over 40 girls applied and those selected were chosen for their passion for science, their eagerness for new experiences, a desire to build science-confidence, and a lack of other opportunities to actively participate in field-based science. As one GeoGirl put it, “Getting to learn more outside the classroom was very eye-opening.” GeoGirls learned more than just science but also how to work in teams, about hiking and camping and about leadership. “I felt independent,” one GeoGirl said after the program, “I gained more confidence.”

GeoGirls 2016 plan is in the works and with continued fundraising it will hopefully run far into the future. For more information and to donate visit [http://www.mshslc.org/volcanic-explorations/youth-programs/geogirls/](http://www.mshslc.org/volcanic-explorations/youth-programs/geogirls/).

To donate for fundraising for GeoGirls 2016, inquire about the program for next year or learn more in general

There were big smiles all around as the GeoGirls head back to camp after a successful and fun day of fieldwork!
### Upcoming Field Trips & Talks (NW Geological Society Calendar)

#### NW Section Society of Petroleum Engineers Symposium - Energy Infrastructure Preparedness for a Cascadia Mega-Earthquake
**Symposium with Field Trips**  
**October 2 and 3, 2015**  
Location: Hood River, Oregon  
Price: Depends upon membership and field trips ($185 or higher)  
Check to see if there is still room  
Registration Form (great deal of information):  
http://nebula.wsimg.com/b091fe1fe889eeb5aa39a2326fe84a03?AccessKeyId=27C22228561905D02408&disposition=0&alloworigin=1  
Schedule & General Info: http://www.nwenergy.us/

#### Deformation and Tectonism of the Olympic Mountains
**October 2-4, 2015**  
NWGS Fall Field Trip  
Leader: Jim Aldrich  
Contact: Kathleen Goodman at Kathleen.goodman@amecfw.com for more information

#### Did Mount Saint Helens Teach Us Something About Impact Craters on Mars and Can Those Craters on Mars Teach Us Something About Earth?
**October 13, 2015**  
Location: Seattle, WA (Talaris Conference Center)  
Speaker: Susan Kieffer  
Price: $5 to $45 (depending on your choices)  
More info & reservations:  
http://www.nwgs.org/calendar/calendar.htm

### Upcoming Field Trips & Talks

#### Symphony of the Soil (Film)
**September 23-26, 2015**  
The Eastern Ice Age Floods Scablands  
Loc: Spokane, Washington - Gonzaga University  
- John J. Hemminston Student Center Auditorium  
Price: Free  
Contact: Gary Ford 208.660.3757  
More Info: http://www.iafi.org/events.asp

#### Ice Age Flood Deposits, Flood Features, and Bedrock of the Rathdrum Prairie, Idaho (Field Trip)
**September 26, 2015**  
Location: Farragut State Park, Idaho  
Leaders: Roy Breckenridge & Dean Garwood  
Price: $20 (non-members Ice Age Floods Institute/ $5 for members Ice Age Floods Institute)  
Confirm by August 10, 2015  
Contact: Tony Lewis at galewi@lsu.edu or 208-255-1284  
More Info: http://www.iafi.org/events.asp

#### The Reach (Field Trip)
Ice Age/Benge/Esquatzel and Washtucna Coulees  
**September 26, 2015**  
Location: Richland, WA  
Leader: Gary Kleinknecht  
Price: $80  
Confirm by September 21, 2015  
Contact: Kris Cargile 509-943-4100 x108  
More Info: http://www.iafi.org/events.asp

Continued on page 11
### Upcoming Talks

**Bob Hart Will Portray Father of Oregon Geology Thomas Condon**

**September 25, 2015, 7:30 pm**

Location: McMinnville, Oregon (Yamhill Valley Heritage Center)

Price: Depends ($10)

This is part of a conference & follows a banquet. However, they advertise the talk separately with a suggested fee.


**Author of the New Edition of Roadside Geology of Oregon (2014) will Speak**

**October 9, 2015, 7:30 to 9:30 pm**

Speaker: Dr. Marli Miller

Location: Portland State University, Cramer Hall

Cost: Unknown

For more information: [http://www.gsoc.org/field-trips/2015/4/22/friday-night-lecture-may-8](http://www.gsoc.org/field-trips/2015/4/22/friday-night-lecture-may-8)

### Upcoming Field Trips & Talks

**Ice Age Field Institute (Cont.)**

<table>
<thead>
<tr>
<th>Field Trip To Old Blewett Pass (Field Trip)</th>
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<tbody>
<tr>
<td><strong>September 27, 2015</strong></td>
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<tr>
<td>Ice Age Floods Institute: Ellensburg</td>
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<tr>
<td>Location: Ellensburg, Washington</td>
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<tr>
<td>Price: Unknown: contacts below</td>
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<tr>
<td>Contact: Nick Zentner 509-963-2828</td>
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<tr>
<td>More Info: <a href="http://www.iafi.org/events.asp">http://www.iafi.org/events.asp</a></td>
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<tr>
<th>&quot;Elwah Dam Removal&quot; (Evening Lecture)</th>
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<tr>
<td><strong>October 1, 2015</strong></td>
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<tr>
<td>Location: Ellensburg, Washington</td>
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<tr>
<td>Speaker: Andy Ritchie</td>
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<tr>
<td>Details to be determined</td>
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<td>More Info: <a href="http://www.iafi.org/events.asp">http://www.iafi.org/events.asp</a></td>
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<tr>
<th>The Reach (Field Trip)</th>
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<tr>
<td><strong>October 3, 2015</strong></td>
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<tr>
<td>Wallula Gap: Bottleneck for the Ice Age Floods (Hiking)</td>
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<tr>
<td>Location: Richland, WA</td>
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<tr>
<td>Leader: Bruce Bjornstad</td>
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<tr>
<td>Price: $65</td>
</tr>
<tr>
<td>Confirm by September 28, 2015</td>
</tr>
<tr>
<td>Contact: Kris Cargile 509-943-4100 x108</td>
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<tr>
<td>More Info: <a href="http://www.iafi.org/events.asp">http://www.iafi.org/events.asp</a></td>
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<tr>
<th>On The Trail Of The Ice Age Floods; Eastern WA Geology (Afternoon Lecture): October 3, 2015, 2 pm</th>
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<tr>
<td>Ice Age Floods Institute: Cheney-Spokane</td>
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<tr>
<td>Speaker: Dr. Gene Kiver</td>
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<tr>
<td>Location: Usk, Washington (Kalispell Wellness Center)</td>
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<tr>
<td>Price: Free</td>
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<tr>
<td>Contact: Gene Kiver 360.299.2759</td>
</tr>
<tr>
<td>More Info: <a href="http://www.iafi.org/events.asp">http://www.iafi.org/events.asp</a></td>
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Upcoming Field Trips & Talks: Ice Age Field Institute (Cont.)

Geology & Railroad History On Bikes (Field Trip): October 4, 2015
Location: Rock Lake, Washington
Leaders: Dr. Gene Kiver And Dr. Charles Mutschler
Registration & Info Sheet: https://app.box.com/s/07lxmjbpcvmc9mrm4qemutiknwyewkm8
Price: $10 to $30, depending on IAFI membership and teacher (or student) status
Contact: Linda Long, 509.235.4251 or email lindakl@centurytel.net
More Info: http://www.iafi.org/events.asp

Steamboat Rock (Field Trip, Hiking)
October 10, 2015
Location: Coulee City, WA
Leader: Gene Kiver and Bruce Bjornstad
Registration & Info Sheet: https://app.box.com/s/pes0d8s6gfxesospn8quegn5dpgrb5rrk
Price: $10 to $30, depending on IAFI membership and teacher (or student) status
Contact: Linda Long, 509.235.4251 or email lindakl@centurytel.net
More Info: http://www.iafi.org/events.asp

Hike, Wagon Trail Road (Northup Canyon):
October 11, 2015
Location: Coulee City, WA
Leader: Gene Kiver Bruce Bjornstad
Registration & Info Sheet: https://app.box.com/s/pes0d8s6gfxesospn8quegn5dpgrb5rrk
Price: $10 to $30, depending on IAFI membership and teacher (or student) status
Contact: Linda Long, 509.235.4251 or email lindakl@centurytel.net
More Info: http://www.iafi.org/events.asp

The Ice Age Floods National Geologic Trail Becomes a Reality in 2016! (Evening Lecture):
October 15, 2015
Location: Tualatin, Oregon (Tualatin Public Library)
Leaders: Rick Thompson
Price: $3 donation requested
Contact: Sylvia Thompson 503-257-0144
More Info: http://www.iafi.org/events.asp

Continued on page 13
Upcoming Field Trips & Talks: Ice Age Field Institute (Cont.)

"Fasten Your Seat Belts Geology Fans" (Evening Lecture with Hang Gliding Footage of Ice Age Floods Region)
October 23, 2015, 7 to 9 pm
Location: Spokane, WA (Lair Auditorium, Spokane Community College) – follows IAFICS meeting
Speaker: Tom Tabbert
Price: Free
Contact: Melanie Bell 509.954.4242
More Info: http://www.iafi.org/events.asp

Salvage Paleontology
November 19, 2015
Location: Tualatin, OR
Leader/Speaker: Sheila Alfsen (Tualatin Heritage Center)
Information still in the works
Contact: Larry McClure Phone: (503) 885-1926
More Info: http://www.iafi.org/events.asp

AWG Foundation (AWGF)

"The mission of the AWG Foundation is to attain equality of opportunity for women in the geosciences and train new leaders by funding high impact programs for women in the geoscience." Quoted from the AWG Foundation page on the AWG website.

AWGF funds:
- Scholarships and Travel Grants
- Professional Development Programs
- Awards and Outreach Programs

To find out more about donating to AWGF, applying for AWGF funds, or just AWGF in general, visit the AWG Foundation page at http://www.awg.org/awgfoundation/.
**AWG – PNW**

**New Officers**

The votes are in! The officers for 2015 – 2016 AWG – PNW board are

- President: Kathy Vanderwal Dubé
- Vice President: Brandy Rinck
- Secretary: Theresa Burton
- Treasurer: Elena Ramirez
- Past President: Marcia Knadle
- Website: Keith Olsen

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**Letter from your Editor:**

Hello! I would like to thank everyone who contributed stories, photographs, and ideas. This issue contains quite a bit of the great science our members are conducting, as well as opportunities that they are providing for the next generation. Thank you!

Thank you in particular to Brandy Rinck, Marcia Knadle, Abigail Groskopf, Sonja Melander, Kate Allstadt, and Beth Bartell for contributing copy. If there is anyone not listed here who sent me something, please re-send it. It just means that I didn’t receive it for some reason. If it is not time sensitive or is, but can make it into the next newsletter (probably in December), I'd love to read it.

Have an outstanding autumn!

Your AWG – PNW editor

Shari Maria Silverman