



President's Message

Marcia Knadle, AWG-PNW Chapter President

Summer's finally really here, but my usual summer work crunch began at least two months ago. I'm hoping for a bit of a slow down so I can actually enjoy some of the nice weather. We had a good chapter field trip to tour Seattle's Cedar River Watershed last month, and we didn't even get rained on much. It was special for me because it was my first time there after hearing my dad's stories about working up there for nearly 30 years. He also seemed to relish the opportunity to see it again, and he added a lot of "color commentary." The trip filled quickly and we even had a waiting list, so we may arrange another one sometime. We had hoped to organize a chapter weekend field trip for late summer or early fall, but I'm not sure we'll manage that this year. However, the Portland area group will be having a Mt. St. Helens day hike later this summer.

In the meantime, keep your eyes open for the chapter officers' ballot later this month, as well as the 2012 scholarship announcement in late summer. With your help, we hope to be able to award a total of \$1500 to deserving students again.

AWG GOALS

- **Encourage** the participation of women in the geosciences
- **Exchange** educational, technical, and professional information
- **Enhance** the professional growth and advancement of women in the geosciences

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Upcoming AWG Activities

Mt St Helens One Day Field Trip

Our Oregon chapter members are currently planning a Mt. St. Helen's one-day field trip for later this summer. The trip will include a hike over varied terrain to view debris flows and other volcanic features on the southwest side of the mountain. More details to follow as they become available. Please contact Lina Ma lina.ma77@gmail.com or Keith Olson keithvolson@gmail.com, if interested.

Fall 2012 AWG Meeting: Geologic Disasters – One Municipality's Plan

Erika Lund from the Seattle Office of Emergency Management has agreed to give a talk this fall about what the City is doing in terms of planning. More details to follow as they become available.

October 27 or 28 TBD, Fall 2012 AWG Board Meeting:

The AWG Board will meet to discuss the Chapter program for the coming year. This is a great time to be involved. If any member is interested in attending the Fall board meeting, please contact Marcia at president@awg-ps.org or marciaAWG@aol.com.

Message from the Editor – Summer is here, let's go hiking! And get out the rock collection and celebrate Earth Sciences Week

Jenny Saltonstall, AWG-PNW Newsletter Editor

Welcome to the Summer 2012 Edition of the AWG-Pacific Northwest Chapter newsletter!

Thanks to all who responded to my survey on PNW geology hikes: "What are your favorite Pacific Northwest geology hikes and why? ... If you have other geology hiking information you'd like to share, such as a favorite book or website on geology hikes, please send along."

Responses:

- Several responses for two publications from the Mountaineers: Babcock, Scott and Carson, Bob—Hiking Washington's geology; and Bishop, Ellen M. and Allen, John E.—Hiking Oregon's geology.
- Other publications suggested were Rowland Tabor's Guide to the Geology of Olympic National Park. U of Wash. Press, c1975. and his Routes and Rocks, Mountaineers, 1965. Thanks Jean!
- There was only one hike suggested: Wallace Falls, 1200 ft elevation gain, near Goldbar. "I really don't know what the geology is... we've primarily gone there for the falls."

I think there are a lot of hikes that fall under that category for me also. Our favorite waterfall hike is Twin Falls along I-90, a 3-mile, low elevation gain walk. The beach walks along Whidbey Island's bluffs are wonderful ways to see the Pleistocene sequences on a low tide day. The Sunrise trail at Frenchman Coulee is another nice walk to see both CRB's and Missoula Flood geomorphology. But my biggest challenge is packing up the family and heading outside.

Get Out The Rock Collection – Earth Science Week is Coming Soon!

Time to dust off those special samples and plan to call your local elementary or highschool. I know, it is weeks away. But sometimes those boxes in your garage are buried deep. AGI celebrates Earth Science Week on October 14 – 20th this year, and October 13th is Women in Geosciences Day. Any teachers who are also members of AWG in the Pierce or King County, WA area, please let me know if you'd like a professional to visit the classroom and talk about hydrogeology or environmental consulting and I'd be happy to stop by. Also for educators, there are some geosciences kits and other information on AGI's website here: <http://www.earthsciweek.org/forplanners/index.html>

And if you plan to volunteer, please drop me a line. I'd like to highlight AWG members who are active with their communities for Earth Sciences Week.

From AGI's website:

October 14-20, 2012 Take part in Earth Science Week 2012! "Discovering Careers in the Earth Sciences" ESW 2012 encourages people everywhere to explore the natural world and learn about the geosciences. "Discovering Careers in the Earth Sciences," the theme of ESW 2012, engages young people and the public in learning how geoscientists gather and interpret data about the Earth and other planets.

Oct 9 International EarthCache Day

Oct 11 No Child Left Inside Day

Oct 12 National Fossil Day

Oct 13 Women in the Geosciences Day

Oct 14 Chemistry and Our Earth Day

Standard Plug: Please let me know if you have any announcements or would like to submit articles on local earth sciences issues/events, articles on related to the participation of women in the geosciences, or even book or movie reviews. If you have ideas for how to improve or expand this newsletter or ideas for AWG events, please drop any of us a line and let us know your ideas!



A Student's Perspective

Bridget Smith, PNW Chapter Member

To the Association of Women in Geosciences,

Do you remember what it was like when you were in the thralls of completing your undergraduate studies? Late night crams to complete homework assignments, all weekend study groups to prep for exams, endless piles of books to read, questions to answer, and problems to solve. Throw in raising an almost three year old boy, working for yourself in lawns and gardens, learning what it means to compromise with a significant other, and everyday upkeep of one's health and well being, and you have one accomplished, exhausted, happy geology student, me.

The most difficult aspect of my education adventure has been keeping my course materials in correlation with the information I acquired in my Geology class. When I traveled through the Physics sector I was constantly relating what I was learning to plate movement and all of the processes which exist because of and around volcanic activity. As I continue to explore the Chemistry realm I am continuously applying my new skills to the rock cycle and the breaking down, mixing, and regrowth of the earth beneath our feet. Every opportunity I have taken to dive further into mathematics, the easier it is to acquire, calculate, interpret, and apply the numbers I collect during lab time from all of my science lab courses.

In my private time I am outside. Working in my community garden plot, at the park with my son, or errand running on foot through Oregon City. However, I prefer hiking, 4 bying (4x4 all terrain vehicles), and swimming through the Mt. Hood National Forest, The Great Basin, and once in a while I can be found along the Cascade Mountain Range. I'm always looking for outcrops, evidence of mass wasting, new to me plants and animals, and always looking to the sky for signs of whatever is next to come. My most recent adventure took my small family and our friends back to the caves which can be found along the Santiam Pass. Excellent pahoehoe features, basalt lave tubes, and air conditioned-like caves for us to explore. It's wonderful to enjoy rock formations this side of Mt. Hood where most of what's cool is usually hidden under the dense foliage and thick forests.

As I continue with my education I am always being brought back to the notion that not only do I need to continue to study and understand the earth and its process as she moves around me, but I also need to continue to find my place in the renewable energy world. For geology and energy go hand in hand, with my little hand in the middle, staying aware, inquisitive, and

sharing what I have learned with those around me willing to listen.

Thank you to the AWG simply for being around. Recently I have felt down on myself, worried I wasn't making enough progress fast enough, only to be contacted and awarded a scholarship or asked to share my journey with others. If there is any advice I could give to anyone pursuing a dream, it is to persevere, keep your eye on your goal, don't lose heart, the fight is tough because it is worth going through, and above all, don't talk yourself down, there is a whole world out there who'd like to bring you down, so talk yourself up, relish in small victories, dare to be brave and bold and hold your chin up and your shoulders back. Victory is had by those who don't quit on themselves.

Sincerely,

Bridget



Bridget and her son William

Bridget Smith received the AWG-PNW chapter's second place scholarship award last year, and is currently enrolled at Clackamas Community College in Oregon.

Book Review: Alone in the Universe (Why Our Planet is Unique)

Janet Tanaka, PNW Chapter Member

***Alone in the Universe (Why Our Planet is Unique),
by John Gribbin***

Publisher(s): first--Penguin Books Ltd, Great Britain, 2011

Reviewed edition--John Wiley & Sons, Inc., 2011

205 pgs, Hardback

Our planet is unique? There are no other worlds like ours, no other beings like us?

How can that be? We are hearing on the news media how other "Earth-like" planets are being located. We are confused.

Dr. Gribbin presents his case, beginning with the astrophysics of the Beginning, from the Big Bang onward. Then, using geology he shows how we are not only "star stuff", but we are the only folks like us because we are "earth stuff." (Thanks/blame go to plate tectonics.)

His main arguments go into great detail to show how geology has directed our evolution. He also makes a

point many scientists don't. When a researcher says "life" she should make clear that the meaning is "life LIKE US". No matter how many planets, Earth-like or not, the life born of them is "custom made" by their environment.

The first 4 chapters deal with the origin of the universe, this galaxy, and our solar system, They impart a lot of information, explaining not only current knowledge, but some arguments from different theories.

The next chapters explain how geology, mainly plate tectonics, has guided our evolution. And it is fascinating, taking on climate, volcanoes, deserts, oceans and the ways they have made us who we are.

It's a lot of information, but Gribbin makes it intelligible for readers with some basic knowledge of the chemistry and physics involved.

Make no mistake: We are Gaia's children-- the only Terran Homo Sapiens.

Field Trip Re-Cap: Tour of the Cedar River Watershed

Shari Silverman, PNW Chapter Vice President

When we turn on the tap, most of us don't give much thought to where the water came from, and we usually take for granted the quality and quantity of the water. All of us residing/working in Seattle south of the Ship Canal, as well as a large number of those who live north and in many of Seattle's suburbs, drink water from the Cedar River, Seattle's first mountain watershed.

On June 9, 2012, the Pacific Northwest Chapter of the Association of Women Geoscientists (AWG-PNW) enjoyed a field trip to the Cedar River Watershed near North Bend (Figure 1) focusing on the history and hydrology of the dam and water system. Seattle City Light's Pierre LaBarge led the trip. During the tour, he discussed numerous aspects of the watershed including climate change and snowpack, the town of Cedar Falls, Masonry Dam, the dam's reservoir (Chester Morse Lake) and its seepage, and the surrounding forest's restoration. Finally, he took us to the Cedar Falls waterfall. Marcia Knadle's father, Grant, worked in the Cedar River Watershed from the mid-1950s to the mid-1970s. He offered additional historical perspective.

Climate Change and Watershed Layout

The group met at the Watershed's Education Center, which housed a relief model of the watershed. Using the model, LaBarge pointed out the watershed's boundaries, water, snowpack, and highest peaks; then discussed climate change and potential effects to the snowpack and Seattle water supply.



Figure 1. Group photo: Front row (left to right): Kathy Vanderwal Dubé, Marcia Knadle, Shari Silverman, Holly Glaser; Back row (left to right): Tom Dubé, Grant Knadle, Betsy Hay, Lynn Simmons, Mary Lynne Poole, Anne Lutrick, David South, Jackie Hughes. Photo by Pierre LaBarge.

By 2050, the average winter freezing level is expected to rise to 4500 feet above sea level (ft asl), instead of the current 3500 ft asl. The highest peak, Meadow Mountain, stands 5414 ft asl. This will result in a much lower snowpack.

The Town of Cedar Falls

LaBarge next drove us through the town of Cedar Falls, which was considered the birthplace of Seattle City Light. Founded as Moncton as a railroad town in 1907, the Moncton railroad depot was renamed Cedar Falls in 1912. Moncton was flooded in 1915 (explained later), but Cedar Falls, a Seattle City Light town, peaked during the late 1920s and 1930s. Seattle City Light employees lived there until the 1990s. The town was a tourist destination until September 11, 2001.

When Moncton was originally settled, it was on a natural prairie by a lake. The lake once consisted of a seasonal wetland with camas. The town predated Masonry Dam by five years.

Masonry Dam

LaBarge drove us from Cedar Falls to Masonry Dam (Figure 2), the only barrier on the Cedar River upstream from Ballard Locks in Seattle. This dam's construction directly impacted the town of Moncton, and continues to affect Cedar Falls. The underlying geology was key to the problem.

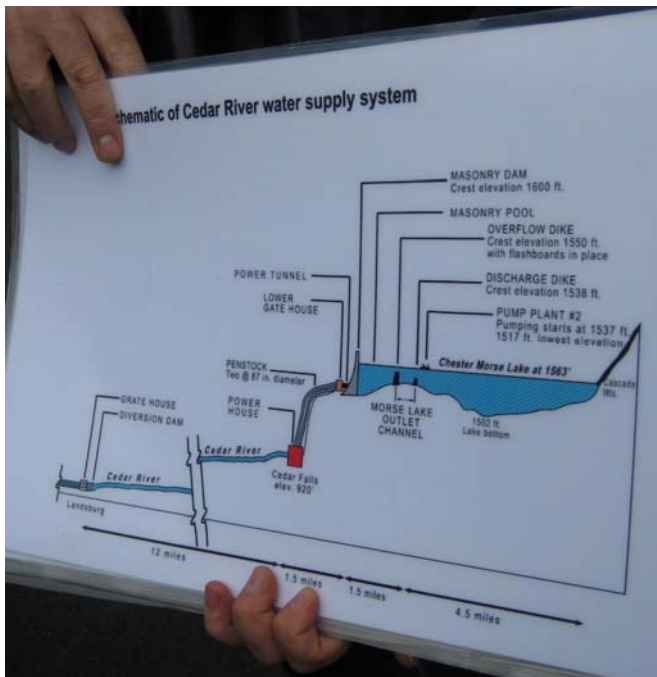


Figure 2. Schematic of Masonry Dam system

The south side of the dam is anchored in andesite and basalt bedrock, and its reservoir's north side consists of soft silts within a glacial moraine deposit. The "till" on the north side (really stratified and heterogeneous ice-contact deposits) had seepage issues. Designers could not find an impenetrable layer within the till. Masonry Dam's construction began in 1912 and ended in 1914, but the problems were not noticed until six to eight weeks after the reservoir filled.

Water seeped through the soft silts of the reservoir's north side (Figure 3). Water gushed out of the hills, flooding the town of Mocton. Seattle City Light condemned the town. They attempted to cement the seepage; and in 1918, they deemed the reservoir sealed.

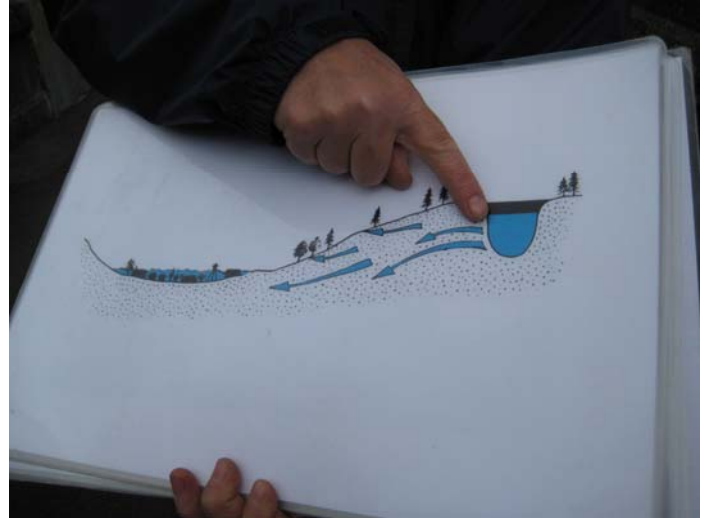


Figure 3. Seepage through reservoir downslope to Cedar Falls.

However, a heavy rain soon swelled the reservoir. On December 23, 1918, a washout and slide flooded Cedar River and destroyed the town of Edgewick and its sawmills. The Box Leak Blowout (or Curse) resulted in no loss of life. The night watchmen woke community members.

Due to the resultant lawsuit, the court ruled that the reservoir (Chester Morse Lake) could never be filled to full capacity. Dozens of piezometers now permeate the moraine to monitor head.

Chester Morse Lake

LaBarge drove us to our next destination, which was higher up the watershed along the shores of Chester Morse Lake (Figure 4). Along the roadway to our stop, we saw submerged land and trees. We climbed out of the vehicle at a picnic area with a view of anchored floating stations and surrounding forest, both of which were topics of discussion at the stop.

Anchored Floating Stations

Anchored floating stations are along the perimeter of Chester Morse Lake in case of drought (Figure 5). They are only turned on when levels are so low that Seattle City Light needs to pump water out of the lake. Despite the pumps, the stations operate mostly via gravity. They require a two month deployment.

Seattle City Light has never had to operate the stations. However, they have been within days of flipping the switch.

Surrounding Forest: Habitat Restoration

The City of Seattle owns 99% of the lands within the Cedar River Watershed. They manage the forest to support the water supply. During the late 1800s and early 1900s, much of the watershed was logged. Attempts at reforestation occurred, but frequent fires destroyed them. In 1924, Seattle City Light hired a University of Washington forestry specialist to design a plan to replant and replace the forest. The plan included hiring a forester on a permanent basis to manage it.

During the latter part of the 20th century, forest practices shifted gradually from harvest to habitat rehabilitation. This transition resulted from Seattle residents' willingness to pay more for water, and the presence of a variety of endangered species within the watershed that needed protection. During the early part of the 20th century, Seattle City Light wanted to harvest the forests for additional revenue. In addition, portions of the watershed were owned by the U.S. Forest Service in a checkerboard pattern, and many of those blocks were logged throughout the 20th century. Now the City's goal is to grow old growth habitat for restoration and to hold

the snowpack, and some of the checkerboard properties have been purchased by the City.

Lastly: Cedar Falls (the Waterfall)

The last stop on the trip was scenic, though the drive was educational. Along the road, seeps from Chester Morse Lake through glacial till were shown to us. They were the small waterfalls spilling from the roadsides along the way. Cedar Falls itself was quite lovely (Figure 6).

Missed the Fieldtrip or Want to Learn More?

The Cedar River Watershed's Education Center holds regular tours throughout the summer. Their website also contains an abundance of information and historic photographs. This is the website's URL: http://www.seattle.gov/util/About_SPU/Water_System/Water_Sources_& Treatment/Cedar_River_Watershed/index.asp.

Cedar River Watershed Education Center
A: 19901 Cedar Falls Rd SE
North Bend, WA 98045
www.seattle.gov/util/crwec/



Figure 4. Chester Morse Lake



Figure 5. Anchored Floating Station



Figure 6. Cedar Falls

Everything You Always Wanted To Know About State Geological Surveys but Were Afraid To Ask – May Meeting Review – Featuring Dr. Vicki McConnell, Oregon Dept of Geology and Mineral Industries

Review By Marcia Knadle, AWG-PNW Chapter President

Our May meeting was held jointly with Northwest Geological Society and featured speaker Oregon State Geologist (and chapter member) Dr. Vicki McConnell. Besides heading DOGAMI (Oregon Department of Geology and Mineral Industries), she's been serving as President of the Association of American State Geologists, so she started off with an overview of how state geological surveys are faring financially across the country. I was surprised to learn that, generally speaking, they haven't actually been hurt too badly in the current economic downturn, and that funding has been fairly flat since about 1980, although staffing levels have gradually dropped. However, the sources of funding have changed significantly over that time, with less and less money coming from state appropriations (down to about 40% on average), and an ever increasing proportion coming from the federal grants.

As one of the few women state geologists, Vicki has been very interested in the distribution of women at state geological surveys.

- State geologists -- 6%
- Geoscience staff – 26%
- Geoscience students on staff – 38%
- Support staff – 49%

The proportion of women students on staff is encouraging, and suggests that there are plenty of women in the pipeline to become geoscience staff eventually. However, the number of minority geoscientists at state surveys is very small, so ethnic diversity is clearly a larger issue.

At DOGAMI, geological hazards (characterization and

mitigation) are a major area of focus. (Vicki's a volcanologist, so this should be no surprise.) To make the most of limited resources, DOGAMI focuses projects and mapping on areas that have LiDAR coverage, and they've put a big push on getting coverage of populated areas in particular. They also require that all new technical staff be adept with GIS. Areas of active research include:

- Earthquakes – especially identifying local active faults on LIDAR images
- Landslides – also identified on LIDAR
- Tsunamis – they now have Tsunami Evacuation zone maps online
- Volcanoes – They're now seeing that the numbers of cinder cones and the volumes of associated volcanic deposits are eastern Oregon is much larger than they'd realized. They're also mapping lahars that had gone unrecognized before. It's clear that many communities are much more vulnerable than they'd realized.
- Coastal Erosion

On the resource side, DOGAMI has been searching for less-obvious geothermal prospects using TIR (Thermal InfraRed flights).

Vicki's presentation was well attended and very well received, based on comments I got from both AWG and NWGS members afterward. I'd like to thank Vicki for making the trip up to Seattle, and also for her ongoing support of Pacific Delegate (and DOGAMI staff member) Lina Ma's participation on the AWG Board.

REGISTRATION OPEN: Non-AWG Event: Trip to Owyhee River Canyon, Aug 23-26, 2012

The 2012 Joint Pacific Northwest/Rocky Mountain Friends of the Pleistocene field trip will tour the spectacular Owyhee Canyon volcanic region of southeastern Oregon on August 23-26, 2012. We will examine the geomorphic impacts of channel-encroaching lava flows and landslides that potentially play a significant role in creating and maintaining the landscapes of uplifted volcanic terranes throughout the western U.S. Over the last 2 Ma, numerous lava flows and landslides have entered the canyon of the Owyhee River in southeastern Oregon, dramatically and repeatedly altering the river's course and profile.

Field trip participants will visit the Cenozoic lava dams and landslides along the eastern rim of the Owyhee Canyon, ponder the unusually extensive and persistent landslide and earth-flow complexes at The Hole in the Ground, and explore the Holocene Coffee Pot crater and lava lake in the Jordan Craters area. The trip will include moderately strenuous hiking into the Owyhee canyon to the most recent Pleistocene West Crater lava dam and associated lacustrine deposits. 4-wheel drive or high-clearance vehicles recommended.

For more information about the trip, enticing photographs, and registration go to <https://sites.google.com/site/owyheefop/>. Add your name to the Owyhee FOP email list or direct any questions about the FOP trip to owyhee2012@gmail.com.

Field Trip Leaders: *Lisa Ely*, Central Washington University, *Kyle House*, U.S. Geological Survey, *Cooper Brossy*, Fugro Consultants, Inc., *Elizabeth Safran*, Lewis and Clark College, *Jim O'Connor*, U.S. Geological Survey

2011-2012 Contact Information

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Established in 1985 as the Puget Sound Chapter*

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About AWG

The Association for Women Geoscientists is an international organization devoted to enhancing the quality and level of participation of women in geosciences and to introduce girls and young women to geoscience careers. Membership is open to anyone who supports AWG's goals. Our members include:

- professional women and men from industry, government, museums, academia, and K-12 teachers
- students
- retirees
- others interested in supporting our goals.

Our diverse interests and expertise cover the entire spectrum of geoscience disciplines and career paths, providing unexcelled networking and mentoring opportunities. Our membership is brought together by a common love of earth science and the desire to ensure rewarding opportunities for women in the geosciences.

MEMBERSHIP

If you are interested in becoming a member of AWG, please contact the Chapter Executive Committee. More information is available at the AWG home page: <http://www.awg-ps.org/>

Reminder to renew membership – please support the chapter!

Renewal notices will be arriving soon. It's very easy to put it aside and think you'll do it later. Please take the time **now** to go online or mail in your membership renewal. Also, please remember that if your contact information changes during the year, you can go online and update it yourself. This is especially important if you change your email address. If you've decided not to renew your membership for a specific reason, we'd appreciate knowing why – please contact me at president@awg-ps.org.