



# Association for Women Geoscientists Pacific Northwest Chapter Winter 2011 Newsletter

## President's Message

*Marcia Knadle, AWG-PNW Chapter President*

It's been a year since the last chapter newsletter and my last message to you. We didn't plan it this way – historically we've had 3-4 newsletters each year. However, our newsletter editor became ill last winter and has had to focus on her health. The chapter board decided that being newsletter editor and web site manager was really too much for one person to manage, so we recruited two people to take over these jobs. I'd like to thank Jenny Saltonstall for taking on newsletter editor – this extra large issue is her inaugural effort. Also, many thanks to Keith Olson for taking on the position of web site manager. He has made the herculean effort of going through and updating the chapter website ([www.awg-ps.org](http://www.awg-ps.org)), which had fallen into disrepair over the past several months and badly needed updating. It's now all bright and shiny and up to date – we'll try to keep it that way. I'd also like to thank Heather Vick for stepping up and covering the task of emailing announcements to the membership over the summer – all while frantically busy with helping organize the field trip.

Despite our challenges in publicizing our chapter activities, we've had an active year, with two Seattle-area meetings, several Portland area events, and two field trips. The scholarship application period is underway, and we'll be announcing the recipient(s) early next year. We're planning to hold at least two Seattle-area meetings and at least one field trip this coming year. There are also a couple of AWG events coming up in 2012 that may be of interest. The AWG convention will be held in Hartford, CT in March, and the AWG field trip this year is a raft trip down the Grand Canyon in June. I attended the last Grand Canyon raft trip AWG sponsored back in 2005, and it was wonderful! Kata McCarville is a delightful field trip leader and a very knowledgeable Grand Canyon guide. If you've never been there, this is a great way to see it.

You should also be aware that the chapter has made some changes to our outreach programs. Last year, we got enough donations that we were able to award a second-place \$500 scholarship, and we're hopeful that we'll be able to do that again this year. With the chapter expansion to cover Oregon as well as all of Washington, it's great to be able to offer more than one scholarship. We're still committed to recruiting and supporting judges and prizes at science fairs. However, we've discontinued the AWG Foundation project which provided our chapter with matching funds. The program doesn't cost that much and we decided that the administrative burden was too great for

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a relatively small amount of money. If you'd like to continue to support this program, you can send a check made out to "AWG-PNW Chapter" to the chapter mailing address. However, please be aware that only donations sent to the AWG Foundation, e.g., for the chapter scholarship, are tax deductible.

All of this is by way of pointing out that the chapter relies on the efforts of volunteers, mostly officers but also our Portland-area volunteer organizers. Occasionally, life attacks an officer and some things may fall through the cracks for awhile if other officers can't pick up the slack. As members, you may not notice much unless a relatively obvious function is affected, like the newsletter. I appreciate that you continue to support the chapter through these (hopefully brief) periods of dysfunction, when newsletters and/or events may be a bit thin. However, we have a strong chapter and we're able to recover from temporary setbacks. We have a healthy bank balance and a full set of officers this year, so I'm looking forward to a productive year for the chapter. I'll have plenty of help from our current Board: Shari Silverman (Vice President), Heather Vick (Treasurer and Past President), Suzanne Dudziak (Secretary), Jenny Saltonstall (Editor), Lina Ma (Pacific Region Delegate), and Pat Reed (Scholarship Chair), as well as from Keith Olson (website manager) and Portland-area organizers Heidi Yantz and Jill Betts. Finally, I'd like to thank Holly for her enthusiastic and able service as newsletter editor and webmistress for the past 3 years. If you have any comments about the chapter or ideas for chapter activities, please feel free to send them to me at [president@awg-ps.org](mailto:president@awg-ps.org).

## 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!

You should all have received notices to renew your membership. 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](mailto:president@awg-ps.org).

## AWG Spring Field Trip: Historic Roslyn and Its Coal Mines

*By Pat Reed, AWG-PNW Scholarship Chair*

### HISTORIC ROSLYN AND ITS COAL MINES

In May 1886, surveyors from the Northern Pacific Railroad found coal deposits on railroad land east of its new station at Cle Elum. The railroad needed coal to fuel its locomotives as it worked to complete the line across the Cascades through Stampede Pass. Workers immediately began to construct a rail line from Cle Elum to the new settlement of Roslyn, along with houses and mine works.

In December 1886, the first coal was shipped out of the Roslyn No. 1 mine. Roslyn -- named by Northern Pacific Vice President Logan M. Bullitt either for a town in Delaware, the birthplace of a sweetheart, or for a town in New York, the residence of a friend -- grew to more than 1,200 residents including many immigrants and African Americans. Roslyn No. 1 mine was followed by three more Northern Pacific mines in the area.

Northern Pacific Railway constructed a branch line between Cle Elum and Roslyn in 1886 and on to Ronald in 1887 that transported coal as well as local residents. Although the rails are gone, the route has been preserved as a historical walk with markers along the way identifying significant sites.

### THE TRIP

We met in the morning near the trail head of the old coal mine trail. A total of five people attended from left in the photo: Theresa Burton (AWG, Moses Lake), Lina Ma (AWG, Portland) and Sea McIlwain (a friend), and Alan Andrist (husband) and Pat Reed (AWG Seattle, not pictured).

We headed east along the mine trail toward Cle Elum. The trail is the old railroad right-of-way, which is a fairly wide gravel-lined pathway. It has a very slight grade, and runs past the old mine workings through and forest. Most of the forest has grown up since the mines stopped working in the early 1940s. The old mine workings were soft lumps and humps in the forested floor, with the exception of some tailings piles and concrete structures. The handouts included some photos of the structures during the heyday of mining, and some geologic maps from various publications. We walked about a mile, chatting and enjoying the fresh warm air on a sunny day.

Toward 11:00 we turned around and walked back to Roslyn to grab a bite of lunch and meet our guide at the Museum in town. Some folks hadn't brought a lunch, so we all decided to go have lunch in the historic Brick Tavern a block away from the Museum. The food and conversation was great!



From Left: Theresa, Lina, Sean, and Alan

### THE ROSLYN MUSEUM

At the Museum we met with Tad, a volunteer with lots of stories about the town and the mines. He showed us around their collection of mine maps, historical artifacts related to mining, and the town history. The collection includes maps of the mines, with borings logs of the area. Pat explained to the non-geologists how the sequence of coal, mudstone, and sandstone related to the depositional environments.

The maps showed the sequence of mining too, with "room-and-pillar" mining going into the mine leaving "pillars" of coal to support the roof, and those pillars being removed as work reached its final depth and returned to the surface. After removal of the coal, the open tunnels were allowed to cave in behind the work. The map showed dates of coal pillar removal, and mine accessways. Historic photos in the



Museum showed the heyday of the mines, with surface works, subaerial rock bursts, and disasters.

Tad invited his next-door neighbor, Steve Jensvold, who works with the geology department at Central Washington University.



Looking over the mine map

Steve gave us a great talk on the geology of the area, and how the mines are in seams that dip at about 35 degrees. The coal fields of Roslyn were formed before the Cascades had risen. Mt. Stuart was present, contributing sediment to a swampy plain between it and the coast. The climate was slightly warmer than today, and most of the vegetation was similar to the present forms. Occasional floods

would place soft silt over the rotting vegetation, and changes in the stream channels would create layers of sand. The rotting vegetation, sand, and silt just kept adding more weight, compressing the lower layers. The situation changed when a tectonic spreading center in Alaska was subducted, changing the motion of the plates.

A subduction zone formed off the coast, and began to plunge under the edge of the continent. The subducting plate acted like a conveyor belt with pudding on top. The "pudding" got scraped off and mounded and compressed. The Roslyn sediments got folded and turned into coal under the pressure. The Roslyn formation, as we call it, is 35 to 45

million years old. When the plate began subducting, volcanoes started up all around the plain due to the melting rock beneath the edge of the plate. The Roslyn has ash from 17 volcanic eruptions that fell into the swamp.

There is still a lot of coal left in the seams, but the price of coal is so low it's not worth it to mine it in Roslyn any more. The region now uses more hydroelectric power than coal.

Steve told us about a place on Cle Elum Lake where there was a chunk of sandstone from the Roslyn formation that had been ripped up and engulfed by the Teanaway basalts from one of those volcanoes mentioned above. It's about 10 miles up the road from Roslyn, where the road bed has been blasted out of rock. We found it, and spent about an hour picking up pieces of rock along the road side and comparing them, waving our arms to explain the outcrop. Not even bothering to look at the lovely lake.....well, that's typical for geologists.

If you'd like to know more about Roslyn, the museum's website is: <http://www.roslynmuseum.com/coal-mines-trail.html>.

They are real friendly folks, and can be contacted at: [roslynmuseum@gmail.com](mailto:roslynmuseum@gmail.com).



Historical photo - rock burst in the mine.



White Roslyn sandstone in Teanaway basalt flow near Lake Cle Elum



# AWG/AEG West Olympic Peninsula Field Trip

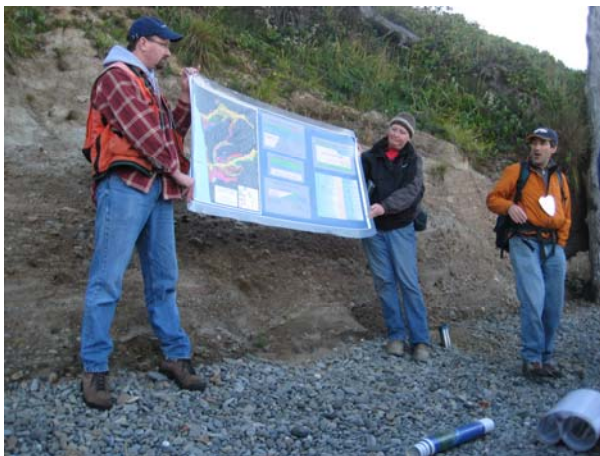
*By Marcia Knadle, AWG-PNW Chapter President*

The weekend of September 9-11, AWG-PNW member Wendy Gerstel and her husband, Association of Engineering and Environmental Geologists (AEG) member Tom Badger (WSDOT), co-led a field trip to the western Olympic Peninsula. The trip was the second of two field trips to the Olympic Peninsula co-sponsored and co-organized by the AWG-PNW Chapter and the Washington Section of AEG. This trip focused on landslides, alluvial landforms and processes (natural and engineered), and tsunami hazards along the west slope of the Olympics. We also were treated to updates on the regional tectonics, with opportunities to look at exposures of tectonically deformed beach and distal glacial sediments.

The trip was well attended, with nearly 40 participants, several of whom were AWG members. We were fortunate to have chosen a beautiful weekend, hot inland and cool and cloudy along the coast where we camped at Kalaloch. Many thanks to Wendy and Tom for superb trip organization! Many thanks also to Heather Vick, who managed the registration and budgeting AND organized the delicious group spaghetti feast on Saturday night. The field trip guidebook can be downloaded from a link at the end of the trip summary in the AEG-WA event archive at: <http://www.aegwashington.org/archive.php>



Pity the after-lunch lecturer on a hot day... Photo by M. Knadle.



AEG-WA Chair Chip Barnett and AWG-PNW Pat Reed help Glenn Thackray (Idaho State Univ.) by holding up a map showing glacial deposits in the western Olympic Mountains. Behind them are glaciofluvial deposits exposed along the coast near Kalaloch. Photo by Marcia Knadle.



Sally Zhang (on right) and her mother enjoy the beach hike. Sally was the 2011 recipient of the AWG-PNW Janet Cullen Tanaka Scholarship. Photo by Marcia Knadle.



The group with our esteemed trip leaders, Wendy and Tom, standing on the right. Photo by Alan Andrist.



Huge landslide and debris flow deposits along the South Fork of the Hoh River. Results in fine exposures in glacial and lacustrine/deltaic deposits. Photo by Pat Reed.

# Volcanic Eruptions and Life at 5000 feet beneath the Ocean's Surface off the Oregon Coast – October Meeting

## Featuring Dr. Deborah Kelley, UW Oceanography

### *Meeting Review By Marcia Knadle, AWG-PNW Chapter President*

Our first meeting of the event year was jointly held with Northwest Geological Society on October 11, 2011. Dr. Deborah Kelley (UW Oceanography) gave a fascinating presentation on volcanic eruptions along the Juan de Fuca Ridge, our local oceanic spreading center. The UW has been conducting research (the VISIONS Project) near the Axial Seamount, including sending mini subs down to film and explore the fields of black smokers that emit large quantities of hot mineralized water. Some of these fields are remarkably long-lived – one has been dated at >200,000 thousand years. There are also rifts that emit hot water and support large microbial communities IN the shallow seafloor. The hot water brings up chunks of white microbial mat from these “snowblower” rifts, resembling snow as it falls out of the water column and coats the seafloor. Researchers are beginning to suspect that the total biomass in the deep biosphere may rival that on land.

The VISIONS Project has been planning to install an internet-connected underwater cabled observatory so they can get real-time data on the volcanic activity at the Axial Seamount, but it erupted last April and covered an area where they'd planned to lay cable! They're considering alternate locations and are still planning to install sensors in 2013. They've also been attempting to measure how much CO<sub>2</sub> these volcanoes emit. Axial Seamount was found to have 9000 ppm in the magma – the highest CO<sub>2</sub> concentration of any volcano in the world.

If you'd like to learn more about the VISIONS '11 Project and see some of the jaw-dropping HD video that Deb presented at the meeting, go to:

<http://www.interactiveoceans.washington.edu/visions11>.

## 2011 Washington State Science and Engineering Fair

### AWG Award Winners 2011

#### *Review By Pat Reed, AWG-PNW Scholarship Chair*

The AWG Pacific Northwest Chapter helps support expenses for members who volunteer to represent AWG as judges to regional and state science fairs. Pat Reed volunteered to judge at the 2011 State Science Fair, held in Bremerton the first week in April at Bremerton High School.

#### First Place

**9<sup>th</sup> Grader Cody (last name unknown\*\*)** “Reducing nitrates from mine waste cheaply” Cody lives near the Kinross Stillwater mine (near Curlew), and became interested in how nitrates were removed from the liquid mine waste. Kinross currently uses plastic pieces as a substrate for Tortora microbes that are used to break down the nitrates. The plastic pieces are oddly shaped, and very expensive to purchase. The Kinross Chemist told her that the shape of the substrate pieces was important because of the additional surface area for the microbes to colonize. The temperature and carbonate sources also had an effect on the efficiency of the system. The Chemist gave her some of the mine waste water, and some microbes. Cody set up four large tubs at home, one with pieces of recycled water bottles, and another with pine cones from her driveway. She added some of the Tortora microbes to one of the recycled water bottle tub, and some to one of the pinecone tubs. She monitored the temperature, and the levels of nitrates over a week. Her findings were that the pinecones without the

microbes performed the best in all temperatures at removing nitrates. The water bottle pieces were not as effective, but did slightly better than the pinecones at cooler temperatures. Her documentation was precise, objective, and comprehensive.

#### Second Place

**9<sup>th</sup> Grader Christin Dicken** “Tsunami Height in Puget Sound” Christin studied the effects of a tsunami (seich) in Elliott Bay. She chose three epicenter locations for an 8.0 earthquake: the Aleutian Trench, Hawaii, and Fuji. She used the bathymetric charts for the Bay, and some very complex wave equations to look at wave height, run-up, and surge. She chose several locations around the Bay, including Fire Station #5 in the south downtown district, the Duwamish Greenbelt, and Alki Point. Her conclusion was that the wave would be devastating to the south Seattle area, and refract several times in Elliott Bay.

#### Third Place

**8<sup>th</sup> Grader Emily (last name unknown \*\*)** “Wasting Away” looking at beach erosion at the the Wyckoff-Eagle Harbor Superfund site. The site is located on the east side of Bainbridge Island in central Puget Sound. It encompasses the former Wyckoff wood-treating facility (operated from 1903 to 1988), a former shipyard, and roughly 500 acres of contaminated sediments adjacent to these former facilities in

Eagle Harbor. The site has been capped, and Emily was looking at the long term effects of erosion by wave action on the beach. Emily set up a water tank and an artificial beach, and used a board to imitate wave action. She had a good presentation, but her conclusion did not factor in additional sediment deposition as well as erosion.

#### **Prizes**

#### Books:

*Geology of the North Cascades* by Rowland Tabor and Ralph Haugerud, The Mountaineers, Seattle, Washington

*The Audubon Society Field Guide to North American Rocks and Minerals*, C. Chesterman, Alfred Knopf, New York

*Roadside Geology of Washington*, David D. Alt and Donald W. Hyndman, Mountain Press Pub., Missoula, Montana

#### Gift Cards:

Powell's Books, Portland, Oregon, \$50 and \$25

#### Miscellaneous:

10 Pewter rock hammers molded and cast by Pat Reed for especially cool presentations

#### **MORE ON SCIENCE FAIRS**

The 2012 State Science Fair will be held in Bremerton the last weekend in March at Bremerton High School, and covers areas not included in other Science Fairs in Washington. There are several other Fairs:

- Central Sound, mid-March, at Bellevue Community College
- Washington Homeschool, late March, in Renton
- South Sound Regional, late March, at Pacific Lutheran University in Tacoma.
- Southwest Washington, early March, in Vancouver
- Mid-Columbia, mid March, in Kennewick
- More info at:

[http://apps.societyforscience.org/find\\_a\\_fair/fairlist.cfm?FairYear=2012&state=WA](http://apps.societyforscience.org/find_a_fair/fairlist.cfm?FairYear=2012&state=WA)

If any Oregon member wishes to judge for AWG at an Oregon science fair, please contact Marcia Knadle at [president@awg-ps.org](mailto:president@awg-ps.org) for information on how to coordinate with the AWG SAGE project.

The fairs usually have 1<sup>st</sup> through 6<sup>th</sup> grade on Friday night, and 7<sup>th</sup> through 8<sup>th</sup> on Saturday morning, and 9<sup>th</sup> through 12<sup>th</sup> in the afternoon. Of course it depends upon the total number of entries. The Poster-style displays are closed to the public when the judging is occurring. Usually judges are sent out in teams of two to four, to listen to three to five presentations of 10 to 20 minutes each. The AWG award is a "Special Award", so we don't have to join a team, but if I have time, I do. The Fair staff usually tries to match judges to their area of expertise, but it isn't always possible. New judges are asked to come early to get oriented, and are sent out with experienced judges for the first part of the day. After listening to a presentation, the judges then retire to the Judges Room, and discuss the entry over coffee and snacks. Lunch is usually provided. Each judge completes a form with their comments, which is sent on to the contestants, and one that is used to tally points based on a how well each student presented, documented, and chose their subject. Uniqueness is a plus. The awards are handed out in the evening, and it lasts a long, long time. As a judge, we are not required to stay for the award presentation. We submit our prizes and certificates, and an announcement blurb, if the standard stuff isn't great, and the Fair takes it from there.

I usually try to get pictures of the winners with their presentations, but this year I forgot my camera. My husband Alan is a former high school teacher, so he has happily joined the judging for the past two years, and enjoys it as much as I do.

*\*\* Judges at the Science Fair are asked not to inquire about the child's last name for privacy, or whether they got adult assistance.*

## **Please Help Support the AWG-PNW Janet Cullen Tanaka Scholarship!**

### ***Pat Reed, AWG-PNW Scholarship Chair***

For over 20 years, our chapter has awarded scholarships to promising, yet financially struggling, female undergraduate geoscience students in Washington and now Oregon. To maintain the \$1000 scholarship award, the chapter needs to raise \$500 annually. The AWG Foundation (AWGF) then provides matching funds. Historically, up to half of the \$500 the chapter raises has come from corporate donations. However, over the past few years and with the current economic climate, these donations have all but dried up.

The past two years, with additional matching funds from AWGF, we've offered a second-place \$500 scholarship contingent on whether we can raise an additional \$250. Last year, you were generous enough that we were able to award it! These scholarships may not be large, but the recipients tell us that they make a real difference.

As difficult as times are for businesses and individuals, imagine how incredibly challenging they are for college students! We're especially counting on those of you who have reasonably stable jobs and haven't been severely affected by this recession to make a donation to the scholarship fund. Even small contributions add up quickly, so please sit down now and write a check. Make it out to "AWG Foundation" and write "AWG-PNW Tanaka Scholarship Fund" on the memo line. Mail it to:

**AWG Foundation Treasurer**  
**12000 N. Washington Street, Suite 285**  
**Thornton, CO 80241**

The AWG Foundation is a tax-exempt 501 (c) (3) corporation, so your contributions are tax deductible to the extent allowed by law.

Thank you! *Pat Reed, AWG-PNW Scholarship Chair*



# Summary of the Fall 2011 Board of Directors Meeting

## *Lina Ma, Pacific Region Delegate*

This fall, the Board of Directors (BOD) reconvened in Minneapolis, Minnesota prior to the annual GSA meeting back in early October. For two days, the BOD sat together to discuss a variety of topics concerning AWG, including reports from the current officers, chapters and regional delegates. One of the main topics for discussion, aside from the usual business, was the development of a mission statement, vision and a strategic plan which will help guide the direction of the association now and into the future. When the strategic plan is nominally finalized by the AWG officers, members will be provided a summary of the plan, as outlined by the BOD, and have an opportunity to provide any feedback to help improve upon these efforts in shaping the values and goals of AWG.

In addition to developing the strategic plan, a number of items and upcoming AWG events discussed are noteworthy, and listed below:

1) Membership Drive- The membership drive continues! AWG's goal is to reach 1000 members, so please take a moment to invite someone you know to join AWG or, if possible, consider sponsoring a student membership. As a bonus, there may be a special prize for the member who brings in the most new membership (more details to follow). And, don't forget the AWG logo-embroidered fleece is still up for grabs since the goal was not yet met in 2011.

2) Events and Activities- Are you looking for something to do? Do you need new ideas for planning an AWG event? Would you like to organize an AWG event closer to your local area? Have no fear! Plenty of events have been held by AWG chapters and the student chapter to get you started. The following is a list of recent AWG events or activities from around the country: science fair judging, assisting Boy or Girl Scouts receive their Rocks Rock! badge, organize an edible soils lesson plan, hold a wine and cheese auction as a fundraiser, have a monthly networking breakfast, attend socials or happy hour events, organize a joint meeting with other geoscience groups in your area, hold membership meetings, have a cheesy geology movie night or an outdoor adventure day, go camping, hold a bake sale or chili cookoff, or anything else you can think of that supports the purpose or mission statement of AWG.

## Message from the Editor

### *Jenny Saltonstall, AWG-PNW Newsletter Editor*

Welcome to the Winter 2011 Edition of the AWG-Pacific Northwest Chapter. This edition is fully loaded with chapter events from this past last year but light on upcoming events. 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

3) Distinguished Lecturer Program (DLP) - The DLP exists to increase exposure of a scientists research to a larger audience. AWG has a list of well-known female speakers participating in this program coming from many geoscience disciplines, but is looking to expand and update the speaker list and topic content. If you would like to participate or learn more about this program, please visit [http://awg.org/AWG\\_PPDLP/index.html](http://awg.org/AWG_PPDLP/index.html), or if you are interested in getting more involved by serving on the DLP committee, contact Program Coordinator, Heather Cunningham.

4) Archives - AWG archives going back to about 1989 are being held at Iowa State University. If you are interested, please contact AWG Secretary, Shawn Blaesing-Thompson, at [secretary@awg.org](mailto:secretary@awg.org) for a complete list of the archive holdings.

5) Support your Association! - Donations to help fund AWG programs and scholarships should be mailed to the AWG Foundation (AWGF). Donations to the AWGF are tax-deductible to the extent allowed by law, and if you would prefer, you can make your donation out to a specific AWG program or scholarship (such as the PNW Janet Tanaka, Chrysalis, Minority scholarship or other).

6) AWG's 35th Anniversary Convention - Last, but not least, the theme for this convention is "AWG- a Lifetime of Leadership". **The AWG convention is coming up on March 16-17, 2012, so save the date!** It will be held just ahead of the NE section meeting of GSA in Hartford, Connecticut. The AWG Convention will provide a great opportunity for you to not only meet those currently serving on the BOD and AWG Foundation, but also to meet fellow AWG members and nonmembers from across the country, and possibly, from around the globe! A few events occurring during the convention include a field trip to Dinosaur State Park and the Peabody Museum of Natural History, workshops, sessions, and evening receptions are being planned. In addition to these great events, Marcia McNutt, director of the USGS, will be a keynote speaker at the convention! Don't miss out on this, or you will have to wait another five years to attend the next AWG convention!

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!

## Logo Contest

The chapter has changed and it now has members in Oregon and Washington, and beyond. When the members were mostly near Puget Sound, this was our logo. Now we have two states and lots of mountains to investigate. The chapter invites you to send in your idea for an expanded logo. Please submit your ideas to the editor at [awg-ps.org](http://awg-ps.org). All entries will be posted!



## 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.

### 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