



The Geological Newsletter

NEWS OF THE GEOLOGICAL SOCIETY OF
THE OREGON COUNTRY

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The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org

GSOC Earthquake Preparedness Outreach to Chinese Delegation

by Sheila Alfsen

In September 2018 Sheila Alfsen was contacted by Jessica Su, program director of MGC International and asked to design and conduct a training session for Chinese government delegates from the People's Republic of China. MGC International is a contractor of the State Administration of Foreign Experts Affairs of the P.R. China and they obtained contact information from the GSOC website.

See Chinese Delegation, Page 4



November's Huangshan Delegation Earthquake Preparedness Conference with Organizer GSOC Vice-President Sheila Alfsen, Dr. Scott Burns, Bill Burgel and Larry Kotan (not pictured).

Calendar

Friday Night Lecture

January 11, 2019, Cramer Hall, Portland State University

GSOC field trip leaders will present our "Year in Review" program with brief slide show summaries of their trips.

see Year in Review, Page 2

Friday Night Lecture

February 8, 2019, Cramer Hall, Portland State University

Speaker Dr. Michael Cummings, emeritus PSU Professor of Geology, will present "Implementing Next Generation Science Standards in Oregon."

see NGSS in Oregon, Page 2

GSOC 84th Annual Banquet

March 10, 2019

84th Annual Banquet at 12:30 – 3:45 p.m. at the Monarch Hotel, 12566 SE 93rd Ave., Clackamas, Oregon. Speaker will be Ian Madin, Earthquake Hazard Geologist, Oregon Department of Geology and Mineral Industries.

see GSOC website, www.gsoc.org, for more information and sign-up

GSOC Friday Night Lectures are held the second Friday evening of most months, 7:30 p.m., Rm. 53, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon. Join GSOC members at Pizzicato Pizza, 1708 SW 6th Ave., at 6:00 p.m. before the lectures for an informal dinner and conversation. Check the GSOC website (www.gsoc.org) for more information and updates to the calendar.

Hourly rates for parking are available in some parts of PSU parking structures. PSU Parking Structure #2, 1724 SW Broadway across from Cramer Hall is \$5.00 flat rate in the evening. Park in permit (NOT reserved) spaces and pay at the kiosk by entering your vehicle license number. There is also on street pay parking, and many mass transit options. Street parking is \$2.00 an hour, but free after 7:00 pm. More info available [here](#).

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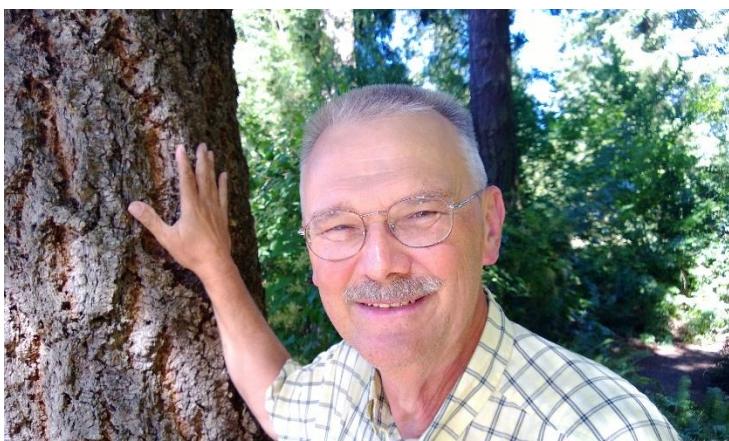
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**Year in Review**

January 11, 2019, 7:30 to 9:00 pm, Cramer Hall

This year's GSOC field trip leaders will present the "Year in Review" program with brief slide show summaries of their 2018 trips:

- Dave Olcott: "The Snake River Plain and Albion Mountains" June 2-8
- Paul Edison-Lahm: "Willamette East Bank Geological Bike Tour and Johnson Creek Van Tour," June 23, September 29
- Sheila Alfsen, "Mt. St. Helens Helicopter Tour," August 18
- Paul Edison-Lahm, "Camp Hancock and John Day Fossil Beds Field Trip," September 14-16

NGSS in Oregon

February 8, 2019, 7:30 to 9:00 pm, Cramer Hall

Dr. Michael Cummings will speak to GSOC at the February Friday night lecture about the advancement of science standards and professional development in Oregon public schools. In 2015, Oregon joined other states to adopt the Next Generation Science Standards (NGSS), which significantly changed the way science is taught in public schools. Supporting teachers as they made the shift from the old way of teaching science to the expectations of NGSS has been the focus of professional development since 2015. Cummings will describe three examples that illustrate how Oregon worked with teachers and districts to implement NGSS. These include: 1) Project based

learning in the Mitchell School District, 2) Groundwater studies in Harney basin at Crane Union High School, and 3) Integration and implementation of NGSS in multi-grade classrooms.

Cummings grew up in Prentice, Wisconsin, a small, rural community in northern Wisconsin. His university degrees are from the University of Wisconsin-Eau Claire, University of Minnesota-Duluth and a Ph.D. from the University of Wisconsin-Madison. From 1979 he has been a faculty member of the Department of Geology, Portland State University.

GSOC Board Meeting Notes

December 14, 2018

In attendance board members Paul Edison-Lahm, Sheila Alfsen, Dawn Juliano, Carol Hasenberg, Rik Smoody, Bo Nonn, Larry Purchase, Julia Lanning. Also member Evelyn Bennett. Minutes of the October 2018 board meeting were approved.

The GSOC 2018 Nominating Committee was formed with members Dawn Juliano, Paul Edison-Lahm, Larry Purchase.

EVENTS

Volunteer Recognition recap (Paul):

Thanks to Paul for organizing this event and board recommends a redo for next year. Board discussed need for a better connection between the board and club volunteers.

Earthquake Preparedness 10/29 & Chinese Delegation recap (Sheila)

- Other Earthquake Committee activities: Yumei Wang, OSSPAC
- Help from Scott Burns, Bill Burgel, Larry Koten. Net fees to GSOC were \$1500 less some expenses.
- OSSPAC meetings, Bill Burgel attending and updating us on state policy.

Friday night lectures

Audio system – the board is taking steps to improve the quality of the audio system.

Upcoming speakers (Sheila) Speakers have been lined up through June.

Yumei Wang Le Val Lund Lecture (November 8, 2019) "Earthquakes, Disasters, and Resilience". We will be co-hosting Yumei Wang's award-winning lecture with the PSU Geology Department.

Nikki Miller will be our new snack coordinator for our Friday night meetings. Big thanks to Marty Muncie for performing these duties for so long!

Field Trips and Other Events

RECAPS

FUTURE TRIPS

Mary's Peak/Coast Range Trip: Sheila and Melanie Klym are working on this one-day trip. Board recommends date in early July.

Wallowas Trip June 19-24: Carol, Julia, and Evelyn Bennett on trip committee. Discussed including group campsite and Wednesday meeting space in fee structure.

Metro trips Downtown (May, Oct), Eastside Bike (June 29), Johnson Creek (Sept.) (Paul): all a go for 2019.

John Day raft trip: Board is currently exploring a geology and rafting trip down the John Day River in May. Decision whether to do this trip as a GSOC event in 2019 will happen in February.

Lewis River: Rik to determine date. Trip will be a one-day event.

Annual Banquet:

GSA Cordillera 2019: Tabled for next meeting.

Other Old and New Business

Treasurer's Report submitted by Dawn and approved by board.

Nomination Committee: Welcome Barb Stroud and Dennis Chamberlin to our nominations roster!

- President - Sheila Alfsen
- VP - Dennis Chamberlin
- Secretary - Barbara Stroud
- Treasurer - Dawn Juliano
- Director, 1 year - Carol Hasenberg
- Director, 2 years - Megan Faust
- Director, 3 years - Julia Lanning

Nominating Committee members Paul Edison-Lahm, Dawn Juliano, Larry Purchase. Thank you for your work!

BOARD MEETING NOTES

continued from Page 3

Other Old and New Business

Next board meeting will be on February 9, 2019, 10:00 a.m. at Paul's house.

Notes compiled by GSOC Secretary Carol Hasenberg.

Chinese Delegation, *cont. from pg. 1*

GSOC's Earthquake Preparedness Committee produces a presentation for Chinese officials

The delegation consisted of officials from the Department of Land and Resources of Anhui Province and they wanted to learn specifically about earthquakes, landslides and floods that are prevalent in their country. The group was interested in knowing about precautionary measures that the United States has adopted, including early warning systems, emergency responses and data analysis to identify future events.

Sheila coordinated the two day program, held on November 5 and November 9th in Cramer Hall at Portland State University. She gave a preliminary lecture on the basics of all three geologic hazards and their causes and mitigation procedures. Bill Burgel of GSOC talked about seismic and lahar early warning systems and flood control measures for the Columbia and Willamette Rivers.

Scott Burns discussed urban landslides and methods to identify hazards and prepare assessment and risk maps. He included the technology of LIDAR and many images of mass movement locally. GSOC member Larry Kotan gave a presentation of Portland's NET program; Neighborhood Emergency Teams of Portland residents that are trained to be first responders by the Portland Bureau of Emergency Management.

During their visit to the Portland area, the delegates talked to emergency management officials in Clackamas County and Salem. Their primary reason for visiting the Portland area was to attend the workshop put on by GSOC members. GSOC is proud to be able to respond to such requests!



Development of Earthquake Early Warning Systems

synopsis of the GSOC Friday night lecture given on September 21, 2018, with speaker William Burgel, retired employee and consultant of Union Pacific Railroad

by Carol Hasenberg

Recently joined GSOC member William Burgel, retired from working for and consulting with the Union Pacific Railroad, spoke to GSOC in September 2018 about his experiences in preparing the railroad system for earthquakes. His expertise stretches back to the 1960's, and along with performing his job for the railroad company, helped organize and deploy early warning systems for earthquake shaking applicable to government and industrial participants.

After graduating from the University of Michigan in the 1960's, Burgel went to work for the Union Pacific Railroad in Pocatello, Idaho. In 1968, the Borah Peak earthquake made him concerned for the safety of railroad bridges, and this led him to develop an early warning system for shaking on the Union Pacific system.

His first warning system was to request that the National Earthquake Information Center (NEIC) in Golden, Colorado, telephone a warning to the railroad whenever larger events occurred. Then this system was replaced in 1983 with a fax system that worked rather well from 1983-1991. Magnitude 5 and over (M5.0+) earthquakes were targeted in this system. Stations at 2 mile increments called "blocks" signaled whether they received an electrical signal that passed through the rails or not. Problems were that track separation in cold weather changed the block's response to positive, but track offset due to earthquakes didn't affect the signal, since the track segments would still be touching.

Burgel arrived in Portland in 1986 when the dispatch center for UPRR moved there. He liked living in Portland and in 1989, when the UPRR moved the dispatch center to Omaha, Nebraska, far from earthquake country, Burgel opted to stay in Portland and work as a consultant for the company.



Typical track deformation due to ground surface motion in an earthquake.

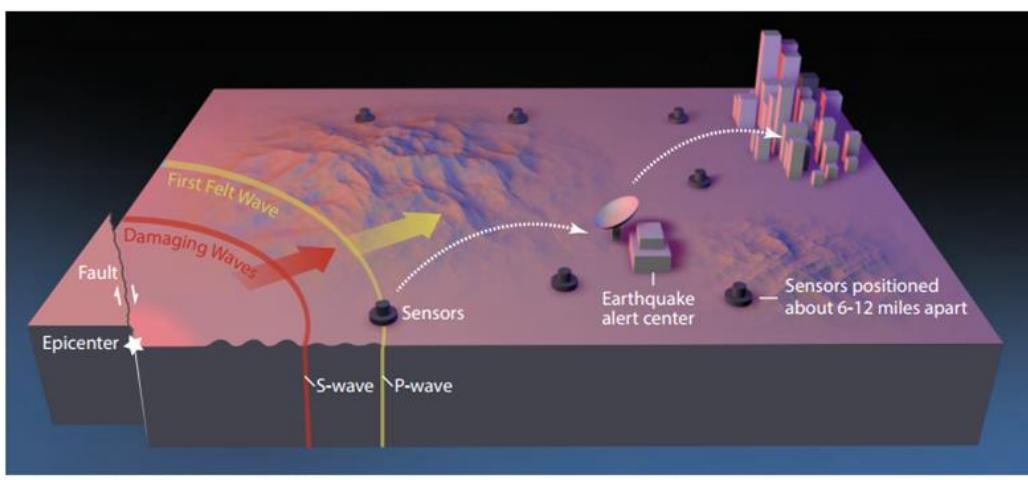
An important event driving the development of more sophisticated systems occurred on June 28, 1992, when the Landers earthquake occurred in the southern California desert. It was the strongest California earthquake in 40 years and it derailed a train from track offsets. As a result UPRR held meetings with the USGS researchers in Menlo Park, California, and researchers at 33 universities to discuss a new system. All the academics were excited that someone was really going to use their system. UPRR also invested a sizable amount in research donations to promote the development of the system.

As the algorithms for the new railroad warning system were developed, the USGS expressed concerns about false alerts coming up with a bogus earthquake and/or missing an event. But UPRR convinced the techs that they preferred erring on the side of caution. The Spring Break Quake, or the Scotts Mills Earthquake in Oregon, 1993, gave a successful test of the new system.

So the plan that was developed in early 1990s was to build a system of broad band seismographs to monitor earthquakes all over the country, which was released by the USGS as Early Notification System (ENS). UPRR was quite pleased with this system and wanted to make sure the research continued, so they continued funding grants of \$100,000 per year, spread out to ten universities, including a couple in the St. Louis area (the nearby New Madrid fault produced a series of very intense earthquakes in 1811-1812). This system is still in use today.

The current early warning system in development,

ShakeAlert—An Earthquake Early Warning System for the United States West Coast

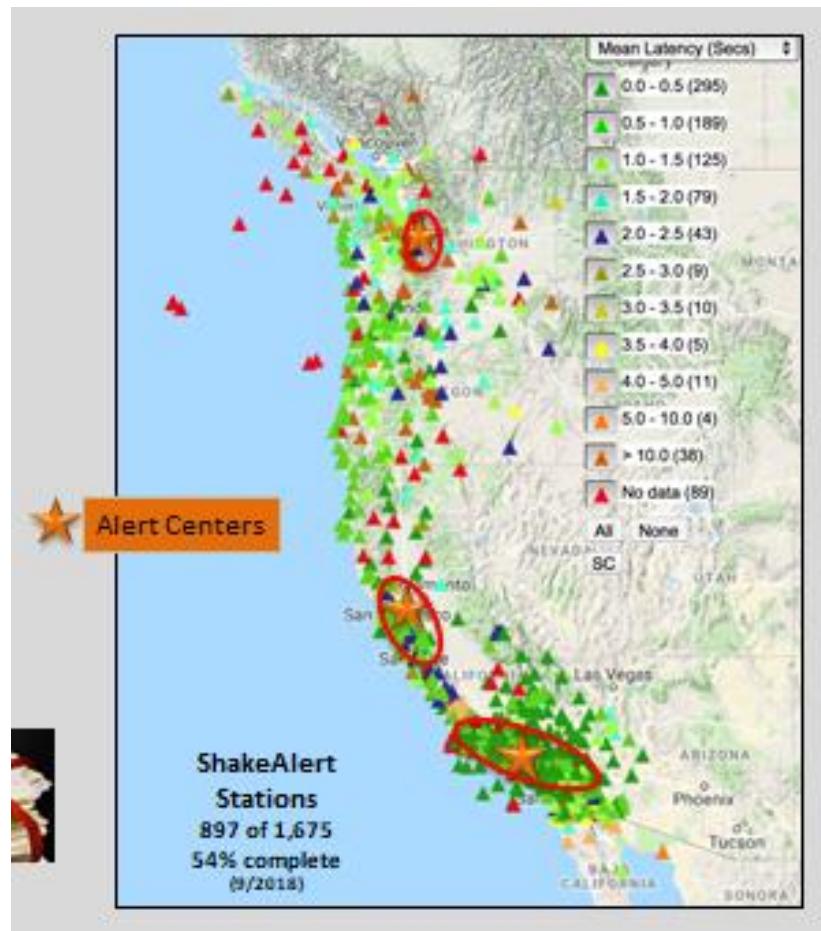


ShakeAlert, has evolved from a Japanese system, Shinkansen, which worked directly from sensors on the track to the train. ShakeAlert sends a signal from a sensor to an earthquake alert center. The center can broadcast the warning to multiple clients. At UPRR a trip wire alerts the trains. The system is designed to beat

the S waves to the sites of potential damage. There is a gap of time between the propagation of the initial P (pressure) waves and the S (shear) waves, which cause most of the damage. There is generally a bit of time to figure out the epicenter and territory affected by the quake and stop the trains in that area. This system has had limited operation in California since 2012 and has been used in several earthquake events.

Oregon will be in the PNW section of the ShakeAlert system, being built in a phased approach. Burgel's wish list is for Oregon to get this system operational. The funding is not all there and \$2M is still needed for the network sensors. If the reader is like minded, he suggests you contact your legislators. One problem Burgel foresees on the Oregon coast is that the sensors are there on the coast and not out in the ocean. So, there would not be much warning, in the event of a Cascadia Subduction Zone quake, for coastal clients. There would be about a minute of warning in Portland. Although if the propagation of rupture is from south to north along the Cascadia Subduction Zone Fault, then Portland may have up to 3 minutes of warning prior to damaging shaking.

You the reader can also be a part of the USGS ENS early warning system. What to do if you get a warning? Avoid injury! Stay in wood frame houses, don't get in an elevator, get out of and away from unreinforced masonry buildings (they can throw bricks quite a distance from the parapets), don't stand under power poles. Other resources for seismic preparedness include the Cascadia Playbook Overview produced by the state office of Emergency Management. Also available online is The Oregon Resilience Plan put out by OSSPAC. It might be a good idea to check out some of these resources and prepare, because basically you'll be on your own for quite awhile in the event of a major earthquake.



Proposed ShakeAlert buildout showing station locations and time between warning and commencement of shaking.



In Memoriam: Connie Battaile

Connie Battaile of Portland was a retired librarian, author, botany and geology enthusiast. She was a mother and a grandmother.

Connie was born in West Virginia and raised in Waldport, Oregon. She held a psychology degree from Oregon State College.

She lived for a time in Ashland, Oregon, and was involved with public service and policy organizations, including the League of Women Voters, the Ashland Citizens Budget Committee, and the Jackson County Planning Commission.

According to her official obituary, she "received her Masters in Library Science from the University of Hawaii and worked as a librarian at the Medford Public Library, Southern Oregon State College (now SOU) library, and Colgate University library (Hamilton, NY)."

Connie held a variety of interests and did a wide variety of projects in her life, including authoring two books on library science, being a hospice volunteer and instructor for classes on making final arrangements, an interest in gardening, plant identification and preservation, an interest in Buddhist meditation and an interest in geology. The latter led her to become a GSOC member.

Memorial contributions may be made to the Oregon Community Foundation.

WELCOME NEW MEMBERS!

Robert Jackson LaVon Murphy
Alan Hull
Lisa & Greg Johnson

...and Sebastian Faust, our youngest member, was born December 2018!

NOMINATING COMMITTEE RESULTS

The following slate of officers has been selected by this year's nominating committee:

President.....	Sheila Alfsen
Vice President.....	Dennis Chamberlin
Secretary.....	Barbara Stroud
Treasurer.....	Dawn Juliano
Director, 3 years.....	Julia Lanning
Director, 2 years.....	Megan Faust
Director, 1 year.....	Carol Hasenberg

Nominations are closed for this year's slate of officers. The slate of officers will be voted on and approved at the February monthly meeting.

The Nominating Committee members were Paul Edison-Lahm, Dawn Juliano, and Larry Purchase. Our thanks to the selected members and members of the Nominating Committee!

THE GEOLOGICAL NEWSLETTER INDEX

Volume 84, 2018

compiled by Carol Hasenberg

January/February	no.1.....	pages 1-9
March/April	2	10-18
May/June	3	19-30
July/August	4	31-42
September/October	5	43-50
November/December	6	51-65

ARTICLES and REPORTS	Page
“Oregon Gems of the Rice Museum,” synopsis of the GSOC Friday night lecture on November 10, 2017, with speaker Leslie Moclock, by Carol Hasenberg	1
“Geology of Eastside Portland and Johnson Creek,” synopsis of Friday night lecture on February 9, 2018, with speaker Paul Edison-Lahm,” by Paul Edison-Lahm and Carol Hasenberg	10
“Seattle Hazards Symposium Report,” by Janet Rasmussen	17
“From Bowlby to Zumwalt – Exploring the Geology of the Wallowa area, Oregon,” synopsis of 83rd Annual GSOC Banquet talk given on March 11, 2017, with speaker Dr. Ellen Morris Bishop,” by Carol Hasenberg.....	19
“Retired, age 65 or older, with time on your hands? Learn some geology —or anything else!” by GSOC Past President, Bo Nonn	29
“A Sharper Image of the Landslides of Skamania County,” synopsis of the GSOC Friday night lecture given on April 13, 2018, with speaker Tom Pierson, USGS CVO, by Carol Hasenberg....	31
“Rotating Crustal Blocks Form a Simplified Picture of Pacific NW Plate Motion,” synopsis of the GSOC Friday night lecture given on May 11, 2018, with speaker Ray Wells, retired USGS, by Carol Hasenberg	38
“Clarno and John Day Lava: Extent and Origins,” synopsis of the GSOC Friday night lecture given on July 13, 2018, with speaker Emily Cahoon, PSU PhD Candidate, by Carol Hasenberg and Emily Cahoon	43
“GSOC Annual Picnic Wrap-up,” August 12, 2018, 12 to 2:30 pm, Rice Museum, Hillsboro, by Larry Purchase.....	49
“Camp Hancock and John Day Basin Field Trip – A Fond Memory,” synopsis of the GSOC President’s Field Trip,” by Carol Hasenberg	51

INDEX, continued from Page 7**SOCIETY BUSINESS**

Board Meeting Notes: December 16, 2017.....	3
Board Meeting Notes: February 10, 2018.....	13
Board Meeting Notes: April 14, 2018.....	21
Board Meeting Notes: June 16, 2018.....	33
Board Meeting Notes: August 12, 2018	45
Board Meeting Notes: October 13, 2018	53

The Geological Society of the Oregon Country (GSOC) is a non-profit organization based in Portland, Oregon. The society is dedicated to the study of geology in the Pacific northwest and is open to persons with all levels of education and professional backgrounds. GSOC was formed in 1935.

In addition to Friday Night Lectures, GSOC offers field trips. Schedules vary year to year for the field trips. You must be a GSOC member or guest of a member to attend most GSOC field trips.

Schedules for all GSOC events are available on the GSOC website, www.gsoc.org. Online payment is also available for most activities and membership.

GSOC also maintains a library at Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

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