



The Official

OREGON SECTION AEG NEWSLETTER

<http://www.aegoregon.org>

November Meeting Details

Tuesday, November 17th

Location: Ernesto's

8544 Apple Way

Portland, Oregon

6:00 pm Social

6:45 pm Dinner

7:30 pm Presentation

Dinner: Chicken, Pasta, Salad

\$20 Dinner

Students FREE with RSVP
(\$5 if no RSVP)

Reservations:

RSVP@aegoregon.org

with "AEG Reservation" in
the subject line by 4pm Friday Nov. 13

There is a \$2 surcharge for
those who do not reserve by
the deadline

Mount St. Helens Volcanic Eruption: Past, Present and Future Engineering Responses

Guest Speaker: David Scofield

PLEASE NOTE MEETING LOCATION

Mount St. Helens volcano began to stir to life in March of 1980. With magma rising within the volcano, the mountain swelled steepening the north side. On the morning of May 18 1980, there were two earthquakes which resulted in the collapse of the

PLEASE NOTE NEW RSVP
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north side of the mountain immediately followed by a large lateral blast and the violent eruption began. The debris avalanche from the collapse of the mountain blocked the natural outlet of Spirit Lake and several other smaller tributary streams to the North Fork Toutle River. A mudflow originated from the avalanche deposit flowed further down the Toutle, Cowlitz Rivers and finally into the Columbia River. The continuing eruption deposited a loose mantling of volcanic ash on top of the avalanche deposit. By the time the eruption ended, 230 square miles of land was devastated, Spirit Lake had risen over 200 feet, new lakes began to form, downstream communities and transportation systems were damaged, and the Columbia River deep water navigation channel was blocked stranding over thirty freighters.

The U.S. Army Corps of Engineers (Corps) was tasked to provide the engineering and construction to assist in recovery efforts. This talk will highlight the Corps engineering response: from initial emergency response, following recovery, today's (35 years later) current actions, and touch upon possible future plans.

The initial emergency response began within days was to dredge and restore the Columbia River channel to international shipping. Concurrently, the Corps began dredging the Cowlitz River and raise levees to restore flood protection to the communities along the lower Cowlitz River. Once these immediate emergency responses were completed, the Corps began to reconnect the blocked drainages to reduce the downstream flood risk due to filling and eventual overtopping and breaching of the newly forming lakes. The first of these efforts were the construction of permanent outlet channels for both

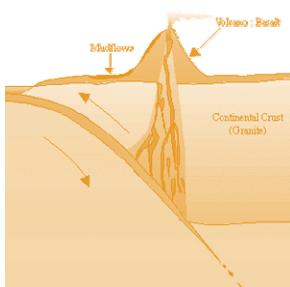


Photo: Spirit Lake Tunnel April 2014. Invert of the tunnel has heaved up 2.4 feet decreasing the hydraulic capacity of the outlet tunnel.

Upcoming Meetings:

Dec 8th George Freitag
Jan 6th AEG/ASCE Meeting
Feb 16th Rob Webb
Mar 15th TBD
Apr 19th Paul Santi
May 17th Jerry DeGraff and
Student Poster Night





Mount St. Helens Volcanic Eruption: Past, Present and Future Engineering Responses (continued)

South Castle and Coldwater Lakes. In addition, an emergency pumping facility was constructed to stabilize the level of Spirit Lake to prevent overtopping until a permanent outlet tunnel could be constructed. Spirit Lake outlet tunnel was constructed under emergency condition. Once the lakes and river system were stabilized, the Corps constructed a large sediment retention structure downstream of the avalanche deposit to slow and contain sediments moving down the river. This effort was to reduce the dredging required downstream to maintain flood protection and navigation.

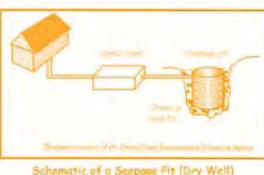
After 25 years, the Toutle River Sediment Retention Structure (SRS) has been completely filled to the spillway crest trapping over 100 million cubic yards of sediments. The Corps continuing role has been to review the expected sediment transport as part of a limited reevaluation study using multiple methods for the management of long-term sediment transport. One component of the plan is to increase the SRS storage capacity by raising the spillway crest. The SRS spillway is designed to safely pass the Probable Maximum Flood/Probable Maximum Mudflow. The U.S. Geological Survey, using the latest analytical tools, reevaluated the size of the design mudflows. Reevaluation has lead to a better understanding of the mudflow size and risk. Better understanding has increased the confidence in raising the spillway in seven foot increments beginning in 2012. Ultimately, the spillway may be raised up to 30 feet. This has allowed the Corps to incrementally increase sediment storage capacity. In addition, the Corps has experimented with a variety of low environmental impact woody debris grade building structures to slow river flow to enhance deposition of sediments to reduce sediment transport downstream.

Since completion, the tunnel has routinely been inspected, leading to several repairs. Recently, the 2014 inspections showed significant ground movement which has reduced the tunnel's hydraulic capacity. Working with the US Forest Service, the Corps has designed and awarded a contract for interim repairs to the tunnel. This work is scheduled to be completed in early 2016.

In the future, the Corps and the Forest Service will be working on a long-term plan for the Spirit Lake Outlet. The shape of the permanent solution has not been formulated yet but it could involve reconstruction of a portion of the tunnel or even construction of a new natural river outlet over the debris avalanche.

Bio: David Scofield

David Scofield is a senior engineer with the Portland District, U.S. Army Corps of Engineers working in the Geotechnical Design Section. He has degrees in Geology and Civil Engineering and is a licensed Civil Engineer and Engineering Geologist. He has 40 years of professional experience with 26 years with the Corps of Engineers working on large complex civil works projects in Oregon and Washington. Some of the major projects he has been involved in are Applegate Dam, Bonneville second powerhouse and navigation lock, Fern Ridge Dam emergency repairs, John Day lock repairs, and Mount St. Helens volcano recovery. Mr. Scofield has spent about 3 years working on various aspects of Mount St. Helens investigating the Spirit Lake debris blockage, Spirit Lake Outlet Tunnel, and Toutle River Sediment Retention Structure. Since 2008, he has been extensively involved in the Corps dam safety risk assessment program serving five years on risk cadre traveling across the nation conducting evaluations of dams. For the last three years, he has focused on risk evaluation studies of Portland District dams.



Schematic of a Seepage Pit (Dry Well)

"Keen observation is at least as necessary as penetrating analysis"

Karl Terzaghi



Message from the Chair

Thanks to everyone who attended the October meeting. A special thanks to Interim State Geologist Ian Madin for his “State of DOGAMI” presentation. Those in attendance were very interested to hear about the financial and administrative challenges facing Ian and the agency over the past year, as well as the tough decisions concerning business practices that had to be made, such as eliminating the Nature of the Northwest store. Also of interest was the array of projects and services that DOGAMI has in the works to help Oregon plan for natural hazards and responsibly develop resources. They’ve had a lot to overcome, but those of us in the audience felt a strong sense of relief to know that DOGAMI is now on a sound financial footing for the next biennium, and we were very grateful to Ian for taking on this immense leadership challenge.

The October meeting was also well attended by students from the AEG Portland State University (PSU) Student Chapter. At a recent career fair, Chapter President Bryan Allen helped to sign up 40 new student members, so we anticipate seeing a vibrant group of future geologists at our meetings this year! We look forward to collaboration with the PSU Student Chapter throughout the 2015/2016 season, as well as with other AEG Student Members in Oregon. The Oregon Section will offer some terrific opportunities for students this year, including Student Night awards and scholarships for 2 students to attend next year’s AEG Annual Meeting in Kona, Hawaii!

I look forward to seeing you on Tuesday, November 17th at Ernesto’s Italian Restaurant when we welcome former Oregon Section Chair Dave Scofield of the US Army Corps of Engineers. Dave will present some intriguing examples of the work that the Corps has been involved with in the area surrounding Mount St. Helens and the associated geotechnical challenges. The talk promises to be interesting, so I hope you’ll join me at Ernesto’s!

See you soon,

*“The earth is large and
old enough to teach us
modesty.”*

Hans Cloos

Photo of the Month Courtesy of Adam Reese

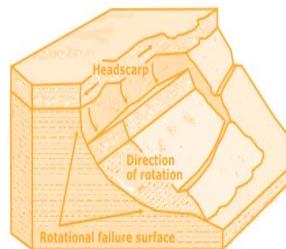


Employees of Apex Companies, LLC and Texas Tech University deploy passive sediment porewater sampling equipment in the Lower Columbia Slough (Portland, Oregon). The sampling was performed in preparation for sediment remediation as a baseline for evaluation of activated carbon amendment performance.



"The earth is large and old enough to teach us modesty."

Hans Cloos



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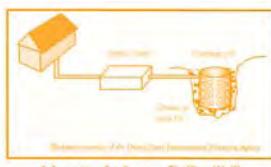
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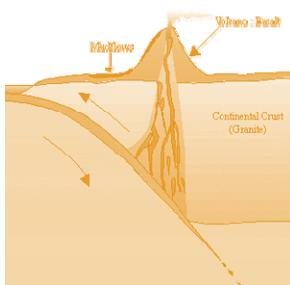
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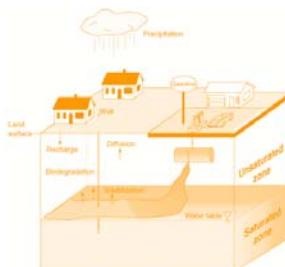
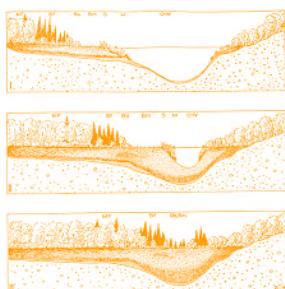
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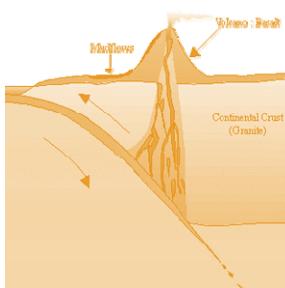
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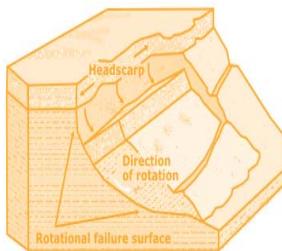
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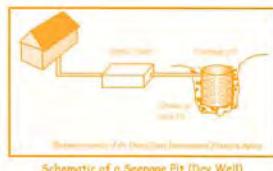
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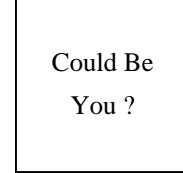
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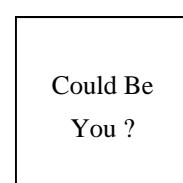
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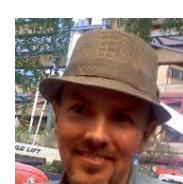
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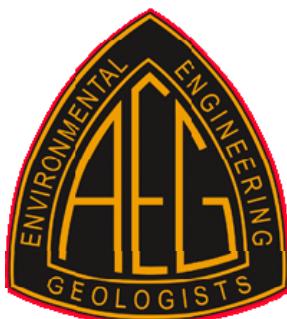
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