OREGON SECTION OF THE ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

November 2014

Volume 15, Number 3

The Official

OREGON SECTION AEG NEWSLETTER

http://www.aegoregon.org

Landslide Mobility and Hazards: Insights from the 2014 Oso Disaster

Guest Speaker: Dr. Richard Iverson

http://blogs.agu.org/landslideblog/2014/03/28/oso-mechanisms-1/

NOTE: WESTERN STATES IS HOSTING THE BEVERAGES!

Some landslides move slowly or intermittently downslope, whereas others accelerate catastrophically and run out long distances across flat or gently sloping terrain. Seldom does landsliding of one type transition abruptly into the other, however, and seldom are the consequences more severe than at a site near Oso, Washington, where 43 fatalities resulted from a high-speed, long-runout landslide on 22 March 2014. Seismic data inversions and eyewitness accounts imply that the Oso event began gradually, with remobilization of old landslide deposits that were unusually wet due to months of exceptional precipitation. For about 50 seconds, relatively slow downslope motion of these deposits withdrew support from a bluff above them, and then the bluff collapsed abruptly. This collapse radiated strong broadband seismic energy and rapidly loaded the old landslide material downslope. We infer that this rapid loading of previously dilated landslide debris caused contractive deformation, widespread liquefaction, and runaway acceleration. The resulting debris avalanche flow (DAF) had a volume of 8×10^6 m^3 and a fahrböschung (H/L ratio) of 0.106, making it exceptionally mobile for a landslide of its size. The leading edge of the Oso DAF may have gained mobility by entraining water as it displaced the adjacent Stillaguamish River and by liquefying wet floodplain sediments as it overran them, and it formed distal deposits that resembled those of many wood-freighted debris flows. The transition from relatively slow landslide motion (which had occurred intermittently for decades at the Oso site) to high-speed motion and long runout appears to have been very sensitive to contingencies. Computer simulations of the Oso event using a new numerical model (D-Claw) show that small differences in water-saturated porosity (n) were sufficient to cause divergent landslide behaviors. In a case with n = 0.38, D-Claw predicts runaway liquefaction and high-speed runout much like that observed at Oso, and in a case with n = 0.36, it predicts much slower landsliding that ceases after only about 100 m of motion. This behavioral bifurcation has large ramifications for assessment of landslide hazards. In particular, it shows that landslide hazard evaluation differs greatly from landslide hazard recognition.

November Meeting Details

Tuesday, November 18th

Location: Old Market Pub
6959 SW Multnomah
Portland, Oregon

6:00 pm Social

6:45 pm Dinner

7:30 pm Presentation

Dinner: Pizza & Salad

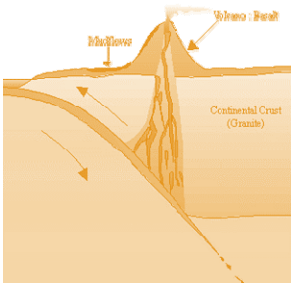
$20 Dinner
Students FREE with RSVP
($5 if no RSVP)

Reservations:
mwegner@cornforthconsultants.com with "AEG Reservation" in the subject line or 971-222-2047 by 4pm Thur. Nov. 13

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

Upcoming Meetings:

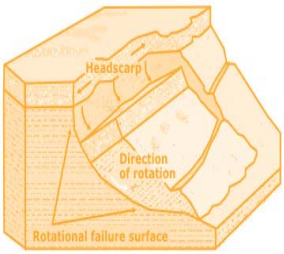
Dec	16th	Jim O'Connor
Jan	20th	AEG/ASCE Meeting
Feb	17th	AEG/AWG Meeting
Mar	17th	Scott Wallace
Apr	21st	Brian McNamara
May	20th	Student Poster Night



Bio: Dr. Richard Iverson

Richard Iverson is a senior research hydrologist at the USGS Cascades Volcano Observatory in Vancouver, Washington. His research there has focused primarily on landslide and debris-flow dynamics, and has included extensive experimentation at the USGS debris-flow flume near Blue River, Oregon. He was among the scientific first responders during the weeks following the landslide disaster near Oso, Washington on 22 March, 2014. Subsequent to his time in the field at Oso, much of his work has focused on understanding the dynamics of the event. Dr. Iverson holds three graduate degrees from Stanford University as well as an undergraduate degree from Iowa State University. He is a fellow of the Geological Society of America (GSA) and American Geophysical Union (AGU), a former Jahns lecturer and (AEG/GSA) and Langbein lecturer (AGU), and a former recipient of the Kirk Bryan and E.B. Burwell Awards of GSA.

2014 Special Symposium Announcement



AEG invites you to attend the 2014 Special Symposium:

Assessment, Monitoring and Mitigation of

Naturally Occurring Asbestos (NOA) Hazards in the Western U.S.

Featuring presentations by: analytical laboratories, consultants, Cal-OSHA, Local Air Quality Management Districts, Caltrans, California Air Resources Board, and San Francisco Public Utilities District.
For a list of speakers and topics, visit the website http://aegsf.org/noa2014/?page_id=52.

Date: **Thursday, December 18, 2014**

Location: Oakland Convention Center / Oakland Marriott Hotel, 1000 Broadway, Oakland, CA

Time: 8am – 5pm, with a happy hour from 5pm – 7pm (registration begins at 7am) Lunch, snacks, and coffee provided

Cost: **$175 for AEG members**, **$195 for non-members** if registered by November 21, 2014 (after November 21, 2014: $225 for AEG Members, $250 for non-members)

RSVP: Please register online (http://aegsf.org/noa2014/?rsvpmaker=naturally-occurring-asbestos-symposium-2014-2014-12-18)

Additional details can be found at the event website http://aegsf.org/noa2014

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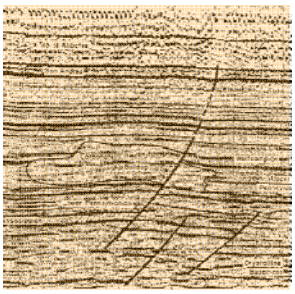
"Keen observation is at least as necessary as penetrating analysis"

Karl Terzaghi

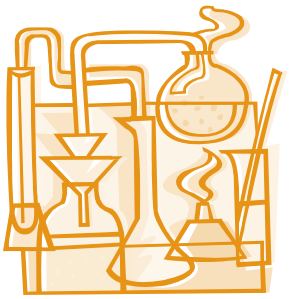


Message from the Chair

Greetings! Thank you to everyone who attended our October meeting and came out to see Dr. Gregory Hempen, the 2014 AEG/GSA Richard H. Jahns Distinguished Lecturer. I thoroughly enjoyed his presentation on mitigating blasting impacts, and I hope that you did too.

The Oregon Section Board is interested in submitting a proposal to host the 2019 AEG Annual Meeting in Portland. Please contact me if you're interested in joining this effort.

One thing that I gained a better appreciation of at the AEG Board of Director's Meeting in September is that we truly have a wonderful, engaged Oregon Section. I was happy to have the opportunity to get to know some of the other Section Chairs and to learn a lot more about how other Sections operate. While many of the other Section Chairs are extremely dedicated - some of them pretty much run their entire Sections themselves - I am fortunate to have a whole team of great Oregon Section Officers and Committee Chairs to help out. So, in an effort to assist some of the other Sections that are struggling a bit with their newsletters and websites, we are sharing our newsletter and webpage templates with other AEG Sections who request them, in the hope that this small act will enable more people to benefit from AEG like we have. Thank you especially to **Scott Braunsten, RG** our newsletter editor, and **Keith Olson**, our Webpage Editor, for their efforts in sharing these resources with other AEG Sections.



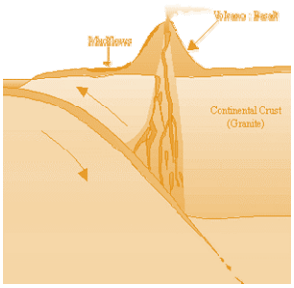
At the AEG Board of Director's meeting I also learned more about AEG's struggles with declining membership numbers and budget challenges. AEG as a national organization, as well as the Oregon Section, benefits when people become members of AEG and/or renew their memberships. This in turn enables AEG to better serve its members by providing networking opportunities, publications, professional development, and career resources. So, if you've let your membership lapse or haven't yet become a member, please consider renewing or becoming a member today!

Now that autumn is underway and the rainy season is upon us, what better time for a talk on landslides? I hope to see all of you on Tuesday, November 18th when we welcome Dr. Richard Iverson, senior research hydrologist at the USGS Cascades Volcano Observatory in Vancouver, WA, to give his talk entitled *Landslide mobility and hazards: insights from the 2014 Oso disaster*. You won't want to miss this talk! Special thanks to Western States Soil Conservation, Inc. for hosting the November meeting beverages.

Cheers,

Linda Mark, RG, CPG

Chair, Oregon Section of AEG



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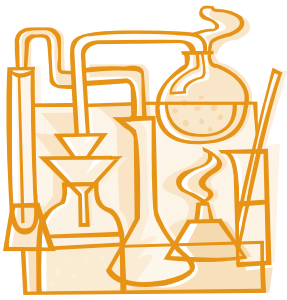
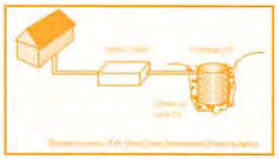
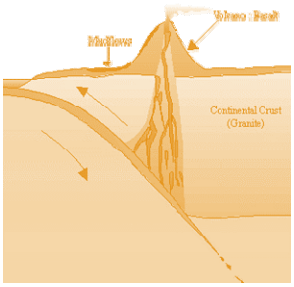


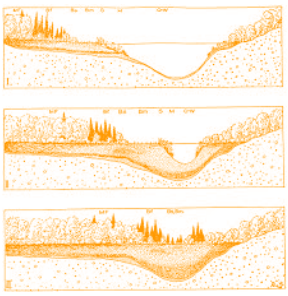


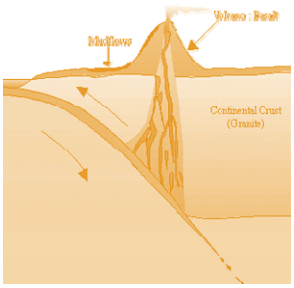
Schematic of a Seepage Pit (Dry Well)

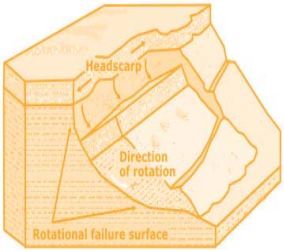
"Keen observation is at least as necessary as penetrating analysis"

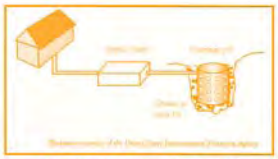
Karl Terzaghi







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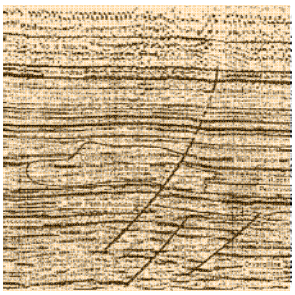
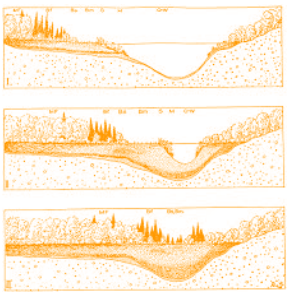
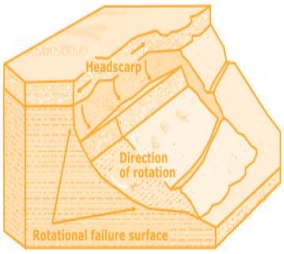
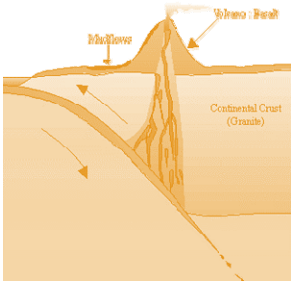


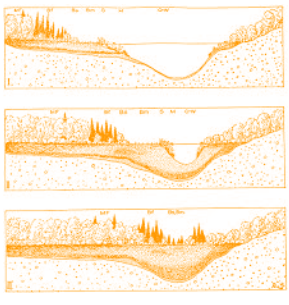


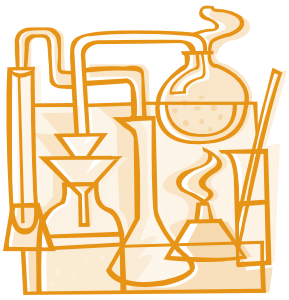


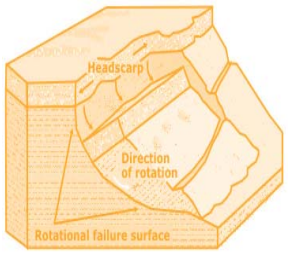
"The earth is large and old enough to teach us modesty."

Hans Cloos









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ESA Vigil-Agrimis

lmark@esassoc.com

Program Chair:

Michael Marshall

GRI

mmarshall@gri.com

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Columbia Geotechnical, Inc.

ruthwilmoth@comcast.net

Newsletter Editor:

Scott Braunsten

PBS Engineering and Environmental

scott.braunsten@pbsenv.com

Secretary:

Mark Swank

PBS Engineering and Environmental

mark.swank@pbsenv.com

The Oregon Section is also on the web at
http://www.aegoregon.org
National AEG webpage:
http://aegweb.org

Webpage Editor:

Keith Olson

PRISM Climate Group, NACSE, OSU

olsonke@nacse.org

Past Chair:

Darren Beckstrand

Cornforth Consultants

dbeckstrand@cornforthconsultants.com

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PSU Student Chapter President:

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dougal@pdx.edu

The Oregon Section Newsletter

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The Association of Engineering Geologists (AEG) contributes to its members' professional success and the public welfare by providing leadership, advocacy, and applied research in environmental and engineering geology. AEG's values are based on the belief that its members have a responsibility to assume stewardship over their fields of expertise. AEG is the acknowledged international leader in environmental and engineering geology, and is greatly respected for its stewardship of the profession.