OREGON SECTION OF THE ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

May 2013

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The Official

OREGON SECTION AEG NEWSLETTER

http://www.aegoregon.org

Ski Areas and Their Slope Stability Problems: The Colorado Story

Guest Speaker: James McCalpin—2013 Jahns Distinguished Lecturer

May Meeting Details

Tuesday, May 14th

NOTE—Meeting is the Second Tuesday in May!

Location: Old Market Pub

6959 SW Multnomah

Portland, Oregon

AEC is hosting the beverages!

6:00 pm Social

6:45 pm Dinner

7:30 pm Presentation

Dinner: Pizza & Salad

$20 Dinner ($5 Students)

Reservations: mwegner@cornforthconsultants.com with "AEG Reservation" in the subject line or 971-222-2047 by 4pm Thur. May 9

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

Upcoming Meetings:

Sep 17th TBD

Most ski areas lie on land leased from the US Forest Service, so proposals for new trails, roads, or snowmaking trigger an EA or EIS, and thus involve a geologist. In recent years the "fatal flaw" of a proposal (as seen by the USFS or opposition groups) is often the anticipated destabilizing effects of tree clearing and snowmaking on quasi-stable hillslopes. An added complication is the fact that most Colorado ski areas lie on ancient landslide terrain, because the lower sideslopes of normal glaciated valleys are too steep for skiing. Only where post-glacial landsliding has "knocked down" the U-shaped valley wall, can beginner skiers get down the mountain to the base area on the valley floor, without killing themselves.

The conventional wisdom in forest sciences is that clearcuts on steep slopes cause landslides, by decreasing material strength (via killing tree roots), and increasing available moisture (by eliminating forest transpiration). Ski trails are basically permanent clearcuts, never allowed to regrow. In addition, almost all ski areas apply artificial snow to trails early in the season (typically 18" of wet snow), which adds to the natural snow that falls later in the season. Given the heritage of postglacial landsliding, it is rather surprising that there haven't been more new and reactivated slope failures in developed ski areas in the past 50 years. Two contributing factors may be: (1) the deep grading of ski trails in the 1960s and 70s, which removed much of the slope colluvium down to bedrock, and (2) the protective effect of the compacted artificial snow layer, which prevents spring snowmelt infiltration into the ski trail.

As a result, careful mapping of historic and prehistoric landslides is necessary before remediation measures can be designed. Normally ski areas are not willing spend much money studying slope failures, and some failures may never even be reported to the Forest Service, resulting in an incomplete history. The Forest Service has very few engineering geologists who could review a proper slope stability study. As a result, the standard of care in EA/EIS studies is far below that for residential and commercial developments. For two decades the author has been trying to persuade a ski area to perform a proper slope stability investigation prior to development, so that a quantitative calibration study could be made of the before- and after-development conditions. In the five ski area Case Histories presented in this talk, slope stability concerns have been critical.

Aspen Highlands, 1994; client wanted to place a restaurant complex in topographic depressions at the summit, but they turned out to be sackungs.

Aspen Mountain, 1996; debris flow initiated on Aspen Mountain and damaged Aspen Music School at base of mountain.

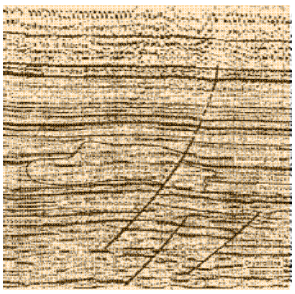
Keystone, 1997; Ski Tip and Saints John lift lines revised to avoid landslides

Powderhorn, 2000; spring landslides moved lift towers on both active lifts.

Crested Butte, 2007-2010; Snodgrass Mountain expansion, where finally a proper slope stability study was performed prior to development.

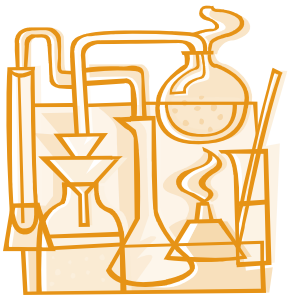
The lesson is that every ski area has unique slope stability problems, dictated by its stratigraphy, topography, and structure. However, there are some common factors:

- reactivation of prehistoric landslide deposits
- cutting trails on oversteepened glacial valley sidewalls, that are at the threshold of slope stability
- debris slides/flows caused by dumping ditch runoff onto steep slopes that have never carried concentrated surface flow



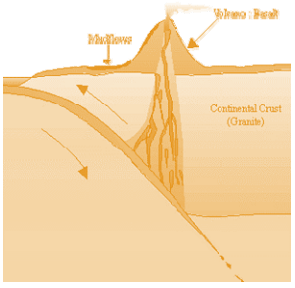
Bio: Dr. James P. McCalpin

James McCalpin has been named the 2013 Jahns Distinguished Lecturer. The Association of Environmental & Engineering Geologists (AEG) and the Engineering Geology Division of the Geological Society of America (GSA) jointly established the Richard H. Jahns Distinguished Lectureship in 1988 to commemorate Jahns and to promote student awareness of engineering geology through a series of lectures offered at various locations around the country. Richard H. Jahns (1915 – 1983) was an engineering geologist who had a diverse and distinguished career in academia, consulting and government.



J.P. McCalpin earned his BA in Geology from University of Texas ('72) and MS from University of Colorado ('75), specializing in geomorphology, Quaternary geology, and rock climbing. He did postgraduate work at University of Alaska, which led to employment in the Alaska Branch of USGS in 1976, and later the Branch of Western Environmental Geology (Menlo Park) in 1977, where he was first introduced to the "new field" of paleoseismology. In 1977 he imported these paleoseismic methods to Colorado and its Rio Grande rift, while mapping and trenching the Sangre de Cristo fault for his PhD at the Colorado School of Mines. After graduation he served as County Geologist for Jefferson County, Colorado in 1982, and then joined the faculty at Utah State University where he taught geomorphology and engineering geology from 1982-1991.

In 1991 he left academia and founded GEO-HAZ Consulting, devoted to applied geological consulting for geologic hazards, primarily seismic and landslide hazards. A related project was publication of the reference book Paleoseismology in 1996, in collaboration with many early US paleoseismologists. The book won the AEG Holdredge Award in 1999 and the GSA Burwell Award in 2000, and is now in its 2nd edition (in English, 2009; in Russian, 2012). In his 20+ years at GEO-HAZ Dr. McCalpin has completed 140 geologic hazard projects in 40 countries, analyzing seismic and other hazards to developments ranging from residential subdivisions to ski areas, from dams to nuclear power plants. Since 2001 he has taught a summer field course in neotectonics and paleoseismology, using the only permanent paleoseismic teaching trench in North America. He enjoys collaborating with international earthquake scientists, and especially with their newer generation of students interested in geologic hazards and in geo-constraints to sustainability and quality of life.



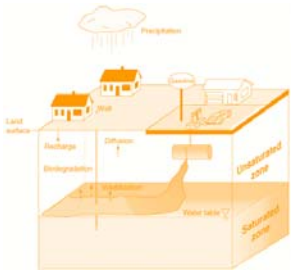
AEC is Hosting the Beverages

AEC is a Service-Disabled Veteran Owned Small Business & a Certified HUBZone Small Business. For more than a decade Anderson Environmental Contracting, LLC (AEC) has offered a broad range of environmental construction services throughout the Pacific Northwest. Our clients include federal & state government entities, large industrial & commercial companies & private individuals. AEC is committed to providing our clients with more than just construction services. We differentiate ourselves through our dedication to exceed our clients' expectations.

Our services include, but are not limited to, stream and habitat enhancement, aboveground & underground tank removal and installation, contaminated soil remediation, building demolition, historical deconstruction and salvage and vacuum truck services.

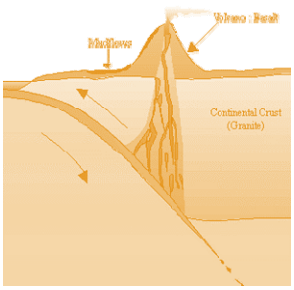
AEC believe success is based on simple principles: work hard, communicate effectively, be professional, demonstrate integrity & commit to providing innovative solutions to complex issues.

From Senior Management to Field Crew each AEC team member is required to maintain specialty licenses to ensure we remain ahead of the ever changing world of environmental construction. To do this all AEC employees remain committed when completing continuing education in their chosen environmental field.



Because of this approach AEC strives to develop & then apply creative, effective & "out-of-the-box" strategies which contribute to limiting the costs associated with environmental construction.

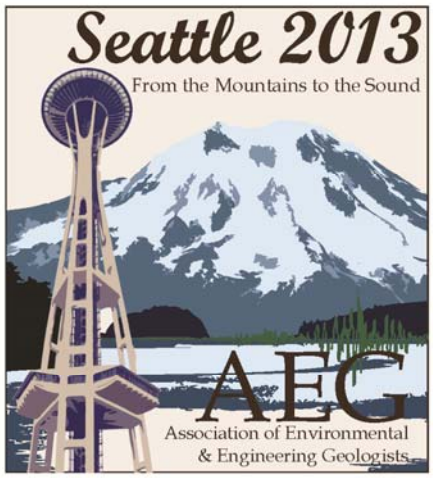
For more information on our company we invite you to contact us or visit our website - www.aecllc.net



Join us at the 56th Annual Meeting in 2013,
as the Washington section celebrates its 50th Anniversary!

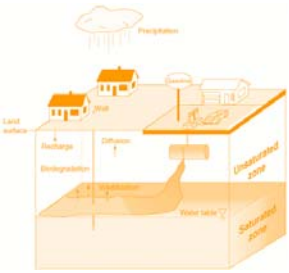
SEPTEMBER 8TH-15TH, 2013

The Westin Hotel in the Heart of Seattle



- Field Trips – 8 planned including Mt. Rainier, Landslides, Active Faults and Tectonics, Seattle Engineering & Environmental Geology, Glacial Geology, North Cascades and Mountain Biking
- Symposia – 10 planned including Tunneling, Fishery Improvements, Transportation Projects, Tsunamis, Environmental Geology Issues of Energy Development, PNW Volcanic and Seismic Hazards, Rivers and Floodplain, Quantitative Engineering Geology
- Technical Sessions – Posters and approximately 10 oral sessions to complement the symposia including Environmental Geology, Landslides, Dams, Seismic Hazards, Mining and Mine Waste Management, Geophysics, Groundwater and Karst
- Short Courses including "Challenges of Peat: Characterization, Significance, and Settlement"
- Walk to Pike Place Market, and enjoy Museums, Restaurants, Shopping and the new Wheel on the waterfront.

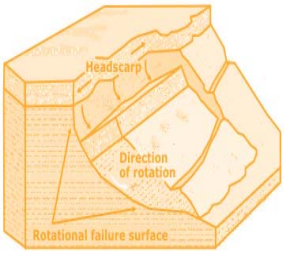
For more information visit: www.aegweb.org
Online abstracts submittal starting January 1, 2013



Message from the Chair

Greetings! We are honored to have James McCalpin (GEO-HAZ Consulting, Inc.), the 2013 AEG/GSA Jahns Distinguished Lecturer, as our speaker for the final meeting of the 2012/2013 season. Of the many wonderful topics James has on his tour, we've selected Ski Areas and Their Slope Stability Problems: The Colorado Story. We thought it fitting for our locale. Please sign up early for the meeting.

A great big thanks to all of you that attended our April meeting, Student Presentation Night, and of course to the PSU students who presented. While traffic snarls slowed our start a bit, all-in-all it was an excellent night, with the students showcasing very interesting projects. I see great things in the future for all of them. A special thanks to the three judges who evaluated the posters for the monetary awards ($600 total) – Anne MacDonald, Stephen Hay, and Jason Hinkle. Your time and thoughtful consideration was much appreciated! Congratulations to the award winners, presented below (primary authors).



- Best Undergraduate Poster – Megan Masterson – Fracture Propagation and Tidal Fluctuation at Kamb Ice Sheet Grounding Line in West Antarctica
- Best Graduate Poster – Courtney Savoie – Variations in Arsenic Mobility and Occurrence in High Silica Ash Tuffs
- Best Contribution to the Environmental or Geotechnical Profession– Kassandra (Kassi) Lindsey – Radon Hot Spots in Oregon and the Underlying Geology
- Best Graphics – Ryan Brown – A Pyroxene-Enriched Shock Melt Dike in the Buck Mountains 005 (L6) Chondrite

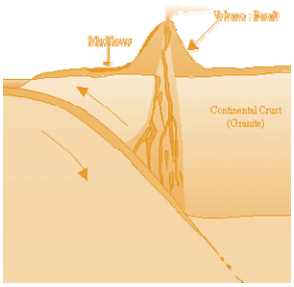
A nice change this year was having two students, selected at random from those who presented posters, do a PowerPoint presentation of their poster while the judges were evaluating the scoring for the awards. Those presentations were 1) Brant Ruiz on Hydraulic Fracturing Comparison and the Effects on Their Watershed, and 2) Kassi Lindsey, Tamara Linde, and Hillary Whitney on Radon Hot Spots in Oregon and the Underlying Geology. Well done, teams! We hope the students and the professionals in attendance liked this change. Please don't hesitate to provide feedback on Student Presentation Night to us, as we all want the event to be successful and well attended.

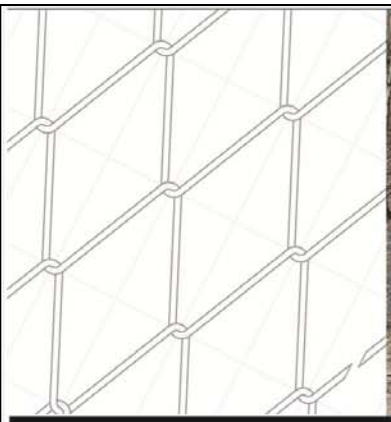
Students, stay tuned for information about our 2013 Oregon AEG Section Student Award. Details aren't set in stone yet, but to win the award, you must have an abstract submitted and accepted for the 2013 Annual AEG Meeting in Seattle this year. I'm sure you've all submitted your abstracts, correct? The deadline for abstract submittal is May 1 (not sure if it will be extended).

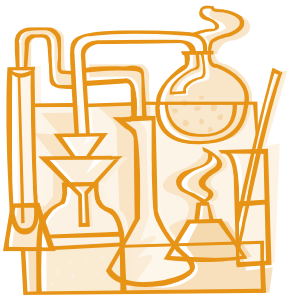
See you on May 14,
Robin

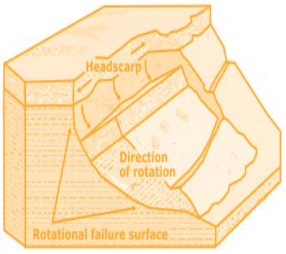
"Keen observation is at least as necessary as penetrating analysis"

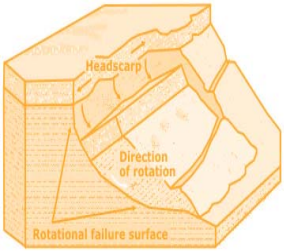
Karl Terzaghi

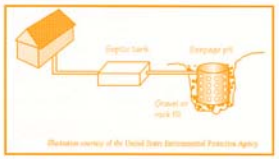






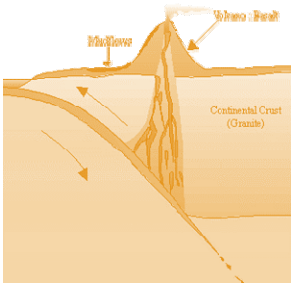





Schematic of a Seepage Pit (Dry Well)

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

Karl Terzaghi



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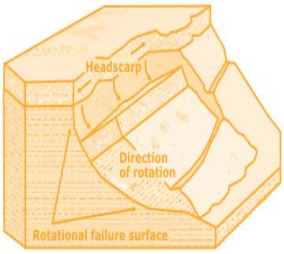

The Oregon Section Newsletter

OREGON SECTION AEG NEWSLETTER is published monthly from September through May. Subscriptions are for members of AEG affiliated with the Oregon Section or other Sections, and other interested people who have requested and paid a local subscription fee of $10.00. E-mail subscriptions are free. News items are invited and should be sent to: Scott Braunsten, OR Section AEG Newsletter Editor, PBS Engineering and Environmental, 4412 SW Corbett Avenue, Portland, OR 97239, e-mail: scott.braunsten@pbsenv.com, phone (503) 417-7737. Electronic media is preferred. Deadline for submittal is the 25th of the month. Advertising: business card $100/yr; ¼ page $200/yr; ½ page $350/yr; 1 page $450/yr. Please notify Scott if you have a change to your email or mailing address.

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.

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GRI

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Cornforth Consultants

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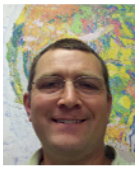

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