



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

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Summary of the:

AEG Professional Forum February 26-28, 2015, Seattle, WA

Time to Face the Landslide Hazard Dilemma: Bridging Science, Policy, Public Safety, and Potential Loss

AEG and the University of Washington Earth & Space Sciences (UW ESS) hosted over 200 geologists, engineers, planners, emergency managers, students, and others from public, private, and academic employers. Twenty-two speakers and 15 poster presenters shared their experiences and knowledge in the UW South Campus Center. Student volunteers helped turn the gears managing everything from registration, A-V, breaks, to clean-up.

Living up to its reputation, Seattle weather was drizzly and 55 degrees on Day 1, but that didn't deter attendees from arriving at AEG's first Professional Forum. The first day focused on landslide mapping programs, impacts, and implementation. Forum co-organizers, Mark Molinari and Kathy Troost kicked off the meeting by reminding attendees the key goal: assessing how we can better protect public health, safety, and infrastructure through better collaboration and communication.

Dr. Joe Wartman of UW was the first keynote speaker, sharing with us the highlights of what the Geotechnical Extreme Events Reconnaissance (GEER) Association team learned about the SR-530/Oso landslide. Their lessons learned included the importance of understanding the pre-development history of landslides when defining zoning areas, clear and consistent communication of risk to the public, monitoring and warning systems, and use of technology to advance what we know about how topography, seismology, and precipitation relate to landslide occurrence.

Our second keynote speaker, Dr. Jeff Keaton of Amec Foster Wheeler, educated us about what would be needed from the landslide mapping community to develop loss models that the insurance industries could use to begin offering landslide insurance. He did this by explaining how earthquake insurance began, and showing us an example of a hypothetical simplified national landslide hazard zone map. He defined "hazard" for us as having units of probability and intensity or size, and "risk" having units of dollars and lives. He encouraged us to collect data on these units when inventorying landslides.

Dr. Jonathan Godt, Program Coordinator for USGS Landslide Hazards, spoke about USGS strategies and tools for landslide hazard assessments and response to crises and events. Two USGS National Hazard Science Strategies he mentioned were to improve communication in landslide science, and (if the President's FY2016 USGS budget increase of \$0.5M passes) expand post wildfire debris flow warning systems, crises response capabilities, and state and private partnerships for data collection and research.

Doug VanDine, President of the Canadian Geotechnical Society, presented the purpose and highlights of the *Canadian Technical Landslide Guidelines and Best Practices related to Landslides: a national initiative for loss reduction*, which he co-edited. The chapters of this Geological Survey of Canada's Open File report are publicly available on <http://geopub.nrcan.gc.ca/>.

Dr. Scott Burns, Professor Emeritus at Portland State University, entertained us with stories of landslides across the world. He discussed the "all hazards" insurance available in New Zealand, and the landslide insurance programs Switzerland and Germany are working on. He reiterated the need for susceptibility maps, good communication between the map makers and planners, landslide insurance, and an increase of awareness about landslide hazards.

Rounding out the Day 1 morning session was Senior Geotech Engineer for the US Army Corps of Engineers, Richard Olsen. Rick reminded us, through examples of landslide events, the importance of communicating our technical findings in a way that can be understood "by our grandparents." He urged us to tell the landslide story through photos, figures, and maps, with concise text accompanying these visual communication methods.

After lunch, sponsored by Cascade Drilling and Shannon & Wilson, the first afternoon session redirected the focus toward examples of state programs. Bill Burns, from the Oregon Department of Geology and Mineral Industries; Jennifer Bauer, with Appalachian Landslide Consultants, PLLC in North Carolina; Matt Crawford, with Kentucky Geological Survey, and Stephen Slaughter, with the Washington Department of Natural Resources each spoke about landslide mapping programs in their respective states, what is working and lessons learned. A key message throughout was the value of LiDAR in developing consistent, high quality landslide inventory maps. During the afternoon break, sponsored by GeoStabilization International, attendees got a chance to chat and view posters before the next session began.

The second afternoon session focused on landslide risk, prediction, and local implementation. Tom Badger with the Washington Department of Transportation spoke about the proactive strategy that they now use to prioritize sites for mitigation, and the challenges of managing risk. Rex Baum, with the USGS, discussed predictability, tools, and assessments of landslides as part of the USGS programs. John Bethel discussed types of landslides in King County, WA, and their ongoing efforts to create an inventory for the county by 2016. The final speaker of the day, Charles Nestle, gave the County of Los Angeles, CA Department of Public Works perspective. He gave the audience some entertaining case histories, where he explained the County's role in requiring suitable

engineering geologic reports before issuing building permits in areas of questionable slope stability.

Following a day full of informative talks, the attendees relaxed during the evening Icebreaker (sponsored by the AEG Washington Section). Scott Burns brought wines from different terroirs for everyone to try. Many attendees connected with old friends, met new contacts, and discussed their involvement with landslides over a beer, non-alcoholic beverage or glass of wine.

The second day's weather was just as gray and dull, but energy was running high at the South Campus Center. After an introduction by forum co-organizer Jeff Keaton, keynote speaker Richard Roth, a Consulting Insurance Actuary, told us about the history of hazard models in the insurance industry, and the questions that need to be answered about landslides in order for insurance companies to develop landslide insurance:

1. When and where will landslides occur?
2. How big will they be?
3. How fast and how far will they move?
4. What areas will the landslides affect or damage?
5. How frequently do landslides occur in a given locality?

Mark Molinari, with AECOM in Seattle, presented examples of planning and zoning ordinances from selected cities and counties in several western states, land use strategies in landslide prone areas, and landslide information aimed at the public. David Sherrard, a Planning Consultant in Washington, explained what geologic hazard information planners need and what they do with it.

Mike Chard, Director of the Office of Emergency Management for Boulder County, CO, really caught the audiences' attention with his high energy presentation. He educated us about the EM side of landslide crises based on his recent experience with the extensive 2013 landslides, and the geologic information they need to make their jobs easier. Abigail Seadler, with the American Geosciences Institute, rounded out the morning session by giving us tips on connecting with our Congresspeople. She outlined the steps it takes to pass a bill in congress, and the steps we need to take to have our "Ask" heard. She discussed the current landslide related "Asks" AGI has made and that we can support.

Over lunch, sponsored by Geobrugg North America, attendees talked with poster presenters about their various projects, case studies, and ideas for moving forward.

After lunch, Dr. Joe Wartman gave us a summary of the National Academy of Sciences workshop "Partnerships for Reducing Landslide Risk," which took place on February 24, 2015, two days before this Forum. He first told us about innovations in New Zealand in response to the 2011 Christchurch Earthquake. Keep an eye out for notes from the workshop from the NAS.

To get Forum participants ready for the afternoon small-groups workshop, the final keynote speaker, Dr. Dave Montgomery with UW asked and answered "Saving Lives and

Property, Is Science the Easy Part?” He finished by outlining lessons learned and recommendations by the Washington State SR530 Landslide Commission.

During the course of the Forum, the co-organizers pulled out themes that continued surfacing during the talks and questions. Forum co-organizers Kathy Troost of UW and Jennifer Bauer explained the five different topics for attendees to divide up among to discuss and define some strategies and priorities for next steps. These topics were:

1. Creation of a “Loss Model;” defining unique landslide characteristics for inclusion.
2. Communication between science, policy, and the public – how can we better speak the same language?
3. Public outreach – steps toward creating a public awareness program
4. Regulation/Planning – what steps are required for landslide map integration into zoning
5. Landslide community next steps: How do we keep this conversation going?

Workshop attendees formed groups that had an hour and a half to answer their questions and prepare a 5 minute report. At the end of the workshop time, everyone got back together and shared their discussions. The groups collectively identified many achievable strategies that we can begin working on immediately.

The final day of the Forum was a field trip to view the devastating SR530/Oso landslide and a nearby similar sized pre-historic landslide and a landslide that has damaged several houses in Everett. Both destinations are in Snohomish County, WA. Unfortunately the attendees were exposed to a perfectly clear and sunny day and did not get the experience of a day in the field in typical Pacific Northwest rain.

This first AEG Professional Forum on landslides achieved its goal of bringing together individuals in the landslide community to talk about the current state of things and how to improve communication to those affected by landslides. The goal is to generate an AEG Special Publication or E&EG journal special issue including the results of the presentations and workshop. The extended abstracts, graciously assembled by Anne Weeks, are available on the AEG website (<http://www.aegweb.org/docs/default-source/events/aeg-ls-forum-program-abstracts.pdf?sfvrsn=2>) many of which include the detail of the presentations. The presentations are posted online here: <http://www.aegweb.org/?page=2015LandslideForum>.

This Forum is just one step on the continued journey of this conversation. The AEG Landslides Technical Working Group is already in discussions about the next Forum. If you are interested in joining the effort, please contact Kevin McCoy (kemccoy@mines.edu) or Casey Dowling (CDowling@bgcengineering.ca) for more info.