

May 21, 2015

## June Regional Meetings

### "Seismic Response of Shallow Tunnels, Deeply Embedded Large Structures, and Pile Foundation Systems"



Professor Ahmed Elgamal, UCSD

Seismic demand on underground structural systems is an area of much relevance to the built environment. Dr. Elgamal's presentation addresses issues through recently conducted research on the seismic response of 1) large deep-foundation systems and embedded structures; 2) pile-supported wharf systems and liquefaction countermeasures; 3) cut-and-cover-

tunnels, and; 4) bridge ground systems. A discussion of enabling tools for analysis of such systems will be presented, as an important element towards practical applications.

There will be two dinner meetings: in Sacramento on Wed. June 17, and in North Hollywood on Thurs. June 18. For complete information about the presentation and location, and to register for the event, go to <http://calgeo.org/> and click on the date you're interested in. Be sure to **RESERVE** your spot by **June 9**. We have a discounted rate for Students who want to attend, too.

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## Carmel Conference Presentations

### Dr. Ross Boulanger Simplifies Liquefaction Triggering

By Clayton Vogan, EIT (CalGeo SDSU, President 2015)

Liquefaction, the potentially destructive result of seismic activity on sandy soils leading to (differential) settlement, was discussed in depth during CalGeo's 2015 Annual Conference at the Quail Lodge in Carmel Valley, CA. Dr. Jonathan Bray, of UC Berkeley, started with a detailed discussion of liquefaction effects, followed by Dr. Ross Boulanger, Director of Geotechnical Modeling, Civil & Environmental Engineering at UC Davis, who demonstrated what's 'under the hood' of a liquefaction analysis framework.

The development of a triggering correlation is an iterative process, which is built on the compilation of CPT and SPT case history databases, as well as lab data, if possible. It involves the synthesis of

experimental, theoretical, and case history findings to overcome the limitations of individual data sources, thereby providing a rational basis for extrapolation. "A liquefaction triggering correlation should work for (all geotechs), from Georgia, where maximum earthquake magnitude is 5.5, to Oregon where subduction activity is possible." Although Dr. Boulanger also cautioned, "Avoid rules of thumb that are too black and white."

The framework involves four functions, all of which are heavily influenced by relative density ( $D_r$ ), contributing to aspects of dynamic site response, penetration testing, and soil behavior. These functions include  $r_d$ ,  $C_{Ne}$ ,  $K_{\sigma e}$ , and  $MSF$ .

According to Dr. Boulanger, the effect of fines content (FC) and plasticity index (PI) has more application to the analysis than cohesion. Studies have shown that loading duration and effects depend on soil type, failure criterion, earthquake magnitude, and soil fatigue.

The Geotechnical Engineer should understand the basis of the functional relationships, to apply a reasonable triggering correlation for each project. While liquefaction triggering analysis is a crucial component of most geotechnical reports, a thorough geologic understanding of the site is imperative, as well.



Professor Ross Boulanger, UC Davis

### **Samuel Johnson, Ph.D Presents California Seafloor Mapping Including Monterey Bay**

*By Rob Pickard (Blackburn Consulting)*



Samuel Johnson, USGS

Dr. Johnson presented a summary of the USGS's ongoing effort to create a comprehensive coastal/marine geologic and marine base map of the California's coastal State Waters at a 1:24,000 scale. At this time the published map sets cover approximately 27% of the California coast. Of particular interest to the geotechnical engineer are map sheets showing detailed bathymetry, acoustic backscatter (helps identify sediment thickness), seismic reflection profiles, and both off-shore and on-shore geologic mapping. The detailed mapping has, and will, allow better delineation of off-shore faults and determination of off-shore fault slip rates. In addition, the identification of older submarine landslides will allow agencies to identify possible areas where tsunamis could originate to assist in coastal zone planning and development. Additional map sets are scheduled to be published in the fall of 2015. Map sets, GIS data,

and additional information can be found at: <http://walrus.wr.usgs.gov/mapping/csmp/index.html>.

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## **Outstanding Project Award**

**Large Budget Winner-Leighton Consulting, Inc.**

**The Santa Ana Regional Interceptor Relocation**

The Santa Ana River Interceptor (SARI Line) is a regional sanitary sewer that conveys 43 million gallons per day of

nonreclaimable wastewater from the upper Santa Ana River basin to the ocean for disposal, after treatment. Originally buried 20 feet below the Santa Ana River bed, sediment cover over segments of SARI Line downstream from the Prado Dam has experienced heavy erosion, exposing the pipeline at several locations. To prevent further damage and provide protection from increased releases from Prado Dam, a 4-mile segment of the sewer line was relocated to cross the Santa Ana River and realigned along the river bank, north of SR-91. The 54-inch diameter pipeline was installed by cut-and-cover and microtunneling through 80 feet deep of alluvium and bedrock. Geotechnical challenges included sensitive habitats, narrow right-of-way, and permitting from various agencies for field exploration, oversize river deposits, shallow groundwater, liquefaction potential, and presence of Whittier-Elsinore Fault.



[Click here for full article.](#)



Djan Chandra Accepting Leighton Consulting Award

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## Professor Jonathan Bray Elected To NAE



Jonathan Bray, Faculty Chair in Earthquake Engineering Excellence, was elected to the NAE for his contributions to earthquake engineering and advances in mitigation of surface faulting, liquefaction, and seismic slope failure.

Dr. Bray earned engineering degrees from West Point (B.S.), Stanford University (M.S. in Structural Engineering), and the University of California, Berkeley (Ph.D. in Geotechnical Engineering). He joined the faculty at UC Berkeley in 1993. He is acknowledged internationally as a leader in geotechnical earthquake engineering. He founded and leads the National Science Foundation-sponsored Geotechnical Extreme Events Reconnaissance (GEER) Association. GEER organizes and executes reconnaissance surveys that capture key geotechnical

Dr. Jonathan Bray

landslides, and storm surge.

observations of ground and building performance and other perishable data following important extreme events, such as earthquakes, massive

Dr. Bray has served as a consultant on major activities that include the California High-Speed Train Project Technical Advisory Panel, Advisor to the New Zealand Earthquake Commission, and the BART Earthquake Safety Program Peer Review Panel. Additionally, he served as the Vice-President of the Earthquake Engineering Research Institute and as a member of the Advisory Committee on Earthquake Hazards Reduction. He pioneered procedures to evaluate seismic slope displacements, the hazards associated with surface fault rupture, and soil liquefaction and its effects on structures. An author of over 300 research publication, he has also received several honors, including the ASCE Peck Lecture Award, SSA-EERI Joyner Lecture Award, ASCE Huber Research Prize, Packard Foundation Fellowship, and NSF Presidential Young Investigator Award.

Election to the National Academy of Engineering (NAE) is among the highest professional distinctions accorded to an engineer. Academy membership honors those who have made outstanding contributions to engineering research, practice, or education and who are pioneers of new and developing fields of technology. In 2015, the NAE elected 67 new members and 12 foreign members.

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## Preparing for Rapid Response

### New GBA Publication Available

Small project problems can quickly grow into claims and lawsuits unless the design firms involved have a rapid-response capability designed specifically to keep small problems small. The Geoprofessional Business Association (GBA) has just published a new GBA Best Practices monographs that explains how to establish such a capability; the people who need to be involved; and the reporting environment that must be established. The attached news release provides more details.

[Click here for news release.](#)

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## Invitation to 7th Annual UCLA Geo-Expo

*By Clint Bannout (President | UCLA CalGeo)*

On behalf of the UCLA CalGeo Student Chapter, we would like to cordially invite you to the 7th Annual UCLA Geo-Expo. The event will take place on Friday, May 29, 2015, from 4:30-8:30 PM at UCLA, and will include a formal dinner along with presentations from professors and students, a poster session of Ph.D. students' work, and a keynote presentation from Dr. Peter Robertson, the recipient of the 2015 HB Seed Medal from the ASCE Geo-Institute. The Geo-Institute Graduate Student Organization at UCLA will also be honoring graduating M.S. and Ph.D. students and will be presenting awards to outstanding students. We would greatly appreciate your attendance at this social and educational gathering of the UCLA geotechnical community. [Please see the attached flyer for details about registration and location.](#)

The suggested donation is \$90 per industry guest. Please RSVP to [calgeobruins@gmail.com](mailto:calgeobruins@gmail.com) by Friday, May 22, 2015. Upon your RSVP, you will be provided with directions and complimentary parking, as well as additional information on the presentations for the evening. This year, we are giving companies the opportunity to sponsor

tables at the Geo-Expo. If you are interested in doing so, [please see attached proposal](#).

Also, please feel free to extend this invitation to other people in your office who may be interested in attending. Thank you for your continued support and we look forward to seeing you on May 29!

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## Safety First

### Fall Prevention In Construction

*Courtesy of Cal/OSHA*

Falls are among the most common reasons for workplace injuries and fatalities in California. Falls generally occur when employees are working at an elevated height and are not adequately protected. Some examples include employees working on elevated work surfaces, ladders, stairs, scaffolds, aerial devices, roofs, bridges, trusses, beams, purlins, plates, suspended staging, catwalks and walkways.

Falls in construction frequently involve slippery, cluttered, or unstable walking/working surfaces, unprotected edges, floor holes or wall openings, unsafely positioned ladders, and misuse of fall protection devices.

Cal/OSHA specifies many requirements for fall protection in construction. [Click here for more information.](#)



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For more information on Geopier slope stabilization, call 800-371-7470 or visit [geopier.com](http://geopier.com).

**THE GEOPIER SRT SYSTEM: LOW-IMPACT SLOPE STABILITY**

[e.Geo Standards for Publication](#)

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