

THE 2019/2020 AEG/GSA RICHARD H. JAHNS DISTINGUISHED LECTURER IN APPLIED GEOLOGY

Scott Lindvall

Scott Lindvall is a Certified Engineering Geologist in California with 35 years of experience working in the consulting industry performing seismic and geologic hazard analyses, fault investigations, and engineering geology studies for both existing and proposed critical facilities. He is particularly interested in advancing the state of the practice by incorporating recent research on active faults and seismic sources into the evaluation of dams, aqueducts, pipelines, nuclear facilities, and other infrastructure.



Scott received his BS in Geology from Stanford University in 1984 and his MS in Geology from San Diego State University in 1988. Dick Jahns was Scott's undergraduate advisor at Stanford, which makes this award especially meaningful to him. He has spent the majority of his career working for consulting firms specializing in seismic hazards and engineering geology. He currently manages the Lettis Consultants International Southern California office, and prior, worked many years at both William Lettis & Associates, and Lindvall, Richter & Associates.

His interest in geology came at a young age growing up in the Transverse Ranges of Southern California. His geologist father, Eric Lindvall, helped instill an appreciation of the outdoors (and therefore geology) and was later instrumental in shaping Scott's career. His interest in earthquakes was triggered at nine years old in the early morning hours of February 7, 1971, with the M6.6 San Fernando earthquake. Experiencing strong ground shaking from the main shock and several large aftershocks in the epicentral region, while dust was slowly rising from rock falls in the surrounding canyons, left a lasting impression.

Scott has performed detailed mapping of surface ruptures of earthquakes in southern California and Turkey, including the 1986 M6.6 Superstition Hills, 1992 M7.3 Landers, 1999 M7.4 Izmit (Kocaeli), 1999 M7.1 Düzce, and the 1999 M7.1 Hector Mine earthquake ruptures. Scott's experience in neotectonics, paleoseismology, and geomorphology has enabled him to pursue research projects designed to better quantify the timing of past events, slip rate, surface displacement, and style of deformation on active strike-slip and reverse faults throughout southern California. He has been awarded over a dozen research grants funded by the U.S. Geological Survey National Earthquake Hazards Reduction Program (NEHRP) and the

Southern California Earthquake Center (SCEC). Scott has directed geologic evaluations and seismic source characterizations in a variety of tectonic environments ranging from active plate boundaries to stable cratons. He served on the Technical Integration Team for a multi-year study sponsored by the U.S. Nuclear Regulatory Commission, U.S. Department of Energy, and the Electric Power Research Institute to develop the Central and Eastern United States Seismic Source Characterization for Nuclear Facilities, which has served as the regional seismic source model for hazard evaluations of nuclear facilities since its publication in 2012. Scott has also served on the advisory committee of the Earthquake-Induced Landslides Working Group for the California Geological Survey's (CGS) Seismic Hazards Mapping Program and, more recently, the CGS Special Publication 42 Advisory Panel to update the regulatory guidance on assessing fault rupture hazards in California.

Scott's lecture topics include:

- Crossing the San Andreas Fault: Improving the Resilience of the Los Angeles Aqueduct System
- The 1971 San Fernando Earthquake and Paleoseismology of the Sierra Madre Fault System
- A Tale of Three Dams Along the Owens Valley Fault System
- Characterizing Fault Displacement Hazards: Significant Progress and Significant Uncertainties
- Seismic Source Characterization for Evaluating Nuclear Power Plants in the Central and Eastern US
- Careers for Students in Applied Geology: Options to Consider

Scott is looking forward to this next year of the lectureship and the opportunities to meet and speak to geology students and colleagues on topics that have interested him throughout his career. Please email any speaking requests to lindvall@lettisci.com to schedule a presentation between October 2019 and September 2020.

Description of 2019/2020 Jahns Lecture Talks

Crossing the San Andreas Fault: Improving the Resilience of the Los Angeles Aqueduct System

This talk focuses on the Los Angeles Aqueduct crossing of the San Andreas fault in the Elizabeth Tunnel and describes the detailed surface and subsurface geologic investigations used to characterize the architecture of the fault zone at tunnel depth. Historic fault displacement data from world-wide strike slip faults are presented along with fault displacement hazard analyses performed to address the new 2019 performance-based seismic design guidelines for the Los Angeles Department of Water and Power.

The 1971 San Fernando Earthquake and Paleoseismology of the Sierra Madre Fault System

Experiencing the 1971 M6.6 San Fernando earthquake as a boy peaked my interest in earthquakes and I have continued to study the Sierra Madre fault system, which has uplifted the

San Gabriel Mountains to form the northern margin of the Los Angeles Basin. Incorporating tectonic geomorphic observations, paleoseismic trench studies, and age-dating research has continued to improve our understanding of past rupture behavior, slip rates, timing of events, and displacement per event on this significant north-dipping reverse fault system, that poses a significant hazard to the region.

A Tale of Three Dams along the Owens Valley Fault System

Three dams (Tinemaha, North Haiwee, and South Haiwee) in the Owens Valley are located on or adjacent to active faults, including the Owens Valley fault zone that produced a large surface-rupturing earthquake in 1872 (about 40 years prior to the construction of these facilities). These aging dams are being reassessed and rebuilt or rehabilitated by the Los Angeles Department of Water and Power to accommodate ground shaking, liquefaction, and fault displacement.



PHOTO BY DUSTIN BLAKEY – FLICKR CREATIVE COMMONS

Characterizing Fault Displacement Hazards: Significant Progress and Significant Uncertainties

This talk will focus on the different methods and underlying data used to develop probabilistic and deterministic fault displacement estimates and well as our understanding of fault behavior (slip rate, magnitude, and recurrence) and the uncertainties associated with fault behavior and observations of historic fault slip. The presentation will also raise critical questions regarding both methodologies and design criteria used for infrastructure projects in light of these uncertainties.

Seismic Source Characterization for Evaluating Nuclear Facilities in the Central and Eastern U.S.

This presentation will describe how seismic sources have been defined in the past two decades in the Central and Eastern U.S. (CEUS) to characterize safety of nuclear power plants in regions where little is understood about the causative faults of past earthquakes. East of the Rockies, the paucity of known active faults requires that seismic source characterization rely less on fault studies and more on spatial and temporal patterns of seismicity and evidence of strong ground shaking, such as paleoliquefaction, in the geologic record.

Careers for Students in Applied Geology: Options to Consider

Most of my engineering geology career has been working for small to moderate-sized consulting firms, however I have collaborated with other geologists and engineers at large engineering consulting firms, utilities, and government agencies. This talk will outline some of the different employment options for young geologists to consider as they begin their careers, by describing how roles, responsibilities, fields of study, and types of geologic investigations may differ.

AEG COMMITTEE MEETINGS in Asheville

LANDSLIDES

Technical Working Group Meeting
Wednesday, 9/18 – Cherokee
12:30–1:30pm

DAMS Technical Working Group Meeting
Thursday, 9/19 – Eagle
12:00–1:00pm

LICENSURE Committee Meeting
9/19 – Eagle
1:40–3:00pm

How to Schedule a JAHNS LECTURE

The individual Jahns Lecturer does almost all of their own scheduling and logistical coordination with the local Chapter. In addition, the Lecturer is conducting talks in other areas— all while trying to perform their "real" day-job back home."

Setting up a Jahns Lecturer takes patience and understanding on both ends, but the product is invaluable in its knowledge transfer, career guidance, and mentoring to students.

If your AEG Chapter would like a Jahns Lecturer's visit to your area, check out the helpful tips on our website at: www.aegweb.org/?page=LecturerVisit or www.aegweb.org/page/JahnsLecturer2019