



February 2018

LOS ANGELES BASIN GEOLOGICAL SOCIETY MEETING ANNOUNCEMENT

February 22 (Thursday) – 11:30 AM

Jayne Bormann, Ph.D.

Assistant Professor, Department of Geological Sciences, CSU Long Beach

HAZARDS FROM THE SEA: ASSESSING EVIDENCE OF FAULT SYSTEM CONNECTIVITY AND POTENTIAL RUPTURE SCENARIOS FOR THE SAN DIEGO TROUGH AND SAN PEDRO BASIN FAULT SYSTEMS

Abstract

In Southern California, the hazard posed by offshore strike-slip faults is poorly constrained, and may be underestimated in current models because the structural relationships between faults may allow ruptures to propagate between discrete fault systems. The San Diego Trough (SDT) and San Pedro Basin (SPB) fault systems are northwest-striking, right-lateral faults that extend offshore between San Diego and Los Angeles. Multibeam bathymetry and multichannel seismic reflection data collected in 2013 demonstrate these two faults may be separated by a gap of <5 km. This distance is significant, as empirical studies of historic earthquakes demonstrate ruptures often propagate across gaps less than 3-5 km.

The USGS ShakeMap earthquake scenario catalog includes three rupture scenarios for the two fault systems: a M 7.3 event on the southern SDT fault; a M 7.3 event on the northern SDT fault; and a M 7.1 event on the SPB fault. Complete rupture of all three segments would extend offshore from Ensenada, Mexico to Los Angeles, California with a length >330 km. Magnitude-length scaling relationships indicate a strike-slip rupture of this length has the potential to produce a M 7.7-7.9 earthquake. Combining individual rupture ShakeMap scenarios with coastal population data suggests >12,500,000 people would be exposed to strong shaking in an end-to-end rupture, with strongest shaking in Ensenada and the Los Angeles Basin.

At present, the paleoseismic histories of both faults are unknown. New observations from ongoing submarine paleoseismic investigations using CHIRP and multichannel seismic reflection sub-bottom profiles, multibeam bathymetric data, and coring surveys constrain the timing of recent deformation on the SDT and SPB fault zones. Characterizing the paleoseismic history at multiple locations along the faults is a key step toward defining the extent and variability of past ruptures. In turn, these constraints will improve estimates of maximum magnitude and potential shaking for future earthquakes on the SDT and SPB fault systems.

Speaker's Biography

Dr. Bormann received her undergraduate degree in geology from Whitman College in Walla Walla, WA, and her PhD in geophysics from University of Nevada, Reno. She completed a post-doctoral fellowship in the Nevada Seismological Laboratory before moving to CSULB in January 2017.

Her research combines geophysical, geodetic, and geological methods to study active tectonics, plate boundary deformation, and seismic hazard in the western US. She has active research projects in the Walker Lane in eastern California/western Nevada, and offshore Southern California in the Inner California Borderlands. She also worked on efforts to incorporate geodesy-based deformation models in UCERF3, and on the 2014 update to the National Seismic Hazard Maps.

Meeting Time, Place, Cost, and Reservations

When:

Thursday, February 22, 2018

Meeting Agenda

Lunch Served: 11:30 AM to 12:00PM
Announcements: 11:45 AM to 12:00 PM
Guest Speaker: 12:00 PM to 12:45 PM
Questions/Close: 12:45 PM to 1:00 PM

Place:

The Grand at Willow Street Conference Center located at 4101 East Willow Street, Long Beach, CA (562-426-0555). Take Lakewood Boulevard south from the San Diego Freeway (I-405), turn west onto Willow Street, and turn right onto Grand Avenue at the sign for the Center. Park for free in the multi-level garage structure.

Cost:

Lunch and Speaker: \$25.00 *with reservations*
\$30.00 *without reservations*
Retired: \$20.00
Student: \$5.00

PAYMENTS IN CASH OR CHECK ONLY

Meeting Reservations:

We encourage you to make your reservations using the LABGS web site, at www.labgs.org

Otherwise, call Maia Davis at (530) 559-1404, or e-mail maiac.davis@gmail.com.

Reservations must be made by: 10:00 AM Tuesday February 20th to receive the discount price noted above. As always, walk-ins are welcome.

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ANNOUNCEMENTS:

Please let a LABGS Board member know if you have a pertinent announcement.