



# LOS ANGELES BASIN GEOLOGICAL SOCIETY

April 2024 Meeting Announcement

## **Examples of Punctuated Tectonics in Southern California: Why Would Faults Turn On and Off?**

*Dr. Nate Onderdonk, Professor, Department of Earth Science, California State University, Long Beach*

**Thursday, April 25<sup>th</sup>, 11:30AM**

**Signal Hill Petroleum, 2633 Cherry Ave., Signal Hill**

**2<sup>nd</sup> floor Conference Room,**

### **Abstract**

The stick-slip model for active faults has been around for over 100 years and we are used to thinking of fault rupture as being episodic, where faults “stick” for a while and then suddenly “slip” in a short event. However, we usually assume that the underlying tectonic processes driving the two sides of the fault past each other are somewhat constant. In this talk I will present some examples from three different tectonic settings in southern California where fault activity seems to vary significantly over periods of a thousand years to hundreds of thousands of years. For example, some blind thrusts in the western Transverse Ranges appear to have been slipping relatively fast (2 to 5 mm/yr) between 85 Ka and 40 Ka, but have since slowed down, or even stopped. Patterns of deposition and deformation in older rock units in the southern California area suggest that this change may just be the most recent cycle in a longer pattern of faults turning on and off over time. Related work we have been doing in the Mud Hills of the Mojave Desert seems to suggest similar large variations in uplift and incision rates over the past 70 Ka. On a shorter timescale, paleoseismic data along the southern San Andreas Fault zone suggests that large earthquakes during the past 2,000 years may be clustered in time with periods of frequent ground-rupturing earthquakes followed by periods of quiescence. These apparent patterns of episodic fault activity were completely unexpected outcomes of different research projects. More work is needed to verify and investigate these interpretations, but I will present some possible explanations in this talk.

## Biography

Nate Onderdonk is a Professor at CSU Long Beach where he teaches classes in geomorphology, tectonics, and geologic field methods. His research is focused on the tectonics of southern California, including fault hazard studies on the southern San Andreas fault system, tectonic uplift and mountain building in the western Transverse Ranges, and crustal extension in the Mojave Desert. He earned a PhD in Geology from UCSB in 2003 and then spent two years at the University of Oslo before returning to southern California where he has been a CSU professor since 2006.

## Luncheon prices, cash or check

Lunch and Talk (pre-registered)	\$25.00
Retired:	\$20.00
Student:	\$10.00
Walk-ins:	\$35.00

Reservations are required by noon, April 22<sup>nd</sup>, at [labgs.org/meeting\\_info.html](http://labgs.org/meeting_info.html) or directly contact LABGS Secretary Joseph Landeros at (626) 497-1710 or [landerosjd@gmail.com](mailto:landerosjd@gmail.com).

## It's that time of year! Scholarships will be awarded by the Society to deserving geology majors!

Who are the winners? Come to the luncheon and find out!

## The Society is looking for a Treasurer!

If you have been considering ways to be more involved and engaged in your local geological community, being directly involved as a member of the Society's executive committee is an excellent way to accomplish that. Contact [daniel@ironhorseenergy.com](mailto:daniel@ironhorseenergy.com), or any of us below, if you are interested, thinking about it, or seek more information about the role.

## The Geologic Book/Paper Giveaway Continues!

Much of J.P. Chauvel's collection has been scooped up by students and luncheon attendees with an eye for value and quality. But there is still much to give away, particularly on the San Joaquin Basin, including works published by the San Joaquin Geological Society. Come and get it!

*The LABGS extends its thanks and appreciation to the estate of Jean Paul Chauvel. "JP" Chauvel was a career geologist with Union Oil of California. JP's curated collection of material has been made available to the Society.*

## Thank You Signal Hill Petroleum!

*The Society would like to sincerely thank Signal Hill Petroleum for their gracious and steadfast support of our monthly meetings by providing a very nice and roomy venue.*

## Pictures from The Field



Our esteemed Society VP, Dr. Rick Behl, left, adjacent to a nice exposure of the Soquel member of the Puente Fm. along Carbon Canyon Road. Karla Tucker, our dedicated Scholarship Chair and interim Treasurer, points to an overturned bed within the Sycamore Canyon member of the Puente Fm., caught in the hanging wall of the Whittier Fault, just off the Oil Trail of the Olinda Oil Museum – a must see. Both field stops were scouting efforts in support of the upcoming 100 Year celebration of the Pacific Section AAPG.

## PERSONAL ITEMS

*Editorial: From January 1947 until Nov-Dec. 1969, the Pacific Petroleum Geologist newsletter carried a "Personal Items" section which provided short, newsworthy, witty, and at times outright hilarious updates on dozens of members. In a nod to the upcoming 100<sup>th</sup> anniversary of the Section, the LABGS will begin the fine tradition anew.*

Dr. Rick Behl, our current VP and Programs member of the LABGS, is now Professor Emeritus at California State University, Long Beach. Rick continues to do research, write, and consult. Last month, Rick was recognized by the Pacific Section – Society for Sedimentary Geology with the Eugene Fritsche Lifetime Achievement Award for his contribution to the Society and to our understanding of the Miocene Monterey Fm. and the sedimentary record of the Quaternary ocean and climate change offshore of California. Congratulations Rick, this is an outstanding achievement and honor!

Karla Tucker, our Scholarship Chair and Interim Treasurer, has been hustling behind the scenes preparing for the scholarship awards to some deserving students this month. Thank you for all you do Karla!

Ben Davidson and Dan Steward bumped into each other at the LA Basin Society of Petroleum Engineers Energy Transition Networking Event held on April 11<sup>th</sup> at the Clubhouse of the Navy Golf Course in Cypress.

Eldon Gath of Earth Consultants International joined Rick and Dan for a quick run through some localities on the Whittier Fault recently. We thank Eldon for his valuable insights (far more right-lateral strike-slip than thrust motion in the last several thousand years) and commentary on recent (<1 Ma) movement on the Fault and research on the same.

Bert Vogler joined the great book (and paper) give away at our luncheons by providing several dated but still valuable text books to join the material donated by the Estate of JP Chauvel.

Mark Yarlot, a longtime petroleum geologist working the San Joaquin Basin, has recently retired from Berry Petroleum. Mark and his wife Janet live in the Bear Valley Springs area of Tehachapi.

For the friends of Mike Clark, his last role being a consultant with Oxy at Wilmington, he and wife Janet are now full-time citizens of Fairfield, California, where they stay busy with their vineyard.

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*Feel free to send a note to Dan if you would like to share a personal update for next month's newsletter - children or grandchildren graduating from college, or getting a job, recent trips, social events, chance run-ins with old friends or colleagues, a ski trip, a mountain bike ride, a promotion, transfers, successful projects (unsuccessful ones are acceptable too!), etc., etc. I'm looking forward to hearing from you!*

## **LABGS Leadership**

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