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**SDAG
Announcements**

SDAG MEETING ANNOUNCEMENT

February 19, 2025

6:00 pm - Social Hour | 7:00 pm - Dinner | 8:00 pm – Program

Tom Ham's Lighthouse

Harbor View Room
2150 Harbor Island Drive
San Diego, CA 92101

SPEAKER: Dr. Karl Mueller

Professor of Geology, University of Colorado, Boulder

TITLE: A New Seismotectonic Framework for Active Faults in Metropolitan San Diego

DINNER: Grilled Petite Top Sirloin & Vegetarian Penne Pasta

COST: Member \$65.00 - Non-Member \$75.00 - Student \$30.00

RESERVATIONS:

Make & Pay your reservation online through the SDAG website, before **NOON SUNDAY, FEBRUARY 9th**

Please sign up early, we need a headcount 10 days in advance!

Please note, all meeting reservations require online pre-payment due to venue costs, venue contracts, and loss of money due to no shows



[Click Here!
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DIRECTIONS:

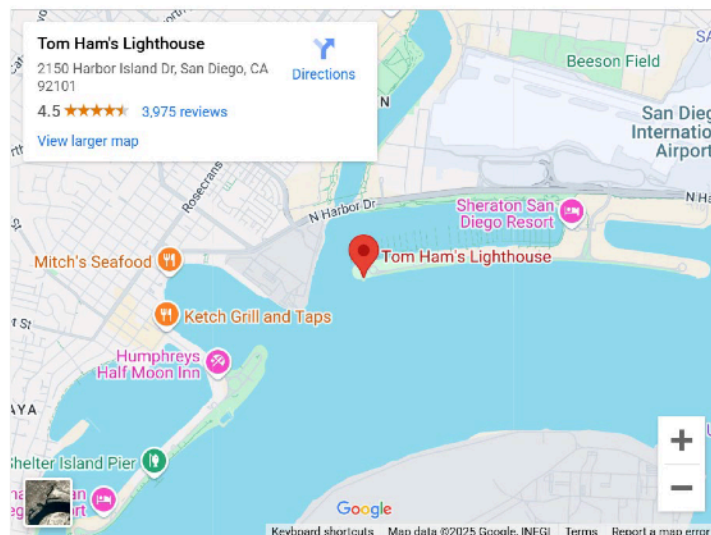
For directions to the meeting venue click on the map icons.



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Meet Our | Speaker



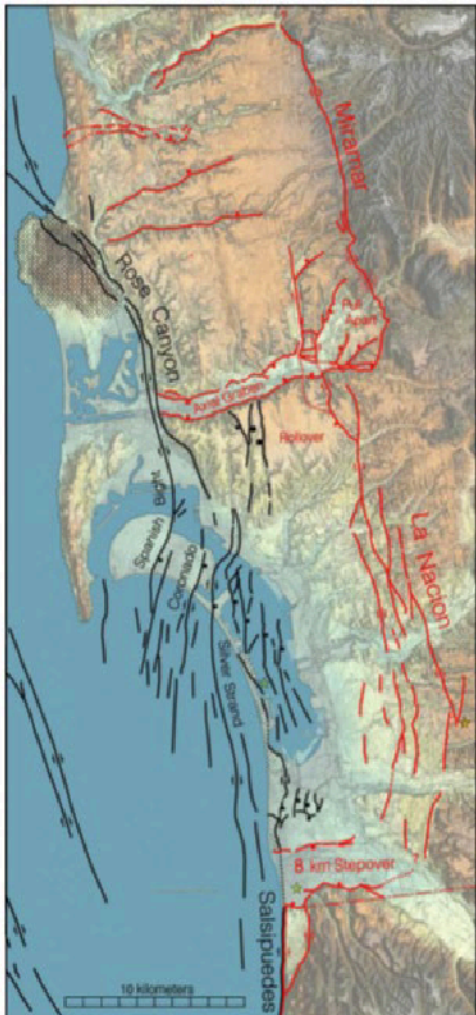
Dr. Karl Mueller

Professor of Geology,
University of Colorado,
Boulder

Karl Mueller is a professor of Geology in the Department of Earth and Science at the University of Colorado, Boulder. A native of San Diego, Karl first earned degrees in Geology at SDSU, working with Tom Rockwell (MSc, '84) on the Laguna Salada Fault. His subsequent time in the oil industry included work on gravity-driven extensional structures in the Gulf of Mexico and a PhD on upper crustal extension in a metamorphic core complex in NE Nevada. These were followed by a postdoc at Princeton working on active blind thrusts in southern California. Karl then teamed up with Tom Rockwell to determine how and why far-field uplift occurs in Southern California and Baja, leading to the rift flank model for marine terrace uplift in coastal San Diego. Other projects included studies of active blind thrusts in Japan, the New Madrid seismic zone, Taiwan, and Utah, exploring how erosion might affect active faulting. Karl has also worked on blind thrusts on Mars and Mercury and their implications for early heat loss on these planets. Karl is now focused on developing new techniques for identifying subtle, slowly slipping active faults in the densely urbanized landscape of San Diego.

Dr. Karl Mueller | Abstract

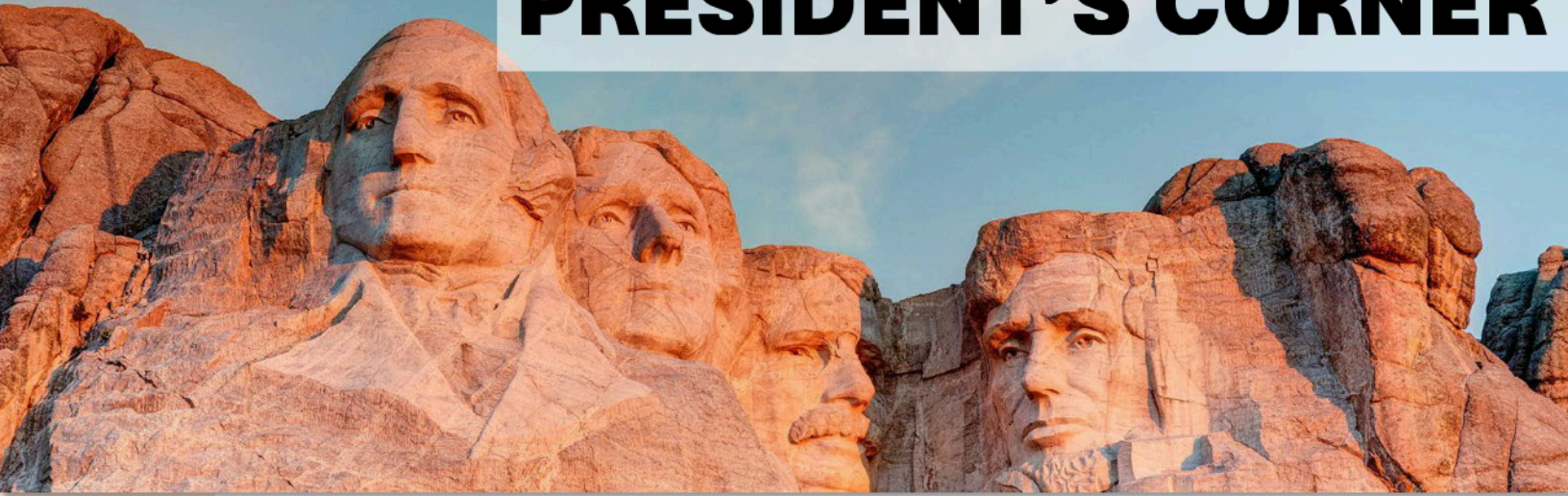
A New Seismotectonic Framework for Active Faults in Metropolitan San Diego



Revised active fault map of San Diego. Red faults denote a newly recognized fault system that is an immature version of the Rose Canyon, except with a slower slip rate and likely longer earthquake.

This talk presents evidence for a recently recognized active right lateral fault system and two extensional stepovers that extend from Poway, CA to Ensenada, Mexico. Mapping of structures using digital elevation models derived from pre-urbanization (1953) air photos and visualization of faults and folds using 3D mapping of contacts suggests the fault system connects the La Nacion Fault Zone (LNFZ) and Salsipuedes faults with three, newly recognized fault segments. These include a right lateral fault that extends the LNFZ 23 km north from a small, 4 km wide pull-apart basin in Allied Gardens, an 8 km long normal fault along the US Border, and a 15+ km long, right lateral fault and splays in Imperial Beach. Scarps along the border offset the Tijuana River floodplain and mark the surface trace of a large listric normal fault, or detachment that extends north beneath much of San Diego. Folding of the hanging wall (i.e., a rollover) above the curved detachment has formed an extensional half graben, the primary structure that drives subsidence in San Diego Bay. The surface expression of the rollover is best defined by the south-tilted flight of terraces south of Mission Valley. Bending moment faults at the crest of the rollover have formed an axial graben (Mission Valley) that is marked by faceted spurs and an offset fluvial terrace at the I-15. Progressive folding of Eocene and Pleistocene strata across the Mission Valley axial graben and synextensional Pliocene fill in the San Diego pull-apart basin suggests the LNFZ likely slips at less than 0.5 mm/yr. The Salsipuedes fault extends north from the coast along Baja into Imperial Beach and along the Silver Strand where it is marked by pressure ridges and scarps to the east, similar to faults defined by seismic reflection profiles in San Diego Bay. This fault represents a plausible continuation of the Rose Canyon fault that may be linked with the Salsipuedes. The small pull-apart basin in Allied Gardens is defined by steeply dipping fault strands that form a positive flower structure exposed on the face of the large rock quarry along the San Diego River. An associated pressure ridge deforms Eocene strata and deflects stream channels in Tierra Santa that marks the newly recognized right lateral fault segment that extends the LNFZ 23 km north to Poway. Faults in the pull-apart basin deform early Pleistocene terraces in a small rollover into the San Diego River channel that creates another axial graben at its crest (Alvarado Canyon). The drop in base level in the Allied Gardens pull-apart is recorded by dramatic stream channel incision and steepened hillslopes, leading to the development of cliff faces in Mission Gorge. The surprising discovery of a seismically active fault system in a densely urbanized city of 3M inhabitants was aided by improved methods for visualizing a lidar-scale DEM made from 1953 air photos and structure contour maps of stratigraphic contacts extracted from geologic maps.

PRESIDENT'S CORNER



Hello SDAG Members,

We had a great January meeting to start off 2025! Thank you to all that were able to attend and hear a GREAT talk by Mr. Scott Rugg! Thank you again, Scott, for highlighting the importance of accurate depth readings when using CPT for fault investigations! It could mean the difference between interpreting there is faulting or NOT, which is a pretty big deal! Hopefully, no one lost too much sleep that night thinking about previous fault investigations using CPT.

For our next meeting, and back by popular demand, we will be returning to Tom Ham's Lighthouse for a very special presentation from Dr. Karl Mueller, Professor of Geology at University of Colorado, Boulder. Dr. Mueller will be flying in to present his new work on active faulting here in San Diego! What's not to love! You're not going to want to miss this presentation! Just a reminder Sunday February 9th at noon, is the last day to sign up!

On a different note, I hope everyone has been unaffected and safe from all the wildfires that have been popping up throughout southern California...here's to hoping it rains this weekend! We desperately need it.

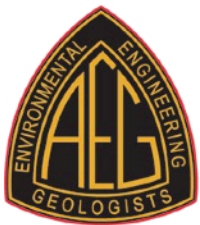
Thanks, and see you all at the February 19th Meeting!! It'll be here before you know it!

**-Heather Reynolds
2025 SDAG President**



2025 Upcoming Meetings

DATE	SPEAKER & TOPICS
February 19	Dr. Karl Mueller on “A New Seismotectonic Framework for Active Faults in Metropolitan San Diego”
March 19	Don Barrie on “There & Back Again: A Geologic Excursion to New Zealand”
April 16	Student research presentations by student scholarship recipients
May 21	TBA
June 18	SDAG / SCGS Joint Meeting
July 16	TBA
August 20	Dr. Mario Caputo on Sedimentary Rocks in the Grand Canyon
September 26-28	SDAG Annual Field Trip, San Andreas Fault in the Wrightwood area, Transverse Ranges (no meeting this month)
October 15	Todd Wirth on “First report of marine invertebrate megafossils from the Eocene Mount Soledad Fm at Tourmaline Surfing Park”
November 19	Joint Meeting with AEG Inland Empire Section
December 17	Traditional Holiday Celebration at the San Diego Natural History Museum with Tom Deméré



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Upcoming February 12th Meeting

Please mark your calendars for AEG Inland Empire Chapter's next dinner meeting, which will be a SOUTH event held in Geocon's Murrieta office with a catered BBQ from the Swing Inn Café. We welcome Dr. Miles Kenney who will speak to us about the controversial Beverly Hills fault.

2025 SDAG MEMBERSHIP

Renew or become a new SDAG Member
2025 Member Dues are Due if you have not already done so.

[On-line Payment \(\\$30 Member; \\$10 Student\)](#) or Bring **FORM** to Meeting



Speakers For 2025 Meetings

If you or someone you know would like to speak at an upcoming meeting contact one of our officers!

GEOPHYSICIST AGNEW KNOWS WHERE BUT NOT WHEN QUAKES WILL HIT.

[Original article: San Diego Union Tribune](#)

Wherever he goes, UC San Diego professor emeritus Duncan Agnew, a geophysicist who has studied earthquakes for 43 years, is asked whether he can predict when an earthquake will occur.

“I was called for jury duty and was being questioned by the lawyers when the judge interrupted after hearing my profession and asked whether we could have ‘the big one’ today,” recalled Agnew, a Del Mar resident. “I responded yes, it can happen at any time. I was not selected as a juror.”

Agnew’s work has earned him recognition as a leading scientist in the so-called Earth tides field. In August 2024, he traveled to France to receive an international lifetime achievement award for “extraordinary experience and influence” in the field. In describing Earth tides science, Agnew explained, “just as the sun and moon push and pull on the oceans to cause tides, they push and pull on the Earth’s soil and rocks. It’s more noticeable with ocean tides because water is easier to move.”

Soil and rock movement over long periods of time can change the Earth’s outermost layer and help cause stress that eventually results in earthquakes. In addition to Earth tides, other causes of stress include the effect of ocean tides and underground movement of tectonic plates.

He has spent much of his career measuring stress and whether earthquakes can be predicted.

Although he can predict where they will occur because he can measure stress, he cannot predict when.

“The stress caused by movement is similar to bending a [plastic] ruler,” Agnew explained. “As you bend the ruler at some point the ruler will break. You know it will break, but you don’t know exactly when it will break.” During the course of his



[Photo from original article of Duncan Agnew](#)

career, Agnew has worked to improve the ability to analyze movement and stress.

Among other things, he wrote new computer programs, developed mathematical calculations and managed for 38 years the world’s only (for some time) laser-based strain meters, instruments that measure Earth tides and show changes in the Earth’s outermost layer.

In addition, he formed and managed a scientific team that installed and maintained seismometers around the world, measuring hundreds of earthquakes and widely sharing his data.

Last year, while reviewing data of the Earth’s rotation, Agnew received worldwide media attention when he discovered a slight rotation change causing a risk that 1 second in time calculation will be lost by 2028. A 1-second loss could seriously affect the internet and ability of computers to communicate using identical time. His finding allows several years to prepare and reduce the effects.

“I looked at the data and recognized the Earth’s rotation was speeding up,” he said. “I saw something in the data no one else had seen.”

Agnew’s discoveries and leadership are not surprising, as he has spent a lifetime immersed in

(Continued on next page)

SDAG | LOCAL SPOTLIGHT

the world of science. Born in 1951, he was raised in Point Loma along with his brother. His father was an engineer who enjoyed reading technical magazines and shared them with his sons. Agnew recalls reading them as a young child.

“I grew up a science nerd,” Agnew said. “Much of the 1960s and 1970s culture passed me by. As long as I can remember, I just wanted to be a scientist.”

After graduating high school in 1968, he attended California Institute of Technology, where he graduated with a bachelor’s in astronomy. He went on to earn a Ph.D. in earth science from UC San Diego in 1980.

Agnew was hired by Scripps Institution of Oceanography at UCSD as an assistant researcher in 1981. He advanced to professor in 1990 and has, ever since, taught graduate-level classes and conducted geophysics research.

Today, after 43 years at UCSD, Agnew is a professor emeritus, meaning he officially retired but continues to research and teach without compensation because of his love for science, something he says he will never lose. ■

Someone San Diego Should Know appears every other Monday. Goldsmith is a Union-Tribune contributing columnist.

About this series

We welcome reader suggestions of people who have done something extraordinary or otherwise educational, inspiring or interesting and who have not received much previous media. Send suggestions to Jan Goldsmith at jgsandiego@yahoo.com

MORE INFO TO COME

Join us for the

SDAG Annual Field Trip, San Andreas Fault in the Wrightwood area, Transverse Ranges

September 26-28, 2025

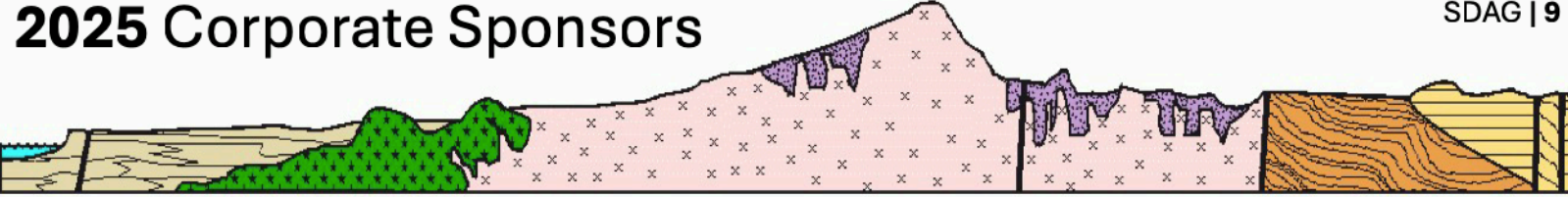
Link to list of [Previous Field Trips](#)

SDAG | January Meeting Recap

thank you

Thank you to our speaker, Scott Rugg, who spoke on the application of CPTs for fault investigation and factors regarding interpretations. And thank you to all those who joined us for our 2025 January meeting! We had a great turn out at the Marina Village for our first meeting of the year. A total of 57 members and non-members combined. We look forward to seeing you at our February meeting!





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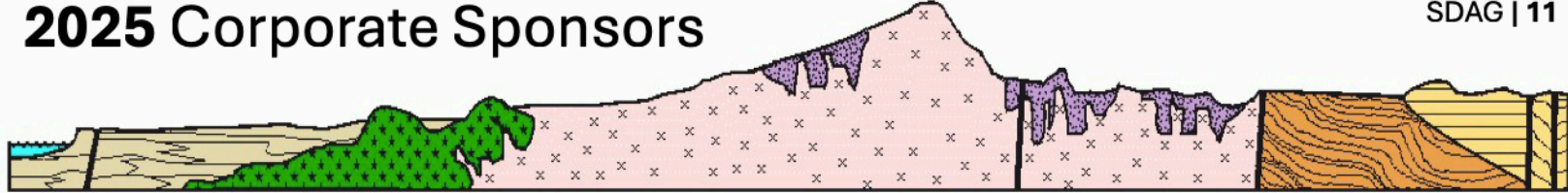
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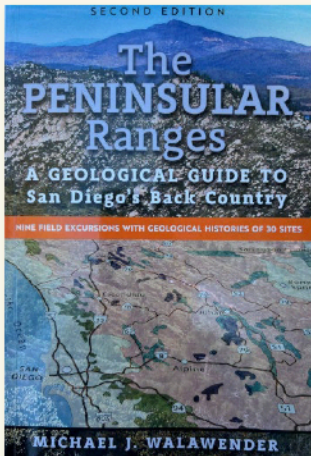
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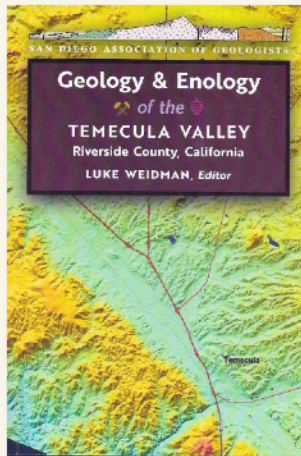


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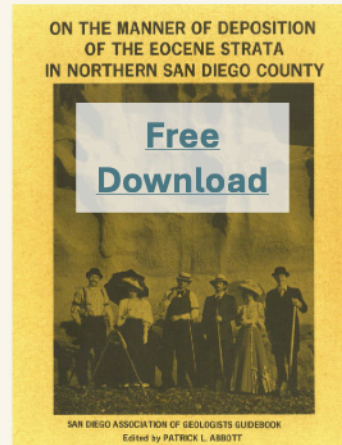
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The Peninsular Ranges: A Geological Guide to San Diego's Back Country 2nd Edition



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On the Manner of Deposition of the Eocene Strata in Northern San Diego