

SAN DIEGO ASSOCIATION OF GEOLOGISTS

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SDAG MEETING ANNOUNCEMENT

Wednesday, February 21, 2024

Where: Marina Village
Catalina Room
1936 Quivira Way
San Diego, CA 92109

When: 6:00 pm - Social Hour
7:00 pm - Dinner
8:00 pm - Program

Dinner: Mexican Buffet

Cost: \$60 Member; Non-Member \$65; Students \$25

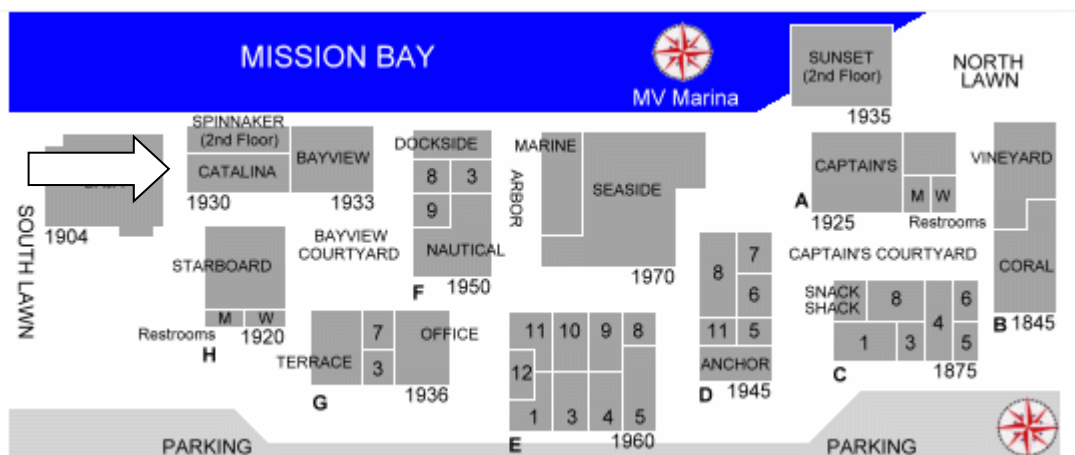
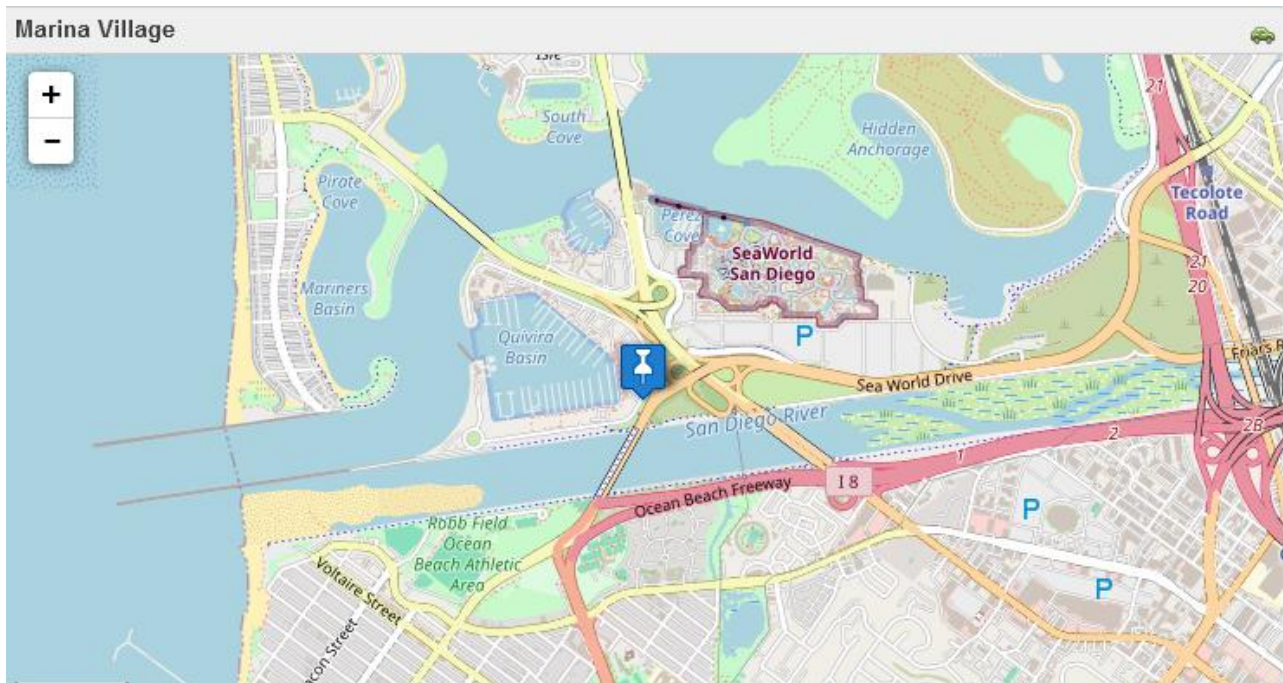
Reservations: Make & Pay your reservation [online](#) through the SDAG website, before Noon Monday, February 19. (*Please note beginning January 2024 all meeting reservations require on-line pre-payment.*)

Speaker: Dr. Ryley Hill, PhD
SDSU/UCSD joint doctoral program, 2023

Presentation Title: Major Southern San Andreas Earthquakes Modulated by Lake-Filling Events

For our 2nd meeting of 2024, we return to the Catalina Room at Marina Village for the first time in a number of years (It's the large room with its very own restrooms!). We are excited to have Dr. Hill present his geophysical research regarding the effects of the Salton Sea and ancient Lake Cahuilla on earthquakes along the San Andreas fault in the Imperial Valley. This builds on his Zoom presentation to SDAG in July 2021. Come join us at the Walawender Bar in the Catalina Room.

Meeting Location Map:



Directions: From I-5

1. Exit Sea World Drive. Turn RIGHT if you have exited going south, turn LEFT if you have exited going north.
2. Continue on Sea World Drive for about 2 miles.
3. West Mission Bay Drive will be on your right, just beyond the lanes marked with arrows to Sea World's entrance.
4. Stay in the right-hand lane, continue around loop to right.
5. After loop, merge all the way to the furthest left lane.
6. At signal for Quivira Road, turn left.
7. Go left again immediately (Quivira Way).
8. Continue about a half mile.
9. Destination is large parking lot on the right-hand side, past Seaforth.

From I-8

1. Take 8 West to the "Beaches" exit, past I-5. Exit to West Mission Bay Drive, turn right.
2. After the bridge ends, West Mission Bay Drive continues on about 100 yards UNDER the overpass, stay in right lanes and curve in the loop to the right. Do NOT continue straight on Ingraham.
3. After loop, merge all the way to the furthest left lane. At signal at Quivira Road, turn left.
4. Go left again immediately (Quivira Way).
5. Continue about a half mile, destination is large parking lot on the right-hand side, past Seaforth.



Ryley attended the University of Nevada, Reno originally in physics/applied math, but after his IRIS summer internship in 2014 studying tomography on the Juan de Fuca Ridge fell in love with geophysics and graduated in 2015 with a BSc in physics, applied math, and geophysics. He spent 1 year after undergraduate degree working for the Nevada Seismological Laboratory as a Letter of Appointment partaking in large field study and computational experiments studying ambient noise. He pursued and graduated with a MSc in Geophysics at University of Nevada in remote sensing developing a snow cover area and grain size retrieval algorithm for hyperspectral data in the Sierra Nevada. Recently, he has just graduated with a PhD in Geophysics from SDSU and UCSD joint doctoral program (Matthew Weingarten's first PhD student). There he studied a variety of poroelastic phenomena related to induced seismology. His interests include: numerical modeling, fluid-effects on faults, induced seismicity, seismic hazard and mitigation, machine/deep learning, carbon sequestration, hydrology, and hydrogeodesy. He's currently looking at a variety of job opportunities.

Speaker Dr. Ryley Hill, PhD

ABSTRACT Major Southern San Andreas Earthquakes Modulated by Lake-Filling Events

Both natural and anthropogenic hydrologic loads have been associated with stimulating seismicity. However, there are few documented examples that hydrologic loads can trigger large earthquakes. The southern San Andreas Fault (SSAF) in Southern California lies next to the Salton Sea, a successor of ancient Lake Cahuilla that periodically filled and desiccated over the past millennium. Here we use new geologic and paleoseismic data to demonstrate that the past six major earthquakes on the SSAF likely occurred during highstands of Lake Cahuilla. To investigate possible causal relationships, we computed time-dependent Coulomb stress changes produced by lake level fluctuations over the last ~1100 years. Using a fully coupled model of a poroelastic crust overlying a viscoelastic mantle, we find that hydrologic loads increased Coulomb stress on the SSAF by several hundred kilopascals and fault-stressing rates by more than a factor of 2, likely sufficient for triggering. Stress perturbations are dominated by pore pressure changes, but are enhanced by the poroelastic "memory" effect whereby increases in pore pressure due to previous lake high stands do not completely vanish by diffusion and constructively interfere with the undrained response in subsequent high stands. The destabilizing effects of lake inundation are enhanced by a nonvertical fault dip, the presence of a fault damage zone, and lateral pore pressure diffusion. Our model provides physical insights into relations between lake level and time-dependent seismic hazard, and may be applicable to other regions with hydrologic loading from either natural or anthropogenic sources.

One Stop Wonder February 10

Rob Hawk has planned a OSW to the traditional La Jolla Shores during a super low tide occurrence the afternoon of Saturday, February 10, 2024. Plan to meet 2:30pm at the beach access at the Marine Room - 2000 Spindrift Dr, La Jolla, CA 92037. Rob plans to have some speakers for a brief discussion, then turn everybody loose for low tide exploration.

2024 Annual Field Trip Committee is Making Plans

Vice President Heather Reynolds is already fast at work on this Fall's annual SDAG Field Trip. This year exploring the Transverse Ranges in the Wrightwood area. Highlights expected to be the San Andreas Fault, Devil's Punchbowl, and various geohazards in the Angeles Crest Mountains. Planned dates September 27, 28, & 29 -- the last weekend of September. Guest speaker Miles Kenney will participate.

UPCOMING 2024 SDAG MEETINGS

March 20, 2024	Bruce Luyendyk & Dave Kimbrough on Antarctica Geotours, at Tom Ham's Lighthouse
April 17, 2024	Student research presentations by student scholarship winners, at Sunbelt Publications
May 15, 2024	Don Barrie & William Buckley present some Icelandic Adventures
June 3 or 19, 2024	SDAG / SCGS joint meeting: Susan Hough on 1994 Northridge Earthquake
July 17, 2024	Chuck Houser, at Sunbelt Publications
August 21, 2024	TBA
September 27 - 29, 2024	SDAG Annual Field Trip, to the Transverse Ranges (no meeting this month)
October 16, 2024	TBA
November 20, 2024	Joint Meeting with AEG Inland Empire Section
December 18, 2024	Traditional Holiday Celebration at the NAT with Tom Demere

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DID YOU KNOW THAT SDAG HAS A FACEBOOK PAGE?

Some of us did not know that! Here is a link to the SDAG Facebook page:

<https://www.facebook.com/sandiegogeologists.org>

Some photos on Facebook from last month's meeting at Geocon, taken by Monte Murbach



2024 SDAG MEMBERSHIP

Renew or become a new SDAG Member - 2024 Member Dues are Due if you have not already done so.

On-line Payment (\$25 Member; \$5 Student):

<https://www.sandiegogeologists.org/MemberForm.html>


Mail in or Bring FORM to Meeting: <https://www.sandiegogeologists.org/MemberForm.pdf>

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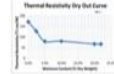
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