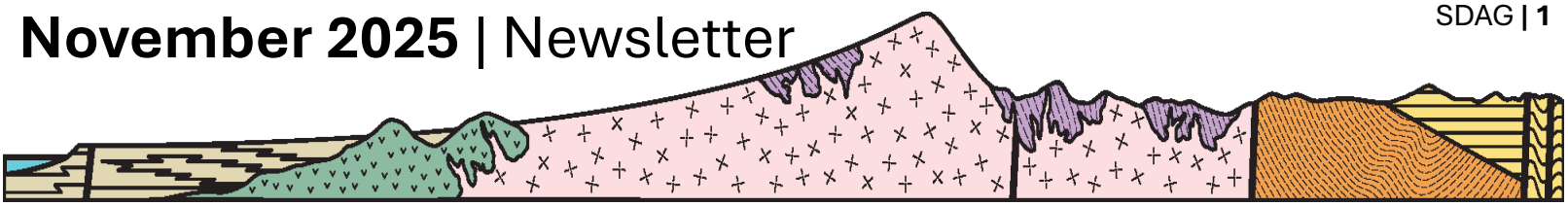
November 2025 | Newsletter



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SDAG Announcements

SDAG MEETING ANNOUNCEMENT

Thursday, November 20th, 2025

6:00 pm - Social Hour | 6:45 pm - Dinner | 7:15 pm – Program

LOCATION:

The Old Spaghetti Factory – San Marcos
111 N. Twin Oaks Valley Rd.
San Marcos, CA 92069

SPEAKER:

ELDON GATH

TOPIC: San Joaquin Hills, Santa Ana Mountains, Puente Hills, and the Whittier fault: The final(?) grand theory of Orange County's tectonic geomorphic evolution.

DINNER: Italian Buffet includes Meat sauce, Mizithra, Fettuccine, and vegetarian options

COST: Member $45.00 | Non-Member $55.00 | Student $20.00

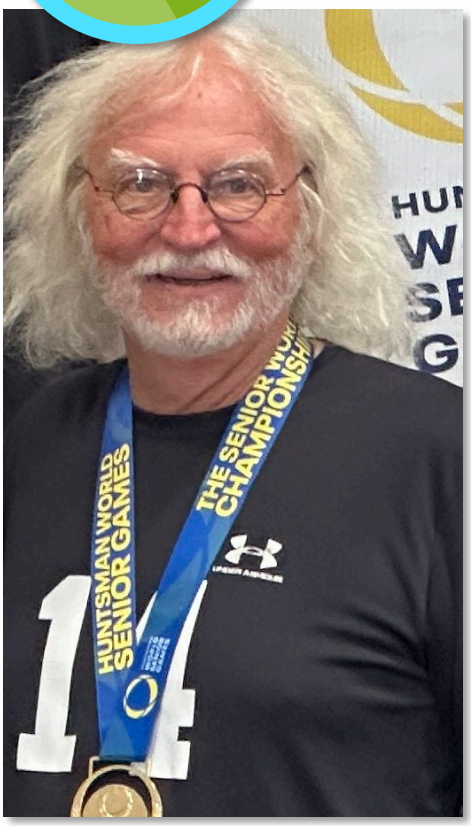
RESERVATIONS:
Make & Pay your reservation online through the SDAG website, before **6PM MONDAY, NOVEMBER 17th**

Please note, all meeting reservations require online pre-payment due to venue costs, venue contracts, and loss of money due to no shows. Refunds cannot be processed after the registration deadline.

DIRECTIONS HERE

REGISTER HERE

Meet Our | Speaker & Topic



ELDON GATH

Eldon Gath is President and Senior Consultant of Earth Consultants International since founding the company in 1997. As a consultant he has worked on projects in Turkey, Panama, Costa Rica, Taiwan, Japan, Mexico, Papua New Guinea and hundreds in California. He is also a Past-President (1987) of the South Coast Geological Society (SCGS), an Honorary Member (2012) and currently serves as the SCGS Board Treasurer. He was President (1996-1997) of the Association of Environmental and Engineering Geologists (AEG) and U.S. National Group Leader (2014-2018) and North American Vice-President (2017-2018) of the International Association for Engineering Geology and the Environment (IAEG). In 2014-2015 he was the AEG/Geological Society of America's (GSA) Richard H. Jahns Distinguished Lecturer in Applied Geology. Along the way he has acquired other notable distinctions such as outstanding paper awards (2010 Burwell from GSA & 2012 Holdredge from AEG), outstanding presentation awards (1995 Aki from S.C. Academy of Sciences and 2008 Hanson from American Association of Petroleum Geologists (AAPG)), Johnston Service award from AEG (2008), GSA Fellow (2011), and others from the National Academy of Sciences, American Geological Institute, and the European Geosciences Union. To date, he has 56 published papers, co-edited 7 SCGS Field Trip Guidebooks, has presented 61 times at professional conferences, and 230+ times at schools, professional societies, and community meetings.

San Joaquin Hills, Santa Ana Mountains, Puente Hills, and the Whittier fault: The final(?) grand theory of Orange County's tectonic geomorphic evolution

As my home, it has always puzzled me by how unstudied Orange County really has been. Sure there are geologic maps, and we can see the geomorphology out there, but do we really understand it? And why not? Hence my decades (career) long effort to generate that understanding and communicate it to others as best I can. This was never a solitary effort, there are too many to name who have helped in many ways: trench scraping, field trips, discussions, suggestions, and sometimes laughter. To them I am deeply appreciative, but any errant conclusions within this talk are not their fault.

Orange County California is home to over 3 million people making it the sixth densest county in the U.S. From its high point atop Santiago Peak it is 5,689 ft (1,734 m) down to the coastline at Laguna Beach, a distance just shy of 100,000 feet (30,000 m). The San Juaquin Hills at (height) and Puente Hills at (height) bound the west and northern county. But at 3 Ma, none of this expensive real estate yet existed; Orange County was part of the Pacific Ocean. This talk will try to explain how this came to be, by starting the clock at 3 Ma and ticking our way up to today.

The Santa Ana Mountains are an indenter (think hydraulic piston) driving northwesterly at ~6 mm/yr by the Elsinore fault. As they close the basin, the entire Cretaceous – Pliocene sedimentary section is folded, faulted and piled onto the front of the indenter. Meanwhile the Puente Hills thrust forms in response to north-south compression against the San Gabriel Mountains. As the compression tightens by 1 Ma, other structures begin to emerge as transpressional folds and faults; the San Joaquin Hills and the Peralta Hills, while the Whittier fault accommodates about 3 mm/yr of right-lateral strain as the basin slides out toin the west.

Today, the indenter is full train-wreck mode as it completes the collision with the Puente Hills in Santa Ana Canyon. We can see this expressed in both the geology and geomorphology of the Canyon. As that collision has tightened, the uplift rate of the Puente Hills has tripled to ~3 mm/yr today. Today we see extensive landsliding in the Canyon area due to that jump in uplift rates for already crushed and seismically weakened Puente Formation rocks, as well as hundreds of small faults, fractures and folds any of which could be candidates to accommodate (minor) deformation in a future earthquake. Orange County is a happening place.

PRESIDENT'S CORNER

Hello SDAG Members!

We had another fantastic meeting on October 15th at Marina Village in our favorite Catalina Room! The views never disappoint. Thank you again, Todd Wirths, for walking us through an informative presentation on the history of geologic mapping, stratigraphy, and first report of Eocene megafossils near Tourmaline Park ("Tourmo") in La Jolla. Thank goodness you did the mitigation monitoring for those two multi-million-dollar mansions with underground garages on the cliffs. Very cool discoveries! Also, who knew microfossil research could result in so much drama through GSA bulletins! Thanks again to Mr. John Teasley for recording this presentation, which is now available on our website!

For any geoscience students out there, the deadline for advisors to submit a letter of nomination with your research abstract is almost here (Monday, November 3rd)! There is $6,000 in funding available and will be divided among selected awardees!

Up next is our November 20th joint meeting with AEG-Inland Empire at The Old Spaghetti Factory in San Marcos! Our speaker will be Eldon Gath, President and Senior Consultant of Earth Consultants International, who will give a presentation on "*San Joaquin Hills, Santa Ana Mountains, Puente Hills, and the Whittier fault: The final(?) grand theory of Orange County's tectonic geomorphic evolution*. " You're not going to want to miss his presentation and our annual get together with AEG-IE!

Just a friendly reminder Monday, November 17th is the last day to sign up!

Thanks, and see you all at the THURSDAY November 20th Meeting!!

-Heather Reynolds
2025 SDAG President

2025 Upcoming Meetings

DATE	SPEAKER & TOPICS
December 17	Traditional Holiday Celebration at the **San Diego Natural History Museum** with Tom Deméré on "150 years of Paleontology at the San Diego Natural History Museum"

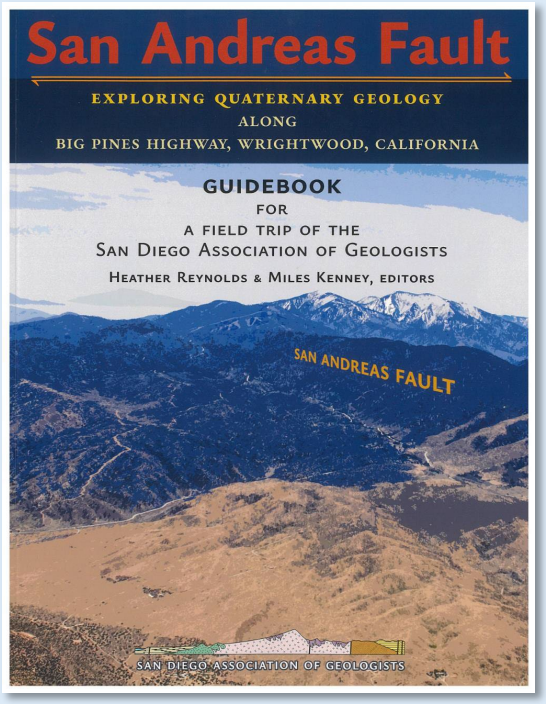
2026 SDAG OFFICER ELECTIONS

Elections for the 2026 SDAG Officers will take place during our Annual December Holiday Meeting!

Interested in serving? Contact one of our current officers to get involved and help lead our amazing geological community!

OFFICER POSITIONS

Treasurer – Secretary – Vice President – President



2025 FIELD TRIP GUIDEBOOKS AVAILABLE FOR PURCHASE

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2025 SDAG SCHOLARSHIPS

Outstanding Research in Geological Sciences

LUKE WEIDMAN, 2016

EMILY IMPERATO, 2024

XIOMARA ROSENBLATT, 2014

CALL FOR NOMINATIONS

The San Diego Association of Geologists (SDAG) is now accepting nominations for the 2025 Outstanding Student Research Awards.

These awards recognize exceptional student research in the geological sciences, including undergraduate and master's-level research, as well as community college students engaged in guided geoscience projects.

SUBMISSION REQUIREMENTS

Students: Contact your research advisor to determine if your research qualifies for nomination.

Advisors: Submit a letter of nomination and the student's research abstract directly to:

Dr. Anne Sturz-*University of San Diego*
Email: asturz@sandiego.edu

Deadline: Monday, November 3, 2025

Both the nomination letter and research abstract must be received by the deadline to be considered.

EVALUATION AND AWARDS

The total funding amount of $6,000 will be **divided among selected awardees** based on the following criteria:

- Quality of the **advisor's nomination letter**
- Quality and clarity of the **research abstract**
- Number and caliber of applicants

Awards will be presented at the **December 17, 2025 SDAG Meeting**, held at the **San Diego Natural History Museum**. Award recipients will also be invited to present their research findings at a **Spring 2026 SDAG meeting**.

FOR ADDITIONAL INFORMATION, VISIT: WWW.SANDIEGOGEOLOGISTS.ORG

SAN DIEGO ASSOCIATION OF GEOLOGISTS

$6,000 Total Funding by

Shannon O'Dunn Scholarship & the SDAG Walawender Scholarship

ABOUT THE SCHOLARSHIP PROGRAM

A primary function of the San Diego Association of Geologists (SDAG) is to support academic opportunities in geology and related sciences. The by-laws of the San Diego Geological Society (SDGS dba SDAG) specify the support of academic opportunity ranging from elementary through graduate levels. The SDAG scholarship program has supported academic research in higher education by awarding scholarships annually to students from two-year and four-year undergraduate and master's level programs. The award is for outstanding research in geology and related sciences. Nominations are solicited from individual faculty and from geology or related science departments at accredited academic institutions. Evaluation of the relative merit of each nominee is based on an abstract describing the objectives and results of the research being conducted by the student and on the letter of recommendation by the student's mentor or nominating committee.

GEOTOURS | 2026 ICELAND TRIP

GEOTOURS
EXPLORE THE WORLD

Please join Mesa College geology professor, Don Barrie, along with Matt Ebiner, retired geography professor and owner/operator of Geotours, LLC, for a 10-day, geologically themed Iceland trip.

This trip is similar to the trip Don and Matt led for SDAG in 2023. All are welcome, geologists and non-geologists alike. Over 10 days, we'll circumnavigate the island by bus, stopping along the way for many activities.

2026 ICELAND TRIP DETAILS [CLICK HERE]

For trip related inquires contact

Don Barrie
dbarriegeo@gmail.com
Matt Ebiner
mattebiner@geotours.us

Field Notes & Snapshots

Brought to you by your SDAG Membership

THE ORBICULAR GABBRO OF DEHESA

San Diego County, California

Mike Hart, *SDSC (not a typo) Class of 1972*

On an oak pedestal outside Room 117 on the first floor of the Geology, Mathematics, and Computational Sciences building at San Diego State University sits a large boulder of orbicular gabbro that has graced the halls of the department since at least 1962. The approximately 1.5-ft.-diameter boulder was collected at Lawson Peak probably by students and faculty of the geology department (photo left). Photo of the polished upper surface is on the [lower left]. This short article, however, describes the only other known locality of orbicular gabbro in San Diego County which is north of Dehesa Road near the Singing Hills Golf Course. (The Lawson Peak locality is the subject of an excellent Master's Thesis by David Hoffman, SDSU, 1975)

Orbicular gabbro has held my interest since I took part in a field trip to the Dehesa site led by Dr. Gordon Gastil too many years ago to recount. After a bit of research, I found that while orbicular gabbro is relatively rare, with only a few known localities in the U.S., it has been described in many other localities around the world.

The first report on the Dehesa locality was by Andrew Lawson (1901) who published a short paper on a sample of the orbicular gabbro that was found as float along Dehesa Road. Lawson gave the coordinates of the orbicular gabbro outcrop as 32º 47' N. 116º 52'W. A more precise location of the nearest accumulation of gabbro boulders similar to that described in the text of a later paper by Kessler and Hamilton (1904) lies 600 feet to the southeast. They indicated that the rock occurs in a small area on the hillside and that only around 2% of boulders exhibit orbicular structure. The orbicular structure

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Field Notes & Snapshots

Brought to you by your SDAG Membership

THE ORBICULAR GABBRO OF DEHESA (CONTINUED)

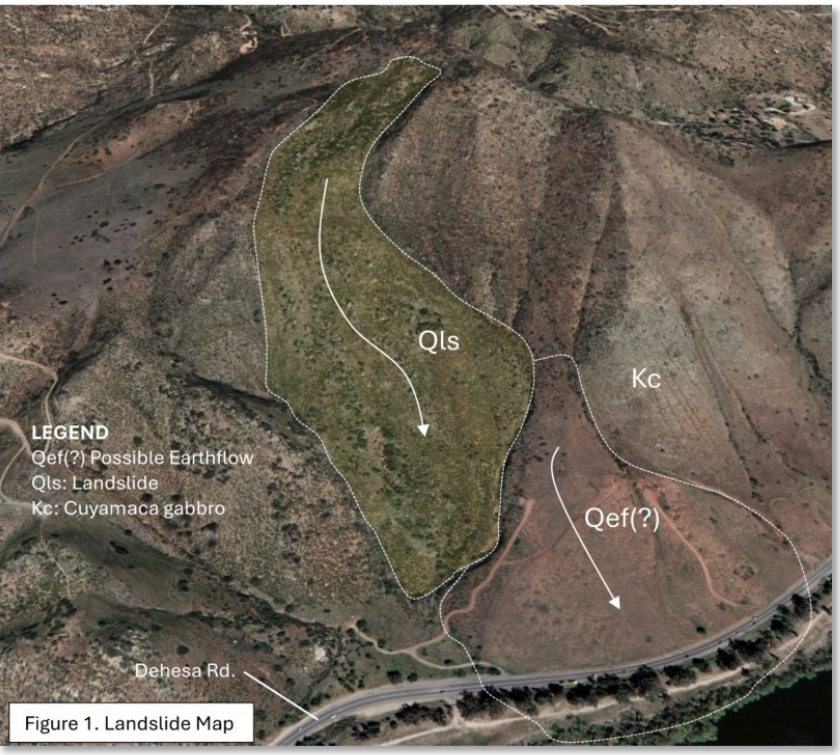

Figure 1. Landslide Map

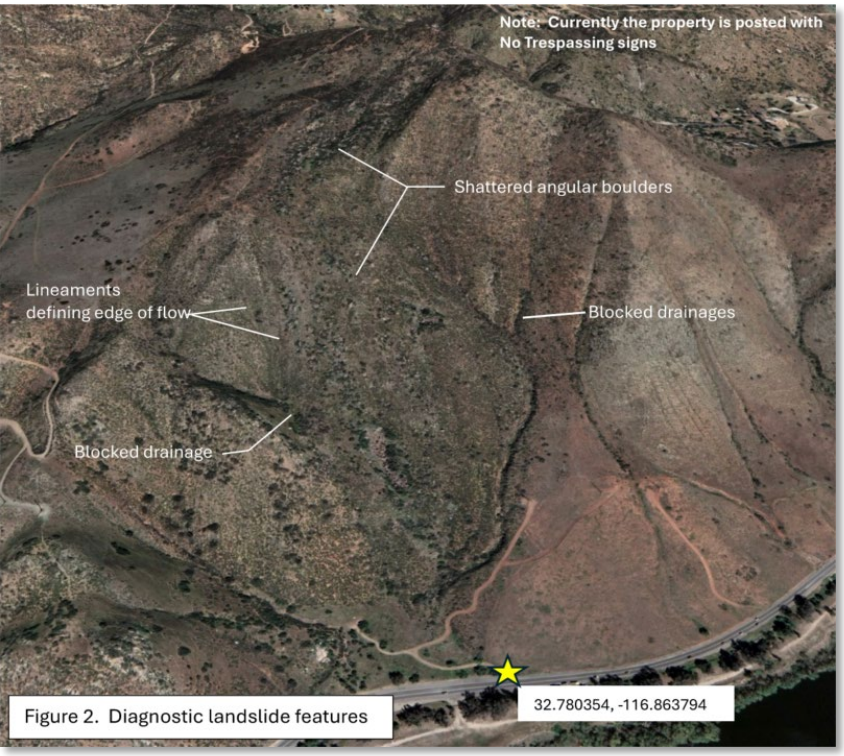

Figure 2. Diagnostic landslide features

is described as having three varieties: 1. With neither concentric nor radial structure; 2. Concentric but not radial structure; and 3. With both concentric and radial structure. The second variety was found to be most common and consists of an outer 40-mm-diameter ring of feldspar 3-4 mm thick surrounding a nucleus of sponge-like feldspar. Concentric rings of olivine are also present and hornblende is common.

Kessler and Hamilton describe the gabbro on the hillside outcrops as "fresh but considerably shattered, huge angular boulders that occur in irregular heaps and isolated masses. In no place can it be found in-situ." Since shattering, or brecciation, commonly occurs during mass movement, landsliding was immediately suspected and then confirmed by review of aerial photographs and Google Earth images. As shown on Figures 1 and 2 the landslide is 0.6 miles in length and extends from near the crest of the ridge above the gabbro outcrops (el. 1675 feet) to an elevation of approximately 520 feet near Dehesa Road (Figures 1 and 2).

The landslide is easily distinguished from the surrounding hillside by geomorphic criteria such as truncated stream channels, lineaments that define the slide limits, and surface textural differences. Large landslides in terrain underlain by gabbro are common in San Diego County and result from mobilization of the unique thick clayey residuum that develops on gabbroic rocks. Examples of locations where such slides occur are Viejas Mountain and all three major peaks of the Cuyamaca Mountains.

Comments and polite disagreements can be sent to Mike at **mwHart40@gmail.com**

References:
Kessler, H.H. and Hamilton, W.R., 1904, The Orbicular Gabbro of Dehesa, California. The American Geologist, vol.XXXIV, Sept.No. 3 pp. 133-140.
Lawson, A.C. 1901, On an Orbicular Gabbro from San Diego County, California, Science (new series) vol.XV, p. 415.

SDAG | September Meeting Recap

A huge thank you to Todd Wirths for making a topic like paleontology feel so relaxed and enjoyable! Todd's easygoing style and the way he shared insights about the paleontology of Tourmaline Beach made the evening flow as smoothly as a perfect set of waves. Thanks also to everyone who joined us—and a special shoutout to Todd's family for being part of the night! It was awesome to see so many students in the crowd, too. See you all next month for another great session!

SDAG | Publications

The SDAG publication page includes links to in stock books we sell thru Sunbelt Publications, out of stock books we sell thru Google Play Books, and out of stock books that we provide free as scanned copies to download.

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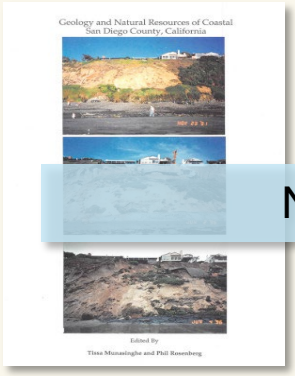
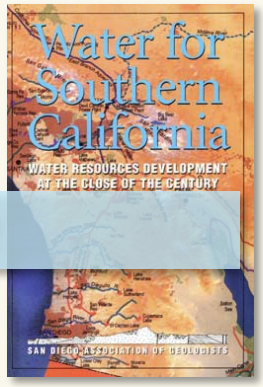
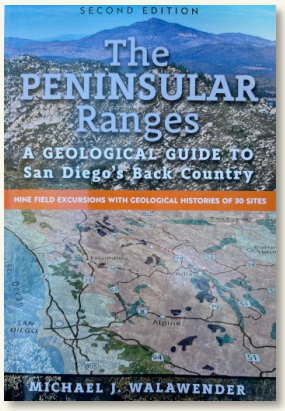


Geology And Natural Resources Of Coastal San Diego County, CA (1996)

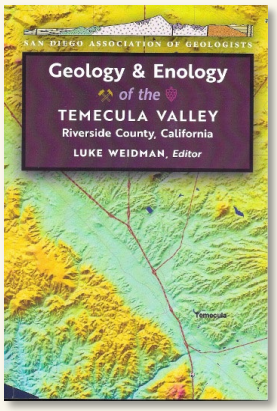
Geology And Geothermal Resources Of The Imperial And Mexicali Valleys (1998)



WATER FOR SOUTHERN CALIFORNIA: Water Resources Development (1999)



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



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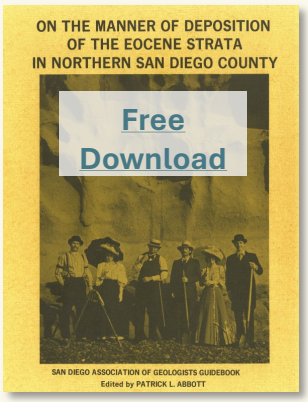

On the Manner of Deposition of the Eocene Strata in Northern San Diego

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- 1972 Otay Mesa
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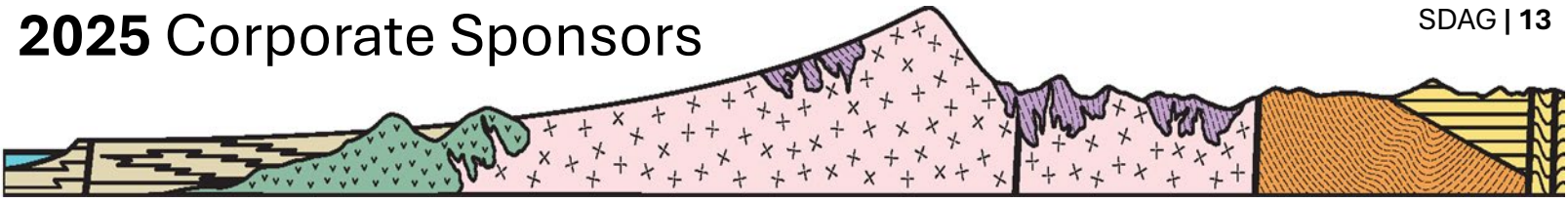

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