

SAN DIEGO ASSOCIATION OF GEOLOGISTS

<http://www.sandiegogeologists.org>

SDAG and SCGS JOINT MEETING ANNOUNCEMENT

Tuesday, January 15, 2018 *3rd Tuesday*

A Landscape Altered: The explosive end to Kīlauea's summit lava lake and the lower East Rift Zone eruption of 2018

Presented by: **Diane Murbach, Matt Burgess and Ken Hudnut**

Where: **Green Dragon Tavern and Museum**

6115 Paseo Del Norte, Carlsbad, CA 92011 (See Map)

When: 5:30 pm – Social Hour

6:00 pm – Dinner

7:00 pm – Presentation

Dinner: Herb Grilled Chicken Breast, Vegetarian Cheese Ravioli, Classic Caesar Salad, Vegetable Medley, Garlic Mashed Potatoes, Bread Rolls, Cheesecake

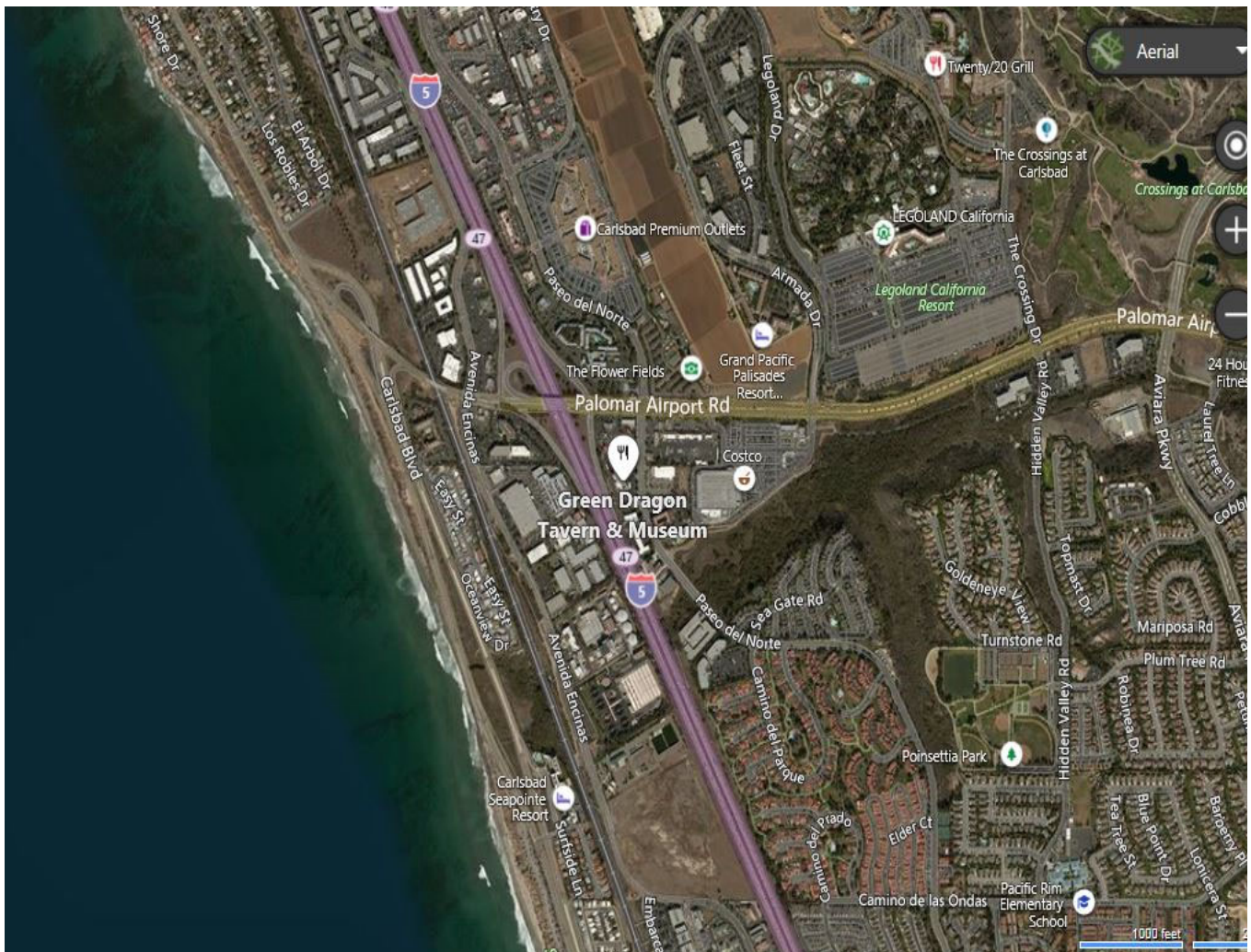
Cost: \$40 Member, \$45 Non-Member, \$25 Students.

Reservations: Make your reservation **online** at <http://www.sandiegogeologists.org/Meetings.html> later than noon, Friday, January 11th. Reservations cannot be guaranteed after Tuesday at noon, but are always preferred over walk-ins. **EARLY reservations well before the deadline are MUCH appreciated.**

Directions: FROM INTERSTATE 5: Take Palomar Airport Road exit. Head East on Palomar Airport Road and make your first right turn (south) on Paseo Del Norte. Green Dragon Tavern is on your right (west side of road) just past the Taco Bell.

FROM INTERSTATE 8: Go to the I-5 and follow the directions above.

Map:



ABSTRACTS

Kīlauea is a basaltic shield volcano located on the Island of Hawai'i characterized by a summit caldera and two radiating rift zones . Currently ranked by the USGS as the number one threat for U.S. volcanoes , along with Etna and Piton de la Fournaise (Reunion Island), it ranks among the world's most active volcanoes and is often considered the most active volcano on Earth. Kīlauea, which is built on the east flank of the massive Mauna Loa volcano, has been Hawaii's most active volcano during historical time. Once thought to be a mere satellite of its giant neighbor, research over the over the past few decades shows that Kīlauea has its own magma plumbing system, extending to the surface from more than 37 miles deep in the mantle . It lies along the Kea trend of magmatic composition, chemically similar to Mauna Kea, Kohala, Haleakalā (Maui), West Maui and east Moloka'i and chemically distinct from the sub-parallel Loa trend volcanoes: Lō'ihi, Mauna Loa, Hualālai, Māhukona, Kaho'olawe, Lāna'i, west Moloka'i and Ko'olau (O'ahu) .

Eruptions are prominent in Polynesian legends as the volcano is home to the deity Pele, who is revered in Hawaiian culture; and though written documentation only extends back to 1820, it records frequent summit and flank lava flow eruptions interspersed with periods of long-term lava lake activity³. The 1.9 x 3.1 mile caldera was formed in several stages, with the most recent caldera forming period lasting about 300 years between 1500 and 1790 CE . The penultimate lava lake within the Halema'uma'u crater in the summit caldera, persisted for about 100 years, ending with explosive eruptions in 1924 when an intrusion entered the lower East Rift Zone . Since 1952 there have been 34 eruptions on the volcano³. Eruptions have also originated from the >32 mile long East and >19 mile long Southwest Rift Zones, both of which extend to the sea from the volcano's summit. About 90% of the surface of the volcano is made up of lava flows less than 1100 years old and 70% of the volcano's surface is younger than 600 years old. A long-term eruption from the Pu'u'Ō'ō vent on the East Rift Zone that began in 1983 produced lava flows covering more than 39 square miles of land, inundating the community of Kalapana, destroying nearly 200 houses (before 2018) and adding new coastline to the island .

In the spring and summer of 2018 Kīlauea underwent drastic changes in its eruption, forever altering the once familiar landscapes. The Pu'u'Ō'ō vent collapsed on April 30 and magma migrated down rift. A magnitude 6.9 earthquake occurred on the volcano's south flank on May 4th and ~60,000 earthquakes occurred on the volcano between April 30 and August 4. Fissures formed in the populated Leilani Estates area of the lower East Rift Zone, eventually erupting ~1 billion cubic yards of lava. 716 dwellings were destroyed as 13.7 square miles of land was inundated by lava and 875 acres of new land was created by ocean entries. The lava lake in Halema'uma'u, present in the Overlook vent since 2008 and overflowing onto the floor of the crater between April 22 and 28, had completely drained by May 10th, a decline of almost 1000 ft. Beginning on May 16 the summit vent became the site of explosive events that sent ash as high as 30,000 ft. On May 29 the caldera around Halema'uma'u began to subside and near-daily summit collapse events continued until August 2nd, with each event releasing energy equivalent to that of a ~ magnitude 5 earthquake. When the dust had settled the partial collapse of the caldera had increased the area of Halema'uma'u by ~1 billion cubic yards and maximum subsidence in the caldera was over 1,600 ft. By August 17th eruption of lava from fissure 8 had stopped and the ocean entries were no longer active by August 21. By September 4th when lava was no longer visible in the fissure 8 spatter cone, Kīlauea's largest eruption in at least 200 years was at least temporarily over.

¹ Montgomery-Brown, Emily K., Poland, Michael P. , and Miklius, Asta, 2015, Delicate Balance of Magmatic-Tectonic Interaction at Kīlauea Volcano, Hawai'i, Revealed from Slow Slip Events, in *Hawaiian Volcanoes: From Source to Surface, Geophysical Monograph 208*. First Edition. Edited by Rebecca Carey, Valérie Cayol, Michael Poland, and Dominique Weis. © 2015 American Geophysical Union.

² Ewert, John W., Diefenbach, Angela K., Ramsey, David W., 2018, 2018 update to the U.S. Geological Survey national volcanic threat assessment, U.S. Geological Survey Scientific Investigations Report 2018-5140, <https://doi.org/10.3133/sir20185140>

³ USGS Hawaiian Volcano Observatory, Kīlauea summary, <https://volcanoes.usgs.gov/volcanoes/kilauea/>, accessed 11/4/2018

⁴ Clague, David A., and Sherrod, David R., 2014, Growth and Degradation of Hawaiian Volcanoes, Chapter 3 in: *Characteristics of Hawaiian volcanoes*: U.S. Geological Survey Professional Paper 1801, 429 p., Poland, M.P., Takahashi, T.J., and Landowski, C.M., eds., <http://dx.doi.org/10.3133/pp1801>.

⁵ Swanson, Donald A., Rose, Timothy R., Fiske, Richard S., McGeehin, John P., 2011, Keanakāko'i Tephra produced by 300 years of explosive eruptions following collapse of Kīlauea's caldera in about 1500 CE, *Journal of Volcanology and Geothermal Research*, 215-216 (2012) 8–25

⁶ Wright, Thomas L., Klein, Fred W., Two hundred years of magma transport and storage at Kīlauea Volcano, Hawai'i, 1790-2008, U.S. Geological Survey Professional Paper 1806, 258 pp., <http://pubs.er.usgs.gov/publication/pp1806>

⁷ Smithsonian Institution Global Volcanism Program, Kīlauea summary, <https://volcano.si.edu/volcano.cfm?vn=332010>, accessed 11/4/2018

⁸ USGS Hawaiian Volcano Observatory, September 2018, Preliminary summary of Kīlauea Volcano's 2018 lower East Rift Zone eruption and summit collapse, <https://volcanoes.usgs.gov/observatories/hvo>

Link to copy of their recently published Kilauea paper:

<http://science.sciencemag.org/content/early/2018/12/10/science.aav7046>

SPEAKER BIOS

Dr. Ken Hudnut has studied earthquakes as a geophysicist for the U. S. Geological Survey (USGS) in Pasadena since 1992. He recently led large team efforts to develop the HayWired Earthquake Scenario, as well as to obtain high-resolution topographic data using helicopter-mounted lidar to assess the eruption of Kilauea volcano. To help understand the San Andreas Fault system and the behavior of faults in general, he has studied earthquakes worldwide using satellite & airborne imagery along with field work to provide ground truth. Recently, he received awards for distinguished service and leadership from the American Geophysical Union and for meritorious service from the U.S. Department of the Interior. He is a Visiting Associate in Geophysics at Caltech and a Lecturer (on engineering geology) in Civil & Environmental Engineering at UCLA. He received his Ph.D. from Columbia in 1989, and his A.B. (high honors) from Dartmouth in 1983.



Matt Burgess was the seismic analyst for the USGS Hawaiian Volcano Observatory from 2013 - April 2018. On May 4th, 2018 he was called into emergency service for the USGS response to the eruption of Kīlauea volcano. For the following five weeks he stood watch 12 -15 hours per day over streaming real time geophysical data, providing situational awareness on the eruption from seismic, infrasound, deformation and atmospheric radar reflections off the tops of ash columns to Observatory staff in the field and Emergency Operations Command from his home in San Diego. He has a MS in Geological Sciences from SDSU (2008) and has previously worked for the USGS California Water Science Center, San Diego Natural History Museum as well as on geophysics research projects at Mt. St. Helens, Long Valley Caldera, volcan Villarrica in Chile and the Alpine Fault, New Zealand. He is currently parenting full time, a volunteer research associate with the Hawaiian Volcano Observatory studying patterns of seismicity on Kīlauea and Mauna Loa, volunteering with the Guza lab coastal studies LiDAR group at Scripps Institution of Oceanography, and looking for meaningful long term employment in the geological sciences in San Diego.



Diane Murbach is a Certified Engineering Geologist (CEG) with 35 years of experience and registered in the States of California, Oregon, Washington and Arizona. She is a principal engineering geologist working as a co-owner of Murbach Geotech (MG) with her husband Monte Murbach. Diane received a B.S. degree from Eastern Washington University and an M.S. degree from San Diego State University in Geology. Diane's volunteer work for geological societies includes being a past President for the San Diego Association of Geologists (SDAG), and the South Coast Geological Society (SCGS). She currently serves as Secretary on the Board of Directors for the San Diego Geological Society, Inc., and chair for the Earth Science working group updating the San Diego Tijuana Earthquake Planning Scenario. Diane's background with volcanoes began in 1979 with Monte when both attended a two week Geology of Hawaii class on the Big Island. Six months later both were on another geology class next to Mount St. Helens in the state of Washington when this stratovolcano erupted. Diane and Monte have been chasing volcanoes and visiting all the Hawaiian Islands for the past 40 years.



UPCOMING MEETINGS

Meetings are usually held on the 3rd Wednesday of the month may change to accommodate the speaker and meeting place schedules. Check the SDAG website for updates

February 20, 2019, Marina Village	Vic Camp – Yellowstone Hotspot
March, 2019	TBD
April, 2019	TBD

2018 SDAG EXECUTIVE COMMITTEE

<u>PRESIDENT:</u>	Ken Haase; haase@geoconinc.com
<u>VICE PRESIDENT:</u>	Adam Avakian; armenianmenace1@gmail.com
<u>SECRETARY:</u>	Heather Reynolds; heather.reynolds@tetrattech.com
<u>TREASURER:</u>	Luke Weidman; lcweidman@gmail.com
<u>PUBLICATIONS:</u>	Lowell Lindsay; <i>Sunbelt Publications</i> ; Ph: (619) 258-4911, x111; llindsay@sunbeltpub.com

SDAG PRESIDENT'S CORNER

Happy New Year SDAG Members!

What a busy year 2018 was. I hope everyone got their geology fill this past year. SDAG set up many One Stop Wonders (OSW) highlighting local geology and Chris Livesey had a great and wide variety of speakers in 2018. I would like to thank Chris for his service to SDAG over the past few years, he has done a great job juggling twins (along with another toddler), taking professional exams and a company change. Take a rest Chris, you deserve it!

I would also like to welcome Luke Weidman to the SDAG Officers as the 2019 Treasurer. We are all excited to have him with us. Heather Reynolds and Adam Avakian will move into their new roles as Secretary and Vice President. Adam has provided a rough outline of his field trip but if you can help with any ideas or locations let him know.

Our first meeting of the year will be a joint meeting with SCGS on January 20th, the 3rd Tuesday of the month at the Green Dragon Tavern in Carlsbad. We have 3 great speakers, Dr. Ken Hudnet, Matt Burgess, and our very own Diane Murbach. They will discuss the 2018 eruption at Kilauea in Hawaii.

Our first OSW is on January 5th in San Clemente with Steve Jacobs looking at a large landslide complex, details follow in the newsletter.

I look forward to being SDAG President for 2019 and if you have any questions, concerns, want to be a speaker or have a cool OSW just email me!

Respectfully,

Ken Haase

2019 SDAG President

Geocon, Inc.

ANNOUNCEMENTS

ONE-STOP WONDER CHALLENGE!

ONE OSW A MONTH IN 2018!

BE A PART OF SDAG HISTORY!

Have an idea for a one-day or half-day field trip?

Want to share your favorite aspect of San Diego
geology?

Contact SDAG to schedule your One-Stop
Wonder!

Your OSW may be chosen to be included in SDAG's One Stop
Wonder Guidebook!

Contact Monte Murbach for scheduling!

montemurbach@gmail.com

2019 SDAG Annual Field Trip – Owens Valley, CA

Hi SDAG members. My name is Adam Avakian. I am the current secretary and future 2019 vice president for SDAG. I am very excited to be tasked with pulling together the annual field trip for 2019 and have some big shoes to fill after attending our latest trip out to the Mojave Desert (thanks to Ken and everyone involved for an amazing trip, and what an awesome group photo!). I am planning on taking us to Owens Valley / Eastern Sierras. I have a few stops in mind already but could definitely use some help on more stop suggestions and *especially any enthusiastic speakers* who have some knowledge and a love for the geology of Owens Valley. Here is a sneak peek at next year's trip:

- Owens Valley Fault - 1872 Earthquake Fault Scarp - Lone Pine.
- Alabama Hills – I was recommended a very interesting geological feature to look at here, also potential campground
- Poverty Hills Geology - Owens Valley Fault Pressure Ridge and beautiful fault scarps preserved in basalt flows - Tinemaha Dam – Big Pine
- Crowley Columns – Lake Crowley
- Bishop Tuff – Ideas??
- More ideas (basalt flows, glacial moraines etc.??)

Because it's a long drive and there is a lot to see I would like to try to start the trip Friday morning which would require participants to either get up extremely early Friday morning to drive or to camp out with the group Thursday night (my preferred option) or you can join the group midday on Friday. The bulk of the trip would be completed Friday and Saturday. I think I will plan for a half day of stops on Sunday and try to make them on the way back south towards home. Sunday would also be optional if anyone wants to get home earlier they can head out Sunday morning and skip the stops. Any help or advice would be much appreciated. Like I said, speakers are more than welcome. I'm planning to speak at Tinemaha Dam as my company has done work there but that's all I've got so far! Please send responses to armenianmenace1@gmail.com

Cheers!

Adam

The “Lindavista” Fm: Marine Terraces to Terrestrial Terraces and all Plants in Between

by Eleanora (Norrie) Robbins, PhD (USGS-retired; SDSU-retired)

I have several specialties, one of which is iron bacteria. So anytime I see red rocks I wonder if iron bacteria had a role in their formation. Recently I've been fixated on the red sandstones at the top of the cliffs at Cabrillo, Torrey Pines, Crest Canyon, and along Highway 52. Tom Rockwell teaches that these red rocks were all Pleistocene marine terraces that have been uplifted to become terrestrial terraces in the past 1.5 or so million years. He and his predecessors have mapped seven old terraces and thirteen very old terraces. In general, the red sandstones on these terraces are called “Lindavista” Fm.

If you drive to Torrey Pines, you've seen the large vertical structures that start in the Lindavista and continue down into the Torrey Sandstone. I am fascinated with Pat Abbot's hypothesis that these large structures might have been mineralized tree roots. That got me thinking about the plant communities that would have colonized the marine sediments when they were uplifted into the terrestrial environment. The first plant community growing on uplifted marine sands had to have been coastal salt marsh; then I presume fresh water marsh, forested wetland, grassland, and now the rocks are colonized by coastal sage scrub and Torrey pines. Using this as my model, I am trying to unravel the post-depositional history of these rocks.

Lithified but never buried, the “Lindavista” is cemented with iron oxide. What was the source of reduced iron that could be oxidized? My working hypothesis is that the sediments contained iron monosulfides and pyrite that formed during the marine and coastal salt marsh phases. I am thinking that with uplift, the iron sulfides were oxidized by iron bacteria to ferrihydrite. If the sediments then went through a salinity phase (i.e., sea level rise), ferrihydrite would dehydrate to hematite; but using reflected light, I rarely see hematite in any of the rocks.

Another fascinating characteristic of the “Lindavista” are Mn-rich soil concretions and nodules. In Virginia, I worked in a wetland that was actively forming these; there, iron bacteria were active in the subsurface where the concretions formed. In places, the “Lindavista” concretions form vast accumulations at the surface, where we call them rollers because they are easy to slip on (ask Joe Coronas). I presume that they are residual lag deposits from sediments and rocks that have eroded away.

Thinking as a paleoecologist, I've started tromping around our coastal salt marshes: Tijuana, Sweetwater, South Bay, Los Penasquitos, and all the coastal lagoons. In these, I'm searching for sedimentary structures, distinctive shells, and sediments with iron sulfides.

There's more to the story, such as the abundance of magnetite in the rocks. The magnetite is perfectly black under the microscope, not rimmed red. I don't understand its provenance and its role. And where are the shell fossils from the marine history? The only shells that have been collected are from the base of the Lindavista, only inland, where it sits on calcareous rocks.

I've been taking the students I mentor out in the field with me, seeing if I can interest some of them in these rocks. But they need a funded professor to move forward with XRD and thin sections; I'm retired. I do welcome anyone who wants to tromp with me on the red sandstones or in the stinky marshes.

See Next Page For Pictures:



Lindavista at Miramar (49) Joe on concretions



Torrey Pines LV with Natasha Rodriguez (9) big concretions in Torrey Ss

Geology Education Rule Making Notice – Board of Professional Engineers, Land Surveyors and Geologists

On November 30, 2018 the Board for Professional Engineers, Land Surveyors, and Geologists (Board) published the Geology Education Rulemaking Notice. The Board proposes to adopt Title 16, California Code of Regulations sections 3022, 3022.1, 3022.2, and amend Title 16, California Code of Regulations section 3031.

Software Info From Woody Higdon's September Talk

Hi All. For those of you who were not at the September meeting, Woody Higdon discussed his methods and programs he uses for taking amazingly detailed photos in stereo and with gps coordinate attachments. He showed us examples of his from the 2018 debris flows in Montecito. Below are links to free software where one can do more than get their toes wet in this type of work. Thanks again to Woody for the interesting talk!

The GIS software can be found at qgis.org

The canon file display software is called Canon Map Utility and is available on the Canon Camera site.

The image viewing program is called Stereo Photo Maker, and available at stereo.jpn.org/eng/.

WOODROW HIGDON

GEO-TECH IMAGERY INTL.

760-754-8423

woody@geo-tech-imagery.com

California Board for Professional Engineers, Land Surveyors, and Geologists California Specific Exam Occupational Analysis Survey

The California Board for Professional Engineers, Land Surveyors, and Geologists (BPELSG) is undertaking a comprehensive research project of the professional geology profession referred to as an Occupational Analysis. You are invited to participate in an online survey that will validate the tasks and knowledge that are important to the work performed by geology professionals as it applies to the definition of geology and the authority to practice in California.

In accordance with §7841 (d) of the Geologist and Geophysicist Act, the California Specific Exam is one of three exams required to obtain the California Professional Geologist practice authority license. As you take this survey, please keep in mind that the California Specific Exam is a SUPPLEMENT to the National Association of State Boards of Geology (ASBOG) Fundamentals of Geology (FG) and Practice of Geology (PG) exams. The California Specific Exam is intended to address the areas of geologic practice that are specific to the State of California, and therefore not addressed by the ASBOG exams. The California Specific Exam IS NOT intended to duplicate general geologic practice tasks common to all geologists nationwide that are covered by the national ASBOG FG and PG license exams.

The results of the study will be used to update the Geology California Specific Exam and will also provide BPELSG with valuable information regarding the work performed by geology professionals. The Occupational Analysis is completed every five to seven years and is the source for determining the content of the licensing exams. This analysis is an essential step in keeping the California Specific Exam current and practice-related.

Your participation is critical to ensuring the success of the study. As part of this study, we need your assistance in completing an online survey. Please consider filling out the survey that takes approximately 45 minutes to complete and can be saved and completed in multiple sessions.

INSTRUCTIONS FOR PARTICIPATION:

If you previously signed up for the Occupational Analysis email list, we thank you. In order to avoid duplication, licensed geologists on the email list are encouraged to use the link sent via email. If you did not sign up or receive an email, you are invited to participate the in online survey using the link provided below.

<https://www.prometricsurvey.com/se/123C457B2D2B599601>

The following contact information is provided if you encounter any technical difficulties with completing the survey online or have questions regarding the survey content. Please be sure to identify the survey you are taking (Geology California Specific Exam Occupational Analysis 2018). Email: julie.morby@prometric.com or Telephone: (801) 541-9738. You will receive a response within 24 hours, Monday through Friday (except holidays).

Your completed survey should be submitted on/by October 31, 2018 (11:59 PM PST).

Thank you in advance for your participation in this survey and ongoing support of the program.

Regards,

The Board for Professional Engineers, Land Surveyors, and Geologists and Prometric

Support SDAG/SDGS using AmazonSmile



What is AmazonSmile?

AmazonSmile is an automatic way for you to support the **“San Diego Geological Society”** (SDGS) SDAG’s 501(c)(3) as your favorite public charitable organization every time you shop on Amazon at no cost to you at smile.amazon.com.

How do I select a charitable organization to support when shopping on AmazonSmile?

On your first visit to AmazonSmile smile.amazon.com, you need to select a charitable organization to receive donations from eligible purchases before you begin shopping. Please select the **San Diego Geological Society**. Amazon will remember your selection, and then every eligible purchase you make at smile.amazon.com will result in a donation to SDGS (SDAG).

How much of my purchase does Amazon donate?

The AmazonSmile Foundation will donate 0.5% of the purchase price from your eligible AmazonSmile purchases.

How can I learn more about AmazonSmile?

Please see complete AmazonSmile [program details](#).

Yonder Dynamics – UC San Diego Student Robotics Organization



Allison Kubo is the Science lead for Yonder Dynamics a university rover team at UC San Diego and an Earth Science student at Scripps. She reached out to SDAG looking for sponsors for their rover this year. Part of the competition is an analysis of the geologic settings of the area and soil retrieved by the rover which incorporates soil moisture, conductivity, and chemical testing.

She would be happy to partner with SDAG or anyone interested in the project.

Here are links to the team's website and sponsorship package:

[Yonder Dynamics](#)

[Yonder Dynamics Sponsorship Package](#)

SDAG Research Tool

SDAG RESEARCH TOOL - A comprehensive listing of all papers published by SDAG, whether as annual field trip guidebooks or special publications, is now available on our website. Entries are sorted by primary author, or chronologically by date of publication, starting with our first guidebook in 1972, from Coast to Cactus in 2014, and finally on the Julian 'Road to Gold' in 2017. These can be accessed or downloaded as .pdf files. They are fully searchable in Adobe Reader or Acrobat, so if you are researching a topic, "oikocryst" for example, you can search for that keyword. This listing will be updated as new books are published. Thanks to Greg Peterson and Hargis + Associates, Inc., for making this possible. See the links below:

http://www.sandiegoeologists.org/SDAG_Pubs_authors.pdf

http://www.sandiegoeologists.org/SDAG_Pubs_chronological.pdf

Interactive Fault Map for San Diego - Tijuana

As part of the update for the San Diego-Tijuana Earthquake Planning Scenario, Working Group No. 1's "Fault Map Subcommittee" completed the first publicly available bi-national active and potentially active fault map (http://sandiego.eeri.org/?page_id=265). This interactive GIS map includes the first publicly available active and potentially fault map locations from the City of San Diego. The map also integrated the faults south of the border for a bi-national cross border view. This map is an on-going project as our knowledge increases about local active and potentially active faults.

You can expand the map legend on the left side to select layers that can be turned on or off for the map view. You can also select from 1 of 12 base maps at the base map icon. You can click on the fault line in your map layer view to see the meta-data source. In addition, the City of San Diego Seismic Safety Study Geologic Hazards & Faults Maps are available in the layer titled "GeoHaz SD City." Please note that the City "Zone 12 Potentially Active" fault layers was not included in this data, therefore you will need to use the City Maps to find Zone 12.

The Fault Map link is available at: http://www.sandiegogeologists.org/Faults_map.html

Please contact Diane Murbach (dianemurbach@gmail.com 619-865-4333), Chair for the SDTJ Earthquake Scenario Working Group #1 - Earth Science, if you have any questions, or see any errors on this new fault map.

I would like to thank Carolyn Glockhoff for her endless GIS work, Jim Quinn and the City for providing their data and time, Jerry Treiman with CGS for his time preparing the Surface Rupture and providing their new State fault data layer, and Luis Mendoza at CICESE for providing the faults south of the border. Please contact Diane Murbach (dianemurbach@gmail.com), Chair for the SD-TJ Earthquake Scenario Working Group #1 - Earth Science, if you have any questions, or see any errors on this new fault map.

Diane Murbach (619) 865-4333

Engineering Geologist, C.E.G.

www.murbachgeotech.com

Request for 2018 SDAG/SDGS Publication Sponsors

On behalf of the San Diego Geological Society, Inc. (SDGS), a public benefit 501(c)3 nonprofit educational corporation, we would like to request tax deductible Donations for our San Diego Association of Geologists (SDAG) group. The list of paid Sponsors and the forms to become a Sponsor are located on the SDAG web site at: <http://www.sandiegogeologists.org/Sponsors.html>.

Your donation will further the SDGS mission to promote geology and related fields in the greater San Diego region, operating through the San Diego Association of Geologists (SDAG), a committee of SDGS. To achieve our primary educational objective, we organize frequent field trips and maintain a program of monthly meetings featuring speakers on current geological topics. We also publish field trip guidebooks and other publications related to geology and natural history. We encourage scholarship and research by awarding scholarships from the elementary through graduate levels. With your \$100 "EMERALD" donation, your name/business will be listed as a sponsor on the SDAG web site (<http://www.sandiegogeologists.org/>) and in the monthly SDAG meeting newsletters. With your \$500 "RUBY" or \$1,000 or more "DIAMOND" level donation, your business card will also be included on the SDAG web site and in the monthly SDAG meeting newsletters. In addition, as a "\$1,000 or more DIAMOND" level donation you will be presented with a thank you plaque.

Should you have any questions regarding a Sponsorship, please contact our non-profit SDGS Secretary (Diane Murbach) at 619-865-4333.

Call for Articles

SDAG invites members to submit articles on their current research or an interesting project they are working on for publication in the monthly newsletter. The article should be no more than 1 page in length. Photos are welcomed; too. Please submit articles to the SDAG secretary via email.

Geo Job Listings

Trevet is an Environmental and Engineering Consulting Firm headquartered in San Diego, CA. We are seeking a **full-time staff level Geologist or Environmental Scientist**. Two to five years of experience preferred. At a minimum a bachelor's degree in geology, engineering, or a related scientific discipline is required. Must be eligible to work in the United States, and on Department of Defense installations. Ability to travel for extended duration (2 to 3 weeks) is required. The ideal candidate will possess great attention to detail, excellent written and verbal communication skills, and ability to work independently and within a team.

Duties will include a combination of field and office related tasks.

Field experience should include:

- Installation of soil borings using multiple drilling methods
- Describing soil using the USCS and ASTM classification systems
- Installing and abandoning groundwater monitoring wells
- Field sampling of groundwater, soil, and soil gas
- Remediation system operation and sampling

Field work may be performed at project sites with environmental media (e.g., soil, sediment, groundwater, surface water, etc.) that has been impacted with hazardous substances and/or hazardous wastes.

Office experience should include:

- Field data collection, analysis, and interpretation
- Preparation of data in visual, graphical, and tabular formats
- Technical report writing

Other Requirements

Familiarity with CERCLA/RCRA requirements

OSHA 40-Hour HAZWOPER Training with current 8-hour refresher class preferred.

Trevet is an Equal Opportunity Employer

Please apply at

<http://www.trevetinc.com/>



Entry-Staff Hydrogeologist

OVERVIEW:

Hargis + Associates, Inc. (H+A) is an environmental consulting and engineering firm founded in 1979 with a commitment to providing high-quality, cost-effective services for our clients. We are headquartered in San Diego and have offices in Sacramento, CA, and Phoenix and Tucson, AZ. Our practice focuses on large facility investigation and remediation projects for Fortune 500 clients where we provide responsive, practical and innovative solutions for the treatment of soil, vapor and groundwater contamination. H+A also provides hydrogeologic and engineering services for groundwater resources assessment, stormwater management, and environmental regulatory and litigation support. H+A employs a staff of approximately 60 hydrogeologists, geologists, engineers, industrial hygienist, and project support personnel.

We are currently seeking an entry-staff level hydrogeologist to join our San Diego office supporting environmental investigation and remediation projects located throughout Southern California. These projects are primarily focused on the characterization and remediation of soil, vapors, and groundwater impacts at large industrial sites. In addition to implementing fieldwork for site investigations, the position will also involve data entry, interpretation, and technical report writing for various soil and groundwater monitoring programs.

RESPONSIBILITIES:

- Implement/and support field investigations for soil sampling, groundwater sampling, borehole drilling, and well installations.
- Complete tasks requiring utilization of critical-thinking skills, scientific, geologic, and engineering analytical techniques.
- Assist in the preparation of reports, work plans, sampling and analysis plans, remedial investigation reports, and groundwater monitoring reports under the direction and guidance of a Senior Geologist/Engineer/Scientist.
- Follow corporate health and safety and quality management plan standards.

REQUIREMENTS:

- BS degree in geology, hydrogeology or related technical discipline is required.
- 1-3 years of field experience in environmental consulting is preferred.
- Experience with geologic, engineering, scientific, or general environmental projects and data interpretation.
- Field experience with drilling, sampling (soil and groundwater), and well installations is a plus.
- OSHA 40-hr. HAZWOPER, current refresher preferred; training provided.
- General computer knowledge (Microsoft Office, Email); GIS and other environmental software experience is a plus.
- Excellent organizational and sound written/oral communication skills.
- Local candidates only; must be eligible to work in the United States.

PHYSICAL DEMANDS:

- Ability to drive, travel and/or perform field work approximately 50% of the time; some overnight and extended travel.
- Ability to lift 45 pounds.
- Must be able to perform the following actions while conducting fieldwork: stooping/kneeling/crouching, standing for long periods of time, pulling/pushing and lifting equipment and supplies, walking on uneven terrain.
- Ability to work in outdoor environments and hot/arid conditions.
- Ability and willingness to work long hours and in proximity to loud noises and hazards (i.e., proximity to moving mechanical parts, moving vehicles, and exposure to chemicals, fumes, odors, dusts, and gases).

Those who seek to apply may submit a cover letter and resume via email to hargisinfo@hargis.com

All qualified applicants will receive consideration for employment without regard to race, color, national origin, ancestry, sex, gender, gender identity, gender expression, age, sexual orientation, religious creed, physical or mental disability, medical condition, genetic information, marital status, veteran status, or any other classification protected by applicable federal, state, or local law.

Geologist Wanted in Corona, CA

GeoTek in Corona is looking for a geologist to prepare reports, Contact Chris Livesey (clivesey@geotekusa.com).

MP Materials, Mountain Pass, CA

Seeking Industrial Hygienist/Radiation Safety Officer

Please contact:

Chris Baker

Senior Environmental Specialist

m: 562.331.4507

cbaker@mpmaterials.com | www.mpmaterials.com

PHOTO OF THE MONTH

If you would like to submit a photo, email them to secretary@sandiegogeologists.org and I will try and put them in the newsletter. Provide a short description of the picture.



Topic: Mount Rainier, Washington State

Photographer: Unknown

This photo was taken by my flight neighbor while we were heading back to San Diego from Seattle. I was looking over his shoulder while he took the photo and was so impressed I asked him to text me the photo ☺. Anyway, it's one of the best views from a commercial airplane I've ever seen. Photo was taken in June I think. I thought this was appropriate since our talk this month is about Volcanoes, albeit very different volcanoes than this.



HARGIS+ASSOCIATES, INC
HYDROGEOLOGY • ENGINEERING

Hargis + Associates, Inc. is an environmental consulting firm specializing in hydrogeology and engineering. We are headquartered in San Diego, California and have offices in Mesa and Tucson, Arizona. Our practice areas include all aspects of hydrogeology and engineering.

As a client service organization, we pride ourselves in being attentive and efficient in meeting our client's needs and solving their problems. In addition to our technical expertise, communication and responsive coordination are hallmarks of our reputation.

We invite you to explore our website to learn more about our firm and the services we provide. We welcome the opportunity to discuss our consulting expertise directly with you.

Contact: **Dr. David R. Hargis**



**Mobile
Geochemistry Inc.**

H&P Mobile Geochemistry is an industry-leading provider of environmental lab services. With ten mobile labs and five direct push sampling trucks and unparalleled experience, H&P's repertoire of environmental lab services includes many forms of environmental lab sampling techniques all the way to on site field analysis services. H&P has successfully and accurately performed environmental lab services delivering quality results to our clients for over 16 years.

2470 Impala Dr., Carlsbad, CA 92010
(800) 834-9888

Contact: **Louise Adams or Suzie Nawikas**



TETRA TECH

complex world | CLEAR SOLUTIONS™

Tetra Tech is a leading provider of consulting, engineering, and technical services worldwide. We are a diverse company, including individuals with expertise in science, research, engineering, construction, and information technology. Our strength is in collectively providing integrated services—delivering the best solutions to meet our clients' needs.

<http://www.tetrattech.com>



Contact: **Rupert Adams, CEG**

Geocon Incorporated

6960 Flanders Drive, San Diego, CA 92121
P | 858.558.6900

San Diego / Riverside County / Palm Desert / Los Angeles /

Orange County / Bakersfield / Bay Area / Fairfield / Sacramento



**EXCAVATING,
DEMOLITION, BREAKERS**

Atlas Excavating & Breakers has been providing operated equipment rentals and excavating services to contractors & geologists in San Diego and Riverside counties since 1991. We offer Mini Ex., 4x4 Backhoe & large excavators up to 75,000 pounds. "40 hour Haz Whopper" trained operator. Asphalt/concrete removal & replacement.

Contact: **Barry Anderson**

760-754-1337



**ENERGETIC
RESPONSIVE
EXPERIENCED**

8(a) / SDB Certified

858-275-6454

Trevet is a San Diego-based environmental engineering and consulting 8(a)-certified small business enterprise.



Leighton is a multidiscipline engineering firm, providing geotechnical, environmental, and testing and inspection services. Founded in 1961, Leighton provides engineering solutions to public agencies, property owners, and facilities. With offices located in San Diego, Irvine, Los Angeles, Temecula, Rancho Cucamonga, Palm Desert, Santa Clarita, Ventura, and Bakersfield, we efficiently service any region of Southern California. Our professional staff of Registered Geotechnical Engineers, Professional Geologists and Certified Engineering Geologists, Registered Hydrogeologists, and Registered Environmental Assessors and Certified Inspectors provide decades of local experience for the successful completion of your projects.

For additional information, please contact Bob Stroh (rstroh@leightongroup.com)

Website link: <http://www.leightongroup.com>

- [Dr. Pat Abbott](#) — SDSU Professor of Geology, Emeritus

- Marty and Sherry Bloom

- Joe Corones

- Greg Cranham — Consulting Geologist

- Damon DeYoung — Battelle

- Dr. Margaret R. Eggers, CHG — [Eggers Environmental, Inc.](#)

- Karen Evans for Jim Evans (Deceased)

- Phil Farquharson — [Geology Guy](#)

- Carolyn Glockhoff — [Caro-Lion Enterprises](#)

- Cari Gomes

- Dr. Sarah Gray

- Dr. Monte Marshall—SDSU Prof. of Geology & Geophysics, Emeritus

- [John Minch](#)

- [James R. Ashby/Mission Geoscience, Inc.](#)

- Jennifer Morton — [Terramar Environmental](#)

- Monte and Diane Murbach — [Murbach Geotech](#)

- [Pacific Drilling Co.](#)

- Peet's Coffee and Tea Solana Beach

- Les Reed—Geotechnical Exploration Inc.

- Rothman Creative (Fritz Rothman 619-278-1771)

- Gerald Shiller

- [Scott Snyder](#)

- Blayne Hartman — [Hartman Environmental Geoscience](#)
- [Southwest Geophysics, Inc.](#)
- Rob Hawk
- David and Jan Steller
- Tom Lamb
- Dr. Anne Sturz
- [Leighton Group](#)
- Mary Walke
- Lowell A. Lindsay & Diana Lindsay — [Sunbelt Publications/AESE](#)
- Carole L. Ziegler
- Cari Gomes — [Pinao Consulting](#) — [Absolution Brewing Company](#)
- Vic Camp
- Dan Gomes – Absolution by the Sea <https://www.absolutionbrewingcompany.com>

Add yourself to this list - Sponsors, Corporate Sponsors, and Patrons provide a significant portion of SDGS's and SDAG's operating and scholarship budgets. SDGS is a 501(c)3 public benefit nonprofit educational corporation. For more information, please see our Sponsorship Form.