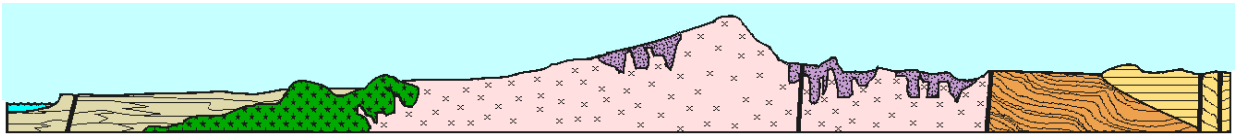


SAN DIEGO ASSOCIATION OF GEOLOGISTS

www.sandiegogeologists.org

SDAG MEETING ANNOUNCEMENT

WEDNESDAY, April 16, 2014

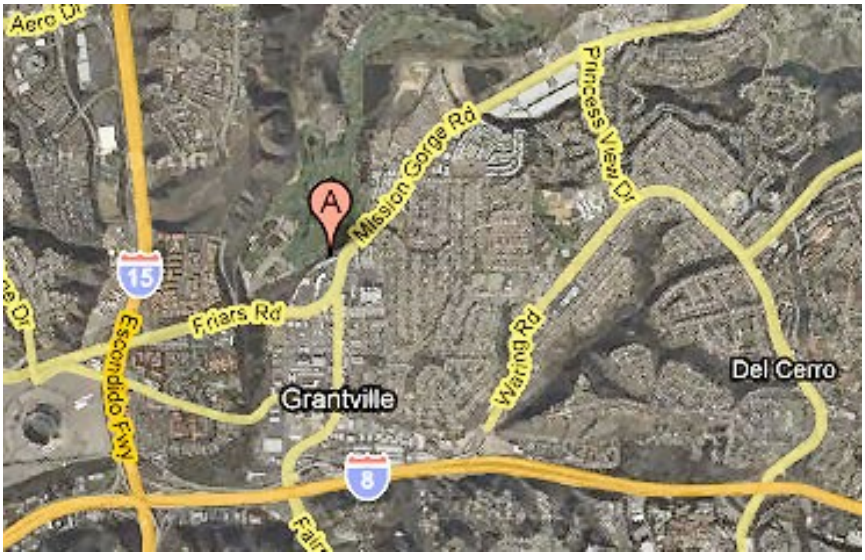
STUDENT SCHOLARSHIP PRESENTATIONS

Presented by

Cornelius Harris
University of San Diego
Brian Rockwell
San Diego State University
Luke Weidman
San Diego State University

Where: **Emiliano's Mexican Restaurant** (Overlooking Admiral Baker Golf Course)
6690 Mission Gorge Road, San Diego, CA 92120 (619) 284-2460
When: 5:30 pm – Social Hour
6:30 pm – Dinner
7:15 pm – Program
Dinner: Mexicano fantastico. Beverage station. Cash bar.
Cost: $30 per person, $5 discount for members, STUDENTS: $15. Add $5 if you did not make a reservation.

Reservations: Make your reservation **online** at www.sandiegogeologists.org **no later than noon, Friday, April 11th.**



RESERVATIONS CANNOT BE GUARANTEED AFTER FRIDAY AT 12 NOON
BUT THEY ARE ALWAYS PREFERRED OVER WALK-INS

ABSTRACTS

Naturally Occurring Concentrations of Seventeen Metals in the Bay Point Formation, San Diego, California

Cornelius Harris (USD Undergrad)

The geogenic concentrations of metals in the native formations of San Diego County is poorly understood and poorly represented in the literature. The concentrations of metals in soils is a fundamental criteria regarding remediation and determining disposal options for soils removed from contaminated or potentially contaminated properties in San Diego County. We present the results of over 200 *in-situ* geogenic soil samples from the Bay Point Formation of San Diego, California. The location for this project is in downtown San Diego and consists of an area of approximately 1.3 square miles (3.34 km) between latitude lines 32^0 43' 30" N and 32^0 42' 30" N, and longitude lines 117^0 09' 00" W and 117^0 10' 30" W. All of the soil samples were analyzed for metals following EPA 6000 / 7000 Series Methods on an ICP Mass Spectrometer. The 95% UCL for 17 metals was calculated using the statistical software package ProUCL.

Our results show the Arsenic concentrations detected during this study exceed commonly used health risk soil screening levels and other risked-based corrective action guidelines utilized by many regulatory agencies in California. Additional research is needed to assess the bio-availability of the Arsenic, the potential impact to human health and the environment, and the impact these results may have on current regulatory thresholds for assessing soils on residential and commercial properties in San Diego County.

Further research is currently underway to identify the range of concentrations of metals in additional formations throughout the San Diego Embayment (e.g. San Diego Formation, Torrey Sandstone, Mission Valley Formation, Scripps Formation). Additional data is also being collected throughout the mountains and desert regions so that a comprehensive study of the concentrations of geogenic metals in San Diego County sediments can be published.

****

Non-central principal component analysis of geochemical data and clay mineralogy from the San Jacinto fault in southern California: a new method to assess alteration intensity in fault zones

Brian Rockwell (SDSU Grad Student)

A new method to analyze geochemical data and derive translation invariant alteration intensity factors within the framework of the fault zone architecture model was applied to the Clark strand of the San Jacinto fault in southern California. The new method utilizes non-central principal component analysis to derive and asses the statistical significance of compositional linear trends. Alteration intensity factors are then derived from orthogonal projection onto the calculated compositional linear trends. PC1 derived from non-central principal component analysis explains 99.7% of the simplicial variability of the spread of A-CN-K data about a calculated compositional linear trend. Results from a one-way ANOVA indicate that at least one significant difference across the group of means of alteration intensity factors are statistically different at the 95% confidence level (omnibus $p = 0.0001$). Post hoc routines indicate that the mean of the alteration intensity factors for the fault core are different than the means obtained from the transition and damage zones. In contrast, at the 95% confidence level, the means of the transition and damage zones are not statistically distinguishable. The results of XRD work completed during this study revealed that the < 2 micron fraction is composed primarily of illite/smectite with ~15% illite in the damage zone, of illite/smectite with ~30% illite in the transition zone, and of discreet illite with very minor smectite in the fault core.

Based on the above results, it is speculated that when fault zones are derived from tonalitic wall rocks at depths of ~0.4 km, the onset of illite/smectite to illite conversion will occur when alteration intensity factors exceed 0.20 ± 0.12, the average alteration intensity factor calculated for the transition zone. Under such conditions during repeated rupturing events, acidic fluids with elevated temperatures (≥ ~125° C) are flushed through the fault core. Over time, the combination of shearing, fragmentation, and relatively elevated temperatures eventually overcomes the kinetic barrier for the illite/smectite to illite transition. Such settings and processes are unique to fault zones, and as a result, they represent an underappreciated setting for the development of illite from illite/smectite.

****

Landslide Hazard Analysis and Mitigation for Sepanjang Village, Central Java Indonesia

Luke Weidman (SDSU Undergrad)

This study is based on 8 weeks of field work and study in Indonesia during summer 2013 participating in a student-based community service program run by Gadjah Mada University. The study was focused on the village of Sepanjang in Central Java which is located on the southwestern flank of Mount Lau, a dormant stratovolcano. The project was a landslide mitigation effort focused on the improvement of landslide education for the village by creating an up to date field map that provided the village with locations and descriptions of landslides, potentially dangerous areas, evacuation routes, and general meeting areas during emergencies.

Indonesia is a massive archipelago that contains 18,000 islands and is located on the southern lobe of the Eurasian plate. Subduction of the Australian plate underneath the Eurasian plate bounds Indonesia to the west and south, and subduction of the Pacific plate underneath the Eurasian plate takes place to the east. These tectonically active zones are characterized by intense volcanism and seismicity that have a continuous effect on the topography. Annual rainfall for Java is 69.1 inches per year, which is almost seven times that of San Diego, CA. These factors contribute heavily to the susceptibility of landslides and result in the imminent danger to people and infrastructure. These susceptibilities were produced by measuring the physical properties of the landslides, including slope, thickness of soil, amount of vegetation, land use, and existing signs of recent movement. Assistance from other Gadjah Mada students allowed for both dispersal of the susceptibility map to local leaders and rescue teams, as well as providing villagers with landslide education and ways to notice and respond to signs of land movement.

Active landsliding is widespread in the area of the village and presents hazards to people and property. The impact of human development on the landscape plays a significant role in producing landslide hazards in the area that include road construction, agricultural terracing, and quarrying for building materials. This study brought to light the lack of landslide understanding in rural Java and the need for educational services to help local villagers see, prepare for, mitigate, and respond to landslide disasters.

SDAG MEETING SCHEDULE – Mark Your Calendars!

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

May 21, 2014	Mike Pallamary – Historical Maps and SoCal Mapping Mysteries
June 18, 2014	Eric Drummond, Ice Cold Gold – SCGS Joint
July 16, 2014	Rob Anders, USGS – San Diego Coastal Aquifer Geochemistry

2014 EXECUTIVE COMMITTEE

PRESIDENT – Brian J. Olson; *FSR Engineering*; Ph: (858) 750-9243; bolson@fsrengineering.com
VICE PRESIDENT – **Jennifer Bauer Morton;** geologyjen@yahoo.com
TREASURER – Lee Vanderhurst; Ph: (858) 531-7729; lee@leev-geology.com
SECRETARY – Matan Salmon matansalmon@gmail.com
PUBLICATIONS – Lowell Lindsay; *Sunbelt Publications*; Ph: (619) 258-4911, x111; fax:(619) 258-4916; llindsay@sunbeltpub.com
WEBMASTER – Carolyn Glockhoff; *Caro-Lion Enterprises,* Ph: (858) 549-3396; carolyn@caro-lion.com

PRESIDENT'S CORNER

Thank you Jennifer Morton for serving it up for us last month at Tom Ham's Lighthouse, and graciously hosting author Markes Johnson. As you read this month's "Corner", Brian J. Olson is once again in absentia. This time, I'm in Ireland with my wonderful wife, exploring Eire and enjoying some husband and wife time. Hope all is well across the pond.

Another quick third Wednesday is coming for us in April. On Wednesday the 16th, SDAG is proud to host our Student Scholarship winners at Emiliano's, in the Grantville area. If you haven't already done so, please peruse the abstracts included in this newsletter. USD undergrad Cornelius Harris looks to have something to say on the Arsenic in the Bay Point. "You mean to tell me we have above background levels of $_{33}As$ in Qop_6? Are there any particular op's that displayed higher levels than others? What do you think about about $Qvop_7$ Mr. Harris?" (*Sorry – had to get in my op jab for the year. I'm good to go now, and good luck Eric!*).

Ice Cold Gold Update: Well in preparation for this summer's El Adobe affair with the South Coast Geological Society, I've successfully kept up with Season 2 of 60-Degree Resources' Animal Planet affair on Thursday nights! The last reality-based television I got into was the Amazing Race, but it has been a while. So far I'm a fan. I can't help but wonder if the navigation system on the camera boat also breaks down when the fog rolls in, and then turns back on when the sun comes out? Greenland may be a "bitch".but she is a beautiful one!

Brian J. Olson
2014 SDAG President

Geology Photo of the Month

Goblins at Sunrise

Goblin Valley State Park, Utah

By Greg Cranham, September 2013

ANNOUNCEMENTS

CALL FOR PAPERS - SDAG 2014 FIELD TRIP
"Traversing a Transform Boundary – Regional Tectonics, San Diego to the Salton Trough"
October 10 – 12, 2014
On this field trip we will explore the interaction of the major faults of Southern California to accommodate for motion between the Pacific and North American Plates. We will consider the tectonic evolution of the region and observe resulting landforms.

SDAG seeks new manuscripts based on original work relating to regional tectonics, from the San Andreas Fault through the continental borderland. We also invite authors to submit articles on the history of the region as it relates to the tectonics.

Deadline for Abstracts: Friday, May 16th, 2014
Please submit the following information along with abstracts:

- Title
- Author(s) and affiliation
- Address, email, and telephone numbers for the author(s)

Please submit abstracts by email to Jennifer Morton geologyjen@yahoo.com

---

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.

CALL FOR PHOTOS! SDAG invites members to submit photographs of an interesting geologic feature for publication in a new section of the newsletter – "Photo of the Month". Please submit your photo along with a caption to the SDAG secretary via email.

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, from our first guidebook in 1972, through the Palms to the Pines, and finally up the San Luis Rey River in 2013. 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, "tsunami" 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.sandiegogeologists.org/SDAG_Pubs_authors.pdf

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

ICE COLD GOLD
SEASON 2

The first season of **ICE COLD GOLD** was but a glimpse of Greenland's power and potential. This season, the threats and rewards are multiplied. Nothing about Greenland is implied; a new world is about to be defined. In the ruby-packed second season of **ICE COLD GOLD,** our spirited team of American miners returns to the most remote mining location on the planet with its eyes on a prize. With possibly the world's largest ruby in the Arctic glinting within reach, Sixty Degree Resources stretches the logistical challenge of returning to its deposit to life-threatening, thin extremes. In Greenland, some of the rules remain the same. The window to the mining season is tight, and with no roads within thousands of miles, Sixty Degree Resources must travel to the most remote mining region in the world by boat and helicopter to reach its deposit. Then, the team must sling in thousands of pounds of heavy-duty mining equipment to get the job done. Nearly killing themselves for what they believe, these ballsy American miners bare all their emotions in chapter two of this life-threatening journey.. The odds are stacked against them - with time being their worst enemy - as they face 24-hour sunlight, massive glaciers, unknown wildlife and remote, uncharted territories no American miner ever has set foot on before.

See Ice Cold Gold Thursdays at 10:00 pm on Animal Planet

JOB OPENING

de maximis, inc., a nationwide firm specializing in project coordination, currently has opportunities for contract employees to provide services in Ecuador. We currently have an opportunity to provide these services and it is our understanding that there are several positions available. We understand that the initial assignment is 1 year. At least one position will require full time presence in Ecuador and the other positions could be done on a rotational basis. Strong spanish skills are essential as well as 3 to 10 years of professional experience. Work assignments and logistics will be handled from domestic de maximis offices.

Project Staff and Project Managers: Candidates would have a B.S. Degree in Environmental Science with either an Engineering or Geology degree as a plus. Candidate should have 3 to 10 years relevant experience in the environmental consulting industry. Candidates needs to have demonstrated site investigation knowledge, work plan and report preparation, task management, cost estimating and scheduling experience. The candidates should be detail oriented and have excellent verbal and written communication skills. Professional Geologist or Engineer or ability to obtain within two years, and Masters degree is a plus. Positions will be based in Ecuador (initially), and will require travel and field work.

de maximis, inc. offers competitive salaries and benefits, and a challenging work atmosphere. To learn more visit our website at: www.demaximis.com.

No phone calls. Qualified candidates should send resumes, along with a cover letter summarizing experience and salary requirements to:

de maximis, inc.
Attention: Jack Keener
1322 Scott St, Suite 104
San Diego, CA 92106
jkeener@demaximis.com

and,

Steve Myers
de maximis, inc.
Albany, New York
smyers@demaximis.com

SEEKING JOB OPPORTUNITIES

Geological Engineer: I am an outgoing and enthusiastic geologic engineer with several years experience working on geological field projects, writing technical reports, and completing rigorous data analysis on large and complex data sets. Through my experience I have developed the ability to think critically, learn quickly, and communicate exceptionally both at the technical and non-technical level. I am an MS graduate with a degree in geological engineering from South Dakota School of Mines and Technology. I have 3 years of experience doing geotechnical investigations, geochemical assessments, and groundwater modeling at compromised sites and underground environments. Detailed work experience, education and more at http://www.linkedin.com/pub/tessa-van-beek/51/46a/272 . Email Tessa Van Beek at tessaj@gmail.com for more information.

Qualifications Summary and Objective: I have 14 years experience directing surface water quality monitoring programs with a proven record of excelling in monitoring plan implementation, quality control, public notification and continuous improvement in operational effectiveness and efficiency. I have built and maintained relationships with key staff in academia, industry, and all levels of government in San Diego and California. I have a widely applicable skill set which includes: analytical thinking, communication and writing skills, data analysis and management, inter and intra-agency project coordination, and staff supervision and training. My objective is to obtain a career position with an industry leader where I can contribute my skills to build the success of my employer as well grow professionally. Detailed work experience, education and more at www.linkedin.com/in/cbclifton2010. Email cbc2006@cox.net or 619-964-1776.
Contact: Clay Clifton

ENGINEERING GEOLOGIST- California PG, MS Geology, over 13 years of applied geotechnical experience, proficient in geotechnical investigations, hazard evaluations, geophysical surveys, construction management and quality control, engineering analyses, special interest in earthquake-hazard and seismic design related applications, strong problem-solving and organizational skills. Detailed resume upon request: Anna, 201-407-7461, Afyodorova103@gmail.com

---

ENTRY-LEVEL ENVIRONMENTAL SCIENTIST - I am a recent UCSB graduate with a double major in Environmental Studies (BS) and Geology (BS, Earth Systems emphasis) who is looking to begin a career in environmental consulting. I have prior lab experience in both professional and academic settings. I am looking to establish myself with a passionate and hard working environmental firm in the San Diego region. For further information about my credentials and work experience please contact Georgi Chertkov at georgichertkov@gmail.com or call me at 505-412-3107.

Request for Sponsors: 2014 SDAG/SDGS and 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 at our San Diego Association of Geologists (SDAG). 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.

CORPORATE SPONSORS

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***

H&P Mobile Geochemistry

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.tetratech.com

Contact: ***Dave Bloom***

MISSION GEOSCIENCE, INC.
ENVIRONMENTAL & GEOTECHNICAL CONSULTANTS

Since 1991, Mission Geoscience has provided consistent and reliable professional services with our dedicated staff of highly credentialed professionals, who are committed to both timeliness and cost-effectiveness as the cornerstones of their work. MISSION's staff remains amongst the most highly respected firms in the environmental and geotechnical industry, which is why many of our clients tend to assign us their most difficult and challenging projects.
http://www.missiongeoscience.com/

Contact: ***Jim Ashby***

At Cardno ERI, we're experts at providing safe, high quality, cost-effective solutions to environmental concerns. We're large enough to tackle extensive, complex projects, yet small enough to provide exceptional service in a timely manner while paying close attention to controlling costs. In short, we combine the expertise, technology, and dedicated service you need to receive the best possible solutions to your environmental concerns. http://www.cardnoeri.com

Contact: ***Steve Zigan***

http://www.fsrengineering.com/

- Dr. Pat Abbott - SDSU Prof. of Geology, Emeritus
- Sally & Dennis Avery
- Dr. Richard Berry - SDSU Prof. of Geology and Geophysics, Emeritus
- Curtis Burdett
- Larry Cann
- Don Wilson Clark and Katy Freese
- Joe Corones - City of San Diego
- Greg Cranham - Consulting Geologist
- Dr. Neal Driscoll – UCSD Professor of Geology and Geophysics
- William J. Elliott, Engineering Geologist
- Phil Farquharson - CG-Squared Productions

- Carolyn Glockhoff - Caro-Lion Enterprises
- Cari Gomes
- Dr. Sarah Gray
- Rob Hawk City of San Diego
- Lowell A. Lindsay and Diana Lindsay - Sunbelt Publications/AESE
- Dr. Monte Marshall - SDSU Prof. of Geology and Geophysics, Emeritus
- John Minch
- Monte and Diane Murbach - Murbach Geotech
- Brian J. Olson
- Pacific Drilling Company
- Peets Coffee and Tea, Store No. 342 , Carlsbad www.peets.com
- Les Reed – Geotechnical Exploration Inc.
- Todd Wirths

- Rigid Lifelines www.rigidlifelines.com
- SEALASKA Environmental Services, LLC, Mukesh Mehta, PG, CEG
- Gerald Shiller
- Bob Smillie, Terra Costa Consulting Group, Inc.
- Scott Snyder http://www.snydergeologic.com
- Southwest Geophysics, Inc.
- David and Jan Steller ("two-fer" - thanks)
- Dr. Anne Sturz
- Sue Tanges - Southland Geotechnical Consultants
- Terra Costa Consulting Group, Inc.
- Mary Walke
- Carole L. Ziegler
- http://www.youtubedownloadersite.com
- Martin and Sherry Bloom – mbloom@san.rr.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.