

# SAN DIEGO ASSOCIATION OF GEOLOGISTS

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## JOINT SDAG / SCGS MEETING ANNOUNCEMENT

**TUESDAY, JUNE 8<sup>th</sup>, 2010**

### ***An Overview of the El Mayor-Borrego Earthquake Sequence***

*Presented by*

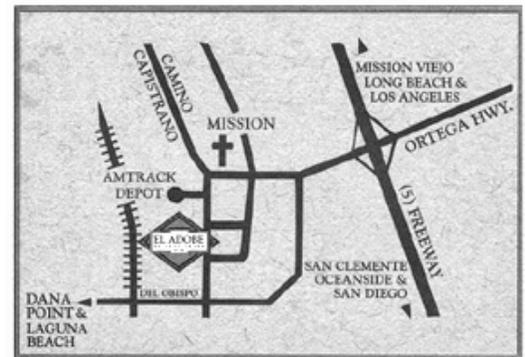
Dr. Tom Rockwell

Professor of Geology, San Diego State University

**Where:** El Adobe Restaurant  
31891 Camino Capistrano  
San Juan Capistrano  
Phone: (949) 493-1163

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

**MAP:**



**When:** 5:30 pm – Social Hour  
6:30 pm – Dinner  
7:00 pm – Program

**Directions:** Take I-5 to the Ortega Hwy exit, go west. Ortega Hwy dead-ends into Camino Capistrano (after 3 blocks); turn left and go about 1 ½ blocks. The El Adobe Restaurant is on the right side of street. Parking lot is behind building. Additional parking can be found across the street.

**or:** **Amtrak** (El Adobe is 3 blocks south of the train station)

**Dinner:** Chips & Salsa, Mixed Green Salad, Veracruz Chicken Enchilada, Beef Taco, Spanish Rice, and Refried Beans. Vanilla ice cream with caramel syrup and whipped cream. Coffee and Tea. Cash bar.

**Cost:** \$30 per person, \$5 discount for members, STUDENTS: \$20. Add \$5 if you did not make a reservation

**Reservations:** Make your reservation **online** at [www.sandiegogeologists.org](http://www.sandiegogeologists.org) **no later than noon, Monday, June 7<sup>th</sup>.**

**RESERVATIONS CANNOT BE ACCEPTED AFTER MONDAY AT 12 NOON.  
IF YOU DO NOT MAKE A RESERVATION, WE CANNOT GUARANTEE YOU A MEAL.**

## 2010 SDAG MEETING SCHEDULE - Mark your Calendars!

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

July 21	<b>Prof. Monte Marshall:</b> Tales of Antarctica and the Southern Seas.
August 18	<b>Rob Hawke:</b> The Mt. Soledad, La Jolla Landslide Repairs
September 15	<b>TBA</b>

### 2010 EXECUTIVE COMMITTEE

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**WEBMASTER** – Carolyn Glockhoff; *Caro-Lion Enterprises*, Ph: (858) 549-3396; [carolyn@caro-lion.com](mailto:carolyn@caro-lion.com)

### SPEAKER BIO

#### Prof. Thomas Rockwell

Dr. Thomas Rockwell is a nationally and internationally renowned paleoseismologist and geomorphologist. He is an expert on the soils and tectonics of southern California and Baja California. He has conducted extensive trenching programs to date earthquakes on faults in the western U.S., Middle East and Asia, and his research is routinely used to date and reconstruct landscapes, assess rates and determine the age of faulting, as well as assess flood hazards. He often acts as a consultant for local geotechnical and archaeological consulting firms, providing input on the age of the soils or geomorphic surfaces of interest and assisting with fault evaluations. In addition to his duties as a professor of neotectonics and Quaternary geology at San Diego State University, Dr. Rockwell has been the principal investigator for numerous research studies funded by the National Science Foundation, the U.S. Geological Survey, and the Southern California Earthquake Center. He serves on several national-level research panels, including NEHRP, NASA, and SCEC, and has served on the Board of Directors for the Seismological Society of America and the Southern California Earthquake Center.

### SPEAKER ABSTRACT

#### "An Overview of the El Mayor-Borrego Earthquake Sequence"

Surface rupture associated with the April 4, 2010 El Mayor-Borrego earthquake extends ~120 km from the northern tip of the Gulf of California to the international border and comprises two distinct geomorphologic and structural domains. The rupture is complex, with breaks along multiple fault strands, including minor re-rupture of the scarps associated with the 1892 Laguna Salada earthquake and several

other older events. The southern part of the rupture consists of a zone of distributed fracturing and liquefaction that cuts across the Colorado River delta. This part of the rupture is incoherent, and it is not clear that actual surface rupture has occurred. InSAR and SPOT differencing clearly indicate significant displacement in the delta region, but not necessarily at the surface.

The northern half of the rupture propagated 55 km through an imbricate stack of east-dipping faults in the Sierra Cucapah. In the southern Sierra Cucapah, rupture extends 20 km along the Laguna Salada and Pescadores faults and reached a maximum displacement of ~ 4m of right-lateral strike-slip, with some down-to-the-east dip slip. The amount of dip slip is variable and changes polarity along strike along the Pescadores Fault before becoming predominantly east-down with maximum offsets of 150 cm along the northern Pescadores Fault. This ruptured terminates in the high elevations of the sierra and jumps nearly 10 km north in a left step-over to the Borrego fault. Maximum measured displacement along the Borrego fault in Borrego Valley was about 3.1 m of strike slip and another 2 m of down-to-the-east dip slip on a nearly vertical fault, yielding oblique slip of nearly 4 m. A low-angle detachment intersects the footwall of the central portion of the Borrego fault at a segment boundary, and rupture bifurcates with a splay that follows the trace of the detachment in a more westerly direction. Over the next 6 km to the north, rupture steps left across a 2km wide zone before finally consolidating on the Paso Superior Fault, which extends the rupture an additional ~10 km farther north. Additionally, parallel to the southern Borrego fault rupture, the northern Laguna Salada fault (1892 segment) re-broke with minor (10-30 cm) dip slip. Part of the complexity of the rupture can be attributed to interaction with detachment faults that allow the rupture to expand in the near surface.

Damage associated with this earthquake is most dramatic in the delta region, where extensive liquefaction caused tilting and submergence of fields and communities, and destruction of roads, canals, and other infrastructure.



Tom Rockwell and another geologist at the business end of the El Mayor-Borrego earthquake. *Photo: Tom Rockwell*

## PRESIDENTS CORNER, JUNE 2010

The month of June is upon us, and summer rapidly approaches. Those of us who have some summer research, field trips, and/or vacations planned, are no doubt putting the final touches on planning before launching some exciting expeditions. This month features our joint meeting with the South Coast Geological Society at the ever popular El Adobe restaurant in San Juan Capistrano.

Following hard on the heels of the Easter Day Mexicali earthquake, some 41 enterprising SDAG members made a trip to view fault ruptures and other fault features. We are honored this month to host, along with the SCGS, Dr. Tom Rockwell, who led the excursion and who will fill us in on the latest concerning the quake and the tectonic setting.

Thank you to those who manned the SDAG/SCGS booth at the annual GSA Cordilleran section meeting in Anaheim, May 27 through May 29.

Looking forward to a long, busy and exciting summer!

Bryan

## 2009 and 2010 SPONSORS - THANK YOU!!

Note the new nomenclature for 2010: Sponsors, Corporate Sponsors, and Patrons provide a significant portion of SDGS's and SDAG's operating and scholarship budgets. By making your payments to SDGS (a 501(c)3 public benefit nonprofit educational corporation) you may be able to claim a tax deduction. In addition to monthly recognition for your contribution, you are entitled to additional benefits as listed on the Sponsorship Form included in this newsletter.

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## ANNOUNCEMENTS

**Call for Papers** for the Upcoming 2010 SDAG Field Guide:  
**“Geology of the Northern Anza Borrego Desert State Park Area”**  
 To be published in association with this years’ SDAG field trip:  
**“The Lows and Highs of Anza Borrego Desert State Park”**  
**October 15 through 17, 2010**

Co-Organizers:

Chuck Houser, SDAG Vice President  
 SCS Engineers  
[CHouser@scsengineers.com](mailto:CHouser@scsengineers.com) (858) 571-5500 x244

Monte Murbach, Principal  
 Murbach Geotech  
[mmurbach@aol.com](mailto:mmurbach@aol.com) (619) 222-2044

**SCOPE:** Papers addressing topics related to mylonites, geology, structural geology, metamorphism, metasediments, faulting, folding, meta-structures, biology, paleontology, environmental issues, geography, Native American culture, and history of the Santa Rosa Mountains, Clark and Borrego Valleys, Borrego Badlands, Coyote Mountain, and San Ysidro Mountains.

**TIMELINE:** Email a statement of interest & topic to the co-editors as soon as possible:

- Manuscripts due: June 18th, 2010
- Revised manuscripts due: July 9th, 2010
- Target publication date: late September, 2010

First Call for Presentations & Exhibitors (open until July 9, 2010): [The 2011 North American Environmental Field Conference and Exposition](#), JANUARY 11 - 13, 2011, at the Hilton Resort Hotel on Mission Bay in San Diego, California. For details, go to <http://www.envirofieldconference.com/exhibit.htm>

## May 1 One-Stop-Wonder: Easter Earthquake Epicenter: More Photos

More photos from the Tom Rockwell-led hike/tour along the surface fault rupture from the  $M_w$  7.2 Sierra El Mayor-Cucapah (EL Mayor-Borrogo) quake that occurred in Northern Baja California on April 4, 2010.



A GSA volume on the Peninsular Ranges batholith, Baja and southern California, is currently in the early stages of preparation. The volume will address both the Jurassic and Cretaceous batholiths and related extrusives. Plans are for a series of overview papers; a number of trans-batholith transects; topical papers dealing with isotopic, chemical, structural, and geophysical aspects of the batholith; as well as structural effects recorded in prebatholithic rocks during the evolution of the batholith. Also to be included are studies of individual plutons, ranging from gabbro to pegmatites, that characterize various elements of the batholith. A section is planned for geologic problems, such as Tertiary fault history, that have been solved through the analysis of batholithic data. Go to <http://www.geosociety.org/pubs/batholithVolCall.htm> for details.

If you would like to submit a paper, or if you know of someone who might be interested, please contact one of the editors: Doug Morton, [douglasmorton@gmail.com](mailto:douglasmorton@gmail.com); Scott Johnson, [johnsons@maine.edu](mailto:johnsons@maine.edu); Dave Kimbrough, [dkimbrough@geology.sdsu.edu](mailto:dkimbrough@geology.sdsu.edu); Scott Paterson, [paterson@usc.edu](mailto:paterson@usc.edu); Keegan Schmidt, [klschmidt@lcsc.edu](mailto:klschmidt@lcsc.edu); Vicki Todd, [vtodd2@comcast.net](mailto:vtodd2@comcast.net); or Paul Wetmore, [pwetmore@cas.usf.edu](mailto:pwetmore@cas.usf.edu).



New Volume:  
"Atlas of Coastal Ecosystems in the Western  
Gulf of California"

Dr. Jorge Ledesma Vázquez, Associate Dean of the Facultad de Ciencias Marinas at the Universidad Autónoma de Baja California in Ensenada, has announced the publication of a new volume by The University of Arizona Press, titled "Atlas of Coastal Ecosystems in the Western Gulf of California: Tracking Limestone Deposits on the Margin of a Young Sea" (192 pp., 32 color photos, 24 maps, cloth binding, with CD-ROM).

"...this atlas captures the dynamics of natural cycles in the fertility of the Gulf of California that have been in near-continuous operation for more than five million years. The book is designed to answer key questions that link the health of coastal ecosystems with the region's evolutionary history: What was the richness of "fossil" ecosystems in the Gulf of California? How has it changed over time? Which ecosystems are most amenable to

conservation?" For more information and ordering, go to <http://www.uapress.arizona.edu/BOOKS/bid2141.htm>.



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- Four units available, each with 3,125 square feet of warehouse and office space.

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- Office available, just under 500 sq. ft. One and a half blocks from La Jolla Shores beach, and just down the road from Scripps Institute. Fully wired for phone and internet. **\$750/month**.
- Contact Izzy at 858-531-3025 or [izzysurfdiva@gmail.com](mailto:izzysurfdiva@gmail.com) for more information.

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## FOR SALE

The following groundwater level and sampling equipment items are for sale. If interested, please contact Mrs. Jacqueline Sorben at (858) 278-8897:

1. Solinst Model 101 Water Level Meter (used to measure depth of water in wells, boreholes and standpipes.)
2. Campbell Monoflex Pneumatic Integrated Vacuum Pressure Controller (designed to operate pumps and samplers to depths of 250 ft. with a maximum operating pressure of 125 PSI, with quick disconnect air fittings.)
3. Model 601 Standpipe Piezometer (designed to be placed within a drilled hole to provide a filtered inlet point.)

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## SEEKING JOB OPPORTUNITIES!

**Todd Wirths, M.S., P.G. #7588:** Environmental geologist seeking a senior project manager-level position. I have over twelve years experience conducting environmental subsurface investigations. Responsibilities included project and data management at leaking underground storage tank sites, conducting Phase II Environmental Site Assessments, large-scale remedial soil over-excavations, and risk assessments throughout San Diego County. Experience with over 50 projects associated with assessment and remediation of petroleum hydrocarbon-impacted retail fuel facilities in the San Diego Region and supervised the installation of nearly 500 wells and borings. Read more on my LinkedIn Profile: <http://www.linkedin.com/pub/todd-wirths/10/3b/939>. Better yet, ask for my resume- call 858-337-0098, or email [todd@wirths.com](mailto:todd@wirths.com).

**Jared Warner:** I am a graduate of San Diego State where I received both my B.S. and M.S. in geological sciences ('06 and '09). I have experience in multiple fields including production geology, fractured reservoirs, reservoir characterization, basic geologic model building, geophysics, paleontology, sedimentology, oceanography, and teaching. I've recently moved back down to San Diego after working for Occidental Petroleum and looking for immediate employment opportunities. For information on my research, contact information, or a resume please feel free to contact me at [jared.j.warner@gmail.com](mailto:jared.j.warner@gmail.com) or call me at (661) 972-5332.

**Greg Fisch:** I have been an Electronic Engineer and Software developer for many years. I originally started out wanting to be a Geologist, but family and friends convinced me to get into electronics and computers instead. So now after 20+ years, it's time to make a career change, get back to my original goal and go back to school to obtain my degrees in Geology. I have been involved with a wide variety of projects including six-legged walking robots, remote telescope/ccd imager/observatory control systems, GPS tracking systems utilizing the Iridium satellite network, GIS mapping and programming, asteroid/comet orbital determination and advanced image processing. I would like to be able to apply my knowledge and skill set in the technology areas to research tasks in the Geoscience area (with a special interest in remote sensing) while I'm continuing my education. Please contact me at (858) 692-2909 (cell) or send email to: [gfisch9862@aol.com](mailto:gfisch9862@aol.com) and I will be happy to send you my current resume.

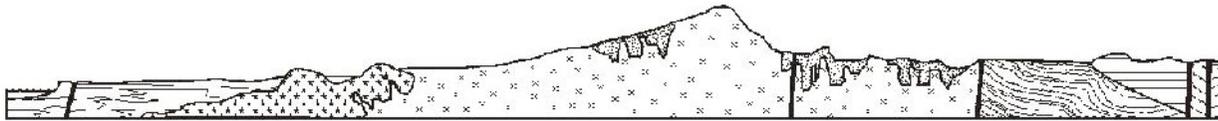
## **JOB OPENINGS!**

**Geologist:** K2 Engineering is a small firm providing geotechnical consulting services for military and public works projects. We are currently seeking qualified engineers/geologists for upcoming projects in San Diego and Riverside Counties. We are looking for individuals who are self motivating and can work independently. As a minimum, the candidates should meet the following:

- Bachelor's degree in Geology or Civil Engineering (with emphasis in soils mechanics)
- Graduate degree and/or professional registration are desired but not required
- Five to 10 years of experience in the geotechnical field. Experience should include field explorations (sampling and logging), knowledge of the local geologic and soils conditions.
- Software experience: proficiency in Word, Excel, Power Point, Microsoft Project.
- Strong verbal and written communication skills.

Responsibilities may include coordination of geotechnical investigations, sampling, logging and report preparation. For consideration candidates should submit a cover letter and current resume to [skemmerrer@gmail.com](mailto:skemmerrer@gmail.com) or fax at (858) 484-8682.





# SAN DIEGO ASSOCIATION OF GEOLOGISTS

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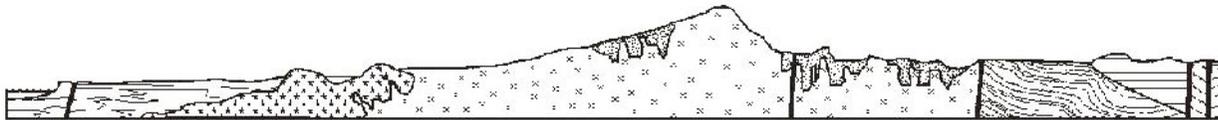
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San Diego, California 92110

*Donations may also be made  
at monthly meetings.  
Thank you!*