



# SAN DIEGO ASSOCIATION OF GEOLOGISTS

[www.sandiegoeologists.org](http://www.sandiegoeologists.org)

## SDAG MEETING ANNOUNCEMENT WEDNESDAY, July 21, 2004

### *EARTHQUAKE POTENTIAL OF MAJOR FAULTS OFFSHORE SOUTHERN CALIFORNIA*

*presented by*

**Mark Legg**

President, Legg Geophysical

**Where:** Tom Ham's Lighthouse Restaurant  
2150 Harbor Island Drive  
San Diego, CA 92101  
(619) 292-9110

**When:** 6:00 pm – Social Hour  
7:00 pm – Dinner  
8:00 pm – Program



**Directions:** Tom Ham's is located at the west end of Harbor Island. From Harbor Drive turn south onto Harbor Island Drive. At the second light turn right. Go to the end.

**Dinner:** The usual large assortment buffet. The spread will accommodate both the Carnivores and the Vegetarians.

**Cost:** \$25.00 per member and guests, \$15 for students. Add \$5.00 if you did not make a reservation.

**Reservations:** Make your reservation online at [www.sandiegoeologists.org](http://www.sandiegoeologists.org) or call the SDAG Reservation Hotline at (619) 255-8380, **no later than 5:00 p.m. Friday, July 16<sup>th</sup>**.

**RESERVATIONS CANNOT BE ACCEPTED AFTER Friday AT 5 PM.**

#### 2004 EXECUTIVE COMMITTEE

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## **BIOGRAPHICAL SKETCH: DR. MARK R. LEGG**

**Dr. Legg** received a B.S. in Space Sciences & Mechanical Engineering from the Florida Institute of Technology in 1973. At F.I.T, he also studied Physical Oceanography for the M.S. program. Dr. Legg continued his graduate studies in Oceanography at the Scripps Institution of Oceanography, with a National Science Foundation Graduate Fellowship, where he received his M.S. in 1980. In 1985, Dr. Legg completed his Ph.D., Geological Sciences, at the University of California, Santa Barbara. His post-graduate research focused upon the geology and seismotectonics of the California Continental Borderland, with detailed studies of the inner borderland west of San Diego and northern Baja California. While a graduate student, Dr. Legg conducted earthquake hazard and risk analysis research for the J.H. Wiggins Company, and helped the California Division of Mines & Geology map faults and earthquakes in the borderland. After the Ph.D., Dr. Legg expanded his marine seismic exploration skills at the Amoco Tulsa Research Center. Since 1988, Dr. Legg returned to Southern California to continue his offshore faulting and earthquake hazards studies. Recent offshore faulting and earthquake research efforts have included

submersible dives (Alvin, Turtle, and Delta) to study borderland faults directly, multibeam swath bathymetry mapping of seafloor structure, and acquisition, processing, and interpretation of MCS and single-channel seismic profiles throughout the borderland. He continues to educate the larger community regarding the seismic hazards of the borderland including the potential for locally-generated tsunamis through seminars and publication. As President of Legg Geophysical, a small consulting firm that specializes in Earth Sciences and Risk Analysis, Dr. Legg is involved in many diverse projects relating to both natural and man-made hazards funded by both government and commercial agencies. He is also a participating scientist with the Southern California Earthquake Center, and adjunct professor at San Diego State University, and a Visiting Assistant Research Geophysicist at UC Santa Barbara. His collaboration with scientists at Oregon State University and UC Santa Barbara to produce more accurate maps of the Borderland bathymetry for fault and tectonic studies led to the discovery of large crater structures.

### **SUMMARY:**

#### **EARTHQUAKE POTENTIAL OF MAJOR FAULTS OFFSHORE SOUTHERN CALIFORNIA**

Major active faults offshore southern California pose a serious threat to coastal populations and structures. A comprehensive high-resolution bathymetric dataset has been compiled to map major portions of the two largest faults within the inner borderland offshore southern California: the San Clemente and the San Diego Trough fault zones, as well as parts of the Palos Verdes-Coronado Bank Fault. The seafloor morphology provides an accurate delineation of fault geometry and character, and illuminates numerous piercing point offsets on a variety of scales. Combined with a dense grid of existing high-resolution single-channel seismic reflection data and observations from the submersible ALVIN, these data are sufficiently detailed to allow a first-order estimate of rates of deformation. With these data, new detailed maps of these faults have

been prepared to assess fault segmentation and the relationship of fault morphology to seismicity. Seafloor observations from the DSV Alvin provide the first confirmation of large prehistoric earthquake occurrences on the submarine San Clemente fault, and allow more accurate interpretation of submarine fault earthquake potential than previously possible. Uplift and subsidence modeled using the fault geometries provides estimates of horizontal rates of motion from the vertical components. Furthermore, the vertical uplift has been used to estimate the potential for generation of destructive local tsunamis along the adjacent coast. On June 15, 2004, a moderate (M=5.3) earthquake centered on the San Clemente fault ended a 28-year quiescence in offshore seismicity and provides an important reminder of this hazard.

## PRESIDENT'S CORNER:

- **June speaker.** George Copenhaver gave a nice presentation of the geology and history of the San Diego and Arizona Railway. I am hoping we can do a field trip to this area in the future.
- **Earthquake!** A couple things happened as a result of the recent offshore earthquake: We got a great June speaker to talk about the current event. Mark Legg has been studying the offshore faults for a long time. This area is his backyard. Mark will be fighting traffic from Orange County to give us his talk - please try to attend this one. The other thing that happened is the new Geologist at Petra, Melissa from Texas, enjoyed her first earthquake. I hope she did not bring a 7 pointer with her...
- **July Meeting Spot.** In anticipation of a large attendance, we are going back to Tom Ham's. The buffet will handle the carnivores and vegetarians alike, as previously mentioned. (One of my favorite lines from MBF Greek Wedding: What do you mean you don't eat meat?! OK – we will have lamb instead!)
- **June Meeting Location.** We received some good feedback from members about the Pizza joint. We will probably go back there later this year. The problem (not really a problem. I think this is great.) is we are averaging about 60 people per meeting so we have to go to places that can handle us. By the way, after the dinner, the Pizza manager told me we ate more Pizza than the soccer league. Congrats!
- **Honorable Mention.** You all know that at every meeting I like to acknowledge past SDAG Presidents. I would like to acknowledge a long time member that never misses a meeting: Robert McEuen. Robert, thanks to you and your wife for the great attendance.
- **Picnic.** The picnic will be as fun as we all make it. Come meet some new faces, say hi to old acquaintances, avoid the ones you don't like, or sit in the sand by yourself. But Please attend. If anything, please come by and say hi to Tom and Dorian Kuper. They will be in town and plan on attending. I think they want that Farthest Traveled Award again...

-- Monte Murbach

## ANNOUNCEMENTS:

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**SDAG NEWSLETTER IS DIGITAL!** If we don't have your e-mail address, or your email address changes, or if you have problems with the electronic format please contact **David Bloom** at 619-524-6967 OR [secretary@sandiegoeologists.org](mailto:secretary@sandiegoeologists.org).

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**Picnic. August 21. Vacation Island on Mission Bay. \$10.** \$5 for students and kids. We are thinking about BBQing Tri-Tip and assorted Hot Dogs and Veggie Burgers. It would be great if members could contribute stuff like homemade salsa, potato salad, etc. to make this a festive event. Please [email one of the officers](#) if you are interested in helping. Some of us will be there early in the morning to hold the spot, otherwise we will be eating around noon-ish. Liquids will include the usual sodas, water and, yes, the beer will be from Alpine Beer Company (the unofficial, official beer of SDAG!). The official time that the picnic will end will be when no one is left, or the liquids are gone, whichever comes first...



Photo: signonsandiego.com

Please sign up by calling Phil's hot line (619) 255-8380. We need a head (and mouth) count by the previous Monday (August 16).

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## ANNOUNCEMENTS (CONTINUED):

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*Best wishes everyone!*

This is the first announcement for the **VII International Meeting on the Geology of Baja California**, so you can write it down in your calendar for dates and place to be held.

The objective of the meeting is, as always, to get together in a comfortable academic and geologic setting, to present the latest advances in the ongoing research about the geologic evolution of the Peninsula, at different academic institutions. This time the meeting will be hosted by colleges from Universidad Autónoma de Baja California in collaboration with CICESE in **Ensenada, April 4-7 2005**, without considering possible field trips within these dates.

Shortly, in our next message, we will make available the Webpage address with all the details about the organizing committee, hotel rates, deadlines for submitting abstracts, formats, fees. In addition, information on field trips will be made available.

Language considerations: If you will present your work in English, then all the figures should use Spanish legends, and vice versa.

Anyone interesting in running a field trip, please let us know before August, the sooner the better.

Sincerely,  
Jorge & Ana Luisa

Dr Jorge Ledesma Vázquez Coordinador Académico Área de Geología Facultad de Ciencias Marinas UABC, Ensenada 22800 Tel (646) 174 45 70 ext 146 Fax (646) 174 41 03
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**“Tectonic Evolution of Northwestern Mexico and the Southwestern United States,”** 2003, Geological Society of America Special Paper 374 (471 pages). Editors: Scott E. Johnson, Scott R. Paterson, John M. Fletcher, Gary H. Girty, David L. Kimbrough, and Arturo Martin-Barajas. This volume was assembled as a dedication to the career achievements of R. Gordon Gastil. The papers focus primarily on the Mesozoic and Tertiary tectonic evolution of Baja California and nearby regions of mainland México and southern California. The volume begins with an extensive tectonic overview with the goals of summarizing our present understanding of the geology of Baja California, addressing several controversial issues and providing a framework for more detailed discussions in some of the remaining papers. The volume contains a wealth of modern analytical data and authoritatively explores regional issues. The accompanying CD-ROM contains valuable geochronological and geochemical data, color images, and out-of-print Geological Society of America maps. In particular, the CD-ROM contains the highly sought after geologic maps of northern Baja California published by Gordon Gastil and colleagues in 1975 as part of the Geological Society of America Memoir 140, *Reconnaissance Geology of the State of Baja California*. Order SP 374 for \$76.00 (member) or \$95.00 (non-member) at the GSA online bookstore: <http://rock.geosociety.org/bookstore/>

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**SDAG Historical Geologic Map Archive** Thank you for all your contributions!

Please let us know what other rare, out-of-print geologic maps you would like to see in SDAG's electronic archive. We would like San Diego area geologic maps of regional scale (covering 7.5-minutes or more), and in the public domain. If you have a pristine copy of a rare geologic map, we would like to borrow it for scanning. We are especially interested in a good copy of Marcus Hanna's 1926 geologic map of the La Jolla quadrangle. Please contact **Greg Cranham** at [gcranham@hargis.com](mailto:gcranham@hargis.com), or **David Bloom** at [secretary@sandiegogeologists.org](mailto:secretary@sandiegogeologists.org) or (619)524-6967.



## ANNOUNCEMENTS (CONTINUED):



**Alpine Challenge Metric Century Bike Ride:** - SDAG Officers and Past Presidents were well represented in April: Mike Hart, Lowell Lindsey, Diane Murbach, Monte Murbach, Lynn Perry, and David Bloom. Come join us for other rides!

**SDAG Wear:** - Monte (Murbach) has a variety of shirts, hats, visors and even a nice vest with the SDAG logo. A small selection is available for purchase at the meetings; all SDAG wear can be ordered from Monte.

**SDAG Directory:** We plan to publish a directory of SDAG members for 2004. You should receive a mailing this month with your information. Please review and submit changes or additions to SDAG Secretary David Bloom at 619-524-6967 or email [secretary@sandiegoeologists.org](mailto:secretary@sandiegoeologists.org).

**DO YOU HAVE AN ANNOUNCEMENT??** Do you have an event, job opening, field trip or other announcement you would like to share with our members?? Just call or email our SDAG Secretary, **David Bloom** at 619-524-6967 OR [secretary@sandiegoeologists.org](mailto:secretary@sandiegoeologists.org).

## 2004 CORPORATE SPONSORS - THANK YOU!!

A significant portion of the SDAG operating and scholarship budget is provided by corporate sponsorship. Please consider becoming a Corporate Sponsor for 2004! In addition to monthly recognition for your contribution, you will be entitled to a free Internet "link" from the [SDAG Website](#), and all Corporate Sponsors are listed in the front of the annual SDAG Field Trip Volume.

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# ***FINAL CALL FOR PAPERS!***

## **SDAG 2004 ANNUAL FIELD TRIP**



### **JOSHUA TREE NATIONAL PARK**

October 30-31<sup>st</sup>

## **FINAL CALL FOR PAPERS!!**

Although the field trip will focus on the Mojave Desert portion of the park, submissions which include or focus any facet of the park or surrounding environs will be welcome. Potential subjects may include updates on geologic/fault interpretations, weathering phenomena, local flora and fauna, and cultural, mining or historical interests. Please contact Margaret if you would like to discuss a potential paper. The deadline for submission of papers and associated graphics is July 15th. Text can be an unformatted WORD file, with graphics in JPEG or TIF format (no PDFs or AutoCAD files please!).

Call Margaret Eggers at 760-757-7711, or email at [mmeggers@eggerv.com](mailto:mmeggers@eggerv.com) if you have questions.

This beautiful gem of Southern California will be the destination for our 2004 field trip. We will be focusing on the higher elevation, Mojave Desert portion of the park. SDAG members will camp in the park, and we will visit several points interest, both geologic, mining and cultural. The trip will be limited to 60 individuals, and carpooling is a must to keep things moving smoothly. Field trip stops have not been finalized so contact Margaret Eggers ([mmeggers@eggerv.com](mailto:mmeggers@eggerv.com)) if you have a specific suggestion. We are will make every effort this year to have the field guides printed and available the day of the trip so please submit papers early. Dr. D. D. Trent, co-author of "Joshua Tree National Park: Geology" is scheduled to join us on our trip. Note that Sunbelt Publishing has copies of Dr. Trent's book (with Dr. Richard W. Hazlett, 2002) for sale! Contact Lowell Lindsay at [llindsay@sunbeltpub.com](mailto:llindsay@sunbeltpub.com).

## **MARK YOUR CALENDARS TODAY!**

## ANNOUNCEMENTS (CONTINUED):

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### THE SANTA BARBARA MUSEUM OF NATURAL HISTORY *DIBBLEE GEOLOGY CENTER* PRESENTS TEN NEW DIBBLEE MAPS AND ANNOUNCES JOHN MINCH AS THE NEW DIBBLEE MAP EDITOR

**Santa Barbara, Calif. – June 15, 2004, –** In late June, the Dibblee Geology Center of the Santa Barbara Museum of Natural History will release ten new Tom Dibblee maps of the San Luis Obispo County region. This year alone, the Dibblee Geology Center plans to release 40 new Dibblee maps. Using an all digital map-making process we are able to decrease the amount of time needed to produce and publish each map and to create a set standard for all Dibblee maps.

The Museum would also like to welcome John Minch as the Map Editor for the Dibblee Geology Center. John is well known in the geologic community having published nearly a hundred papers and abstracts, held a number of society offices, and served on local and national committees. As well as bringing a new style of producing the high quality Dibblee maps in digital form, John works first hand with Tom Dibblee in the editing and drafting of each map. John has been actively involved in extending the legacy of Tom Dibblee and will continue to contribute his expertise at the Dibblee Geology Center.

Over the course of 75 years, the legendary Tom Dibblee has created maps that have been instrumental in understanding California's geology. Today, Dibblee, who personally mapped more than a quarter of the state of California, remains actively involved in the publication of each new map. The magnitude, integrity, and permanence of Dibblee's geologic mapping are truly unprecedented and legendary, which is why it is the first priority of the Dibblee Geology Center to complete the publication of Tom's maps.

Dibblee maps are renowned for their high quality and serve a diverse group of users such as engineering geologists, oil companies, U.S. Forest Service, environmentalists and students, among others. To date, the Dibblee Geology Center has released 107 maps and 3 CDs. The ten new maps of **San Luis Obispo County** are 7.5-minute quadrangles of:

- San Luis Obispo
- Atascadero
- Templeton
- Estrella/Shandon
- Lopez Mountain
- Santa Margarita
- Creston/Sheppard Canyon
- Santa Margarita Lake
- Wilson Corner
- Paso Robles



The maps will be available at the Santa Barbara Museum of Natural History for \$20.00 rolled and \$15.00 folded plus tax and shipping fees. For more information you can contact Chloe Diegel via email at [cdiegel@sbnature2.org](mailto:cdiegel@sbnature2.org), you can call to place an order at (805) 682-4711 ext. 371, or visit the store to purchase the maps online at [www.sbnature.org/estore](http://www.sbnature.org/estore).

#### *ABOUT SANTA BARBARA MUSEUM OF NATURAL HISTORY*

One of Santa Barbara's cultural and environmental treasures, the Santa Barbara Museum of Natural History was founded in 1916. The mission of the Museum is to enlighten the public by developing and presenting fundamental knowledge of natural history research, so as to teach and inspire a lifelong passion and abiding respect for the natural world.

## SDAG PUBLICATION ORDER FORM

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## JOB OPENINGS!

**Ninyo & Moore** Ninyo & Moore has immediate openings for Staff, Senior Staff, and Project Geotechnical Engineers and Geologists in their San Diego and Irvine offices, and a Senior Technical Marketing Associate in their San Diego office. Submit resumes to our Corporate office: Ninyo & Moore, 5710 Ruffin Road, San Diego, California 92123, Attention: Ms. Margot A. Graves (EOE) Please visit us at our web site at [www.ninyoandmoore.com](http://www.ninyoandmoore.com).

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**KLEINFELDER** is seeking a **Senior Environmental Engineer for their Temecula office**. Qualifications: Job Code #292: Seeking individual with management experience (personnel and projects). Positions require BS degrees in civil, chemical, mechanical, or environmental engineering; MS degrees with EIT, PE, or certification preferred. Ten plus related experience required. To submit a resume online, go to [Kleinfelder.com](http://Kleinfelder.com) and click on "Careers." (1203)

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**Hargis + Associates, Inc.**, a San Diego based consulting firm (**and SDAG Corporate Sponsor**) specializing in **hydrogeology and engineering**, currently has opportunities in both our Mesa, Arizona, and San Diego offices. We are currently looking to fill the following positions:



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Staff Hydrogeologist: Candidate would have a B.S. Degree in Geology, and 3 to 5 years relevant experience, including experience with sampling, well installation, workplan and report preparation. Candidate should possess strong writing and presentation skills. GIS skills, Masters degree and/or California registration is a plus. Position will be based in San Diego, and may require some travel and field work. OSHA 40-hour training required.

Staff Engineer: Candidate would have B.S. Degree in Chemical, Civil, or Mechanical Engineering and EIT Certification, and two to four years of relevant experience, including design, operation, and maintenance of remediation systems. Masters degree and registration is a plus. Candidate should possess strong writing and presentation skills. Position will be based in San Diego, and may require some travel and field work. OSHA 40-hour training preferred, but not mandatory.

Senior Engineer: Candidate would have a B.S. Degree in Civil Engineering and registration in Arizona with ten+ years of relevant experience, including design, operation, and maintenance of remediation systems. Masters degree and/or California registration is a plus. Strong leadership, writing and presentation skills required. Position will be based in Mesa and may require some travel and field work. OSHA 40-hour training and MSHA training preferred, but not mandatory. Excellent opportunity for an experienced, registered Arizona Civil Engineer.

Hargis + Associates offers competitive salaries and benefits, and a challenging work atmosphere. Hargis + Associates in an Equal Opportunity Employer. To learn more about Hargis + Associates, please visit our website at: [www.hargis.com](http://www.hargis.com).

Qualified candidates should send resumes, along with a cover letter summarizing experience and salary requirements to:

Hargis + Associates, Inc.  
Attention: Kim Stransky  
2365 Northside Drive, Suite C-100  
San Diego, CA 92108

**San Diego Association of Geologists  
c/o David M. Bloom  
3728 Mt. Almagosa Place  
San Diego, CA 92111**