

SAN DIEGO ASSOCIATION OF GEOLOGISTS

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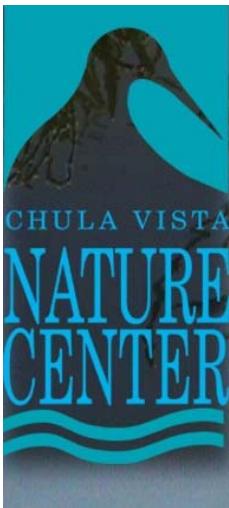
SDAG MEETING ANNOUNCEMENT

WEDNESDAY, SEPTEMBER 17, 2003

Ridge Trench Interactions and the Ongoing Capture of the Baja California Microplate

presented by

John M. Fletcher, PhD, Departamento de Geología, CICESE



Where: CHULA VISTA NATURE CENTER

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

Directions: The Chula Vista Nature Center is located on San Diego Bay approximately seven miles south of downtown San Diego and seven miles north of the international border. From Interstate 5, take the E Street exit in Chula Vista, go west to the parking lot. A shuttle will take you from the parking lot to the Nature Center

Dinner: Taco Express will provide us with a mexican buffet including munchies before dinner. Beer and soft drinks provided .

Cost: \$25.00/person, \$10/student

Reservations: Make your reservation online through the SDAG website at www.sandiegogeologists.org or call Margaret Eggers at (760)757-7711, **no later than 5PM Monday, September 15th**.

To learn more about The Chula Vista Nature Center, visit www.chulavistanaturecenter.org

Speaker:

Dr John Fletcher is a structural geologist and currently holds a faculty position at CICESE, which is one of the most highly regarded scientific-research institutions in Mexico. Dr. Fletcher received his B.S. in Geology from Oregon State University in 1984, his M.S. in Geology from Northern Arizona University in 1989, and his Ph.D. in Geology from the University of Utah in 1994.

Much of Dr. Fletcher's research has focused on extensional tectonics and he has worked in many highly extended terranes throughout the world including several regions in the Basin and Range Province in the western United States, the MARK area of the Mid-Atlantic Ridge, and the Gulf Extensional Province in western Mexico. His dissertation studies in the central Mojave

metamorphic core complex addressed several process-oriented problems such as (1) the mechanics of brittle-ductile normal faulting and evolution of three-dimensional stress fields during crustal extension, (2) the origin of the characteristically nonplanar geometry brittle-ductile normal faults, and (3) the interplay between magmatism and crustal extension. In 1991, Fletcher worked as a summer geologist for Mobil Exploration and Producing in central Nevada and developed a new model for the genesis of oil reservoirs in Basin-and-Range extensional tectonic settings. Throughout 1992 and 1993, Dr. Fletcher was a geologic consultant for Kennecott. His primary responsibilities were to determine subsurface potential of mineral deposits and characterized relationships between mineralization and deformation in ductile shear zones and other structurally complex terranes. In 1993, he served as structural geologist on Leg 153 of the Ocean Drilling Program, which studied deformed gabbro and peridotite at the MARK area of the mid-Atlantic Ridge. His post-cruise studies provided the first well-documented evidence for kinematically coordinated brittle and ductile normal faulting at a mid-ocean ridge.

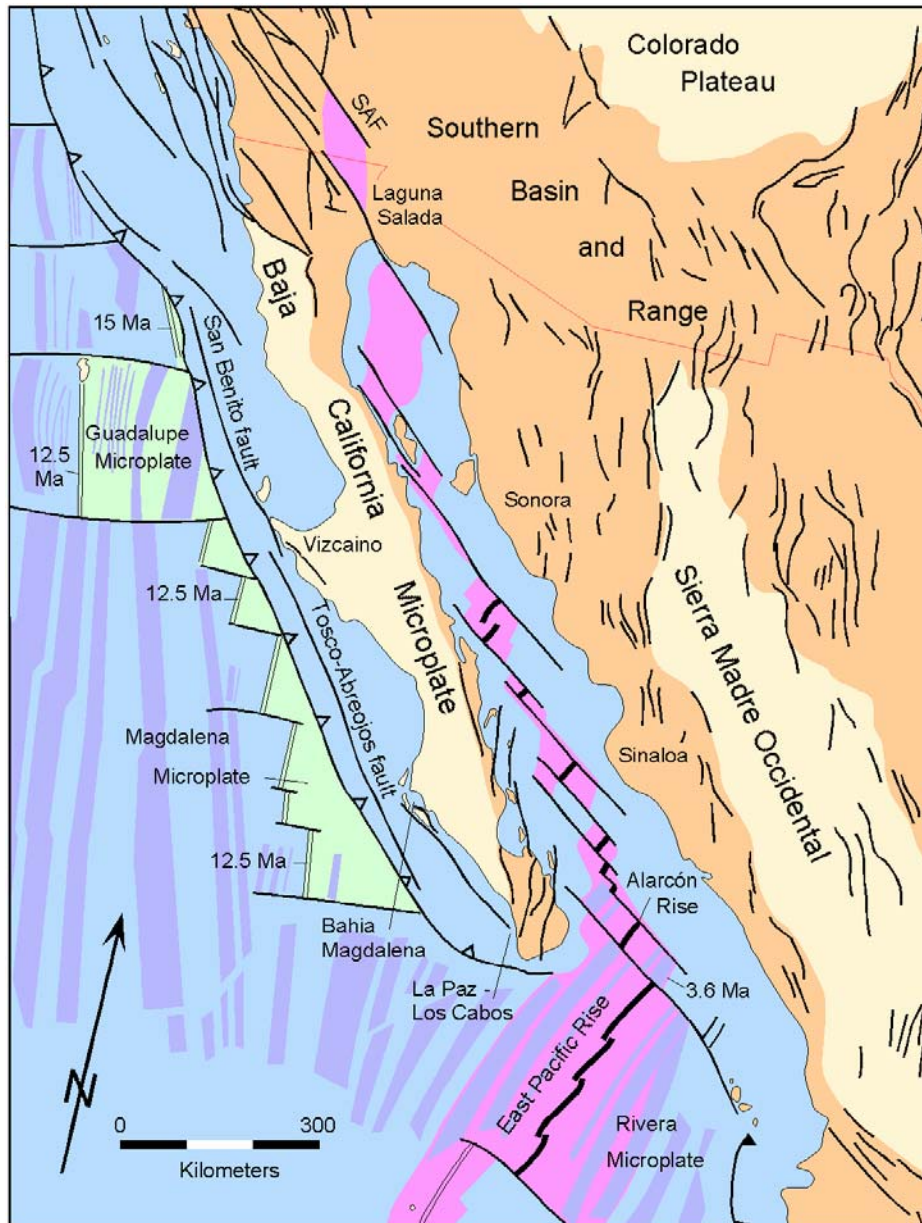
Dr. Fletcher was a member of the editorial staff of *Geology* and regularly reviews articles for most of the main Journals in Earth Sciences. He has been invited to present the results of his studies at numerous universities and research centers and teaches several graduate-level courses on structural and microstructural analysis and lectures in both Spanish and English.

ABSTRACT

The modern strike-slip tectonic regime that affects most of the western margin of North America initiated ~29 Ma when the paleo-East Pacific Rise first encountered the long-lived Franciscan trench. By ~25 Ma, two distinct triple junctions had formed and began migrating in opposite directions expanding the length of the Pacific-North American sheared margin. The Mendocino triple junction in the north is a transform-transform-trench triple junction that has migrated in a continuous manner to the north and is now located near the Oregon-California border. In contrast, the Rivera triple junction in the south is a transform-trench-ridge triple junction that has migrated to the south by discontinuous jumps that have followed the fragmentation, rotation and ultimately abandonment of Pacific-Farallon ridge segments. The largest jump occurred ~12.5 Ma when the Rivera triple junction migrated ~700km to near its present position in the mouth of the Gulf of California leaving the spreading centers and two large Farallon-derived microplates along the paleo-trench offshore of Baja California (Figure 1).

Following the southward jump of the Rivera triple junction (c.a. ~12.5 Ma), it is widely thought that two major belts of deformation began to accommodate plate margin shearing on either side of the Baja California microplate. Although there is wide consensus on the existence of the two deformation belts, there is still much controversy over the kinematics and magnitude of shearing that each belt has accommodated. Many workers have proposed that the Gulf of California opened in two main phases. In the proto-gulf phase it is thought that plate margin transtension was kinematically and spatially partitioned into orthogonal rifting across the Gulf of California and right lateral shearing across the Pacific margin of Baja California. In the latest Miocene it is thought that faults along the Pacific margin died and the dextral component of plate margin-shearing jumped into the Gulf of California, which continues to accommodate integrated transtensional shearing. However, new geologic relationships indicate that much greater magnitudes (~450 km minimum) of shearing have occurred in the Gulf extensional province. It can also be shown that much less shearing (150 km maximum) has accumulated across the Pacific borderland of Baja California. These new kinematic constraints preclude the two phase model of opening and require that significant dextral translation was accommodated in the Gulf of California from the onset (~12 Ma). Additionally numerous new correlations can now be identified between offshore Farallon-derived microplates and the geology of the overlying continental crust. In fact, the Gulf of California itself is recognized as one of the many indelible signatures of the profound interactions between the microplates and the western margin of North America.

Understanding the processes of ridge-trench interactions and microplate capture requires the characterization of the history, style and finite magnitude of shearing across the two main deformation belts that define the Baja California microplate. The revised kinematic model presented in this study provides significant new insight into the geodynamics of ridge-trench interactions and microplate capture.



2003 EXECUTIVE COMMITTEE

PRESIDENT - Patrick Brooks; NAVFAC, SW Div., Ph: (619) 532-0930; fax: (619) 532-0995; brooksgp@efds.w.navy.mil

VICE PRESIDENT - Monte Murbach; Petra Geotechnical; Ph: (858)-485-5530; fax ----; mmurbach@petra-inc.com

SECRETARY - Margaret Eggers; Eggers Environmental, Inc., Inc.; Ph: (760) 757-7711; meggers@eggersenv.com

TREASURER - Phil Farquharson, Ph. 619) 224-8463; fax (619) 255-8380; geoguy@cq-squared.com

PUBLICATIONS - Lowell Lindsay; Sunbelt Publications; Ph: (619) 258-4911 x111; fax: (619) 258-4916; llindsay@sunbeltpub.com.

WEBMASTER - Carolyn Glockhoff; Ph: (858) 549-3396; carolion@znet.com

ANNOUNCEMENTS:

Upcoming 2003 Meetings - UPDATED SCHEDULE !!!

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| October 25-26 | SDAG Annual Field Trip: "The Elsinore fault and gem bearing pegmatites between Palomar Mountain and the Coyote Mountains, San Diego County, California" The Elsinore fault and gem bearing pegmatites between Palomar Mountain and the Coyote Mountains, San Diego County, California |
| November | TBD |
| December 17 th | Holiday Meeting, San Diego Natural History Museum |

SDAG's 2003 Field Trip, August Update:

Plans for the San Diego Association of Geologists 2003 Field Trip are being finalized. The annual field trip will be held October 25th and 26th. The theme of the trip is **"The Elsinore fault and gem bearing pegmatites between Palomar Mountain and the Coyote Mountains, San Diego County, California"**. We will be meeting at Warner Springs Airport first thing Saturday morning. We will consolidate cars and head up to the Cryo-Genie Mine. There we will check in and have a light breakfast - possibly Pie and Pegmatites! Next stop: an overview of Henshaw Dam. Then it is off to look at a great exposure of the Elsinore fault. Lunch will be catered a short distance away at Menghini Winery. We can argue about faults and tourmalines with a cup of vino, or your beverage of choice. After lunch we will head down Banner Grade, head off road and hopefully take a look at the Ranchita Mine site. Then one more look at the Elsinore Fault followed by a nights camp at Agua Caliente county park. There you can soak your weary parts in some hot water. Sunday details, next month.

The trip and guidebook will be a joint effort of the San Diego Association of Geologists and the South Coast Geological Society. (There will be two field trips.) For more information, please contact Monte Murbach (mmurbach@petra-inc.com)

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, Margaret Eggers at 760-757-7711 OR meggers@eggerv.com.

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 Margaret Eggers at meggers@eggerv.com, or call at 760-757-7711.

SDAG Wear: - Monte 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.

2003 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 2003! 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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POSITIONS AVAILABLE:

- **Project Geologist/Engineer: Onsite Environmental** is looking to interview a candidate for a position as a project engineer/project geologist for the Orange County area. This position is with one of the leading engineering firms in the world with over a 100 offices in 35 countries.

We are looking for a local candidate to assume the role of Project Engineer or Project Geologist for our Orange County Office. This person needs to have good field experience working with drilling, groundwater monitoring, sampling, and remediation systems; in particular pump and treat systems designed for hydrocarbons, BTEX and oxygenates. This candidate also must be well versed in health and safety issues. The candidate should have experience working at a refinery to be considered.

The candidate must possess great interpersonal skills and good experience dealing with clients on a face-to-face, one on one basis. Communication style should be straight forward, clear and effective. The candidate must also retain the ability to be flexible and respond quickly to client requests.

Salary for this position is going to be decided solely on the candidates experience and work history. For consideration contact Kurt Yaeger or e-mail your resume to his e-mail address kyaeger@onsitecompanies.com, 714-347-1220 (0803)
- **ENV America Incorporated**, an environmental engineering, consulting and construction firm, is seeking geologists and engineers for its offices in Irvine and San Diego:

 - Entry level geologists and civil engineers

- Staff- and project-level geologists and civil engineers with experience in remediation design and construction.

The ideal candidate will be a client-focused team player, and possess outstanding analytical abilities, proficiency with software and computers, a Bachelors or Masters Degree in a relevant field, excellent writing skills, and a strong ability to concisely and clearly communicate technical information to technical and non-technical audiences. Send your letter of interest and resume to Tom Mulder, ENV America Incorporated, 2247 San Diego Avenue, Suite 135, San Diego, CA 92110, or e-mail tmulder@envamerica.com. (5/03)

- **Kleinfelder** has an outstanding career opportunity for a qualified project geotechnical engineer in our San Diego Office. This position is ideal for the right motivated individual interested in excelling professionally. Teamplayers and client-focused individuals who are comfortable and capable of practicing advanced geotechnical engineering techniques will be considered. The primary responsibilities will be to coordinate, analyze, and compile reports for geotechnical projects including shallow and deep foundations, slope stabilization, soil mechanics, and construction observation. Ideal candidates for the project engineer position will possess 4 to 8 years of progressive geotechnical engineering experience, an M.S. degree in civil (geotechnical emphasis) engineering, a P.E. or the ability to register in California within one year, and exceptional verbal and written communication skills. Ideal project level candidates will also be results - oriented, creative in applying technology for highly diverse designs and projects, and have some experience in proposal preparation and client management. For additional information please contact: Bob Stroh, RG, CEG, Project Engineering Geologist, Kleinfelder, Inc., 5015 Shoreham Place San Diego, California 92122, 858.320.2270 direct.

San Diego Association of Geologists
c/o Margaret R. Eggers, PhD, CHG
Eggers Environmental, Inc.
2181 El Camino Real
Suite 100
Oceanside, CA 92054