NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

MEETING ANNOUNCEMENT

DATE: **September 24, 2008**

LOCATION: **Orinda Masonic Center, 9 Altarinda Rd., Orinda**

TIME: **6:30 p.m. social; 7:00 p.m. talk (no dinner) Cost: $5 per regular member; $1 per student or K – 12 teachers**

SPEAKER: **Dr. Rolfe Erickson,** Emeritus California State University, Sonoma

Granites in the Franciscan Formation at Cazadero, California

The Franciscan Complex underlies most of the Coast Range of California. Since the onset of the plate tectonic model in the 1960's, it has been regarded as a subduction complex of offscraped marine components, especially various basalts and gabbros, cherts, and marine sediments, developed along an east-dipping subduction fault which also produced the Sierras as a continental magmatic arc. The characteristic sediment in many areas is *melange*, composed of blocks (*exotic* blocks) in a matrix. Melanges may have tectonic or sedimentary (olistostrome) origins.

The King Ridge Road melange at Cazadero, California, is an olistostrome melange with hundreds of variably metamorphosed exotic blocks in a sandstone matrix. Although most of the blocks are, indeed, metabasalts and cherts of marine origin, some are of granitoid rocks, a type not heretofore reported. I will discuss two of these blocks and make some other broader comments about granitic components in the Franciscan.

One 50 m block is a hornblende-biotite quartz diorite. Extensive isotopic and geochemical data make it clear that the block is part of an epizonal pluton from an M- type oceanic island arc, akin to the modern Mariana Islands, which lay offshore to the West for part of the Jurassic. This is a second arc for the west Coast subduction complex, and requires existence of a previously unknown arc, subduction zone and plate out in the open sea.

The second ~10 m block is a leucocratic (light-colored) biotite dacite, a felsic lava, which is granitic in composition although dominantly aphanitic. It developed a distinctive micro-augen gneiss texture and has had a very different metamorphic history than the first block. I speculate that its premetamorphic history will be surprising.

Continued on back page…

NCGS 2008 Calendar

Wednesday September 17, 2008
AAPG Distinguished Lecturer (Early Date!)
A Geologist's Introduction to Permeability Averaging and the Effects of Scale on the Permeability of Heterogeneous Rocks – Dr. Jim Jennings, Shell International Exploration and Production, Houston, Texas
See attached flyer; 1:30 **Chevron; VIZ Room, Chevron Park, Building C, CLL279**; Non-Chevron attendees should contact Beverly Reynolds to request a security badge at (925) 842-2710 or beverlyreynolds@chevron.com

Wednesday September 24, 2008
Granites in the Franciscan Formation at Cazadero, California – Dr. Rolfe Erickson, California State University, Sonoma
7:00 pm at Orinda Masonic Center

Thursday October 2, 2008
AAPG Distinguished Lecturer
Modern Rainfall and Paleoclimate across NE Tibet: Climate Consequences of the Growth of the Tibetan Plateau - Dr. Carmala Garione, University of Rochester, N.Y.; See attached flyer;
7:00 pm at Orinda Library; 26 Orinda Way (See map on back cover)

Wednesday October 29, 2008
The impact of fire on hydrologic systems
Dr. Laura Rademacher, Univ. of the Pacific, Stockton
7:00 pm at Orinda Masonic Center

Wednesday November 19, 2008 (One Week Early!)
TBA - 7:00 pm at Orinda Masonic Center

Wednesday January 28, 2009
Geophysical vignettes from the wine country: implications for the northward continuation of the East Bay fault system - Dr. Victoria E. Langenheim,
U.S. Geological Survey, Menlo Park, CA
7:00 pm at Orinda Masonic Center

Upcoming NCGS Field Trips

September 20 & 21, 2008
Early Date!
See Attached Flyer!
Key Sites of Uplift and Glacial Constraints, Central Sierra Nevada,
Jeffrey Schaffer, Napa City College

November 15, 2008
See Attached Flyer
Earthquake at UCB? - The Hayward Fault, Campus Retrofit, and the Seismological Laboratory
Do you have a place you've wanted to visit for the geology? Let us know. We're definitely interested in ideas. For those suggestions, or for questions regarding, field trips, please contact Rob Nelson at: rlngeology@sbcglobal.net

Peninsula Geologic Society
Upcoming meetings

For an updated list of meetings, abstracts, and field trips go to http://www.diggles.com/pgs/. The PGS has also posted guidebooks for downloading, as well as photographs from recent field trips at this web address. Posted upcoming meetings include the following topics and dates:

- September 30, 2008, Tom Brocher; TBA.

Association of Engineering Geologists San Francisco Section
Upcoming meetings

Meeting locations have been rotating between San Francisco, the East Bay, and the South Bay. For further meeting details go to: http://www.aegsf.org/.

Third Conference on Earthquake Hazards in the Eastern San Francisco Bay Area
Science, Hazard, Engineering, and Risk
California State University, East Bay
Hayward Campus
October 22-24, 2008

This conference will highlight information on Eastern San Francisco Bay Area earthquake hazards that has been developed since 1982 and 1992 conferences. The activities and publications will take advantage of interest generated by the 140th anniversary of the 1868 Hayward fault earthquake (October 21). In addition to technical sessions, the conference will include a public forum, field trips and tutorials for educators. This conference is an excellent opportunity to help make public and to synthesize the exciting results of earthquake related studies conducted since the last conference in 1992. Please help us spread the word and tell your

colleagues. The preliminary technical program and a description of the field trips can be found at: http://www.consrv.ca.gov/cgs/News/Pages/sessions.aspx There will be four related field trips will be conducted Saturday and Sunday, October 25 to 26. For the field trips go to: http://www.consrv.ca.gov/cgs/News/Pages/fieldtrips.aspx For more details see: www.consrv.ca.gov/cgs/news/eastbayconference.htm.

NO CHILD LEFT INSIDE

THE 2008 EARTH SCIENCE WEEK THEME

American Geological Institute (AGI)

October 12 – 18, 2008

"No Child Left Inside" will focus the nation on learning about the earth sciences in their natural setting, outside. Schoolchildren across the nation will turn off the TV and step away from their computers to discover the rocks, soil, watersheds, and weather patterns in their community.

"The best earth science classroom, any geoscientist will tell you, is the outdoors," says Ann E. Benbow, AGI Director of Education and Outreach. "We're encouraging students, teachers, and everyone interested in earth science to learn by experiencing it firsthand during Earth Science Week 2008. That means hiking over and digging into the Earth, taking water samples, making cloud observations, and more."

This year marks the 10th anniversary of Earth Science Week. Since the beginning, the event has grown dramatically, enabling more students to focus on the many aspects of the earth sciences and the various careers within the field.

AGI leads Earth Science Week annually in cooperation with its sponsors and the geosciences community as a service to the public. Each year, community groups, educators, and interested citizens organize celebratory events. Earth Science Week offers the public opportunities to discover the earth sciences and engage in responsible stewardship of the Earth. Earth Science Week is supported by the U.S. Geological Survey, the AAPG Foundation, and many other geoscience organizations.

To learn more about this week, ways to become involved; including newsletters, local events, and classroom activities, please go to the Earth Science Week website at: http://www.earthsciweek.org. or http://www.agiweb.org/direct/.

Friends of the Pleistocene

First Announcement - 2008 Pacific Cell Fieldtrip

November 14-16, 2008

Organizers and Leaders: Tom Rockwell, Mike Oskin, Kim Le, Lewis Owen, Warren Sharp, Kate Fletcher, Susanne Janecke, Becky Dorsey, Caitlin Lippincott, Eldon Gath and George Jefferson

Focus: Cross-correlation of Quaternary dating techniques, slip rates, and tectonic models in the western Salton Trough, including stops on: Deciphering the neotectonics of the southern San Jacinto and Elsinore fault zones, including slip per event and slip rate variations through time, their lifetime slip-rates versus their latest Quaternary slip rates. Have slip rates varied due to changing fault structure? Examining evidence for the Early Quaternary age of the San Jacinto fault zone. Discussions on derivation of slip rates based on various dating techniques, including cosmogenic via U-series on pedogenic carbonate. Dating Lake Cahuilla shoreline deposits with Optically-stimulated luminescence - how good is OSL in a nearly ideal environment? The implications of clast provenance and fan morphology combined with various dating techniques in estimating slip rates. Implications of fault arrays in mud-rich basins for paleoseismic studies. Crossing active faults-what is the evidence and how do they do this? Implications of ramps and flats on strike-slip faults. Fault youth and fault maturity: is this a useful model? *10Be, U-series, OSL, soils. Dating soils. Limited to 3000 top-rate Quaternary types! No exceptions! Accommodations will be based on long-standing FOP standards – i.e. - we'll camp.*

Insurance Issues

A Message from the Pres

In June 2008, NCGS joined the California Federation of Mineralogical Societies (CFMS). This may sound like an odd affiliation for us, but we had a good reason to join. A while back, AAPG stopped providing liability insurance for its member clubs and we were forced to seek coverage for the Society. It turned out the least expensive (and least paperwork) option was to join the CFMS, which has a good group liability policy. Although most members of CFMS are rockhounds and hobby

jewelers, the organization, its member clubs, and its parent organization (American Federation of Mineralogical Societies, AFMS) are strong supporters of education in geology, which happens to be one of our primary missions. Both AFMS and CFMS award scholarships to university geology students each year, and many member clubs also have scholarship programs and/or provide member outreach to their local schools. At our September meeting, Richard Pankey, Past President of CFMS, will make a short presentation to our members describing the CFMS in more detail. You can also visit the web sites (www.cfmsinc.org and www.amfed.org), where there is more information and a newsletter archive. - Barb Matz

The Geography of Rodinia

This Week in SCIENCE July 11, 2008

250 million years ago, all of the continents were assembled into a large supercontinent, Pangea. Its breakup had large effects on the geological evolution of the various fragments and affected evolution and Earth's climate. About 1 billion years ago, all the continents were also thought to be assembled into a supercontinent, Rodinia. The breakup of Rodinia controlled the geological and evolutionary history of the Paleozoic. The geography of Rodinia, and particularly connections across the western margin of North America, has been uncertain and widely debated. **Goodge *et al.*** present geochemical data on detritus in the Tran Antarctic Mountains and identify a rock clast there, which provides a link to a set of distinctive granitic rocks exposed in North America. The data support a model in which Antarctica (to the south) and Australia were juxtaposed along western North America.

Ironing Out Ancient Ocean Chemistry

This Week in SCIENCE August 15, 2008

The Neoproterozoic Era, which lasted from approximately 1 billion to 540 million years ago, was distinguished by a phenomenal diversification of organisms and a transition from an anoxic to an oxic atmosphere. How did ocean chemistry change during that time? **Canfield *et al.*** report that for most of the mid- and upper Neoproterozoic, the deep ocean was enriched in ferrous iron (ferruginous), sometimes sulfidic, and finally oxic. The observed return of ocean chemical conditions to the ferruginous ones not seen for more than 1 billion years probably was because of the long preceding interval of a sulfidic marine environment.

Arsenic and Old Organisms

This Week in SCIENCE August 15, 2008

Mat-forming purple bacteria and cyanobacteria that couple arsenite oxidation to the reduction of carbon dioxide in the absence of oxygen have been found in hot brine springs of Mono Lake, California. The advent of photosynthesis was a key moment in the evolution of the Earth because the reaction split water to release oxygen and promoted the diversification of life and our planet's characteristic geochemistry. But photosynthesis evolved under anoxic conditions, and one alternative route is that light-driven carbon fixation was based on arsenic as an electron donor. In a series of biochemical investigations on the Mono Lake organisms, **Kulp *et al.*** have confirmed the phylogenetic hints that this scenario was indeed the case. Increasingly, arsenic is implicated in a complex round of redox transformations mediated by microorganisms, to the extent that examples have been discovered of entire microbial communities supported by a metalloid that is toxic to most other forms of life.

Climate Science: Dry and Getting Drier

Editors' Choice: Highlights of the recent literature

August 1, 2008

Global warming is expected to have a substantial impact on the amount and pattern of rainfall worldwide. Although projections indicate that the overall effect should be an increase in precipitation, at a regional scale there will be areas that receive less rainfall; many such areas are already arid and particularly vulnerable to further drying. One of these regions is northwestern Africa, which recently suffered a severe drought from 1999 to 2002. In order to establish a context for understanding drought frequency and severity in the region, Touchan *et al.* constructed a 547-year summer drought record by measuring and analyzing ring widths of cedar and pine trees across Algeria and Tunisia. They found that the multiyear drought of 1999 to 2002 was the longest in their entire record and that 2002 was the single driest year, a troubling set of statistics if the data do indeed reflect ongoing anthropogenic climate change. Climate models are unable to identify the physical causes of drought in this region, however, so a mechanistic understanding of rainfall dynamics there remains elusive.

Geophys. Res. Lett. **35**, L13705 (2008).

2008-09 AAPG Distinguished Lecture

Abstract

September 17, 2008; 1:30pm

Chevron Park, San Ramon

JIM JENNINGS

Shell International Exploration and Production
Houston, Texas

Funded by the AAPG Foundation

A Geologist's Introduction to Permeability Averaging and the Effects of Scale on the Permeability of Heterogeneous Rocks

Most naturally occurring porous media exhibit some degree of spatial permeability variation, usually referred to as heterogeneity. Few rocks are homogeneous, although some are more variable than others. One of the consequences of heterogeneity is scale dependence. That is, the permeability of a large volume of rock, often called the "effective permeability," will in general be different than the permeabilities of smaller volumes within it.

In this presentation I will use published measurements to illustrate the effects of scale on permeability. Then I will outline some important theoretical predictions concerning effective permeability and show how these theories offer a powerful framework for understanding the behavior of heterogeneous rocks. Finally I will suggest a permeability averaging method that can be used to reconcile observations at different scales and to predict effective permeability for reservoir modeling purposes.

Jim Jennings

Education

1983 Ph.D., Petroleum Engineering, Texas A&M University
1981 M.S., Petroleum Engineering, Texas A&M University
1978 B.S., Petroleum Engineering, University of Wyoming

Experience

2007–present	Principal Reservoir Engineer, Shell International Exploration and Production, Houston, Texas
2000–07	Research Scientist, Bureau of Economic Geology, The University of Texas at Austin, Texas
1995–2000	Research Associate, Bureau of Economic Geology, The University of Texas at Austin, Texas
1998–95	Senior Research Engineer, ARCO Exploration & Production Technology, Plano, Texas
1986–88	Reservoir Engineer, Standard Alaska Production Company, Anchorage, Alaska
1983–86	Project Engineer, Standard Oil Production Company, Warrensville, Ohio

Publications and Awards

2006 Editor, Advances in reservoir characterization reprint volume, Society of Petroleum Engineers
2003 Visiting Professor, Shell International Exploration and Production, Rijswijk, The Netherlands
2002 Outstanding Technical Editor, Society of Petroleum Engineers
Authored or co-authored over 40 journal and conference proceeding papers.

Professional Memberships

American Association of Petroleum Geologists
International Association for Mathematical Geology
Society of Petroleum Engineers

Professional Interests

Carbonate reservoir characterization
Applications of statistics and geostatistics in reservoir analysis and modeling
Modeling flow in porous media and scaleup of fluid flow properties
Applications of Fourier transform methods in analysis and modeling of spatial statistics

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

KEY SITES OF UPLIFT AND GLACIAL CONSTRAINTS, CENTRAL SIERRA NEVADA

Saturday / Sunday September 20 & 21, 2008

Leader: Jeffrey Schaffer; Napa Valley College

The first significant Sierran geologists were Josiah Dwight Whitney, William H. Brewer, Clarence King, and James T. Gardner, members of the California State Geological Survey. All had been trained in geology under Yale University's Prof. James Dwight Dana, who had embraced and taught a logical, if false, 1840s assumption on the origin of the Ice Age, proposed by Harvard University's Prof. Louis Agassiz. Agassiz and Dana, both devout Christians, biased their views with Genesis, and saw mountain ranges and their glaciated canyons as young. In 1862 Brewer described some Sierran uplift evidence that "validated" Agassiz and Dana, but this was a miner's tale that fit the "young Earth" view; he never visited his described type locality. Brewer's lava table mountain in Tuolumne County does exist; what does not exist are the bouldery river gravels and canyon bottom that Brewer had drawn beneath the lava. To this day, no one has found any site as described in the official state report, and yet virtually every Sierran geoscientist *knows* that the elusive bouldery canyon bottom, as depicted, must exist. With the new millennium, more imaginary uplift evidence has been published, substantiating what we "know" to be true.

On this field trip we will discuss the uplift and glacial history of the Sierra Nevada from Late Cretaceous through Neogene (Quaternary) time. We will visit several localities that constrain Sierran uplift, glacier extents, and glacial erosion. Collectively, these sites provide hard constraints against significant Sierran uplift in the last 30 million years and no significant canyon widening and/or deepening by glaciers, all publications to the contrary. We will also visit one of Waldemar Lindgren's Tertiary gravel sites to test the credibility of his nearly universally accepted paleo-rivers map. Specifically, over **two days** we will observe:

(1) The North Fork American River gorge and adjacent uplands ("peneplain"), just northeast of Auburn, that appear to argue for a low early Tertiary (Paleogene) Sierra Nevada and youthfully incised canyons.

(2) Tertiary gravels along Interstate 80 roadcut near the Gold Run Roadside Rest.

(3) Volcanic and glacial deposits along Interstate 80 near Emigrant Gap, above Bear Valley. The area's highest glacial deposits constrain the thickness of the Bear Valley glaciers.

(4) Andesitic remnants along Bear Valley's floor, which were not removed by glaciers. Minor pre-volcanic falls near the Sierra Discovery Trail demonstrate that the Bear River already had its stepped ("glacial") profile and the valley had its modern dimensions by at least 18.5 Ma.

(5) Alpha Diggings above the gold-mining town of Washington: could Lindgren's 11-mile-long paleo-river really transport this deposit's 8 m long megaboulders?

(6) Donner Pass rhyolites and andesites: no significant (> 10 m) incision by the once enormous South Yuba River and its ensuing 300 m thick glaciers. We will also examine a major, mapped fault just east of the pass.

(7) Southwestern Lake Tahoe's Emerald Bay and Fallen Leaf Lake: how thick were past glaciers and how much

did they erode?

(8) West Fork Carson River: thicknesses and lengths of past glaciers and changing glacial-valley topography (Hope Valley vs. Carson Canyon).

(9) From the Green Creek trailhead we will make a 2-mile round trip hike (200 feet elevation gain) to examine intact basalt on the floor of a glaciated canyon.

(10) West Walker River moraines. How long were its Tioga and Tahoe glaciers?

(11) Middle Fork Stanislaus River's Columns of the Giants, on the floor of a deep, glaciated canyon: how does this canyon-bottom lava flow evolve into a ridge-top lava flow, and why does this transformation leave no evidence of the 60-mile-long canyon it descended?

(12) The Dardanelles. Two-mile round-trip hike (300 feet elevation gain) to examine the volcanic strata that comprise The Dardanelles. Ransome mapped them correctly, then, ignoring his mapping, reached uplift conclusions that negated his mapping. Why did he do this?

(13) Donnell Vista: greatly variable glacial-valley topography in the same plutonic rock and with nearly constant glacial thickness: why the variations?

(14) Table Mountain near Jamestown: no pre-volcanic canyon here.

(15) Westernmost Table Mountain latite near Knights Ferry: why is the latite flow at the bottom of the stratigraphic column when it is atop The Dardanelles?

**********Field Trip Logistics**********

THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE.

Time & Departure: **Meeting Time and Place: 9:00 A.M. on September 19 at Masonic Lodge in Orinda**

Directions to Masonic Lodge: Take Highway 24 to Orinda/Moraga Exit (Camino Pablo). Go northwest on Camino Pablo Way ¼ mile. Go slight right to Santa Maria Way. Turn right on Santa Maria Way. Go straight, Santa Maria Way becomes Altarinda Road. Go ¼ mile to Masonic Lodge on left (9 Altarinda Road).

Alternate Meeting Place: McDonald's in Auburn. Take the Auburn Ravine/ Forestville exit and drive briefly to McDonald's. Park in back, in the upper lot. Be there at 11:00 Sharp.

Camping/Motels: We will be staying in Mono Village, about 13 miles up Twin lakes Road from Bridgeport (Highway 395). Mono Village has campground, cabins, and bar. Contact them at www.monovillage.com or 760-932-7071. If no cabins are available, you can try nearby Twin Lakes Resort at www.twinlakesresort.com or 760-932-7751. (Bridgeport also has lodging.) Also, at the lower end of the Twin Lakes are two USFS campgrounds, Twin Lakes Campground and Crags Campground.

You will be responsible for your own meals, so either bring your own food or buy it at various opportunities along the way.

Cost: $60 **Limit: 30 People**

REGISTRATION FORM (Uplift and Glacial Constraints, Central Sierra Nevada Field Trip)

Name:_____ E-mail:_____

Address:_____ Phone (day): _____Phone (evening):_____

Cell Phone: _____ Will meet in Orinda_____ Will meet in Auburn _____

Please mail a check made out to **NCGS** and this form to: Rob Nelson, 269 College View Drive, Rohnert Park, CA 94928. Carpooling is suggested for this fieldtrip. Please let us know if you can provide a van and NCGS can reimburse your gasoline expenses. Before the trip I will email a list of attendee's email addresses and home towns so that you may arrange carpools.

Questions: e-mail: rlngeology@sbcglobal.net Cell: (707) 548-3268; Home: (707) 795-8090

2008-09 AAPG Distinguished Lecture

Abstract

Thursday October 2, 2008;
Orinda Library; 7:00 pm

CARMALA N. GARZIONE

Department of Earth and Environmental Sciences,
University of Rochester, Rochester, New York

Funded by the AAPG Foundation

Modern Rainfall and Paleoclimate across NE Tibet: Climate Consequences of the Growth of the Tibetan Plateau

The NE Tibetan plateau consists of sedimentary basins at elevations between ~2 to 3 km and intervening mountain ranges that reach elevations 1 to 2 km higher than the basin floors. The stable isotopic composition of modern rainfall across NE Tibet shows patterns associated with the topography across the region. The patterns in precipitation amount and isotopic composition across NE Tibet are compared with paleoprecipitation composition derived from sedimentary carbonates to understand the development of late Cenozoic topography across the region. Based on paleoflow patterns and the Sr and stable isotopic compositions of lacustrine carbonates, individual sub-basins in NE Tibet appear to have been segmented early in their history (by ~20 to 10 Ma). Similar to modern isotopic patterns since ~8 Ma across the region suggest that individual ranges formed significant topographic barriers by that time. These data, as well as (U-Th)/He cooling histories from basin-bounding ranges, indicate that NE Tibet experienced a long term growth history that established the major topographic features that bound individual basins between ~45 and 8 Ma. Since ~10 to 8 Ma, outward growth of the Tibetan plateau has accommodated deformation on the distal margins, including the northern Qilian Shan along the northern margin and the Liupan Shan along the northeastern margin.

Carmala N. Garzione

Education

2000 Ph.D. in Geoscience, University of Arizona, Tucson, AZ
1996 M.S. in Geoscience, University of Arizona, Tucson, AZ
1994 B.S. in Geology, University of Maryland, College Park, MD

Appointments

2006 - present Associate Professor, Department of Earth and Environmental Sciences, University of Rochester
2000 - 06 Assistant Professor, Department of Earth and Environmental Sciences, University of Rochester
2003 - 04 Visiting Research Associate, CIRES, University of Colorado, Boulder
1999 Chevron Internship, Asian Business Unit, Chevron Overseas Petroleum Inc., San Ramón, CA
Chevron Internship, South Texas Production Team, Houston, TX

Awards

2007 Donath Medal, Geological Society of America Young Scientist Award
2007 University of Maryland Geology Alumni Award
2007 University of Arizona Geosciences Alumni Achievement Award

Selected Publications

Garzione, C.N., Ikari, M., and Basu, A., 2005, Source of Oligocene to Pliocene sedimentary rocks in the Linxia Basin in NE Tibet from Nd Isotopes: Implications for tectonic forcing of climate: Geological Society of America Bulletin, v. 117, p. 1156-1166.

Dettman, D.L., Fang Xiaomin, Garzione, C.N., Li Jijun, 2003, Uplift-driven climate change at 12 Ma: a long ? 18O record from the NE margin of the Tibetan plateau: Earth and Planetary Science Letters, v. 214, p. 267-277.

Fang Xiaomin, Garzione, C.N., Van der Voo, R., Li Jijun, Fan Majie, 2003, Flexural subsidence by 29 Ma on the NE edge of Tibet: magnetostratigraphy of Linxia Basin, China: Earth and Planetary Science Letters, v. 210, p. 545-560.

Garzione, C.N., DeCelles, P.G., Hodkinson, D.G., Ojha, T.P., and Upreti, B.N., 2003, East-west extension and Miocene environmental change in the southern Tibetan plateau: Thakkhola graben, central Nepal: Geological Society of America Bulletin, v. 115, p. 3-20.

Garzione, C.N., Quade, J., DeCelles, P.G., English N.B., 2000, Predicting paleoelevation of Tibet and the Himalaya from ? ? 8O vs. altitude gradients of meteoric water across the Nepal Himalaya: Earth and Planetary Science Letters, v. 183, p. 215-229.

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

NCGS FIELD TRIP IN COMMOMERATION OF 1868 HAYWAED EARTHQUAKE

FIELD TRIP – EARTHQUAKE AT UCB? THE HAYWARD FAULT, CAMPUS RETOROFIT, AND THE SEISMOLOGICAL LABORATORY

Saturday November 15, 2008

Leaders: Peggy Hellweg, Doris Sloan, Christine Shaff, and Craig Comertin
University of California at Berkeley

Have you walked through an offset stream channel? Sat on a shutter ridge? The Hayward Fault runs right through UCB's Memorial Stadium and the uphill edge of the campus. Join the Berkeley Seismological Laboratory's Peggy Hellweg, to walk the trace of the fault and learn about its past and present. On our way back Christine Shaff and Craig Comertin will provide an insider's tour of the retrofit activities on campus. Finally, at the Seismolab, Peggy will give an introduction to its earthquake monitoring activities and seismological research.

THIS FIELD TRIP WILL BE LIMITED TO 40 PEOPLE.

********** **Field Trip Logistics** **********

Time & Departure: November 15, 2008, 8:30 am, North Gate Entrance (The public is allowed to park in the "Lower Hearst" structures and weekends and people can purchase a permit from the machines there).

Cost: $15/person (includes guidebook, lunch, refreshments, soft drinks)

**********REGISTRATION FORM (Hayward Fault at UCB Field Trip)**********

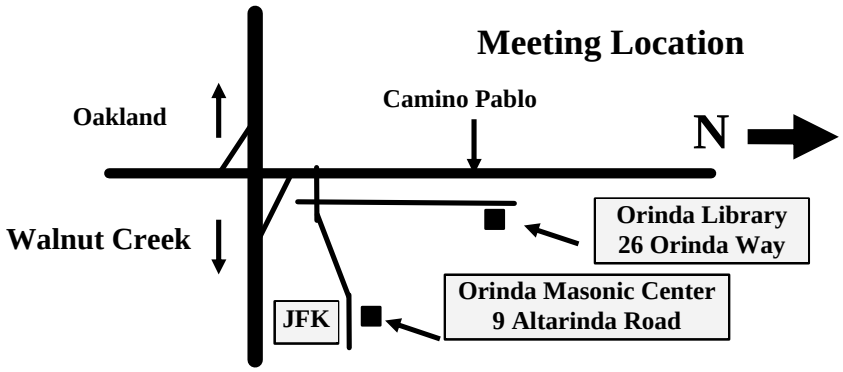
Name:_____ E-mail:_____

Address:_____ Phone (day):____ _____ Phone (evening):_____

Lunch: Regular:_____ Vegetarian: _____ (Please check one) Check Amount: _____

Please mail a check made out to "**NCGS"** to: **Tridib Guha**
5016 Gloucester Lane,
Martinez, CA 94553

Questions: e-mail: tridibguha@sbcglobal.net Phone: (925) 370-0685 (evening) (925) 363-1999 (day)



Both the above blocks and hundreds of other are enclosed in a massive sandstone matrix, The sandstone is composed of quartz, plagioclase, Kspar, biotite, and muscovite, together with a variable lithic clast population; the sandstone is a disaggregated granite, and of continental origin!

Maps and articles by me on the Cazadero area are available as pdf files in the faculty digital archive at the Sonoma State University library.

The website is: **http://scholarworks.calstate.edu/swmanakin/handle/10211.1/95.** A 1995 California Geology article by me also provides a good overview of Cazadero geology.

Biography: Dr. Rolfe Erickson grew up in northern Wisconsin. He earned his Bachelor's degree at Michigan Technological University, and his Masters and PhD degrees at the University of Arizona, graduating in 1970 with a PhD in Geochemistry.

He joined the Geology faculty at Sonoma State College (now University) as one of two founding members in 1966, teaching hardrock petrology and mineralogy, geochemistry, and computer applications, and retired in 2008 after 39 years of service. He now is attempting to finish several research projects in the Franciscan Complex and in the Arizona Precambrian. He is also taking time to live well!

Northern California Geological Society
c/o Mark Detterman
3197 Cromwell Place
Hayward, CA 94542-1209

PLEASE RENEW – IT'S A NEW YEAR!!