

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



NCGS Newsletter & Website Editor:

Mark Detterman

mdetterman@blymyer.com

Secretary:

Dan Day: danday94@pacbell.net

NCGS Voice Mail: 925-424-3669

Website: www.ncgeolsoc.org

NCGS OFFICERS

President:

Bill Perkins,

weperkins@comcast.net

President-Elect:

Barb Matz,

barbara.matz@shawgrp.com

Field Trip Coordinator:

Rob Nelson,

rlngeology@sbcglobal.net

Treasurer:

Phil Reed, philecreed@msn.com

Program Chair:

Mark Sorensen,

msorensen@itsi.com

Scholarship:

Phil Garbutt,

plgarbutt@comcast.net

K-12 Programs:

John Stockwell,

kugeln@peoplepc.com

Membership:

John Christian,

jmc62@sbcglobal.net

COUNSELORS

Mel Erskine,

mcerskine@comcast.net

Tridib Guha,

Tridi.bguha@sbcglobal.net

Don Lewis, donlewis@comcast.net

Ray Sullivan,

sullivan@lucasvalley.net

MEETING ANNOUNCEMENT

DATE: Wednesday, June 27, 2007

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, and \$1 per K – 12 teachers (**new!**)

RESERVATIONS: Leave your name and phone number at 925-424-3669 or at danday94@pacbell.net before the meeting.

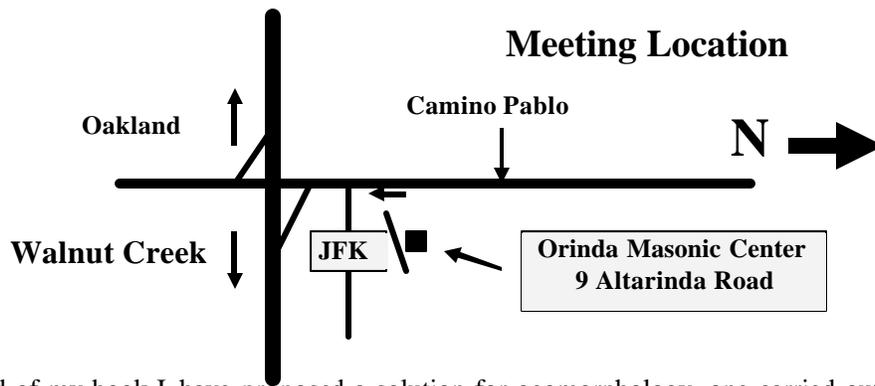
SPEAKER: Jeffery P Schaffer, Napa Valley College
Seeing the Elephant: How Perceived Evidence in the Sierra Nevada Biased Global Geomorphology

This is a synopsis of my book-length manuscript of the same title, which was submitted to UC Press in early June. This book is the sequel to a generalized version of my 1990s UC Berkeley dissertation and in book form is *The Geomorphic Evolution of the Yosemite Valley and Sierra Nevada Landscapes: Solving the Riddles in the Rocks* (Wilderness Press, 1997). In that book's Epilogue was a short section entitled "Science gone astray," which is what *Seeing the Elephant* is all about.

Postmodernists' boldest assertion may be that even a hard science (one with readily verifiable evidence) can be culturally biased to render it a pseudoscience, and *Seeing the Elephant* documents an example of this postmodernist contention. I've traced alpine geomorphology back to its origins, and what was found was astounding: it is based on an 1840s false premise by a Biblical literalist and "verified" in the 1860s by an unvisited, non-existent type locality. By the 1890s, geomorphology under William Morris Davis had reached the stature of a legitimate science, but in reality it had evolved into a pseudoscience, thanks to the constraints imposed by the alpine geomorphology paradigm. For example, except for a few pages of Don J. Easterbrook's *Surface Processes and Landforms*, virtually all of the geomorphic processes and time frames accord with a literal interpretation of Genesis.

What has been discovered is that ironically in the 1890s, geologists had all the evidence necessary in the Sierra Nevada to refute the alpine geomorphology paradigm, but after some 50 years it had become entrenched, taught at Harvard and Yale, so instead geologists began to add imaginary evidence, distort existing evidence, and ignore evidence in order to conform to the paradigm. Rather than peer review correcting this pseudoscience, peer pressure enforced its dogma. The beginning of our new millennium was no different, with imaginary geology being published as fact, and computer numerical simulation models verifying what everyone knew was true.

Needless to say, *Seeing the Elephant* is very controversial, but I present more than sufficient *verifiable* (not imaginary) evidence to make my case. At the



end of my book I have proposed a solution for geomorphology, one carried out by none other than the University of California, since it possesses 35 reserves that are more or less in a relatively natural state, each one a field lab for long-range studies (50 years) of interacting geomorphic/edaphic/biologic/climatic processes.

Biography: Jeffery P Schaffer grew up in southern California. Initially he went to M.I.T. to continue an early interest in yacht design. Unfortunately yacht design was not in vogue while supertanker design was, and this held no interest to him. Consequently, he began investigating Natural History at Harvard's Peabody Museum of Natural History, transferred to UC Berkeley, and began studying natural history, where he received a B.A. in Field Biology in 1965. He spent the summer climbing in Yosemite (where he still climbs). Returning to UC Berkeley he sought and received a Masters in Physical Geography. Shortly thereafter he began co-authoring a guidebook on the Pacific Crest Trail, and continued intermittently on a PhD degree. Through the years he has written 13 more guidebooks, mostly on national parks and wildernesses (For more information on some of his books to go: <http://www.wildernesspress.com/Book173.htm>). In 1988 he returned to UC Berkeley to resume a PhD thesis. During his research, he discovered that there were significant problems with the evidence used to support the uplift of the Sierra Nevada and associated glaciation. His dissertation attempted to use the field evidence to straighten the record; however, the research findings were controversial and the degree was denied. As a result he has published the research as a book, and again it encountered controversy. In 2006 he completed a second book, not yet published, which traces geomorphology (the study of landscapes) from its Biblical roots to today's computer modeling. In it he attempts to demonstrate that science, like religion, is largely "faith-based", that is, enforced by those in power. He is currently affiliated with Napa Valley College. Note: Copies of his first book, *The Geomorphic Evolution of the Yosemite Valley and Sierra Nevada Landscapes*, including a 2007 update, will be available for purchase at \$20.00 each.

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

Would you like to receive the NCGS newsletter by e-mail? If you are not already doing so, and would like to, please contact **Dan Day** at danday94@pacbell.net to sign up for this service.

NCGS 2006 Calendar

Wednesday June 27, 2007

Jeffery P Schaffer, Napa Valley College

Constraints on Sierra Nevada Uplift and Glaciation

7:00 pm at Orinda Masonic Center

As Usual - Our Summer Break

Wednesday September 26, 2007

Dr. Eric Cowgill, U.C. Davis

Long-term slip on an orogen-scale fault system: Uplift history of the northwestern Himalayan Mountains

7:00 pm at Orinda Masonic Center

Upcoming NCGS Field Trips

July 7 & 8, 2007

Crustal Deformation of the Eastern Sierra Frontal Fault,
Dylan Rood, LLNL and UC Santa Barbara

Summer 2007
(Pending)

Modern Geophysical Techniques for Site Characterization,
Dr. Mitchell Craig, Cal State University East Bay

May 2008

Point Lobos to Point Reyes: Evidence of ~180 km Offset of the San Gregorio & Northern San Andreas Faults, **Kathleen Burnham**, Independent Researcher

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

Upcoming Field Trips by Others

October 6, 2007
SEPM Field Trip

Geology and Stratigraphy of Stanford Linear Accelerator Center (SLCA), Stanford, CA

October 7, 2007
SEPM Field Trip

Paleogene Conglomeratic Submarine Canyon Fill, Point Lobos State Reserve

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. Recent field trips include: *The 1906 Earthquake and the San Andreas Fault on the San Francisco Peninsula* (2006), *Granites in the Franciscan* (Fall 2005), *San Andreas Fault - Carrizo Plain* (Spring 2005), *Panoche and Tumey Hills* (2004), *White-Inyo Range* (2002), *Napa Wine County* (December 2001), *Mount Shasta and the Klamath Mountains* (May 2001), *Big Sur (Salina / Nacimiento Amalgamated Terrane, Big Sur coast Central California, 2000)*, and the *Northern Sierra Nevada (Geologic Transect of the Northern Sierra Nevada Along the North Fork of the Yuba River, 1982)*. Posted upcoming meetings include the following topics and dates:

- All future events are currently 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/>.

- September 11, 2007, Doris Sloan and John Karachewski, San Francisco Bay Geology
- November 13, 2007, Bruce Hilton and Tim Bech, Kleinfelder, Ferguson Rockslide on Highway 140 near Yosemite.

Geology of the San Francisco Bay Region Wins International Award

by Patrick Lufkin

Geology of the San Francisco Bay Region has earned top honors in an international technical publications competition sponsored by the Society for Technical Communication (STC). The book not only received a Distinguished Award, but was nominated for Best of Show. As a Distinguished Award winner, the book was displayed at the STC's annual conference in May in Minneapolis where it was viewed by hundreds of technical communicators from around the world.

Authored by NCGS members **Professor Doris Sloan** and **photographer Dr. John Karachewski**, *Geology of the San Francisco Bay Region* was published this past fall by the University of California Press as part of its

California Natural History Guide series. The authors, who are both members of the NCGS, gave a presentation based on their work at the NCGS meeting this past November.

The STC is an international professional association of technical writers, editors, publication managers, academics, and others interested in improving the presentation of technical information. The STC has fourteen thousand members world-wide and six chapters in Northern California.

As part of its mission, the STC sponsors annual technical communication competitions at both the regional and the international levels. The international competition only accepts entries that have received Distinguished Awards in regional competitions. *Geology of the San Francisco Bay Region* won a Distinguished Award in the Northern California competition earlier this year.

In keeping with the organization's educational mission, STC competitions make the judges' comments available to the entrants.

Overall, the judges felt that *Geology of the San Francisco Bay Region* was beautifully written, and that it did an excellent job of explaining its subject. As one judge observed "This book is gorgeous. The photography is absolutely top-notch, the print quality is exceptional, and the maps and illustrations are outstanding." Many of the judges commented on the accessibility of the writing, which draws in the lay reader, while still holding the interest of the professional.

Enthusiasm for the book is apparently also shared by the public. Since its release, *Geology of the San Francisco Bay Region* has sold briskly and is nearing a second printing.

Patrick Lufkin is a member of both the STC and the NCGS. He co-chaired the 2006 STC Technical Communication Competition for the Northern California region.

NCGS Announces Reduced Meeting Fee for K -12 Teachers!

The Northern California Geological Society is pleased to announce that at the recent Spring NCGS Board Meeting a new reduced monthly meeting fee of \$1.00 will be observed for K - 12 teachers at our regular monthly meetings. The intent of the reduced fee is to help encourage attendance by educators in order that geologic content in classroom settings might increase, and be easily and locally accessible for these educators. Please

encourage the attendance of K - 12 teachers who might be interested in this new program that you are aware of!

As a reminder, all students (K-12, undergraduate or graduate) have also been eligible for the \$1.00 monthly meeting fee for several years. (As well as annual membership dues of only \$5.00!). Please encourage students to join and come to the meetings to take advantage of these benefits!

The NCGS Masters and PhD Scholarships – Renamed! to the **NCGS Richard Chambers Memorial Scholarships**

The NCGS is very pleased to announce the strengthening and renaming of our Masters and PhD Scholarship Awards. Recently the NCGS received a substantial bequest from the Estate of former NCGS member **Richard Chambers** (substantial at least for the NCGS). The will stipulated that the funds were to be used for future NCGS scholarships. As a result the NCGS Board, at the Spring Board meeting, voted to rename the existing Masters and PhD scholarship program **The NCGS Richard Chambers Memorial Scholarships** and to increase the award amounts to the extent possible. To that end the Masters Scholarship was raised to \$1,000, and the PhD Scholarship was raised to \$2,000 for the coming year (2007 – 2008), at the Board Meeting. The name of the existing NCGS scholarship awards for a Bachelors degree will remain unchanged and will be funded with funds directly generated by NCGS members (dues, donations, etc.).

As a young man, Dick Chambers served a tour in the Navy on an aircraft carrier, became an avid fan of aviation, and in later years was often seen helping out at events at Buchanan Field in Concord. Dick was an accountant for the Production Department in Chevron and spent most of his career in the Central Valley of California and Alaska. He was interested in geology and was a member of the NCGS. Demonstrating this interest, the Geology Department at Oregon State University and the California State Mining and Minerals Museum also received bequests. After retirement from Chevron he was active in Mount Diablo Interpretive Association as a docent and was very active in the Concord Historical Society. He had not married, and at his passing was living in Pittsburg.

Announcement and Congratulations AAPG Election of Delegates 2007 – 2010

Because the NCGS is affiliated with the AAPG, NCGS members who are also members of the AAPG recently voted to elect regional Delegates to the AAPG. We are pleased to announce and extend our congratulations to NCGS members **Donald Lewis, Robert Lindblom, and Steven Patti** to their election as Delegates to the AAPG for the 2007 – 2010 term. Additionally NCGS member **Mel Erskine** was also elected as an Alternate Delegate, should one of these three members be unavailable.

Climate Change and the NCGS Meeting of January 1989

Recently while carrying out an action item from the Spring Board meeting, NCGS counselor **Don Lewis** noted that on January 10, 1989 **Dr. Edward Teller** spoke to the NCGS. The title of his talk was *The Greenhouse Effect*. The talk drew 150 people! Ahead of the curve, as usual!

Ores and Orogenesis: Circum-Pacific Tectonics, Geologic Evolution, and Ore Deposits

**A Symposium Honoring the Career of
William R. Dickinson
Tucson, AZ, September 24 – 30, 2007**

Sponsored by the Arizona Geological Society the Ores & Orogenesis conference is focused on tectonics, geologic evolution, and ore deposits in the circum-Pacific region. The conference will consist of four days of talks and posters, pre-meeting and post-meeting field trips and short courses, a core shack, a vendor exhibit hall, luncheon speakers, short courses and workshops, a reunion night, and a banquet honoring Bill Dickinson. The meeting seeks to attract industry, academic and government geologists as both technical presenters and attendees. *The Ores & Orogenesis Symposium aims to be one of the premier events of 2007 for both the tectonics community and for economic geologists.*

The conference is being specifically designed to encourage the attendance of spouses and families. The venue is a resort hotel offering numerous recreational activities in a spectacular natural setting, with attractions to fit everyone's tastes available in the greater Tucson area.

Even though it's a long distance, it looks like a dynamite meeting. One of the field trips is in British Columbia and the Yukon, and will look at Cache Creek terrane along the Cassiar. Other field trips are slated for Mexico and the South Pacific. The website is:

www.AGSsymposium.org

Thanks again to Kathleen Burnham for calling this to our attention!

AEG Announces Review Courses for ASBOG Geology Licensing Exam

The Association of Engineering Geologists has announced the Summer 2007 series of review courses for the ASBOG geology licensing exam taught by REG Review, Inc. AEG and REG Review, Inc. have partnered to provide these courses since 1992. In the Summer of 2007, review courses will be offered US-wide in Louisville, KY, Raleigh, NC, Philadelphia, PA, Kansas City, MO, Minneapolis-St Paul, MN, Chicago, IL, Austin, TX, Seattle, WA, and two locations in California (Santa Ana, and Oakland). The California courses have an extra hour devoted to the California Supplemental exam. We have reinstated the CEG and CHG courses in California and these will be held in Oakland and Santa Ana CA each November. Summer 2007 course dates and locations are as follows, please visit the REG REVIEW website (<http://regreview.com/>) for more details and additional out of state locations:

LOCATIONS - Summer, 2007 West Coast ASBOG Courses

2007SC-3 Santa Ana, CA

DATE - Friday, August 3, 2007, 8am - 5pm

2007NC-3 Oakland, CA

DATE - Saturday, August 4, 2007, 8am - 5pm

2007PNW-2 Seattle, WA

DATE - Sunday, August 5, 2007, 8am - 4pm

The pre-registration deadline for Summer 2007 courses is July 13, 2007 for West Coast courses and June 14, 2007 for all other courses.

Current information on study manuals, flash cards, and courses may be found online at the REG REVIEW, Inc. website at <http://regreview.com>

Mantle Melt Mixing

This Week in *Science*
April 20, 2007

The heterogeneity of the convecting mantle is a result of recycling of oceanic and some continental crust within it. **Sobolev *et al.*** (p. 412, published online 29 March; see the Perspective by Herzberg) have developed a method for separating out the recycled crust components in basalts by combining measurements of a variety of elements, including Ni, Ca, Co, Mn, Cr, and Al. They amassed a large sample of olivine phenocrysts collected from basalts from mid-ocean ridges, ocean islands, and large igneous provinces. Ion microprobe analyses were carried out for 17,000 grains from 232 samples. By analyzing their compositions jointly, variations were seen for the different basalt types that can be ascribed to crustal mixing. Recycled material is detected in almost all melting environments, and its contribution to the melt can be related to potential temperature and the thickness of the lithosphere.

Climate Science – Backdrop for the Future

Editors' Choice
April 20, 2007

One of the most frequently invoked potential effects of global warming is an abrupt change in precipitation patterns. In order to assess the onset of such a change, it is necessary to have baseline knowledge of the variability of precipitation in the past. Narisma *et al.* have analyzed the record of global rainfall for the 20th century in order to establish the spatial and temporal distributions of abrupt decreases in rainfall over that period. They find that about 30 regional instances of large, sudden decreases in precipitation have occurred over the past 100 years, all of which deviated from the climatological norm by at least 10% and lasted for 10 years or more. The authors also observe that these sudden decreases in rainfall occurred mostly in arid and semi-arid regions, which is consistent with the results of climate modeling studies, and they suggest that this finding could be a consequence of a strong positive feedback between vegetation and climate.

Geophys. Res. Lett. **34**, L06710 (2007)

Drying the American Southwest

This Week in SCIENCE
May 25 2007

The large human population and widespread industrial and agricultural economies of the southwestern United States and northern Mexico depend on the cheap and ready availability of water that may be affected by changes in precipitation, evaporation, groundwater storage, and river flow as climate warms. **Seager *et al.*** (p. 1181, published online 5 April) show that a broad array of climate models agree that this region will dry substantially during the next century and that conditions as dry as those of the Dust Bowl will become the normal ones in the region. These changes would be caused by atmospheric circulation patterns that create a poleward expansion of the subtropical dry zones. This aridification should be unlike any climate state that exists in the instrumental record.

Geology - Death Valley in Slow Motion

Editors' Choice
June 1 2007

The San Andreas Fault is thought to mark the right-lateral slip between the North American and Pacific plates, but a large amount of the slip (~20 to 25%) occurs on a set of faults farther inland, extending from Death Valley in eastern California up through western Nevada. These faults have produced some of the largest earthquakes within North America, comparable in size to temblors on the San Andreas itself, and this slip is responsible for the great depth of Death Valley. Today, the fault network near Death Valley is moving at about 12 mm/year, but whether this represents the long-term rate has been hard to determine. Frankel *et al.* measured cosmogenically produced radionuclides in boulders to date offsets in an alluvial fan in Death Valley. The long-term rate for the fault system for the past 70,000 years is indeed close to the current rate, whereas farther south, where several recent earthquakes have occurred, the current strain rate seems to be exceeding the long-term average.

J. Geophys. Res. 10.1029/2006JB004350 (2007).

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



NCGS FIELD TRIP

TO

THE SIERRA NEVADA FRONTAL FAULT ZONE

Saturday / Sunday July 7 & 8, 2007

Leader: Dylan Rood; LLNL and UC Santa Barbara

Up to 25% of the plate boundary deformation in the western US is currently localized within a ~100-150 km wide dextral shear zone referred to as the Eastern California Shear Zone (ECSZ) and Walker Lane Belt (WLB). Active deformation near the western edge of the Great Basin is demonstrated by Quaternary fault patterns, seismicity, and geodetic data. The Sierra Nevada Frontal Fault Zone (SNFFZ) is located on the westernmost margin of the Great Basin, at the tectonic boundary between the relatively undeformed Sierra Nevada block and WLB. In the central-eastern Sierra Nevada, the SNFFZ consists of a series of left-stepping fault-bounded basins produced by normal or oblique-slip faulting. Little is known about either the long-term history of slip on many of these faults or the variation in slip rates through time. The major focus of this field trip will be to examine and discuss the location, geometry, kinematics, and rates of deformation across the transition from the Sierra Nevada to the Walker Lane belt (WLB) in the region of the eastern Sierra Nevada from Sonora Pass to Mono Basin.

On this field trip, we will discuss the deformation history of the SNFFZ during Tertiary through Quaternary time. The field trip area is unusual, if not unique, in the Sierra Nevada and western Great Basin, because it offers distinctive strain markers spanning the past 10 My. Well-preserved and regionally extensive Late Tertiary, Pleistocene, and Late Quaternary markers provide accurate estimates of cumulative slip across faults (both vertical and horizontal). We will visit several localities where we constructed fault slip rates by combining geologic and/or geomorphic mapping, GPS surveying, and various geochronologic methods (including $^{40}\text{Ar}/^{39}\text{Ar}$ and cosmogenic ^{10}Be exposure dating).

Specifically, we will observe:

- (1) Evidence for Miocene (~10 Ma) faulting along the SNFFZ within the Ancestral Cascades Arc by looking at an angular unconformity exposed within the unique Tertiary volcanic stratigraphy of the Sonora Pass region.
- (2) A long record of Quaternary normal faulting preserved in a suite of glacial deposits in the Sonora Junction area. With differential displacements along the same fault system ranging in age from 10 Ma to 10 ka, we can compare Tertiary and Quaternary fault slip rates.
- (3) Tertiary and Quaternary deformation in the Bridgeport Basin, where both normal and oblique-dextral faulting is expressed in offset Tertiary volcanic and Quaternary glacial/alluvial markers.
- (4) Geothermal evidence for active faulting in the Bridgeport Basin by visiting the beautiful hot springs of this part of the eastern Sierra.

Sierra Nevada Frontal Fault Zone Field Trip

July 7 & 8, 2007

Meeting Time and Place: 9:00 A.M. on July 7 at Buckeye Campground

Directions to Buckeye Campground: Follow Highway 395 south from Bridgeport, turn left and travel approximately seven miles on Twin Lakes Road. Turn right on Buckeye Road at Doc and Al's Resort and travel about 3 miles. Turn left at fork and travel another mile to campground.

Camping/Motel: We will be camping at Buckeye campground on Friday and Saturday nights. Otherwise, motels are available in the Bridgeport area.

Because of differences in arrival times, you will be responsible for Friday night's dinner. Breakfast and lunch on Saturday and Sunday will be provided. There will be a NCGS sponsored dinner on Saturday Night. Get your BBQ aprons on, or be prepared otherwise to help out!

Cost: \$115

Limit: 30 People

*******REGISTRATION FORM (Sierra Nevada Frontal Fault Zone 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: **Rob Nelson**
269 College View Drive,
Rohnert Park, CA 94928

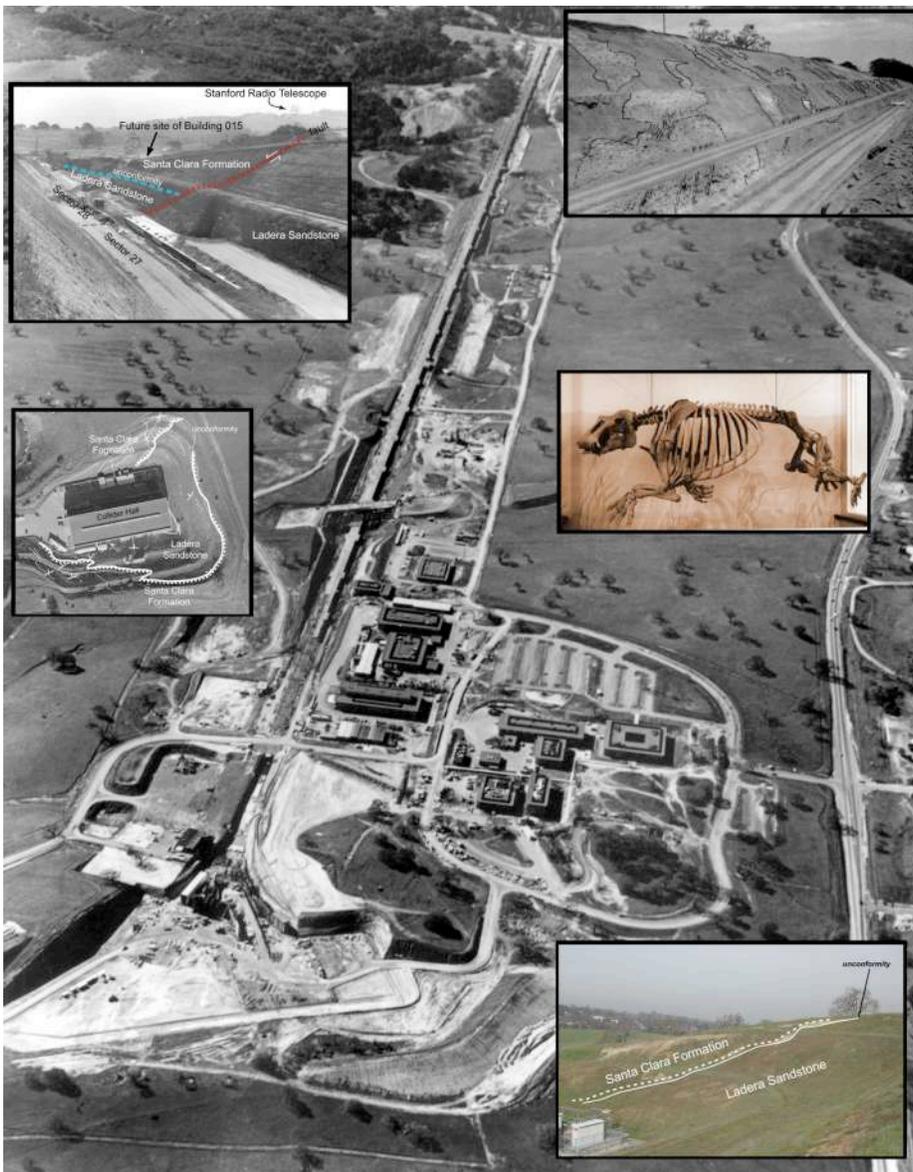
Carpooling is suggested for this fieldtrip.

Questions: e-mail: rlngeology@sbcglobal.net Phone: (707) 795-8090 (evening)
(707) 548-3268 (day)

Saturday, October 6, 2007: Geology and Stratigraphy of Stanford Linear Accelerator Center (SLAC), Menlo Park, California

Leaders: Kenn Ehman, Chevron Energy Technology Company, Houston, TX
Susan Witebsky, Stanford Linear Accelerator Center, Menlo Park, CA

Stanford Linear Accelerator Center (SLAC) is a national research facility whose mission is the study of basic properties of matter. It is owned and operated by Stanford University for the U. S. Department of Energy. The facility is located in San Mateo County on 426 acres of low, rolling foothills between the alluvial plain to the east and the Santa Cruz Mountains to the west. A two-mile trench was excavated for the construction of SLAC in the 1960's. The excavation was logged in detail and provided unparalleled insights into the stratigraphy and structure of this region. The stratigraphy exposed along the trench includes the marine Whiskey Hill Formation (Eocene), the marine Ladera Sandstone (Miocene), the marine Monterey Formation (Miocene), and the nonmarine Santa Clara Formation (Plio-Pleistocene). This geologic field trip will focus on the stratigraphy and depositional environments of these units exposed along the excavation and other areas. We will examine the units within the structural framework, and address issues regarding engineering and groundwater geology at SLAC.



Complete skeleton of the rare marine desmostylian mammal, *Paleoparadoxia*

Sunday, October 7, 2007: Paleogene Conglomeratic Submarine Canyon Fill, Point Lobos State Reserve

Leader: Ed Clifton, U. S. Geological Survey, Menlo Park

The Carmelo Formation at Point Lobos State Reserve, on the central coast of California, provides an excellently exposed example of conglomeratic submarine canyon fill in one of the most scenic settings of the California coast. The trip will focus on facies hierarchy and internal organization within the canyon fill and possible connections to sequence stratigraphy. Participants will explore processes of sediment transport and deposition, including evidence of large-scale mass instability within elements of the canyon fill. Implications for hydrocarbon exploration and reservoirs in similar deposits will be a theme throughout the trip. We will examine stratigraphic relations adjacent to the canyon's wall, where evidence exists for alternate filling and exhumation of the canyon fill. The finer-grained component of the fill feature a complex assemblage of trace fossils, some of which are almost unique to this locality. Because Point Lobos is a State Reserve, rock hammers and collecting are not permitted.

