

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



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Ray Sullivan,

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## MEETING ANNOUNCEMENT

**DATE:** Wednesday, October 25, 2006

**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 member

**RESERVATIONS:** Leave your name and phone number at 925-424-3669 or at [danday94@pacbell.net](mailto:danday94@pacbell.net) before the meeting.

**SPEAKERS:** *Dr. Richard Stanley, Dr. Russell Graymer,*  
U.S. Geological Survey, Menlo Park

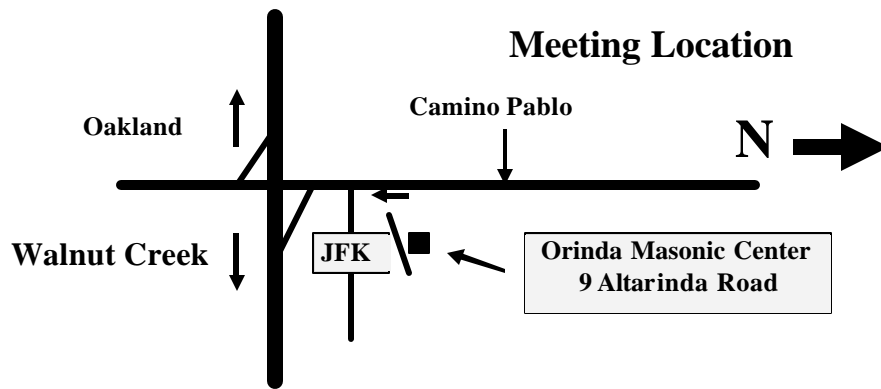
### *Subsurface geology, basin evolution, tectonic development, and climatic cyclicity of the Santa Clara Valley area*

Dr. Rick Stanley and Dr. Russ Graymer will discuss recent work by the U.S. Geological Survey on the geology of the Santa Clara Valley. Rick will begin the presentation with an overview of concealed sedimentary basins and petroleum geology. Russ will follow with a discussion of geologic structure, tectonic evolution, and Quaternary stratigraphy and its relationship to changes in climate. The talks by Rick and Russ will include many ideas that were presented at the 2005 GSA/AAPG meeting in San Jose, and new information gained since then.

### **Biographies:**

Dr. Rick Stanley and Dr. Russ Graymer are geologists at the USGS in Menlo Park.

Dr. Stanley (Rick) was born and raised in the East Bay, and received a Master's in geology from Rice University and a Ph.D. in earth sciences from U.C. Santa Cruz. He worked for Pennzoil in Houston and taught at Fresno State before joining the USGS in 1984. Rick's work with the USGS has included geological field mapping, sedimentary basin analysis, and studies in petroleum geology, mainly in California and Alaska.



Dr. Graymer (Russ) was born Oregon and raised in the East Bay. He received a B.S. in geology from Caltech and a Ph.D. in geology from U.C. Berkeley, working on the terranes of the Sierra Nevada Foothills. A USGS-funded post-doc brought Russ to the geology of the San Francisco Bay region, and eventually to a post at the Survey. Russ' work with USGS has included geologic mapping, regional tectonic synthesis, Quaternary fault mapping, and, more recently, 3-D geologic mapping, in central and northern California.

**It's that time of year! Please Renew Early –  
See Attached Form!!**

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](mailto:danday94@pacbell.net) to sign up for this service.

# NGCS 2006 Calendar

Wednesday September 27, 2006

Dr. Doris Sloan, University of California, Berkeley

Dr. John Karachewski, Weiss Associates

*Geology of the San Francisco Bay Region – The Story Behind the Book*

For details on the UC Press book go to:

<http://www.ucpress.edu/books/pages/9237.html>

Wednesday October 25, 2006

Dr. Richard Stanley, Dr. Russell Graymer,

U.S. Geological Survey, Menlo Park

*Subsurface geology, basin evolution, tectonic development, and climatic cyclicity of the Santa Clara Valley area*

7:00 pm at Orinda Masonic Center

Wednesday November 15, 2006

**EARLY MEETING DATE!!!!**

Dylan Rood, Lawrence Livermore National Laboratory and UC Santa Barbara

*Movement along the eastern Sierra frontal fault: constraints from cosmogenic nuclide dating*

7:00 pm at Orinda Masonic Center

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## Upcoming NCGS Field Trips

Pending, Pending, and Pending!

For questions regarding, or suggestions for, future field trips, please contact Rob Nelson at: [rlngeology@sbcglobal.net](mailto:rlngeology@sbcglobal.net)

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## Point Lobos and Point Reyes: A Shared Past Revealed

Kathleen Burnham leads NGCS  
May 20-21 Field Trip

Reported by Anne Sanquini

We lined up early at the entrance to Point Lobos California State Reserve in order to condense our carpools and beat the divers to a few parking spots at Stop 1, Whalers' Cove. Kathleen Burnham, our leader for the next two days, overviewed the trip and the process we would use. At each stop, we would take 15 minutes to gather data then regroup

to discuss our findings. Later, we would compare what we observed here at Point Lobos to what we would see at Point Reyes, to begin to understand the story that Kathleen had to tell. It's a tale of similar rocks being transported ~180km to the north along the San Gregorio and Northern San Andreas faults.

Given that this was a group of geology enthusiasts, far more observations were made than were requested by the blanks in the guidebook, and interpretation of it all prompted much discussion and debate. This made Phil Garbutt's task rather challenging. Tridib Guha, who handled the pre-trip coordination work, had asked Mark Detterman to be field trip coordinator on the actual trip. Mark in turn asked Phil Garbutt to be the timekeeper. Just when things would get really involved, one could hear "tic tock tic tock" from Phil, like the Peter Pan crocodile coming around.

The granodiorite at Whalers' Cove features exceptionally large K-feldspar crystals. Frank Darr measured one 9 cm long. These crystals have an unusual aspect ratio: they are long and narrow. They also exhibit Carlsbad twinning, with the intergrown crystals having opposite directions. It was noted that this exact granodiorite is found, in the California Coast Ranges, only within 12 miles from here.

Stop 2 took us around the cove, past some sleeping sea lions, to Granite Point. Or rather *Granodiorite* as Dave Mustart observed. Often. We stopped at a viewpoint on the way and speed-mapped what appeared to be depositional and fault contacts between the plutonic rock ☺ and the conglomerates on the far cliff. Continuing down to the base of the point, we traveled through some middens: abalone shell debris left by Native Americans. The base of the point revealed a depositional unconformity between the granodiorite and the conglomerate. We reviewed events that occurred to create this contact: hot magma intruded upward, cooled and crystallized, five to 10 miles of overlying material eroded, a submarine canyon formed and conglomerate deposited, and finally it all was uplifted above sea level. What had appeared to be another inexplicable contact is interpreted by Kathleen to be simply a large granodiorite clast, the largest one in the park. This was subject to debate of course. Tic tock, we move on.

The Weston Beach plunging syncline was Stop 3. If we had been here about 50 million years earlier, we could have seen scolicia, chondrites, ophiomorpha and other marine organisms. Today, we only see evidence of their lives: their burrows, feeding traces, tracks and trails. Ray Sullivan noted several fossil features and background on this environment, including that we were standing on a distal turbidite bed comprised of finer grained overbank deposits and that there were five 50-ft bedsets, aka sequences, in the park; we stood on the youngest one. These beds also exhibited flame structures caused by the overlying beds squeezing the mudstone beneath. Other turbidite beds that we see later are coarser and therefore more proximal: closer to the center of the canyon. The Field Guide includes several references on the fossils. The featured fossil of course was the very special trace fossil, *Hillichnus lobosensis*, made by a bivalve mollusk. We saw traces over five feet long. They are beautiful, unusual, and appear here and at Point Reyes. There was much to examine here but before Dave and Rolfe Erickson could conclude their discussion about concretions, tic tock we headed out to the next stop.

Stop 4 brought us to Punta de los Lobos Marinos. Here we examined the Carmelo Formation conglomerate. It is comprised mostly of rounded volcanic clasts, in a matrix of subangular grains from plutonic parent rock. The source for the clasts is different from the source for the matrix: the source for the clasts is a volcano far away while the source for the matrix is the local canyon walls. We identified five types of clasts: purple volcanic with pink crystals, brick-red volcanic with white crystals, gray/buff tuff with fiamme, white tuff, and blue/buff siltstone. One could see stream imbrication in the pebbles of the conglomerates and liesegang banding in the sandstone. The turbidites had sharp contrasts between the finest, highest sediment and the sudden coarse beginning of a new bed, indicating paleo-up. Punta de los Lobos Marinos is an attractive hangout for geologists. Ray and Dave suddenly saw a colleague that they had worked with many years ago, here on the beach, just looking at the rocks. A mini reunion ensued.

We headed north to Olema Campground at Point Reyes National Seashore. After getting settled we met for dinner at Café Reyes.

Until this point we had been quite lucky with the weather. That changed with rain at 3:00 am but by then we were all tucked in. The following morning at the campsite we feasted on berries, yogurt, coffee, and the BEST pastries, still warm from the oven of a bakery in Inverness. All served from the tailgate of Anne's truck, a convenient dry spot in the camp.

At Drake's Bay, Stop 5, we walked down picturesque Chimney Rock Road to the historic Lifeboat Station where we were stopped in our tracks. A formidable gang of marine mammals had control of the beach between us and the granodiorite that we had come so far to see. What to do? Employing good field geology sense of direction and balance, we made our way up the cliff, through the yellow flowering mustard, and finally back down to the granodiorite exposure.

Here we examined the plutonic rock and compared it to its Point Lobos counterpart. It exhibited all the same minerals, including very large K-feldspars. However, these K-spars were not as long as the ones at Point Lobos and did not have the same aspect ratio as at Point Lobos. This is interpreted to indicate that the Point Reyes rock cooled faster, at the edge of the pluton while the Point Lobos rock enjoyed a longer cooling period more towards the center of the pluton. The rock was cross cut by several dikes. John Christian and Susan Panttaja climbed to a close-up view that Dave had pointed out: aplite, with sand sized crystals, cutting pegmatite, which in turn cut the granodiorite.

The drive to the Point Reyes Lighthouse, Stop 6, took us through a riot of green grass, wildflowers and happy cows. On occasion, we had to stop to let them cross, which they did at their own happy-cow pace.

In the Point Reyes Conglomerate above the lighthouse, we identified all five clasts as seen at the other location, including the very beautiful purple porphyry. These clasts are a bit smaller and more rounded versus those in the Carmelo conglomerate at Point Lobos.

The same clasts and matrix indicate that the conglomerates both originated in the same submarine canyon while the smaller size and more rounded shape indicate that this was deposited further away from the source, downstream from

where the Carmelo conglomerate was deposited. Here and there, we also saw large granodiorite clasts (boulder-sized) with K-spar crystals of the same long and narrow aspect ratio that we saw at Point Lobos. Kathleen, Ray, Dave, Rolfe and others also pointed out many features such as mud cut-ups, some small normal faults, trace fossils and had a nice debate about sole marks versus scours.

Lunch was at the picnic grounds at Stop 7, the Bear Valley Visitors Center. Since this trip was part of the commemoration of the 1906 earthquake, it seemed fitting that we walk the Earthquake Trail together. The trail has excellent new interpretive signs along the way. Of course (tic, tock) not everyone agreed with all the information on all the signs and so we debated to the end, thus turning a simple tourist trail into another major geological expedition. Space prohibits the author from relating the various hypotheses presented regarding the San Andreas Fault zone.

The NCGS is grateful to Kathleen Burnham for leading this interactive field trip to Point Lobos and Point Reyes, and for the presentation she gave at the April 26, 2006 NCGS meeting. The NCGS also thanks Tridib Guha, Mark Detterman and Phil Garbutt for logistics support and thanks all the participants for their interaction and for sharing their knowledge and observations with each other throughout the trip.

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### **Renew Early So You Won't Miss an Issue of the Newsletter!!**

Because the NCGS calendar runs between September and September of a given year, it is once again time to renew your membership. We are also planning on providing an update to the membership directory with revisions and modifications as an insert for the current directory. Because we need a cut-off date for this, members who are not current as of December 31, 2006, will not be included in the directory update. Please renew early so as to not miss an issue, or to miss inclusion in the membership update. To make it easy, please use the renewal form attached to this newsletter!

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From The American Association for the Advancement of Science – Editors' Choice, Vol. 313, No. 5795, September 29, 2006:

**Geophysics: Westward Migration:** The effects of Hurricane Katrina have been felt further afield seismically as well as politically. Gerstoft *et al.* detected seismic activity in California corresponding to pressure and surface waves generated by pounding ocean waves in the Gulf of Mexico during the height of the storm, 28 to 29 August 2005. The seismologists used beam-forming techniques to back-project very low frequency seismic energy received at an array of stations in southern California. Body waves at double the ocean wave frequency (0.1 to 0.2 Hz) rattled deep through the earth from their source in shallow water east of New Orleans during the storm and for 9 hours after its landfall. Surface waves were also detected across the Gulf and tracked the ocean wave frequency and higher harmonics. The seismic surface waves mimicked the ocean wave pattern, with higher frequencies emanating from the eastern side and lower frequencies to the west of the eye. Thus, both surface and body seismic waves were generated in shallow water by breaking ocean waves from Katrina, but different physical mechanisms couple the water and ground motions that produce them. -- **JB**

*Geophys. Res. Lett.* **33**, 10.1029/2006GL027270 (2006).

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### **Satellite Gravity Measurements Confirm Accelerated Melting of Greenland Ice Sheet** **J. L. Chen, C. R. Wilson, B. D. Tapley**

Using time-variable gravity measurements from the Gravity Recovery and Climate Experiment (GRACE) satellite mission, we estimate ice mass changes over Greenland during the period April 2002 to November 2005. After correcting for the effects of spatial filtering and limited resolution of GRACE data, the estimated total ice melting rate over Greenland is  $-239 \pm 23$  cubic kilometers per year, mostly from East Greenland. This estimate agrees remarkably well with a recent assessment of  $-224 \pm 41$  cubic kilometers per year, based on satellite radar interferometry data. GRACE estimates in southeast Greenland suggest accelerated melting since the summer of 2004, consistent with the latest remote sensing measurements. From AAAS

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2007 UNDERGRADUATE SCHOLARSHIP ANNOUNCEMENT

The Northern California Geological Society is pleased to announce the availability of a scholarship to help support undergraduate-level student research in geology during the year 2007.

- **\$500 will be awarded to students working toward completion of a senior thesis.**

These scholarships will be awarded competitively, based upon our review of submitted summaries of proposed research. Funds are intended to support field and laboratory components of research programs. The research must be scheduled for completion during the 2007 calendar year. Winners will be invited to speak about or otherwise present their research at a regular evening NCGS meeting in Orinda, California.

### Application Procedure

Candidates may apply by forwarding a signed cover letter on department letterhead requesting the award, accompanied by a brief (no more than 2 page) summary of the proposed research topic. The letter must include candidate contact information (both departmental and home mailing address, telephone, and e-mail).

The bottom of the candidate letter must bear the note:

“Degree Program \_\_\_\_\_, Approved by \_\_\_\_\_, (Print) \_\_\_\_\_, Title \_\_\_\_\_,  
Telephone \_\_\_\_\_, E-mail \_\_\_\_\_, Date \_\_\_\_\_.”

with the signature and printed name/title/telephone/e-mail of a department chairperson or thesis advisor, to show that the recipient has departmental approval to receive the award. An application form is not required.

Please submit the letter and proposal to:

**Phillip Garbutt**

Chair, NCGS Scholarship Committee

6372 Boone Drive

Castro Valley, CA 94552-5077

Voice: (510) 885-3440 or (510) 581-9098

Fax: (510) 885-2526

e-mail: [phillip.garbutt@csueastbay.edu](mailto:phillip.garbutt@csueastbay.edu) or [plgarbutt@comcast.net](mailto:plgarbutt@comcast.net)

no later than November 11, 2006. Awards will be made by December 1, 2006.

Issue date: September 11, 2006

For further information: <http://www.ncgeolsoc.org>

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2007 GRADUATE SCHOLARSHIP ANNOUNCEMENT – MS & PhD DEGREES

The Northern California Geological Society is pleased to announce the availability of a scholarship to help support graduate-level student research in geology during the year 2007.

- **\$750 will be awarded to students working toward the MS degree**
- **\$1,000 will be awarded to students working toward the PhD degree**

These scholarships will be awarded competitively, based upon our review of submitted summaries of proposed research. Funds are intended to support field and laboratory components of research programs. The research must be scheduled for completion during the 2007 calendar year. Winners will be invited to speak about or otherwise present their research at a regular evening NCGS meeting in Orinda, California.

### Application Procedure

Candidates may apply by forwarding a signed cover letter on department letterhead requesting the award, accompanied by a brief (no more than 2 page) summary of the proposed research topic. The letter must include candidate contact information (both departmental and home mailing address, telephone, and e-mail).

The bottom of the candidate letter must bear the note:

“Degree Program \_\_\_\_\_, Approved by \_\_\_\_\_, (Print) \_\_\_\_\_, Title \_\_\_\_\_,  
Telephone \_\_\_\_\_, E-mail \_\_\_\_\_. Date \_\_\_\_\_.”

with the signature and printed name/title/telephone/e-mail of a department chairperson or thesis advisor, to show that the recipient has departmental approval to receive the award. An application form is not required.

Please submit the letter and proposal to:

**Phillip Garbutt**

Chair, NCGS Scholarship Committee

6372 Boone Drive

Castro Valley, CA 94552-5077

Voice: (510) 885-3440 or (510) 581-9098 (evening)

Fax: (510) 885-2526

e-mail: [phillip.garbutt@csueastbay.edu](mailto:phillip.garbutt@csueastbay.edu) or [plgarbutt@comcast.net](mailto:plgarbutt@comcast.net)

no later than January 31, 2007. Awards will be made by February 28, 2007.

Issue date: September 11, 2006

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2006-2007 Renewal Form

Please fill out this form and attach your check made out to NCGS.

Mail to:

Phil Reed  
NCGS Treasurer  
488 Chaucer Circle  
San Ramon, CA 94583-2542

<b>Dues</b>		
	Regular (\$15)	\$ _____
	Student (\$ 5)	\$ _____
<b>Contribution</b>		
	Scholarship	\$ _____
	Teacher Award	\$ _____
<b>Total</b>		\$ _____

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For further information: <http://www.ncgeolsoc.org>