

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## *NCGS Newsletter & Website Editor:*

Mark Detterman

[mdetterman@blymyer.com](mailto:mdetterman@blymyer.com)

## *Secretary:*

Dan Day: [danday94@pacbell.net](mailto:danday94@pacbell.net)

NCGS Voice Mail: 925-424-3669

Website: [www.ncgeolsoc.org](http://www.ncgeolsoc.org)

## NCGS OFFICERS

### *President:*

David Bero

[dbsquare@earthlink.net](mailto:dbsquare@earthlink.net)

### *President-Elect:*

Bill Perkins

[wep Perkins@comcast.net](mailto:wep Perkins@comcast.net)

### *Field Trip Coordinator:*

Tridib Guha:

[tridibguha@sbcglobal.net](mailto:tridibguha@sbcglobal.net)

### *Treasurer:*

Phil Reed: [philecreed@msn.com](mailto:philecreed@msn.com)

### *Program Chair:*

Randy Kirby

[rkirby.geosci@usa.net](mailto:rkirby.geosci@usa.net)

### *Scholarship:*

Phil Garbutt

[phillip.garbutt@csueastbay.edu](mailto:phillip.garbutt@csueastbay.edu)

### *K-12 Programs:*

John Stockwell

[kugeln@msn.com](mailto:kugeln@msn.com)

### *Membership:*

Barb Matz

[barbara.matz@shawgrp.com](mailto:barbara.matz@shawgrp.com)

## COUNSELORS

### *Programs:*

Mel Erskine

[mcerskine@comcast.net](mailto:mcerskine@comcast.net)

Don Lewis: [donlewis@comcast.net](mailto:donlewis@comcast.net)

Ray Sullivan

[sullivan@lucasvalley.net](mailto:sullivan@lucasvalley.net)

Greg Bartow: [gbartow@swater.org](mailto:gbartow@swater.org)

## MEETING ANNOUNCEMENT

**DATE:** Wednesday, September 28, 2005

**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.

**SPEAKER:** *Christen Rowe*, Doctorial Student, U.C. Santa Cruz

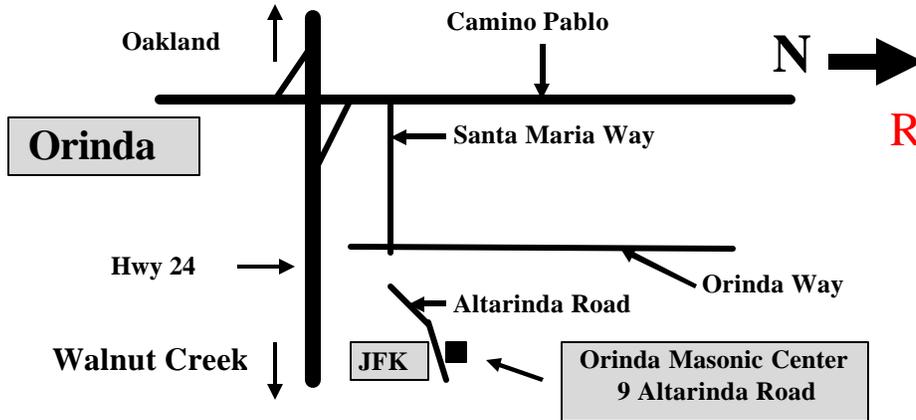
### *Searching for Subduction Zone Seismogenesis in the Rock Record*

It is well known that the planet's subduction zones are responsible for the world's largest earthquakes. However, relative to other tectonic environments which can be observed on continents, subduction thrust fault systems are difficult to directly observe. Seismologists, geodesists, hydrologic and thermal modelers have made great contributions to understanding macroscopic properties of the subduction thrust system. In many cases these results and models are limited by a lack of geologic data to constrain such parameters as temperature, mineralogy, and structural geometry within fault zones.

Exhumed subduction thrusts are preserved in accretionary complexes such as the Kodiak Accretionary Complex of south central Alaska as well as the Franciscan Complex of California. Geologic research in these environments has declined, possibly due to the structural complexity of accretionary systems as well as the paucity of economic motivation to solve the structural problems. The Kodiak Accretionary Complex contains fault-bounded terranes which are internally undeformed since subduction thrust activity, making this an excellent place to study thrust activity at various stages of development. The descriptions of mineralogy and structure and the inferred processes recorded in preserved faults in this environment provides a simple model which aids in the interpretation of more complexly deformed terranes, such as within the Franciscan Complex.

I will report a survey of subduction thrust faults I have studied in the Kodiak Islands, with an emphasis on questions about the role of fluid flow in thrust faults, both in changing the material properties of rocks in fault zones, as well as possible role in seismogenesis. I will describe pseudotachylytes discovered in an ancient décollement zone, the third reported from the subduction thrust environment, and the largest reported occurrence to date. Finally, I will

## Meeting Location



Renewal Form Enclosed!!

Please Renew!

explain how the insights gained from the work in the Kodiak Complex is contributing to an understanding of the shear zone underlying the ultramafic rocks on Ring Mountain, Marin County, and give NCGS an update on my collaborative work there with David Bero, and other possible correlations between the Kodiak and Franciscan complexes.

**Biography:** Christen Rowe grew up in the Franciscan Complex and has maintained a life-long interest in collisional margins. She studied blueschist and eclogite mineralogy in Marin and Sonoma Counties for her bachelor's thesis at Smith College. Christie worked for 18 months as an environmental consultant in the Bay Area and Tahoe. As a graduate student at UC Santa Cruz, she is studying the geochemistry of subduction thrust faults in the Kodiak Accretionary Complex. Her thesis research examines the feedbacks between metamorphic, and structural evolution of faults and fluid flow and seismogenesis in subduction zones. In 2004, Christie's team discovered the largest pseudotachylytes ever described from a subduction thrust fault. Supported by the NCGS, (**NCGS \$1,000 Graduate Collage Scholarship** for the 2004 – 2005 year; *Fluid-Assisted Metamorphism Along a Dismembered Fragment of the Coast Range Thrust, Ring Mountain, Marin County, California*) Christie has returned to Ring Mountain to document fault relationships between Franciscan and ultramafic rocks in collaboration with David Bero. In her rare free time, Christie enjoys sailing, riding bikes, and working on her sail boat. More information about Christie's research can be found at <http://www.es.ucsc.edu/~crowe>

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.

# ***NCGS 2005-2006 Calendar***

***Wednesday September 28, 2005***

**Christen Rowe**, Doctorial Student, U.C. Santa Cruz  
***Searching for Subduction Zone Seismogenesis in the Rock Record***

**Poster Presentation: Ryan Alward**, CSU Chico  
(2003 Undergraduate Scholarship Award Winner)  
***Stratigraphic and Sedimentologic Study of the Tuscan Formation***

7:00 PM at Orinda Masonic Center

***Saturday October 22, 2005***

**Teacher's Workshop**, Black Diamond Mines  
Regional Preserve, Co-sponsored in association with  
the East Bay Regional Park District ***Let your  
children's teacher know about this event (Flyer  
Attached). It'll make a great field trip for their (or  
your) kids.***

***Wednesday October 26, 2005***

**Todd Crampton**, Geomatrix  
***Engineering Geology of a Proposed Fourth Bore for  
the Caldecott Tunnel***

**Poster Presentation: Sunshine Mansfield**,  
Humboldt State University (2004 Undergraduate  
Scholarship Award Winner)  
***Structural and Petrologic Investigation of the  
Cooskie Shear Zone, Mendocino Triple Junction,  
California***

7:00 pm at Orinda Masonic Center

***Wednesday November 16, 2005 An Early Date!!***

**Dr. Eldridge Moores**, University of California, Davis  
***Future of Geological Education***

7:00 pm at Orinda Masonic Center

***As Usual - No December Meeting***

***Wednesday January 25, 2006***

**Sarah Andrews**, Author, Em Hansen Forensic  
Geology Novels  
***The Mind of the Geologist***

7:00 pm at Orinda Masonic Center

***Wednesday February 22, 2006***

**Dr. Richard Buffler**, University of Texas at Austin  
***Geologic Setting of the Abdur Archaeological Site  
on the Red Sea Coast of Eritrea, Africa***

7:00 pm at Orinda Masonic Center

***Wednesday March 29, 2006***

**Dr. Mary Lou Zoback**, U.S. Geological Survey,  
Menlo Park

***The 1906 Earthquake – Lessons Learned, Lessons  
Forgotten, and Looking Forward***

7:00 pm at Orinda Masonic Center

***Wednesday, April 26, 2006***

**Kathleen Burnham**, Consultant  
***San Gregorio and Northern San Andreas Faults,  
Point Lobos to Point Reyes, CA***

(This is a lead-in to the May 2006 field trip: ***Point  
Lobos to Point Reyes: Evidence of ~180 km Offset  
of the San Gregorio & Northern San Andreas  
Faults***)

7:00 PM at Orinda Masonic Center

***Wednesday May 31, 2006***

**Dr. George Brimhall**, UC Berkeley  
***A History of Field Geology at UC Berkeley, and  
Issues Facing Field Geology Training Programs  
Today***

(This is a lead-in to field trip in September 2006:  
***Field Geological Mapping Using Modern  
Technology***)

7:00 PM at Orinda Masonic Center

***Wednesday June 28, 2006***

**TBA**  
7:00 pm at Orinda Masonic Center

***Wednesday September 27, 2006***

**Dr. Doris Sloan**, University of California, Berkeley  
**Dr. John Karachewski**, Weiss Associates  
***Slide Show Lead-in to Book Publication (Title  
TBA)***

***Wednesday October 25, 2006***

**Dr. Richard Stanley, Dr. Russell Graymer, Dr.  
Carl M. Wentworth**, U.S. Geological Survey, Menlo  
Park

***Subsurface geology, hydrology, basin evolution,  
and climatic cyclicity of the Santa Clara Valley  
area, CA/Fault and bedrock mapping from  
Sonoma into northernmost Contra Costa counties,  
CA (Title TBA)***

7:00 pm at Orinda Masonic Center

## Upcoming NCGS Field Trips

- October 29, 2005**      *Panoche Hills Paleocene Cold Seeps,*  
Mel Erskine, Consultant  
**See Attached Field Trip Flyer!**
- November 12, 2005**      *Coastal Cliffs and Landslides*  
**Dr. Monty Hampton,**  
Emeritus, U.S. Geological Survey
- September 2006**      *Field Geological Mapping Using Modern Technology*  
**Dr. George Brimhall,**  
U.C. Berkeley
- October 2006**      *TBA*  
**Dr. Rolfe Erickson,**  
Emeritus, Sonoma State University

Please contact Tridib Guha at:  
[tridibguha@sbcglobal.net](mailto:tridibguha@sbcglobal.net) for questions you may have.)

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## 1906 Earthquake Centennial

The *Northern California Geological Society* will be participating in the centennial observance of the San Francisco 1906 Earthquake. We are currently finalizing our contributions to the observance and the events will be posted to the website of the **1906 Earthquake Centennial Alliance** (as well as the NCGS website!). The full set of events range from professional meetings, an SSA professional conference, multiple museum exhibits, as well as commissioned music to be played by the Contra Costa Wind Symphony, (and much more). Please visit the website if you have not done so to see what is planned by the alliance:

<http://www.06centennial.org/>

## NCGS Centennial Events

- March 2006**      *A Walk Along The Old Bay Margin in Downtown San Francisco - Tracing The Events of The 1906 Earthquake and Fire,*  
**Dr. Ray Sullivan,** Emeritus,  
San Francisco State University
- April 2006**      *Tracing the Hayward Fault – A Potential Disaster Area,*  
**Dr. Joyce Blueford and Dr. George Saucedo**
- May 20 – 21, 2006**      *Point Lobos to Point Reyes: Evidence of ~180 km Offset of the San Gregorio & Northern San Andreas Faults (Field Trip)*  
**Kathleen Burnham,**  
Consultant

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## Come Help Out The NCGS!!

Are you interested in geology? (Dah) Are you interested in all of the 1906 Centennial events? Are you interested in field trips? Are you interested in helping the NCGS out? Would you be interested in helping out?? We are always on the look out for a bit of help “behind the scenes”. It only takes as much time as you want or can provide, its interesting and fun (we’re not just saying that), and it helps the society coordinate and bring all of the events that keep you interested in being members. We are starting a new year of walks and talks, so take the time to talk to us, identify an area of interest, and help **your** society out. Please contact one of the members listed on the sidebar on the front page and let them know!

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## A Cool Website

### ***SAN FRANCISCO BAY WIND PATTERNS***

This is a product of the US Geological Survey, San Jose State University, and Frank Ludwig. Without going into details, it's a near real time depiction of wind flow patterns in the greater Bay Area. Study it for awhile and you'll see a lot of interesting features, including eddies, the impact of mountains (see Mt. Diablo) and valleys (wind gaps).

<http://sfports.wr.usgs.gov/wind/streaklines.shtml>

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### **And Another Interesting Website - *Volcano World***

This website recently won the **GeoScience Information Society's 2005 Best Website Award**.

Do you need to find out about the most recent volcanic activity across the world? Do you need volcanic trivia? Do you need a teaching tool? Do you need to refresh your volcanic terminology? Do you want to see lots and lots of amazingly good photographs of volcanic activity? Do you just want to know how volcanically active this planet is?? Then you need to check out this website!

<http://volcano.und.nodak.edu/vw.html>

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## **Fremont's Hidden Geology**

*Reported by Dan Day*

On Saturday, March 12, 2005, NCGS members participated in a unique field trip experience. ***The Colorful Geology of the Fremont Area***, led by **Dr. Joyce Blueford** of the Fremont Math Science Nucleus and **Dr. Paul Belasky** of Ohlone College introduced their audience to educational activities, wetlands preservation, and Quaternary fossil discoveries that

are part of Fremont's surprisingly rich contribution to East Bay geology.

That morning, members assembled at the Math Science Nucleus off Fremont Boulevard. This unique nonprofit educational facility includes laboratories, a classroom, a small store stocked with earth science kits and collectibles, and is also the site of the Gordon Discovery Museum. The latter displays Pleistocene-Holocene fossils that were collected by San Leandro school teacher Wesley Gordon, who had enlisted a small group of grade school students to help him excavate the Fremont area fauna he had discovered in the late 1930's.

Dr. Blueford is a former USGS paleontologist and sedimentologist who specialized in microfossils. She helped establish the marine sediment stratigraphy off the coast of Sakhalin Island in the Russian Far East, just south of the Kamchatka peninsula and the Sea of Okhotsk. While at the USGS, Joyce helped found the Math Science Nucleus, and is now a permanent staff member. The Math Science Nucleus provides classes and instruction to K-12 students on basic sciences, the earth sciences, and other natural science topics. It provides public access to the Gordon fossil collection (donated to the Nucleus by Wes Gordon's son, Phil), sponsors student essay competition for entrants from Joyce's home state of New York, works to help restore the local watershed and the Tule sag ponds at Tyson and Stivers Lagoons, is actively translating storybooks and science literature for students in Eritrea, Africa, provides affordable science instruction resources for local K-12 teachers, leads field trips, and hosts an excellent website. Joyce provided a superb introduction to the Math Science Nucleus' activities, and Phil Gordon, Wes Gordon's son, was available to answer questions about the outstanding Gordon fossil exhibits.

Dr. Blueford then took the group to the Tule Ponds at Tyson Lagoon. Located astride the Hayward fault on Walnut Avenue in Fremont, this is just one small aspect of the Alameda Creek Watershed Management Program. A consortium of sponsoring agencies, including the East Bay Regional Parks District, the Alameda County Water District, the Alameda County Resource Conservation District, The National Resources Conservation Service, Alameda County Public Works, Zone 7 Water Management, Hetch Hetchy Water and Power, and the City of Livermore

have joined forces to address watershed management needs for agriculture, flood control, storm water quality, natural resources and wildlife, recreation, and reliable water supply to the public. Retired Alameda County Public Works Agency engineer Richard Wetzig conceived and designed the storm water treatment project on the 14-acre Tyson Lagoon site. The Alameda County Flood Control and Water Conservation District undertook the project in 1998, combining both a natural and a constructed wetland into a single ecosystem.

The Tule Ponds at Tyson Lagoon is part of the Mowry Slough watershed. Tyson Lagoon is a sag pond cradled between two splays on the Hayward Fault. This site features an innovative engineered storm water treatment complex designed to pacify runoff from surrounding urban dwellings and to remove heavy metals and other contaminants from the water. It showcases complementary natural and manmade wetlands in a unique urban wildlife sanctuary. The site has a wetlands museum complete with a panoramic view of the pond system. Exhibits address the local flora and fauna, ecosystem preservation strategies, and host a special display describing thin plastic sheet peels taken from trench walls crossing the Hayward fault—after all, this is perhaps the most heavily dissected fault trace in the Bay Area! The peel process was pioneered by the Japanese to preserve features on transient fault trench walls. Here too it captures the subtleties exposed by trenching—fracture offsets, detailed soil and sedimentary horizons, and a 4,000 year-old possible tremor-induced liquifaction event. The stormwater tule ponds, originally designed by Wetzig to act as siltation ponds and oil/solid entrapment basins to help purify the urban runoff, were unfortunately improperly graded and tend to reverse flow direction during the wet season. However, the concept is admirable, and certainly improves water quality while providing an educational forum to study and promote wetland conservation.

The group left the Tyson Lagoon visitor's center and carpooled to the second stop in Morrison Canyon. Located in the hills east of Fremont on Walnut Avenue where it crosses Mission Boulevard, the canyon was cut through steeply dipping Cretaceous-Paleocene, middle, and late Tertiary sediments by Morrison Creek. The streams that flow out of the East Bay Hills in this area are spring-fed by sandstone

aquifers. Over the years, the Alameda Creek Watershed sustained by this and other drainage systems in the East Bay Hills have been modified by Alameda County Engineers for flood control purposes. Water flow has historically been heavily taxed by human needs as the Fremont area grew. The group drove up the steep two-lane country road, parked, and then trekked uphill through the late Miocene Briones Formation (sandstone, siltstone, pebble conglomerate, and marine shell hash) into the middle to late Miocene Claremont Formation, a bedded chert to laminated siltstone equivalent of the Monterey Formation. The Briones is a stalwart East Bay unit that contains pebbles of black and red chert, quartzite, andesite, argillite, siltstone, basalt and felsic tuff, and vein quartzite. It is a resistant unit that forms Mission Peak and other high ridges in the East Bay Hills. The section the group traversed is part of an east-vergent thrust on the west limb of a syncline compressed by Franciscan terrain accretion to the Diablo Range. Drag folds are evident as the thrust plane is approached. As streams exit the East Bay Hills, they form gravelly to clayey alluvial fan deposits, and levee and flood plain sediments that transition into Bay muds. The car caravan undulated over the country roads to I680, exited at Mission Boulevard, and continued south to Ohlone College.

Lunch was eaten on a large concrete patio bordering a picturesque campus pond along the Mission Fault. Afterwards Ohlone college professor **Dr. Paul Belasky** took everyone to instruction rooms where fossils donated by Phil Gordon on behalf of his father had been carefully curated. Paul and his assistant Andre, whose superb illustrations of Irvington fauna decorated the room, discussed many of the exhibits on display. Also on exhibit were Ohlone Indian tribe artifacts. The geological and archeological collections are earmarked to be transferred to a more spacious venue where they can enjoy broader public exposure.

The next series of stops were along campus hiking trails skirting the slopes of Mission Peak. Walking southward, Dr. Blueford noted outcrops of the Late Miocene Briones Formation. This is a ubiquitous ridge-forming unit in the East Bay Hills that underlies Mission Peak, Las Trampas ridge west of Danville and San Ramon in the I-680 corridor, and is exposed on the western flanks of Mt. Diablo. It consists of basal gray to white fine-grained sandstone and siltstone giving way up-section to conglomeratic

sandstone, conglomerate, and distinctive shell hash conglomerate / coquina beds. The upper formation reverts back to light-colored massive to cross-bedded sandstone. To the west at the base of Mission Peak Joyce pointed out the toes of massive landslide units crowded by recent housing developments. This area has a rich history of landslide activity, the most recent being the Fremont landslide that produced a large scar on the hillside just below Mission Peak. This event occurred suddenly after prolonged winter rainfall in the late 1990's, and awoke local residents and city officials to the tenuous stability of the steep slopes south of the campus. After circling back to campus via wooded stream channels cut in the hillside, the group re-assembled and carpooled to a nearby neighborhood just west of the I-680 Washington Boulevard exit, and south of the freeway.

Bell Quarry on Sabercat Creek was the final leg of the field trip. Here was where Wes Gordon and his Hayward Boy Paleontologists excavated Irvingtonian faunal fossils in the 1940's. The quarry, now abandoned and overgrown, lies subtly across the curve of I-680 as it exits the East Bay Hills and turns south toward Milpitas. This small corner of Fremont encompassing Ohlone College, Mission San Jose, and Bell Quarry has a rich history. The Mission, officially known as San Jose de Guadalupe, was founded in 1797 by Franciscan Father Fermin de Lasuen on land prized for its fertile soil and flowing streams. Eventually a reservoir was constructed there to provide water for crops and extensive vineyards, and to power a flour mill. In 1846, the land around Tyson Pond was granted to Juan Bautista Alvarado and Andres Pico by the Mexican government. This grant was nullified by the United States Land Commission in the 1850's and sold to settlers for \$1.25 an acre. One of the purchasers was Englishman William Tyson, who settled in Iowa in 1841 and was drawn to California by the 1849 Gold Rush. After a series of unsuccessful business ventures, Tyson's brother-in-law convinced him to settle near Mission San Jose on Alameda Creek. He bought a parcel of land that included Tyson Lagoon.

Fossils had been recognized in the Irvington District by Orlando Gordon Yates in 1868. Wes Gordon, father of Phil Gordon and a San Leandro school teacher, had begun collecting fossils in the Fremont area between 1934 and 1943. In 1943 he assembled

the Hayward Boy Paleontologists to help him excavate the rich fauna exposed at Bell Quarry. This effort continued through the late 1950's and yielded thousands of fossils, many of which were sent to the U.C. Berkeley Paleontological Museum. Wes Gordon convinced the San Lorenzo School District to maintain the Discovery Museum for the fossils, but funding ran out in 1997. This compelled Phil to approach the Math Science Nucleus for help, leading to the museum's relocation there and on the Ohlone College campus. Two intensive summers of collection at the Bell Quarry were needed to remove as many fossils as possible before construction of I-680 began in the early 1960's. This having been done, the quarry was closed and the northern portion purchased by Caltrans. This section has great potential for unearthing more fossils and establishing an Irvington gravel stratigraphy, but access must be granted by Caltrans.

Wes Gordon's contribution to Pleistocene fauna is significant. It was a labor of love that established the Irvingtonian fauna and provides an outstanding basis for Quaternary studies in the Bay Area. Wes Gordon's efforts recovered 58 faunal species that have been catalogued by the Math Science Nucleus Discovery Museum, at Ohlone College, and at the U.C. Berkeley Paleontological Museum. Now the field trip participants plunged into the abandoned Bell Quarry to view the remains of this extraordinary fossil site. The group wandered through the now overgrown quarry rock piles and slipped into gullies to examine pebbles exposed in the streambeds. It was an exhilarating experience to share the same space that had been scavenged by inspired youths fifty years ago.

The NCGS sincerely appreciates the outstanding efforts of Dr. Joyce Blueford, Dr. Paul Belasky, Phil Gordon, and their assistants in executing a superb field trip detailing the multi-faceted geology of Fremont. The trip highlighted geological, water management, environmental, and Pleistocene paleontological issues in this area. Its major impact was to inform NCGS participants of the rich fauna that resides in the Irvington gravels and the need to continue this research to help determine when Hayward fault movement began, to date local tectonic uplift, and to better characterize faunal evolution during late Pleistocene-early Holocene times.

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## NCGS FIELD TRIP “PANOCHE HILLS PALEOCENE COLD SEEPS”

**Saturday October 29, 2005**

**Leader: Mel Erskine, Geological Consultant**

This field trip focuses on ancient cold seep features exposed along the western margin of the south central Diablo Range. The primary field area is located in the southern Panoche Hills, where extensive Paleocene seafloor fluid migration system is well exposed in the upper portion of the Cretaceous and Paleocene Moreno Formation. Fossiliferous  $\delta^{13}\text{C}$ -depleted carbonates and the remains of chemosynthetic invertebrates are the primary evidence for Paleocene seepage in this region. However, a network of interconnected clastic intrusions linked to the paleoseep carbonates likely represents the plumbing for the fluid system and is thus considered to be an additional paleoseep component. Seep-related carbonates and clastic intrusions in the Moreno Formation are exposed for 20 kilometers along strike. From the base of the lowest clastic intrusions to the uppermost paleoseep carbonates the system is nearly 800 meters thick; the carbonates themselves are exposed over approximately 200 meters of section, representing prolonged, episodic expulsion of fluids.

In my own interpretation these seeps were driven primarily by dewatering of a thick shale sequence due to compaction loading, however regional unconformities in the early Paleocene of the Vallecitos syncline to the southwest suggests at least a probable tectonic component. This will be discussed on the outcrop.

I note also that the KT boundary has been mapped within the Moreno Formation in this area. It is marked by shocked quartz but no radioactive layer.

**THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE. CARPOOL/VANPOOL IS A MUST**

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

**Time & Departure:** Saturday October 29, 2005, 8:00 am (sharp), gathering place at the Chevron Parking Lot, San Ramon.

**Cost:** \$25/person for both members & non-members

\*\*\*\*\***REGISTRATION FORM (Panoche Hills 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](mailto:tridibguha@sbcglobal.net) Phone: (925) 370-0685 (evening - PREFERRED) (925) 363-1999 (day – emergency)  
People who are willing to drive their car or SUV please indicate such.

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2005-2006 COLLEGIATE SCHOLARSHIPS PROGRAM

The Northern California Geological Society is pleased to announce the availability of three scholarship awards for the 2005-2006 academic year:

### **Undergraduate Scholarship Award of \$500**

For candidates working toward completion of a senior thesis or honors research program

Funding is provided for projects implemented during the 2006 calendar year

*Application deadline is November 11, 2005 for a December 2, 2005 award date*

### **Graduate Scholarship Award (MS Degree) of \$750**

### **Graduate Scholarship Award (PhD Degree) of \$1,000**

For candidates working toward the MS or PhD degrees

Funding is provided for projects implemented during the 2006 calendar year

*Application deadline is January 31, 2006 for a February 28, 2006 award date*

Individual scholarship announcements with instructions can be requested from and proposals submitted 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)

Funding priority will be directed to research programs focused on topics in mapping, structural, stratigraphic, economic, engineering or environmental geology, geophysics, stratigraphic paleontology, or paleoecology, implemented within the State of California or immediately adjacent western states. Funds are intended to support field and laboratory components of research programs. Candidates will be evaluated based on submission of a cover letter requesting the award, a brief (no more than 2 page) summary of the proposed research topic, and a faculty signature confirming departmental approval of the application. Winners will be invited to speak or otherwise present their research at a regular evening NCGS meeting in Orinda, California.

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## NORTHERN CALIFORNIA GEOLOGICAL SOCIETY and AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

### K-12 EARTH SCIENCE TEACHER OF THE YEAR AWARD

\$750 Northern California Geological Society  
\$500 Pacific Section AAPG  
\$5,000 National AAPG

#### **Call for Nominations for the Year 2006 NCGS Competition**

The Northern California Geological Society (NCGS) is pleased to announce that it will accept applications from candidates in the Northern California region for the Year 2006 competition for the Earth Science Teacher of the Year Award. The \$750 NCGS award is intended to recognize pre-college earth science programs already in place, and to encourage their organization in districts where they have not been fully developed. Nominations of qualified K-12 teacher candidates are solicited from teachers, school administrators, teacher outreach programs, and other interested parties.

The NCGS awardee's application will be submitted to a regional competition sponsored by the American Association of Petroleum Geologists (AAPG) Pacific Section. The Pacific Section winner will receive a \$500 award at the Pacific Section regional meeting in Anchorage, Alaska in May, 2006, plus up to \$250 toward meeting expenses. The regional winner's project will be submitted to AAPG headquarters for the national contest. The national winner will receive an expense-paid trip to Long Beach in 2007 to attend the national meeting and receive the award.

At the national level, the AAPG Foundation presents an annual \$5,000 award to a K-12 teacher for *Excellence in the Teaching of Natural Resources in the Earth Sciences*. The award recognizes balanced incorporation of natural resource extraction and environmental sustainability concepts in pre-college Earth science curricula. It includes \$2,500 to the teacher's school for the winning teacher's use, and \$2,500 for the teacher's personal use. The award will be given at the April 2007 AAPG Annual Meeting in Long Beach, California.

**The deadline for application submittal by candidates for the \$750 NCGS award is Friday, February 17, 2006.**

Interested candidates or nominators can request Application Information and an Entrant Application Form, or submit an application, by contacting:

**John Stockwell, Chair, K-12 Geoscience Education Committee**  
**Northern California Geological Society**  
1807 San Lorenzo Avenue  
Berkeley, California 94707-1840  
Tel: (510) 526-1646  
e-mail: [kugeln@msn.com](mailto:kugeln@msn.com)

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## K-12 GEOSCIENCE TEACHING AWARD

\$500 Northern California Geological Society

Call for Applications for the Year 2005 - 2006 NCGS Competition

The Northern California Geological Society (NCGS) invites applications from candidates in the Northern California region for the Year 2005-2006 competition for the K-12 Geoscience Teaching Award. Applications may be submitted by any teacher regardless of experience.

Applications reflecting teaching of units addressed to any of the earth or environmental sciences, including but not limited to mineralogy, petrology, economic geology, geomorphology, paleontology, hydrology, and planetary geology are invited from physical science, earth science, and geology teachers.

**The deadline for application submittal by candidates for the \$500 NCGS award is Monday, January 16, 2006.**

The winner will receive a \$500 award at a Northern California Geological Society meeting in Orinda in late January, 2006.

Interested candidates can request Application Information and an Entrant Application Form or submit an application by contacting:

**John Stockwell, Chair, K-12 Geoscience Education Committee**

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## ***TEACHER'S WORKSHOP***

**SATURDAY OCTOBER 22, 2005; 9 a.m-5 p.m.**

### **BLACK DIAMOND MINES REGIONAL PRESERVE**

**SPONSORED BY**

### **EAST BAY REGIONAL PARK DISTRICT AND NORTHERN CALIFORNIA GEOLOGICAL SOCIETY**

To celebrate National Earth Science Week 2005, NCGS and the Educators Academy of the East Bay Regional Park District, are co hosting a very special day for teachers at Black Diamond Mines near Antioch. From the early 1860s to about 1904, the Mount Diablo coalfield was the site of a flourishing coal mining operation. Five major towns emerged in the coalfield and for a time formed the major population center of Contra Costa County. Over 4 million tons of coal were mined in this area and provided a major source of fuel to the emerging industrial facilities of Bay region and beyond. The increasing costs of mining and the importation of coal from other places led to a rapid decline of the mining operations. Although the towns were abandoned, the records of life in the mining towns are preserved in the historic Rose Hill Cemetery overlooking the town site of Somersville. Exotic trees mark the former home sites and waste piles and tunnels indicate the site of the old mines. Later, from the 1920s to the 1940s, the area was mined again, this time for silica sand for glass making by the Hazel Atlas Glass Company of Oakland. The Black Diamond Mines Regional Preserve was set aside to protect this area rich in Geology and mining history and it is a popular place for school field trips.

The day will begin at 9 a.m. with an orientation and slide presentation in the underground theatre in order to introduce the teachers to the Geology and cultural history. This will be followed by an underground mine tour through a portion of the Hazel Atlas Mine led by geologists from NCGS and naturalists of the East Bay Regional parks. A barbecue lunch will be provided to participants by the NCGS. The lunch will be followed by a walk through the Somersville townsite and a visit to the Rose Hill Cemetery where teachers will learn about the way of life for the families who lived in the mining towns. Participants will receive a teacher's guide and other materials that will be useful in bringing class groups to the park.

The cost of the field course (Course 9369) is \$49 (Alameda/Contra Costa County residents, \$51 non-resident. 1 academic unit is available (add \$49). ***The NCGS will provide a \$15 subsidy to each teacher the morning of October 22, 2005.***

**\*Call** (510) 636-1684 between 8:30a.m. And 4p.m., Monday through Friday. Have the course numbers and your credit card ready.

**\*Download, complete, and mail or fax** the [enrollment form](#) (31k Adobe Acrobat PDF, 1 page, 8.5 x 11 inches). Fax to (510) 635-5502.

**Mail to:**

Educators Academy  
Reservations Department  
East Bay Regional Park District  
P.O. Box 5381  
Oakland, CA 94605-0381

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2005-2006 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>		\$ _____

Please provide the following information:

Name: \_\_\_\_\_

e-mail: \_\_\_\_\_

I would like to receive the monthly newsletter via:      E-mail \_\_\_\_\_      Regular mail \_\_\_\_\_

I can help with:

Programs \_\_\_\_\_    Field Trips \_\_\_\_\_    Newsletter \_\_\_\_\_    Web Site \_\_\_\_\_

K-12 Programs \_\_\_\_\_    Scholarships \_\_\_\_\_    AAPG Delegate \_\_\_\_\_    Membership \_\_\_\_\_

Please complete the following *only* if there are changes since last year:

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Phone:      Home (\_\_\_\_) \_\_\_\_\_      Work (\_\_\_\_) \_\_\_\_\_      Fax (\_\_\_\_) \_\_\_\_\_

Employer \_\_\_\_\_      Job Title \_\_\_\_\_