NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

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MEETING ANNOUNCEMENT

DATE: **Wednesday, May 25, 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* before the meeting.**

SPEAKER: ***Dr. Paul M. (Mitch) Harris, ChevronTexaco, San Ramon***

Geologic Framework and Reservoir Distribution, Tengiz Field, Kazakhstan

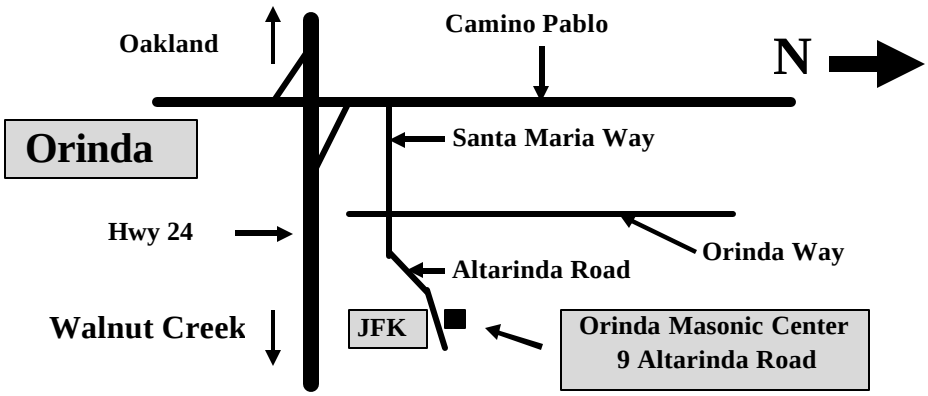
The super-giant Tengiz field of western Kazakhstan produces oil from an isolated carbonate platform (aerial extent of 160 km2) of Devonian and Carboniferous age. Seismic and well data clearly show two principle regions within the buildup – platform and flank – that directly relate to reservoir quality and production characteristics.

The supersequence-scale stratigraphic framework was developed through an integrated interpretation of seismic, core, log, and biostratigraphic data. An initial broad Late Devonian platform was followed by punctuated backsteps during the Tournaisian and Viséan. The Serpukhovian is characterized by several kilometers of platform progradation. Drowning in the Early Bashkirian halted carbonate platform growth. Paleotopographic relief from the top of the Bashkirian platform to the basin floor approaches 1,500 meters.

On the platform, hydrocarbons are produced from Upper Viséan through Bashkirian grainstones and mud-lean packstones. Multiple porosity types are recognized, but matrix permeability is controlled primarily by intergranular porosity. Within the flanks, in-place upper-slope microbial boundstone and transported lower-slope boundstone debris form thick and areally extensive mappable reservoirs (Late Viséan and Serpukhovian) that have distinctive seismic facies and production/performance characteristics. Fractures contribute to non-matrix permeability in these boundstones.

The coarse stratigraphic architecture was used to further subdivide the platform portion of the reservoir for better reservoir

Meeting Location



characterization and for reservoir modeling. The temporal and spatial variability in reservoir quality of the platform, as shown by cross sections and maps, is directly related to stratigraphy. The reservoir is also partitioned based on geographic position along a platform-to-basin profile. Time-slice mapping of synchronous depositional facies provides the basis for predicting reservoir distribution and continuity.

Biography: Paul M. (Mitch) Harris, is a Carbonate Reservoir Consultant with ChevronTexaco Energy Technology Company in San Ramon, California, performs carbonate research, supports technical projects, and provides consulting and training for the various operating units of ChevronTexaco. His work during the last 25 years has centered on facies-related, stratigraphic, and diagenetic problems that pertain to carbonate reservoirs and exploration plays in most carbonate basins worldwide. Mitch received his B. S. and M. S. degrees from West Virginia University and Ph.D. from the University of Miami, Florida. He has published numerous papers, edited several books, and is active in AAPG and SEPM. He has been a Distinguished Lecturer and International Distinguished Lecturer for AAPG, and was awarded Honorary Membership from SEPM. Mitch is also adjunct faculty at Rice University, the University of Miami, and the University of Southern California.

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 2004-2005 Calendar

Wednesday March 30, 2005
Dr. Barbara Bekins, U. S. Geological Survey
Hydrogeology and the Weak nature of Plate Boundary Faults
7:00 pm at Orinda Masonic Center

Wednesday April 27, 2005
Dr. Michael Manga, University of California, Berkeley
An Explosive Theory About Volcanoes
7:00 pm at Orinda Masonic Center

Wednesday May 25, 2005
Dr. Paul M. (Mitch) Harris, ChevronTexaco, San Ramon
Geologic Framework and Reservoir Distribution, Tengiz Field, Kazakhstan
7:00 pm at Orinda Masonic Center

Wednesday June 29, 2005
Dr. Monty Hampton, Emeritus, U. S. Geological Survey
Formation and Evolution of Coastal Cliffs (or the All-Time Shortest Coastal Cliffs Short Course)
7:00 pm at Orinda Masonic Center

Summer Break

Wednesday September 28, 2005
TBA
7:00 pm at Orinda Masonic Center

Upcoming NCGS Field Trips

May 21, 2005	***Robert Sibley Volcanic Regional Preserve in Berkeley Hills*** **Stephen Edwards,** Director, Tilden Regional Botanic Garden
June 25 - 26, 2005	***Blueschists and Breweries (Brewschists II)*** **John Wakabayashi**, Consultant
Fall 2005	***Fossil Overpressurized Zone on the East Side of the Diablo Range,*** **Mel Erskine,** Consultant

Don't miss your chance for a field trip by **Dr. Edwards**, renowned Director of the Tilden Regional Botanic Garden. Dr. Edwards received his PhD (geology) for work on the Sibley Volcanics. And don't forget that the $10 cost includes one of Tridib's renowned BBQs!! This is anticipated to be a relatively short field trip, as the BBQ will conclude the event!

As many of you are aware, **Dr. Wakabayashi** will be returning from Fresno, where he is the most recent addition to the Department of Earth and Environmental Sciences at Fresno State University, to lead this field trip. Don't miss your chance to wish him well in his new home and position! Tridib reports that 22 members have reportedly already reserved a spot on the "Brewschists II" field trip. The field trip can accept a total of 42 participants. Transportation will be by bus, thus eliminating the need for individual driving. For stop by stop details please refer to the February 2005 newsletter (expect some changes).

Flyers for both field trips follow.

Please contact Tridib Guha at aars@netscape.com **for questions you may have.**)

Upcoming Meetings of Interest – Bay Area Geophysical Society

Thursday May 26, 2005
Acoustic Emission Precursors of Large California Earthquakes
Valeri Korneev, Lawrence Berkeley Laboratory
Location: ChevronTexaco Park, 6001 Bollinger Canyon Road, San Ramon, CA 94583
Lunch: 11:30 a.m., ChevronTexaco Cafeteria
Talk: 12:30 p.m. Building D, Room D2193
In order to get visitor access to ChevronTexaco campus please contact either Warren King at (Warren.King@chevrontexaco.com) or Peeter Akerberg at (peeter@chevrontexaco.com), preferably a day or more ahead of the talk. They will request a visitor badge for you that can be picked up at the front desk in the main lobby the day of the talk.
Directions and Map: Please follow these directions

Abstracts, biographies, directions, and maps can be found at: http://sepwww.stanford.edu/bags/

Association of Engineering Geologists, San Francisco Section

Tuesday June 14, 2005
Dynamics of Debris Flows and Rock Avalanches
Dr. Richard M. (Dick) Iverson, University of Washington, Seattle (Jahns Distinguished Lecturer)
Location: Spengers, Berkeley

Tuesday July 12, 2005
Tsunami Generating Landslides
Location: TBA

Once available, more details can be obtained from the San Francisco Section's website: http://www.aegsf.org/

California Geological Survey

A list of recent publications from the CGS can be found at http://www.consrv.ca.gov/cgs/ under Recent Releases (bottom of page). This includes among many others the ***Geologic Map of the Lake Tahoe Basin, California and Nevada***, 1:100,000 (RGM Map No. 4).

$1,000 Graduate College Scholarship Award by the Northern California Geological Society

The Northern California Geological Society is pleased to announce that **Ms. Christen Rowe** at the University of California at Santa Cruz has been awarded the Society's annual $1,000 Graduate College Scholarship for the year 2004-2005. Ms. Rowe's proposal ***Fluid-Assisted Metamorphism Along a Dismembered Fragment of the Coast Range Thrust, Ring Mountain, Marin County, California*** describes a creative analysis of new data relevant to northern California geology. Her proposal was selected from a field of well designed and highly competitive applications. We look forward to a presentation of her research findings at a future meeting of the NCGS in the year 2005.

Sliding Under Lake Tahoe

The Great Basin of the United States is called that because, over the past 40 million years, the crust has been extending broadly. The locus of extension, which is characterized by faulting and volcanism, has moved from the center of the basin to its eastern and western margins, notably forming Death Valley, California. Along the western margin, the extension is complicated by its interaction with the San Andreas fault, a major strike-slip fault, and is now impinging on the Sierra Nevada Mountains (which have some of the highest elevations in North America).

Kent *et al.* have determined the recent extension at the margin in the Lake Tahoe area (on the border between California and Nevada) by dating and mapping offset shorelines and ancient avalanches into the lake. This history implies that the region is extending by about 0.5 mm/year, enough to produce a magnitude 7 earthquake approximately once every 3000 years. Such a quake could generate waves in Lake Tahoe approaching 10 m, or even much higher waves if the earthquake were to induce a slide into the lake as has happened in the past.

Geology **33**, 365 (2005); From Highlights of Recent Literature; AAAS

$1,000 Donation to the Dibblee Geological Foundation by the Northern California Geological Society

The Northern California Geological Society is pleased to announce that the Society has provided a $1,000 donation to the Dibblee Geological Foundation. The funds will allow the Foundation to continue the work of placing all quadrangles mapped by honorary member (deceased) Tom Dibblee back into print, in color, and at a single scale. These maps are expected to be a compliment to the regional U.S.G.S. map effort (http://sfgeo.wr.usgs.gov/). The donation was presented to Foundation Map Editor John Minch and Foundation President Tom Powell at the Dibblee Foundation Map Release Party held in association with the recent convention in San Jose. Fifteen northern California quadrangle geologic maps were released for the first time at the party and were available for purchase as were several T-shirts depicting the geology of several of the Channel Islands. Order information can be obtained from the Foundation's website (associated with the Santa Barbara Museum of Natural History): http://www.sbnature.org/dibblee/

Teacher's Workshop
Saturday October 22 2005
9 a.m. – 5 p.m.

Black Diamond Mines Regional Preserve Sponsored by the East Bay Regional Park District And the 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 over looking 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 in flux but is expected to be less than $45 (Alameda/Contra Costa County residents, $51 non-resident; 1 academic unit is available (add $49). Call (510) 636-1684 between 8:30a.m. and 4p.m., Monday through Friday, and have the course numbers and your credit card ready. Please download, complete, and mail or fax the one page enrollment form (PDF) from http://www.ebparks.org/ Please fax to (510) 635-5502. Or mail to:

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

Our Logo is Back!!

No, the NCGS Logo was not changed last month. Our flip'en logo was courtesy of a computer program glitch last month that we appear to have worked out!

AAPG Distinguished Lecture Explores the Genesis and Architecture of Turbidite Reservoirs Using a Multi-Basin Approach

Submitted by ***Dan Day***

The March 9, 2005, AAPG Distinguished Lecture was presented by **David C. Jennette**, Bureau of Economic Geology, Austin, Texas and former Exxon-Mobile geologist. David's lecture ***Making Sense of Turbidite Reservoirs: A Multi-Basin Perspective on What Drives Architecture and Rock Properties*** reviewed the current state of thinking on the origin and diversification of turbidites and their reservoirs, as influenced by various geological factors. The importance of turbidite reservoirs in today's petroleum industry has driven exploration geologists to better understand the genesis of passive margin turbidite systems.

Turbidite reservoirs are quite challenging to study. Internally complex, our understanding of their structure and evolution has been tremendously enhanced by today's powerful 3-D seismic imaging technology. Oil companies have an enormous portfolio of high resolution seismic images that can be

used to reconstruct turbidite depositional systems. The structure (architecture) interpreted from these images can then be refined by systems process analysis to understand how these reservoirs evolve and what regional factors control their genesis.

Simplistically, turbidites can be considered as submarine avalanches. Because of their sediment load, they are denser than water, yet behave like a fluid as they flow down the continental slope. Their speeds are legendary. On November 18, 1929, an earthquake off the Grand Banks, Newfoundland, triggered a turbidite event that severed several Trans-Atlantic telegraph cables. Oceanographers Maurice Ewing and Bruce Heezen seized the opportunity to calculate its velocity by measuring the time interval between cable disruptions. Knowing the distance separating the failure points, Ewing and Heezen calculated turbidite speeds of 65 mph on the continental slope and 25 mph on the abyssal plain. The sediment transported by this turbidite was estimated to cover 280,000 km^2 one meter deep, an area 40% the size of Texas.

Turbidite genesis encompasses four distinct geographical regions: the shelf sediment distributory system, the shelf edge, the shelf slope, and the basin-seafloor abyssal plain. Physiographic features associated with each of these components control the architecture of the turbidite petroleum reservoirs. David used a multi-basin approach to define the effects various geographical scenarios have on reservoir development. The three locations used for comparison are the North Sea, a graben terrain with mature, channelized sands; the West African continental margins with incised slope channel distributory complexes; and the Gulf of Mexico's mini-basins and layered reservoir deposits.

The process-oriented approach begins with the sediment delivery system. The latter involves source area sedimentary provenance, climate, tectonic influences, the width of the delivery system, and the distribution of sedimentary traps along the delivery route. These factors create three types of turbidite sources: sand-rich, mixed sand and mud, and mud-rich deposits. These sediments accumulate at the slope margin and control key turbidite physical properties. The rheology or turbidite flow characteristics are determined by the sediment source. Rheology influences the flow velocity, particle segregation, deposit geometry, and thickness. Turbidite sediment load, which determines these characteristics, can be low concentration, high concentration, or a sand-rich debris flow. A turbidite is a turbulent grain suspension with solid contents of 0.01 to 10%. The low load concentration turbidites create thin-bedded deposits with current ripples and a "gull wing" levee-bounded channel system that has both vertical and horizontal fining sequences. Turbidites with higher solid contents develop thicker bedding (feet to tens of feet thick) and interdigitated lobe deposits with the fines concentrated toward the lobe edges. These flows are fluid and tend to mix with the surrounding water. The debris flows have over 50% solids, behave like a cohesive plastic mass, do not mix with the surrounding water column, have a clay-silt binder, are internally homogeneous, show minimal facies changes, and can pull apart tensionally as the flow velocity decreases.

The shelf edge is the most important part of the turbidite system. It establishes the volume, feed rate, and turbidite rheology by its sediment accommodation space. The resulting turbidite flows can be small, medium, or large sized; episodic; quasi-continuous; or catastrophic. Narrow shelf edges like off the California coast allow the turbidites to interact with strong long-shore currents.

The shelf slope morphology affects the flows, and may include scattered intermediate basins that intercept turbidites before they reach the seafloor. The seafloor bathymetry influences flows on the abyssal plain by establishing equilibrium between localized erosion and sediment deposition. Ultimately, reservoir architecture is dependent upon how these processes interact.

David offered three examples of these integrated turbidite processes. The first was at the Pleistocene Amazon River mouth. The Amazon delta has a mud-rich delivery system and a very distant source area in the Andes Mountains. In between is a low-gradient drainage basin located in a humid tropical climate with strong chemical weathering. It has a silt-dominated high-suspended bed load. The sediment delivery system is sinuous, has abundant overbank channel flows, thin-bedded levee deposits, and frontal splays. The delivery currents are sustained (lasting for days), indicating stable conditions punctuated by quasi-annual climate-influenced fluctuations. Flow rates vary from 2 to 4 m/sec in slope canyons, to 0.5 to 1 m/sec in channels. The currents travel 800 km. out to sea at the delta front. Similar characteristics are noted at the Mississippi and Nile River deltas, where reservoir sands can be up to 300 feet thick.

The West African coast has a very narrow shelf with low sediment accommodation space and incised slope valleys. The turbidites here have classic distal fan distributory systems formed when sea level dropped to near the shelf edge. Fluvial streams feeding the fans established a gravity-fed distribution system without a delta. A series of high-angle clinoforms (large prograding foreset-bedded structures) were deposited, became oversteepened, and failed. The turbidites derived from these structures were thick, mounded sub-slope episodic deposits.

The North Sea rifted during the early Tertiary, forming a series of grabens. The incoming sediments were sand-rich and have been recorded with excellent seismic control. Proximal uplift occurred in Scotland during the Paleocene, forming a high relief hinterland that fed an abundant sediment supply into a high accommodation shelf edge.

Delivery streams were bed load dominated. These conditions spawned high volume turbidites, sandy channel deposits, and no classic levee system. A Paleocene flooding surface ended seafloor fan activity. The Eocene saw another pulse of seafloor fan activity that generated turbidite deposits hundreds of meters thick and several kilometers wide. Again the sediments were thick, clean sands and linear debris mounds that thinned symmetrically away from the flow axis. The deposits show no lateral particle sorting. The Eocene fans are associated with micritic carbonate muds. Of particular interest is the Eocene Tay Formation, whose sand-rich mound deposits form good reservoirs. These are thought to be cohesive gravity flows that bifurcate down slope and form uniform-textured nested lobes that formed just before a third order sea level rise terminated fan activity. The glauconite clay in the sands is a shelf edge environment indicator. As sea level rose, the shelf edge accommodation space increased and the sands prograded. Slump structures gave way to fluvial deposits, sand-rich flows, debris flows, and major slumps.

The effects of continental slope to basin floor profiles and seafloor bathymetry is clearly illustrated by the Veracruz Basin on the southwest edge of the Gulf of Mexico. It is nestled between the west Gulf Coast and the Yucatan peninsula. The Veracruz Basin was strongly influenced by Mid-American Trench subduction on Mexico's western coast, which gave birth to the Trans-Mexican Volcanic Belt. Southwest of the Veracruz Basin lies the Zongolica Fold and Thrust Belt, the southernmost expression of the Tertiary Laramide Orogeny. The latter provided a hinterland that shed sediments into the basin. The two sedimentary cycles affecting the basin were influenced by significantly different slope gradients. During the Miocene, a steep 6 to 15 degree tectonic slope existed off the Zongolica Fold Belt and the sediment source was indurated crystalline rock. The continental slope was cut by deep canyons about 1 km. wide by 5 km. deep with little slope edge accommodation space. Sediment was swept into the basin, by-passing the slope. Lobe-shaped sandstone fans 500 meters thick intercalated with conglomerates formed out on the basin floor. The sandstone layers formed excellent reservoirs with up to 30% porosity. These were laid down between 12.5 and 16.5 million years ago.

The subsequent Pliocene sedimentary cycle was driven by uplift from the Trans-Mexican Volcanic Belt. Active basin formation occurred between 5 and 7 m.y. ago. The uplift was less extensive than the Miocene event and created a 2 to 4 degree slope angle. Gentle slope edge clinoforms developed and sinuous channel complexes deposited flat-lying sediments in a relatively low-energy environment. Little erosion was associated with the turbidites and small seafloor fans were formed. The contrasting fan architectures of the Miocene and Pliocene sedimentary basin cycles necessitate different exploration strategies.

The effect of seafloor bathymetry on reservoir architecture can also be seen by comparing the Gulf of Mexico plays with those off the Gabon coast in West Africa. Beginning with the shelf, the West African margin drops off to a slope with incised ponded lobe deposits, incised levee channels, and deeply incised levee-bounded channels controlled by normal faulting. The ponded lobes occur at the shelf slope-seafloor transition. These features were caused by interaction between sediment gravity flows and the seafloor topography. Distal lobe deposits and sediments ponded upslope experienced headward-eroding channel migration that eventually converted them into incised ponded lobe deposits. Juxtaposed mixed depositional and erosional regimes along the shelf slope record an upstream-migrating shelf edge nick point. Subsequent turbidite flows eroded pre-existing reservoir sediments and redeposited them further downslope. This temporal evolution of turbidite sands affected the reservoir architecture and the exploration strategy used to find hydrocarbon resources.

Recapping, a systems approach can be used to define the shelf-slope-seafloor geometry and model turbidite sedimentary reservoir architecture. The hinterland-shelf-shelf edge-seafloor gradient are intertwined and play major roles in the reservoir system evolution and sedimentary style. The primary reservoir features controlling reservoir development are: the shelf edge sedimentary delivery system, which involves both the source provenance and the hinterland relief; the shelf edge accommodation space; turbidite rheology and sediment concentration; and the seafloor bathymetry (topography). The latter controls erosion/deposition relationships and is strongly influenced by the slope to basin transition geometry. Other key factors in reservoir genesis include the effects of climate, eustatic sea level changes, and local tectonics; the latter being a more benign influence in passive margin settings. David finished by mentioning the need for process geomorphologists to help stratigraphers unravel the complex depositional mechanisms associated with turbidite reservoir systems.

The NCGS offers its deepest appreciation to AAPG Distinguished Lecturer David Jennette for presenting his lecture to its members and to ChevronTexaco employees. It was a comprehensive study of turbidite reservoir genesis on passive continental margins. The NCGS is also indebted to ChevronTexaco Corporation for its continuing support of the AAPG Distinguished Lecture program. ChevronTexaco provides NCGS with a generous annual donation to defray the lecture costs. We also thank ChevronTexaco for allowing the Distinguished Lecture Program to use facilities at its San Ramon Park campus.

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

NCGS FIELD TRIP and PICNIC (BBQ)

ROBERT SIBLEY VOLCANIC REGIONAL PRESERVE IN THE BERKELEY HILLS

Saturday May 21, 2005

Leader: Dr. Stephen Edwards, Director Tilden Park Regional Botanical Garden

The volcanic rocks at Robert Sibley Volcanic Regional Preserve are all late Miocene Moraga Fm. Garnis Curtis has studied this formation and this site for decades and believes this is a piece of the Quien Sabe Volcanics that has been transported north on the East Bay fault system. In terms of accessibility and exposure, Sibley is the showcase site for this volcanic complex, which is also represented by the Tolay Volcanics in Sonoma and probably Burdell Mountain in Marin County. We will be looking primarily at basltic-andesitic rocks, but with considerable textural and structural variety. A basaltic volcano (Round Top) dominates the landscape. Kaiser quarrying and erosion have exposed its deep interior and underpinning like no other volcano in California.

Following the field trip, geoscience family & friends gathering with BBQ (vegi & non-veg) at Tilden Park

THIS FIELD TRIP WILL BE LIMITED TO 70 PEOPLE

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

Time & Departure: Saturday May 21, 2005, 9:30 am (sharp), gathering place at the Visitor' Center.

Cost: $10/person for both members & non-members

********** **REGISTRATION FORM (Sibley Volcanics Field Trip & Picnic)** **********

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: aars@netscape.com Phone: (925) 370-0685 (evening - PREFERRED) (925) 363-1999 (day – emergency)
People who are willing to drive their car or SUV please indicate.

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

NCGS FIELD TRIP

BLUESCHISTS AND BREWERIES *(BREWSCHISTS II)*

Saturday & Sunday June 25 -26, 2005

Leader: Dr. John Wakabayashi, Consultant

Many field trips celebrate wine and geology. The Coast Ranges, whose geology is world famous because of the Franciscan Complex, is world famous for another fermented beverage besides wine---beer. Just as Franciscan blueschists have attracted the interest of geologists from around the world, the ales of US West Coast have won international acclaim as a regionally distinct style. One can make a good case that the small breweries of this region are as renowned among international beer enthusiasts as the wineries of the region are among wine lovers. This two-day field trip is a celebration of two things for which California is famous, blueschists of the Franciscan Complex, and wonderfully aromatic hoppy ales. There will be no private vehicles on this trip as participants will be transported by bus. All of the pubs on the schedule feature good food, so there is plenty to enjoy for individuals or families that do not wish to have beer. This trip reprises a trip that was run in 2001, but features a different camping spot (Lake Sonoma), and a different Sunday lunch stop.

THIS FIELD TRIP WILL BE LIMITED TO 42 PEOPLE

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

Time & Departure: Saturday June 25, 2005, 8:00 am (sharp), gathering place TBA.

Cost: $75/person for both members & non-members; includes guidebook, campground, chartered bus, Saturday night BBQ, beer & wine, Sunday morning breakfast (pastries & fruits) and coffee

**************************REGISTRATION FORM (Brewschists II Field Trip) **************************

Name:_____ E-mail:_____

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

Lunch / Dinner: 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: aars@netscape.com Phone: (925) 370-0685 (evening - PREFERRED) (925) 363-1999 (day – emergency)

Association for Women Geoscientists

Field Trip Announcement

http://www.awg.org/

To ENCOURAGE the participation of women in the geosciences
To EXCHANGE technical and professional information and
To ENHANCE the professional growth and advancement of women in the geosciences

Sierra and San Francisco Bay Area Chapters
Joint Spring Field Trip — June 2005

Neotectonics in the Sacramento-San Joaquin Delta Area
June 4, 2005

By Janine Weber Band, PhD. CEG

DATE: Saturday, June 4, 2005
TIME: Start at 9:00 am, and finish in the late afternoon
LOCATION: Montezuma Hills and beyond. The meeting point is still to be determined and directions will be sent out to participants before the trip.
RSVP: Jean Moran at 510-215-2304 or email to jeanm@stetsonengineers.com by Wednesday, June 1, 2005.
WHAT TO BRING: pack our own lunch and beverages; hiking shoes or boots, and layered clothing for whatever weather might develop.
COST: $10 (Students $5). Net proceeds go towards chapter programs.

Please join us on June 4, 2005 for a field trip by Janine Weber Band based on her dissertation research focusing on the neotectonics in the Sacramento-San Joaquin Delta area.

Field trip description: The Delta area is a structural anomaly in the Coast Ranges - it forms a break between the Central and Northern Coast Range structural patterns. The drainage from the Central Valley currently exits across the Delta and through the Carquinez Straits; ancient drainage patterns also appear to have followed a similar path. Why? Using various types of subsurface data, mainly reflection profiles and well logs, I reconstructed the depositional history and structural development of the region. In the process I found that the so-called Montezuma Fault is incorrectly mapped, and that it and the Midland Fault both show strong evidence of Quaternary activity. What's interesting is that the two faults (one has been renamed as the Pittsburg/Kirby Hills fault) were normal faults that bounded a major graben - it was a structural low spot that lasted through all of the Lower Tertiary while the Coast Ranges were rising both north and south. The fault reversed in the Pliocene at the same time as the change from converging margin to transform margin. Since then, the once-graben has become what we know as the Montezuma Hills, bounded on the east and west by apparently active reverse faults. The stratigraphy and fault history of the Delta region helps tell the story of the development of the Coast Ranges as well as providing yet another odd twist on the nature of the boundary between the Coast Ranges and the Central Valley.

The field trip will visit several locations in and around the Delta where key Tertiary sediments, and the keys to the puzzle - the unconformities, are exposed. We will get a peak at proprietary seismic profiles and enjoy early summer in the glorious Montezuma Hills.

About the trip leader: Janine Weber Band received her B.S. in Geology in1979 from Northern Arizona University and her M.S. from the Colorado School of Mines in 1983. She returned to school and received her doctorate in 1998 from UC-Berkeley. Since then, Janine has been consulting on geologic projects through her own business, EnviroVision, Inc. and has recently joined ATC Associates, an environmental geology firm in the Bay Area.