

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



Website: www.ncgeolsoc.org

NCGS OFFICERS

President:

Tom Barry,
tom.barry@shawgrp.com
Shaw Group, Inc.

President-Elect:

Phil Reed, Consultant
philecreed@yahoo.com

Director Field Trips:

Tridib Guha, Consultant
tridibguha@yahoo.com

Treasurer:

Phil Reed, Consultant
philecreed@yahoo.com

Program Director:

John Karachewski, Department of
Toxic Substance Control
cageo@sbcglobal.net

Scholarship:

Phil Garbutt, Retired, Cal State
East Bay, plgarbutt@comcast.net

K-12 Programs:

Paul Henshaw, Retired, K-12
education
Drphenshaw@comcast.net

Membership:

Rob Nelson, Clearwater Group, Inc.
rlngeology@sbcglobal.net

NCGS Newsletter & Website Editor:

Mark Detterman, Alameda County
Environmental Health
mdetter1@gmail.com

Recording Secretary:

Dan Day, VA Engineering, Inc.
NCGS Voice Mail: 925-424-3669
danday94@pacbell.net

COUNSELORS

Mel Erskine, Consultant
mcerskine@comcast.net

Don Lewis, Consultant
donlewis@comcast.net

Ray Sullivan, Emeritus, San
Francisco State University
sullivan@lucasvalley.net

Mark Sorensen, Innovative
Technical Solutions, Inc.
msorensen@itsi.com

MEETING ANNOUNCEMENT

DATE: March 28, 2012

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

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

SPEAKER: **Dr. Gerhard Neuhuber**
Gall Zeidler Consultants, LLC
San Francisco

Caldecott Tunnel Construction 4th Bore / NATM Tunnel In San Francisco SH 24 California; After Three Tunnel Constructions and Investigation Programs – Are There No Surprises Anymore?

Introduction

The 4th Bore is a highway tunnel on California State Route 24 currently under construction. The 4th Bore was undertaken by the California State Department of Transportation (CALTRANS) and the Contra Costa County Transportation Commission (CCTC) to alleviate traffic congestion on SR24 connecting the cities of Oakland and Orinda in the San Francisco East Bay Area. The cost for the 4th Bore is estimated at \$390.8 Mill. The 3,249 ft long Bore tunnel will have excavated dimensions of approximately 40 ft height and 49 ft width. A total of 7 cross passages will run between the 3rd and the new 4th bore.

Caldecott bores numbers 1, 2 and 3 run parallel to the 4th bore, are offset approximately 100m (328ft) to 32m (105ft). The construction of the 1st and 2nd bore began in 1934 and was completed in 1937. The 3rd bore was excavated from 1961 to 1964.

With a detailed interpretation of all geological and geotechnical data this paper provides a description of the project which discusses important elements such as ground class, ground conditions, behaviors, groundwater and construction considerations. Thereby challenges during the excavation of Bore #4 in comparison to the existing Bores 1-3 and the prognosis under analogy of historical events are discussed.

Geology and Hydrogeology

The project is located in the Oakland Berkeley Hills of the SF Bay Area. The Caldecott Tunnels lie within the easterly assemblage of the Hayward

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... Continued on page 3...

NCGS 2010 – 2011 Calendar

March 28, 2012

Dr. Gerhard Neuhuber, GallZeidler Consultants, LLC; Caldecott Tunnel Construction 4th Bore / NATM Tunnel in San Francisco SH 24 California; After Three Tunnel Constructions and Investigation Programs – Are There No Surprises Anymore?

7:00 pm at Orinda Masonic Lodge

April 25, 2012

Dr. Ray Sullivan, Emeritus, San Francisco State University, Ocean Floor to Shelf; The Lower Tertiary Sequences in the Sacramento Basin

7:00 pm at Orinda Masonic Lodge

May 30, 2012

(Dinner Meeting!)

**Dr. Goeff Marcy, UC Berkeley; (Early Time!)
The Hunt for Another Earth (See Attached Form!)**

6:00 pm at Orinda Masonic Lodge

June 27, 2012

**Dr. Donald L Gautier, US Geological Survey
Volumes, Uncertainty and Costs of Undiscovered Arctic Petroleum**

7:00 pm at Orinda Masonic Lodge

Upcoming NCGS Events

April 2012
(Date Tentative)

**Caldecott Fourth Bore Project
CalTrans and Dr. Gerhard
Neuhuber**

June 2, 2012

**Ocean Floor to the Shelf; The
Lower Tertiary Sequences on
the Flanks of the Mt. Diablo
Dr. Ray Sullivan**

July 2012
(Date Tentative)

**Ancient Basalts of the
“Youthful” North Fork
Feather River Canyon
Jeff Schaffer**

Do you have a place you've wanted to visit for the geology? Let us know. We're definitely interested in ideas. For those suggestions, or for questions regarding, field trips, please contact Tridib Guha at: TridibGuha@yahoo.com.

Peninsula Geologic Society

Upcoming meetings

For an updated list of meetings, abstracts, and field trips go to <http://www.diggles.com/pgs/>. The PGS has also posted guidebooks for downloading, as well as

photographs from recent field trips at this web address. Please check the website for current details.

Bay Area Science

[\(http://www.bayareascience.org/\)](http://www.bayareascience.org/)

This website provides a free weekly emailed newsletter consisting of an extensive listing of local science based activities (evening lectures, classes, field trips, hikes, and etc).

Association of Engineering Geologists

San Francisco Section

Upcoming Events

Meeting locations rotate between San Francisco, the East Bay, and the South Bay. Please check the website for current details. To download meeting details and registration form go to: <http://www.aegsf.org/>.

USGS Evening Public Lecture Series

The USGS Evening Public Lecture Series events are free and are intended for a general public audience that may not be familiar with the science being discussed. Monthly lectures are usually scheduled for the last Thursday evening of each month during most of the year but are occasionally presented on the preceding Thursday evening to accommodate the speakers. For more information on the lectures, including a map of the lecture location (Building 3, 2nd floor; Conference Room A) go to: <http://online.wr.usgs.gov/calendar/>

Projected Climate Change Impacts in California --the consequences of increasing atmospheric greenhouse gases, Tom Suchanek, USGS Western Ecological Research Center Lead Scientist & Climate Change Coordinator

Announcement

Tight Oil Reservoirs - California 2012: Monterey & Surrounding Sediments

Bakersfield, California

May 30-31 2012

With a special focus on –
*Examining Geological Data From California's
Borderline Unconventional Oil Plays To Determine The
Most Effective Completions and Recovery Strategies For
Exploiting Reserves*

For more information -

The website: <http://www.tight-oil-monterey-california-2012.com>

The Speaker line up: <http://www.tight-oil-monterey-california-2012.com/5/speakers>

The Full agenda: <http://www.tight-oil-monterey-california-2012.com/4/agenda/23/agenda>

Dr. Gerhard Neuhuber's Abstract Continued...

Caldecott Tunnel Construction 4th Bore / NATM Tunnel In San Francisco SH 24 California; After Three Tunnel constructions and Investigation Programs – Are There No Surprises Anymore?

...fault zone province which consists of a sequence of sedimentary and volcanic rocks that accumulated in the interval between about 16 and 8.4 Ma (Miocene). The basal rocks of these Tertiary deposits consist of deep marine basin sediments of the Monterey Group. These rocks are overlain uncomfortably by an interbedded sequence of terrestrial sediments (Orinda Formation) and volcanic rocks (Moraga Formation). The Tertiary rocks have been folded into large amplitude, NW trending folds that are cut by N trending strike and slip faults. The SF Bay Region, which is crossed by 4 major faults (San Gregorio, San Andreas, Hayward, and Calaveras), is considered one of the more seismically active regions of the world. The active Hayward fault lies 0.9mi to the west of the Caldecott Tunnels and is the closest major fault to the project area. The tunnel is at the moment under top heading construction: West Portal (360ft) and East Portal (1,968.5ft).

Conclusions

In the presence and near of fault zones (0 – 50 m) the water inflow is significantly lower than expected and in absence of fault zones higher water inflow rates than expected were measured in porous rock materials (Sandstone, Conglomerate, shale). This talk discusses the observed and the measured water inflow influence of fault zones during top heading excavation of the 4th Caldecott Tunnel and in comparison to Bores 1 - 3. The hydraulic conductivity decreased in fractured rock masses adjacent to faults and shear zones – as predicted in the GBR (similar to Bore No. 3, 2 and 1) but during our construction work it became clear, that the most important and most significant for the hydraulic conductivity and water inflows were rock properties and lithology. From the lithology standpoint, the Second Sandstone would be one of the most competent units found. Borings recovered during the investigation phase produced high quality rock and this is reflected in the design. It would appear that there is some along strike

variability within the unit. In Page's 1950 article, he anticipated this variability and notes that local igneous and sandstone dikes produce differing geologic conditions from one tunnel heading to the next. This would certainly apply to underground versus surface exposure, as well.

REFERENCES

Page, B.M. (1950), Geology of the Broadway Tunnel, Berkeley Hills, California, Economic Geology, Vo. 45, No.2.

Bieniawski, Z.T. (1989), Engineering Rock Mass Classifications, Wiley, New York

Neuhuber et al (2011): Caldecott 4th bore tunnel project: The influence of ground water flows and inflows triggered by tectonic fault zones? AGU meeting San Francisco 2011 (in progress).

Bechtel Corporation (1964) Orinda BART Tunnel documentation, Engineering Geology of the Proposed Rapid Transit Berkeley Tunnels: consultants report, June, 16 p., 2 pl.

Marinos, V. et. al. (2005). The geological strength index: applications and limitations. Bulletin of Engineering Geology and the Environment, Vol. 64, pp 55-65.

Goodman, R.E. (1989). Introduction to Rock Mechanics. John Wiley & Sons.

Earth Mechanics Institute, 2005. Seismic Hazard Report and SEE Ground Motions, Caldecott Improvement Project.

Austrian Society for Geomechanics. 2004. "Guideline for the geomechanical design of underground structures with conventional 1 excavation." Draft English translation.

Radbruch, Dorothy H. and Lennert, Ben J., 1966, Damage to Culvert Under Memorial Stadium University of California, Berkeley: U.S. Geological Survey Circular 525, p. 3-6.

ÖNORM B 2203-1: Underground Works. Part 1: Cyclic Driving. Works contract, Issue 2001-12-01.

USBR (U.S. Bureau of Reclamation). 1998. Engineering Geology Field Manual, 2nd Ed., U.S. Washington, D.C.: Government Printing Office.

Thapa, B.B. et al. (2007) Preliminary Design of the Caldecott Fourth Bore, Proceedings of the Rapid Excavation and Tunneling Conference, Toronto.

Geotechnical Baseline Report (GBR June 2009 version): Caldecott Improvement Project, Caltrans Division-4, unpublished. 1

Why Do Dinosaur Skeletons Look So Weird?

Many fossilized dinosaurs have been found in a twisted posture. Scientists have long interpreted this as a sign of death spasms. Two researchers from Basel and Mainz now come to the conclusion that this bizarre deformations occurred only during the decomposition of dead dinosaurs.

More or less complete and articulated skeletons of dinosaurs with a long neck and tail often exhibit a body posture in which the head and neck are recurved over the back of the animal. This posture, also known from Archaeopteryx, has been fascinating paleontologists for more than 150 years. It was called "bicycle pose" when talking with a wink, or "opisthotonic posture" in a more oppressive way of speaking.



A fossil of the Compsognathus longipes from the "Solnhofen Archipelago" shows the twisted posture often seen in dinosaur remains. (Credit: © G. Janßen, O. Rauhut, Bayerische Staatssammlung für Paläontologie und Geologie)

The latter alludes to an accessory symptom of tetanus, well known in human and veterinarian medicine. Usually, an "opisthotonic posture" like that is the result of vitamin deficiency, poisoning or damage to the cerebellum.

Basically, the cerebellum is a brain region that controls fine muscle movement, which includes the body's antigravity muscles that keep the head and tail upright. If the cerebellum ceases to function, the antigravity muscles will clench at full force, tipping the head and tail back, and contracting the limbs.

A syndrome like that as a petrified expression of death throes was discussed for the first time about 100 years ago for some vertebrate fossils, but the acceptance of

this interpretation declined during the following decades. In 2007, this "opisthotonus hypothesis" was newly posted by a veterinarian and a palaeontologist. This study, generously planned, received much attention in the public and the scientific community.

Now, five years later, two scientists from Switzerland and Germany have re-evaluated the revitalized "opisthotonus hypothesis" and examined one of its icons, the famous bipedal dinosaur Compsognathus longipes from the "Solnhofen Archipelago" (Germany). It is widely acknowledged that this 150-millions-years-old land-living dinosaur was embedded in a watery grave of a tropical lagoon.

"In our opinion, the most critical point in the newly discussed scenario of the preservation of an opisthotonic posture in a fossil is the requirement that terrestrial vertebrates must have been embedded immediately after death without substantial transport. But consigning a carcass from land to sea and the following need of sinking through the water column for only a few decimetres or meters is nothing else" says sedimentologist Achim Reisdorf from University of Basel's Institute of Geology and Paleontology.

Biomechanics in Watery Graves Convinced that the back arching was generated, not by death throes, but by postmortem alterations of a decaying carcass, the researchers made experiments with plucked chicken necks and thoraxes, immersed in water. Submersed in water, the necks spontaneously arched backwards for more than 90°. Ongoing decay for some months even increased the degree of the pose. Thorough preparation and dissection combined with testing revealed that a special ligament connecting the vertebrae at their upper side was responsible for the recurved necks in the chickens. This ligament, the so-called Ligamentum elasticum, is pre-stressed in living chickens, but also in dead ones.

"Veterinarians may often have to do with sick and dying animals, where they see the opisthotonic posture in many cases. Vertebrate palaeontologists, however, who want to infer the environment in which the animals perished and finally were embedded have to elucidate postmortem processes and biomechanical constraints too" says palaeontologist Michael Wuttke from the Section of Earth History in the General Department for the Conservation of Cultural History Rhineland Palatinate in Mainz (Germany).

"A strong Ligamentum elasticum was essential for all long necked dinosaurs with a long tail. The preloaded ligament helped them saving energy in their terrestrial mode of life. Following their death, at which they were immersed in water, the stored energy along the vertebra was strong enough to arch back the spine, increasingly so as more and more muscles and other soft parts were decaying" conclude the researchers. "It is a special

highlight that, in the *Compsognathus* specimen, these gradual steps of recurvature can be substantiated, too. Therefore, biomechanics is ruling the postmortem weird posture of a carcass in a watery grave, not death throes."

Story Source: The above story is reprinted from materials provided by Universität Basel, via AlphaGalileo.

Journal Reference: Achim G. Reisdorf, Michael Wuttke. **Re-evaluating Moodie's Opisthotonic-Posture Hypothesis in Fossil Vertebrates Part I: Reptiles—the taphonomy of the bipedal dinosaurs *Compsognathus longipes* and *Juravenator starki* from the Solnhofen Archipelago (Jurassic, Germany).** *Palaeobiodiversity and Palaeoenvironments*, 2012; DOI: [10.1007/s12549-011-0068-y](https://doi.org/10.1007/s12549-011-0068-y)

Recent Geological Activity on the Moon

Summary: New images show that the Moon's crust is being stretched, forming new valleys on the lunar surface.



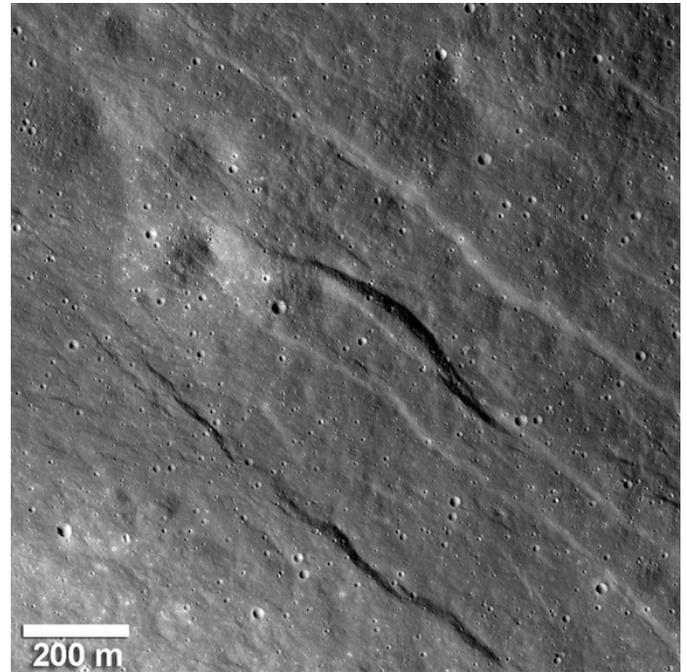
Source: NASA press release

New images from NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft show the Moon's crust is being stretched, forming minute valleys in a few small areas on the lunar surface. Scientists propose this geologic activity occurred less than 50 million years ago, which is considered recent compared to the Moon's age of more than 4.5 billion years.

A team of researchers analyzing high-resolution images obtained by the [Lunar Reconnaissance Orbiter Camera](#) (LROC) show small, narrow trenches typically much longer than they are wide. This indicates the lunar crust is being pulled apart at these locations. These linear valleys, known as graben, form when the Moon's crust stretches, breaks and drops down along two bounding faults. A handful of these graben systems have been found across the lunar surface.

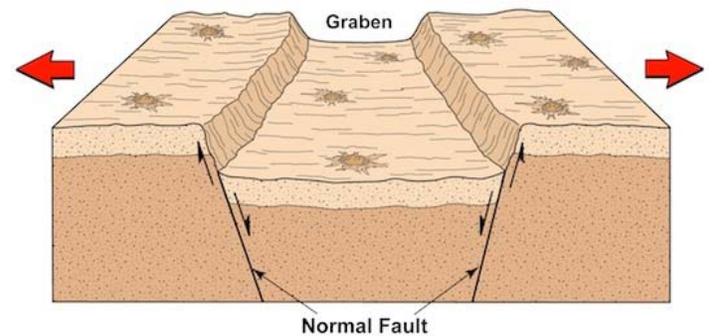
"We think the Moon is in a general state of global contraction because of cooling of a still hot interior," said Thomas Watters of the Center for Earth and Planetary Studies at the Smithsonian's National Air and Space Museum in Washington, and lead author of a paper on this research appearing in the March issue of the journal *Nature Geoscience*. "The graben tells us forces acting to shrink the Moon were overcome in

places by forces acting to pull it apart. This means the contractional forces shrinking the Moon cannot be large, or the small graben might never form."



This shows the largest of the newly detected graben found in highlands of the lunar farside. The broadest graben is about 500 meters (1,640 feet) wide and topography derived from Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) stereo images indicates they are almost 20 meters (almost 66 feet) deep. Credit: NASA/Goddard/Arizona State University/Smithsonian Institution

The weak contraction suggests that the Moon, unlike the terrestrial planets, did not completely melt in the very early stages of its evolution. Rather, observations support an alternative view that only the Moon's exterior initially melted forming an ocean of molten rock.



Graben are troughs formed when the lunar crust was stretched and pulled apart. This stretching causes the near-surface materials to break along two parallel normal faults, the terrain in between the twin faults drops down forming a valley. Credit: Arizona State University/Smithsonian Institution

In August 2010, the team used LROC images to identify physical signs of contraction on the lunar surface, in the

form of lobe-shaped cliffs known as lobate scarps. The scarps are evidence the Moon shrank globally in the geologically recent past and might still be shrinking today. The team saw these scarps widely distributed across the Moon and concluded it was shrinking as the interior slowly cooled.

Based on the size of the scarps, it is estimated that the distance between the Moon's center and its surface shrank by approximately 300 feet. The graben were an unexpected discovery and the images provide contradictory evidence that the regions of the lunar crust are also being pulled apart.

"This pulling apart tells us the Moon is still active," said Richard Vondrak, LRO Project Scientist at NASA's Goddard Space Flight Center in Greenbelt, Md. "LRO gives us a detailed look at that process."

As the LRO mission progresses and coverage increases, scientists will have a better picture of how common these young graben are and what other types of tectonic features are nearby. The graben systems the team finds may help scientists refine the state of stress in the lunar crust. Studying activity on the Moon can help astrobiologists understand the geological behavior of small, rocky worlds, and could provide information useful in the hunt for habitable extrasolar planets.

"It was a big surprise when I spotted graben in the far side highlands," said co-author Mark Robinson of the School of Earth and Space Exploration at Arizona State University, principal investigator of LROC. "I immediately targeted the area for high-resolution stereo images so we could create a three-dimensional view of the graben. It's exciting when you discover something totally unexpected and only about half the lunar surface has been imaged in high resolution. There is much more of the Moon to be explored."

Lava overruns last house in Royal Gardens subdivision

Honolulu Star Advertiser

By Michael Tsai

Mar 03, 2012

A day after surrendering his dream home to the forces of nature, 61-year-old Jack Thompson, the last holdout resident of the lava-besieged Royal Gardens subdivision, was left to ponder his next move.

Thompson and a friend were evacuated from the subdivision Friday night as a fresh lava flow burned through surrounding forest in a straight line toward his home. Thompson took whatever he could fit into the two helicopters, but his home and all of its furniture were soon consumed by the flow.

Thompson, a former air-conditioning and refrigeration installer, had lived at the subdivision for 30 years, proudly holding his ground while every one of his neighbors eventually left.

"It was paradise," Thompson said by phone Saturday. "There was no place like it. I had a beautiful house with beautiful landscaping. It was a one-of-a-kind place and I'm happy to have had 30 good years there."

Over the years, Thompson watched as lava overran areas of his subdivision, held his breath as flows headed toward his home only to turn in some other direction.

To be honest, Thompson said, he didn't necessarily mind being the last man on his little patch of earth.

"You can probably count the number of people who have good neighbors on one hand," he said. "After a while, it was mostly surfers and squatters out here. I paid good money for a piece of land that was supposed to have new homes on it, not a bunch of squatters in tents. I loved it when they all left. I enjoyed the solitude."

Thompson said he always knew that he, too, might one day have to leave.

"But I always hoped for the best," he said.

Thompson is now living in his other home in Ainaloa, which he purchased so he'd have a place to stay in between weekly hikes from Royal Gardens to gather supplies. The adjustment hasn't been easy, Thompson said, particularly having to get used to the chirpy peal of coqui frogs in the night.

Thompson returned today to the subdivision to see for himself what the lava flow had wrought in the space that used to be his home.

"There's nothing left but roofing," he said. "There's a huge flow where my living room used to be. Soon, there's going to be nothing left but rock, just like the rest of the subdivision."

Thompson said he isn't sure what he'll do next. A former neighbor packed up and moved to Thailand, where his Social Security check stretches far enough to ensure a comfortable life. Thompson said that doesn't sound like a bad idea.

"I've had enough," Thompson said. "Maybe it's time to sell this other house and try something else."

Say Hello to CalVO: USGS California Volcano Observatory Opens

USGS Press Announcement; February 9, 2012



Small hills NNE of Mt. Shasta are hummocks slide 380,000 and 300,000 years ago. This view is from the top of Gregory Mountain, located about 40 km from the summit of the volcano. The prominent cone on the right skyline is Black Butte, a collection of four overlapping lava domes that were erupted about 9,500 years ago.

“More than 500 volcanic vents have been identified in the State of California. At least 76 of these vents have erupted, some repeatedly, during the last 10,000 years. ... Sooner or later, volcanoes in California will erupt again, and they could have serious impacts on the health and safety of the State’s citizens as well as on its economy.” Miller, C. Dan, 1989, [Potential Hazards from Future Volcanic Eruptions in California: U.S. Geological Survey Bulletin 1847, 17p.](#)

The U.S. Geological Survey announced the establishment of the USGS California Volcano Observatory, or CalVO, headquartered within existing USGS facilities in Menlo Park, Calif. Establishing CalVO is intended to increase awareness of and resiliency to the volcano threats in California, many of which pose significant threats to the economy and well being of the state and its inhabitants.

“By uniting the research, monitoring, and hazard assessment for all of the volcanoes that pose a threat to the residents of California, CalVO will provide improved hazard information products to the public and decision makers alike,” explained USGS director Marcia McNutt. “This realignment is part of the USGS’s efforts to build the National Volcano Early Warning System, a prioritized modernization of USGS volcano monitoring enabled through the American Reinvestment and Recovery Act.”

CalVO takes on responsibility for research, monitoring, and assessing hazards for all of the potentially active volcanoes in California and coordinating with local and

State emergency managers to prepare for responding to renewed volcanic activity. Previously, the USGS Cascades Volcano Observatory in Vancouver, Wash was responsible for responding to volcanic unrest at some northern California volcanoes.

CalVO replaces the former Long Valley Observatory, established in 1982 to monitor the restless Long Valley Caldera and Mono-Inyo Craters region of California. The creation of CalVO will improve coordination with federal, state, and local emergency managers during volcanic crises, and create new opportunities for volcanic hazard awareness and preparedness. The realignment of USGS Volcano Observatories will further facilitate collaboration with federal and state partner agencies including the California Emergency Management Agency and the California Geological Survey.



Obsidian Flow, a large circular-shaped lava flow, is part of the Mono-Inyo Chain.

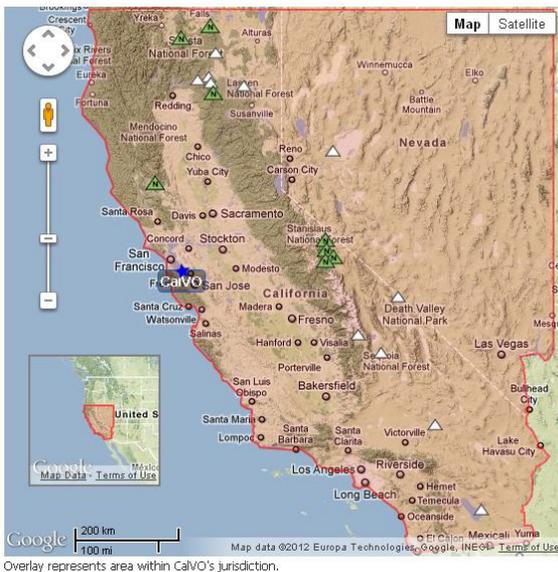
“California has always led the nation in comprehensive planning for potential disasters. Having the USGS take the initiative to enhance their volcanic threat capabilities and, most importantly, improve planning and coordination with California’s emergency managers is welcomed news. At the end of the day, the public expects us to plan for all hazards, and this is another great example,” said Mike Dayton, Undersecretary of the California Emergency Management Agency.

“California is the most geologically diverse state in the nation. We are known for our earthquakes, landslides and flood hazards. But our nearly forgotten hazard is our volcanoes,” said Dr. John Parrish, the State Geologist of California. “The California Geological Survey welcomes the new CalVO with its expanded scope and organization, and we look forward to its successful operations. The new CalVO will streamline our emergency response operations since CGS has offices at the USGS Menlo Park complex, and CalVO’s authority now encompasses all of California’s volcanic provinces in one center.”

In 2005, the USGS issued an assessment entitled [“Volcanic Threat and Monitoring Capabilities in the](#)

[United States” \(USGS OFR 2005-1164\)](#). Volcanic threat rankings for U.S. volcanoes were derived from a combination of factors including age of the volcano, potential hazards (the destructive natural phenomena produced by a volcano), exposure (people and property at risk from the hazards), and current level of monitoring (real-time sensors in place to detect volcanic unrest).

The list of potentially threatening volcanoes on CalVO’s watch list includes Mount Shasta, Medicine Lake Volcano, Clear Lake Volcanic Field, and Lassen Volcanic Center in northern California; Long Valley Caldera and Mono-Inyo Craters in east-central California; Salton Buttes, Coso Volcanic Field, and Ubehebe Craters in southern California; and Soda Lakes in central Nevada. CalVO’s watch list is subject to change as new data on past eruptive activity becomes known, as volcanic unrest develops, as monitoring networks are upgraded, and/or as exposure factors change.



Under the Stafford Act, the USGS has the federal responsibility to issue timely and effective warnings of potential volcanic disasters. In addition to CalVO, the USGS operates four other volcano observatories. The Cascade Volcano Observatory oversees efforts at all potentially active volcanoes in Oregon, Washington, and Idaho. The Yellowstone Volcano Observatory is responsible for volcanoes in Montana, Wyoming, Colorado, Utah, New Mexico, and Arizona. The Alaska Volcano Observatory oversees Alaskan volcanoes and those within the Commonwealth of the Northern Mariana Islands. The oldest USGS volcano observatory, the Hawaiian Volcano Observatory, is responsible for the state of Hawaii and is celebrating its 100th anniversary this year. All USGS volcano observatories share scientific expertise, administrative staff, and equipment.

For more information on the [USGS Volcano Hazard Program](#) visit <http://volcanoes.usgs.gov/>. See also USGS fact sheets: “[The National Volcano Early Warning System \(NVEWS\)](#)” FS-2006-3142 and “[U.S. Geological Survey’s Alert Notification System for Volcanic Activity](#),” FS-2006-3139.

Visit the new [CalVO website](#).

Just one example from the CalVO Website:

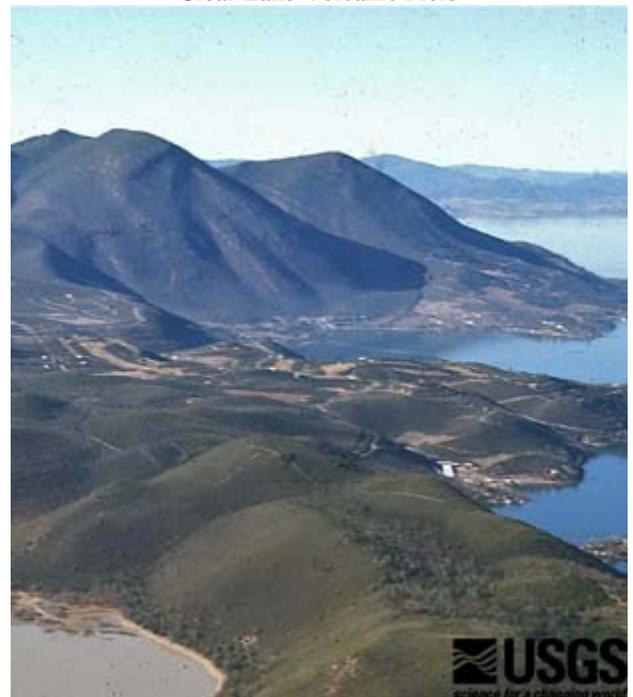
[Clear Lake Volcanic Field](#) [California Volcano Observatory](#)

[Geology & History](#) [Hazards](#) [Monitoring](#) [Multimedia](#)
[Publications](#)



(An interactive Google Map Overlay on web shows area of volcanic center.)

Clear Lake Volcanic Field



Summary & Quick Facts:

Clear Lake Volcanic Field is located about 90 miles north of San Francisco, California. The town of Clear Lake lies within the volcanic field as does much of the 43,000-acre fresh water lake of its namesake. The Geysers steam field, which sits at the southwest margin of the volcanic region, is host to one of the world's most productive geothermal fields, producing enough electricity for 850,000 homes. The heat driving the geothermal system emanates from a zone of partially molten rock ([magma](#)) deep below Clear Lake volcanic field. The volcanic features are [Quaternary](#) and include [rhyolitic lava dome](#) complexes, [cinder cones](#), and [maars](#) of [basaltic](#) composition. The most prominent volcanic feature is 300,000 year-old Mount Konocti, rising about 975 m (3,200 ft) above the southwestern shore of the lake. The most recent eruptions occurred about 11,000

years ago around Mount Konocti. Although Clear Lake volcanic field has not erupted for several millennia, sporadic volcanic-type earthquakes do occur, and the numerous hot springs and volcanic gas seeps at in the area point to its potential to erupt again.

Location: California, Lake County

Latitude: 38.97° N

Longitude: 122.77° W

Elevation: 1,439 (m) 4,721 (f)

Volcano type: volcanic field (red map area)

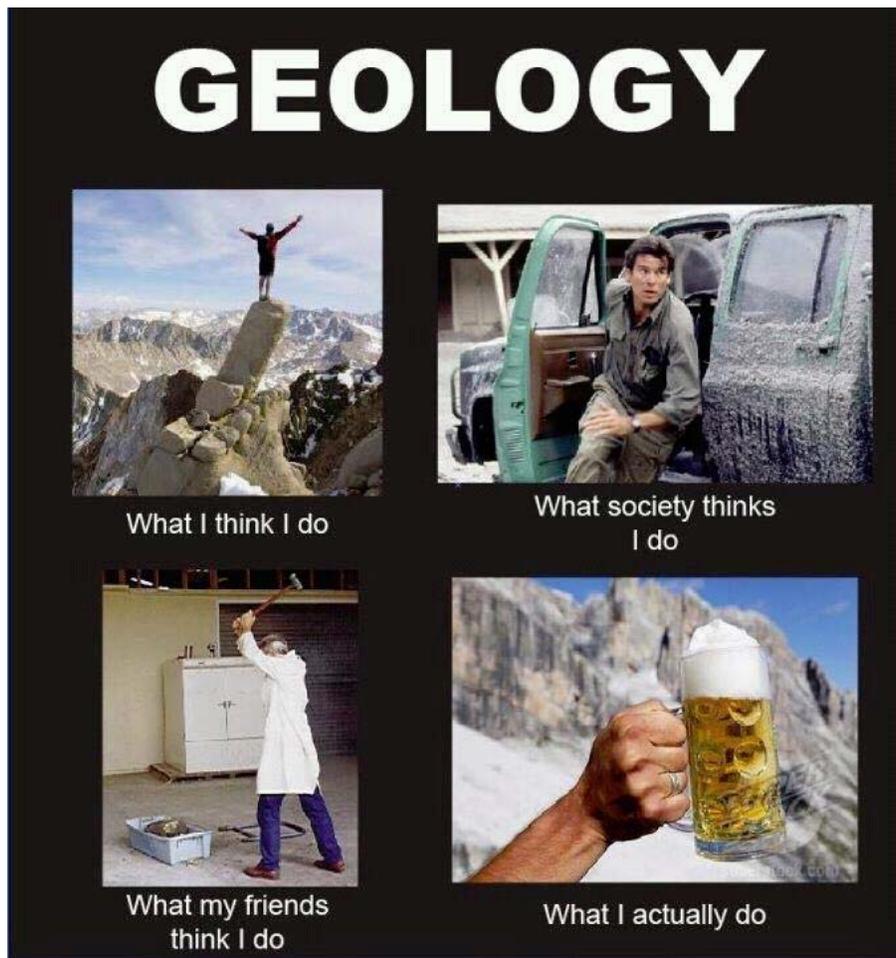
Composition: basalt to rhyolite

Most recent eruption: about 10,000 years ago

Nearby towns: Clearlake, Kelseyville, Lakeport, Lucerne

Alert Level: Normal

And now for a bit of fun:



(Thanks to Scott Seery for bringing this to our attention!)

(And no, this isn't intended to officially endorse any of these activities!)

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



NCGS DINNER MEETING “*The Hunt for Another Earth*”

Speaker: Dr. Geoffrey W. Marcy, Professor of Astronomy
University of California, Berkeley

Wednesday May 30, 2012

6:00 PM at Orinda Masonic Center

(Reservations are required by May 22, 2012, Limit 100 persons)

We are sorry but we will not be able to accommodate “walk-ins”

Stepping out of our normal routine, the **Northern California Geological Society** is pleased to announce this *special dinner and evening* with **Dr. Geoffrey Marcy**. For this unique event, planned for our normal monthly meeting date, but starting one-half hour early, we are planning in typical NCGS style, a **Back Forty Texas BBQ dinner consisting of Pork Ribs and BBQ Chicken, Tossed Green Salad, BBQ Beans, Fresh Corn Cobettes**. For vegetarian dinners a **deluxe veggie burger will be served in place of BBQ**. Desert will include assorted cookies and brownies. We may be again serving wines from California specials (90 pts +). Please also note that a vegetarian option is available if notified ahead (please see the registration form below).

Abstract: *The Hunt for Another Earth* The new Kepler spaceborn telescope is hunting for Earth-size planets, with hundreds in its sights. Kepler has already found definitively rocky planets, like earth, and is now hunting for habitable ones. This talk will present up-to-the-minute results from the Kepler Team. Biologists are working with astronomers to assess the environmental conditions necessary for life, especially intelligent life, on planets elsewhere in the universe.

Speaker Biography: Dr. Geoff Marcy is a Professor of Astronomy at UC Berkeley and an Adjunct Professor of Physics and Astronomy at San Francisco State University. He is the Director of Berkeley’s “Center for Integrative Planetary Science”, a research unit designed to study the formation, geophysics, chemistry and evolution planets. He is an elected member of the National Academy of Sciences and has been the recipient of numerous awards, including the NASA Medal for Exceptional Scientific Achievement. He was named Discovery Magazine’s Space Scientist of the year 2003. He was also co-recipient of the prestigious Shaw Prize. He received his PhD in 1982 from UC Santa Cruz.

Geoff is one of the pioneers and leaders in the discovery and characterization of planets around other stars. He and his collaborators have discovered nearly half of the 450 known exoplanets. They found the first system of multiple planets around a normal (main sequence) star, and also found the first Saturn mass planet and the first Neptune-like planet. They also found the first transiting planet (a co-discovery with T. Brown and D. Charbonneau). His group is now searching for Earth-like planets using NASA’s Kepler Mission and the Keck telescope in Hawaii.

***** Dinner Logistics *****

Meeting Details: Social Hour: 6:00 – 7:00 pm; Dinner: 7:00 – 8:00 pm **Presentation:** 8:00 – open

Time: May 30, 2012, 6:00 pm, Orinda Masonic Center 9 Altarinda Road, Orinda, CA. **Cost:** \$25/person

*****REGISTRATION FORM (Dr. Goeff Marcy’s Dinner)*****

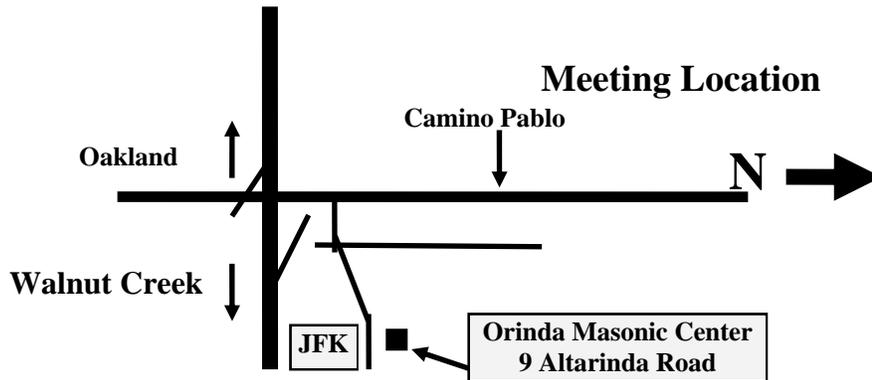
Name: _____ E-mail: _____

Phone (day): _____ Phone (cell) _____

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: tridibguha@yahoo.com Phone: (925) 451-1999



Biography: Dr. Gerhard Neuhuber has over twenty years of experience in Geology, Hydrogeology, and Engineering Geology, and as one part of his work also in the design, construction, and construction management of tunnels and underground tunneling. His expertise encompasses soft-ground, mixed-face, and rock-tunneling for transit structures in urban settings utilizing TBM, NATM, and cut-and-cover techniques; employing ground improvement measures to facilitate tunneling by means of grout injections specialty fore-poling systems. He is the Geotechnical Tunnel Engineer associated with the Caldecott Fourth Bore, and the NATM Tunnel in San Francisco. A citizen of Austria, he holds a Magister Rerum Naturalium degree and a Doctor Rerum Naturalium degree, from the Paris Lodron University, in Salzburg, Austria (received 1990 and 1996, respectively). He holds Civil Engineer Qualifications and a Registration as a Civil Engineer in Geology and Mineralogy (Earth Science) from the Republic of Austria and the European Union. He has extensive experience in the following areas: Engineering Geology, Soil Mechanics, Site Supervision; Geotechnical Tunnel Engineer; Geological Geotechnical Documentation, Reporting, Expertises; Geological – Geotechnical Prediction, Evaluation of Tunnel Projects and Excavation Works; Tunnelling (NATM, Method of Drill + Blast, by Excavator, TBM Tunnelling); Geological Exploration, Soil-Investigations, Geological Mapping, Drilling Campaigns; Geological Mapping (tunnels, surface, etc.), Rock Classification, Consulting in Rock Support; Tunneling (highways, hydro power plants, caverns, etc.) Micro tunneling; Geotechnical Site Supervision; Geotechnical Risk Assessment Studies, Slope Engineering, Hazard Evaluation in rock/ soil; Monitoring Engineering and Project Management of Underground Projects; Hydrogeological Consultancy on sewage and water search projects; Hydrogeological Expert in search and evaluation of drink water reservoir and water supply projects, thermo pumps, supervision of drilling campaigns related to mineral water search; Geotechnical Expert in Dump Assessment and Evaluation of waste/ dump locations.

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 **Rob Nelson** at rlngeology@sbcglobal.net to sign up for this free service.