



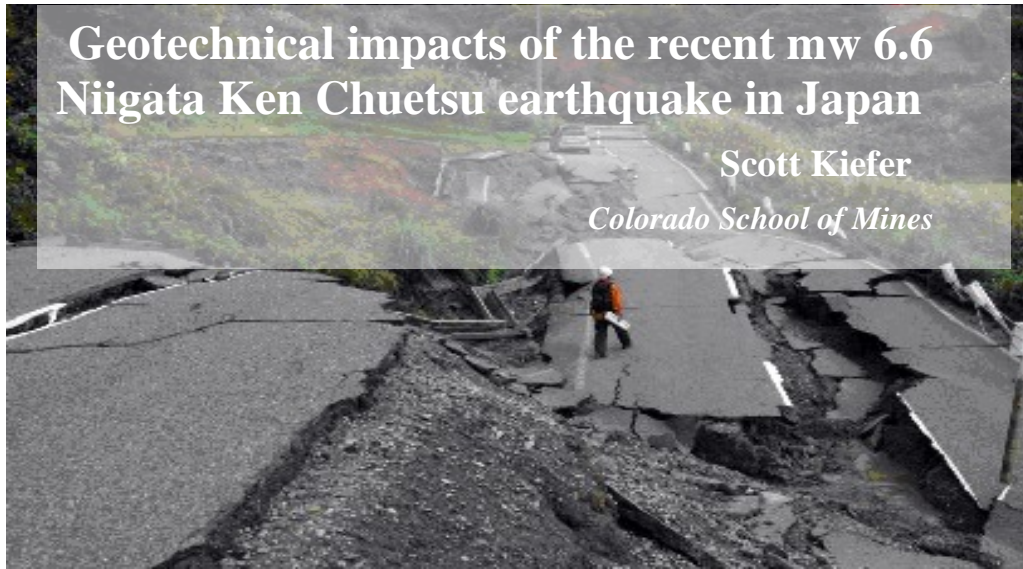
Colorado Scientific Society

*The objective of the Society is to promote
The knowledge and understanding of Earth science,
And its application to human needs*

Geotechnical impacts of the recent mw 6.6 Niigata Ken Chuetsu earthquake in Japan

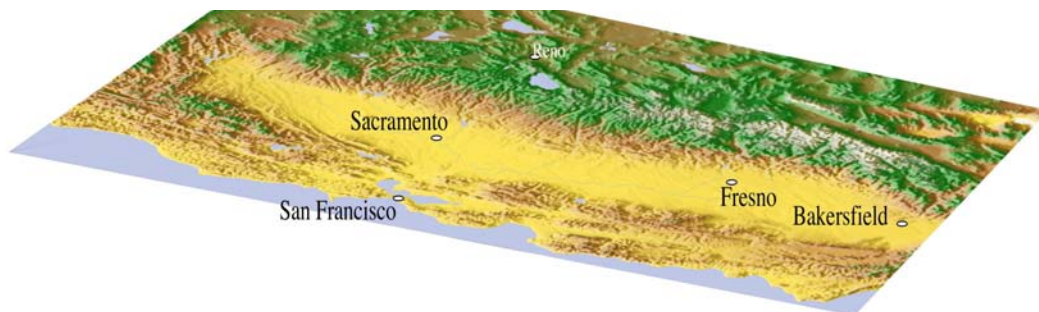
Scott Kiefer

Colorado School of Mines



Haunted by a cryptic orogen: The Sierra Nevada and its impact on the evolution of California

Craig H. Jones *University of Colorado*



Thursday, January 20, 2005

American Mountaineering Center

710 10th St. (NE corner with Washington), Golden

Social half-hour – 6:30 pm. Meeting time – 7:00 pm.

Abstract

Geotechnical impacts of the recent mw 6.6 Niigata Ken Chuetsu earthquake in Japan

By Scott Kieffer, Mining Engineering Department, Colorado School of Mines

The 23 October 2004 Niigata Ken Chuetsu, Japan, M_w 6.6 Earthquake was the most significant earthquake to affect Japan since the 1995 Kobe earthquake. Forty people were killed and almost 3,000 injured and numerous landslides destroyed entire upland villages. Landslides were of all types, damming streams and creating new lakes that are likely to overtop their new embankments at any moment and cause flash floods and mudslides. Landslides and permanent ground deformations caused extensive damage to roads, rail lines and other lifelines, resulting in major economic disruption. A significant factor contributing to the large number of landslides that occurred during the earthquake was heavy rain due to Typhoon Tokage – precipitation measured in the epicentral region was 100 mm (4 inches) on Oct. 20 and 13 mm (0.5

inches) on Oct. 21. In excess of 100,000 persons sought temporary shelter, and as many as ten thousand will be displaced from their upland homes for several years, if not permanently. Total costs of damage are estimated at USD 40 billion, making this the second most costly Japanese natural disaster in history, after the 1995 Kobe earthquake.

Dr. Scott Kieffer was a member of the scientific team mobilized by the U.S. Earthquake Engineering Research Institute to study geotechnical aspects of the Ken Chuetsu Earthquake. He will discuss some of the novel aspects of this earthquake, and their relation to extensive geotechnical failures.

Abstract

Haunted by a cryptic orogen: The Sierra Nevada and its impact on the evolution of California

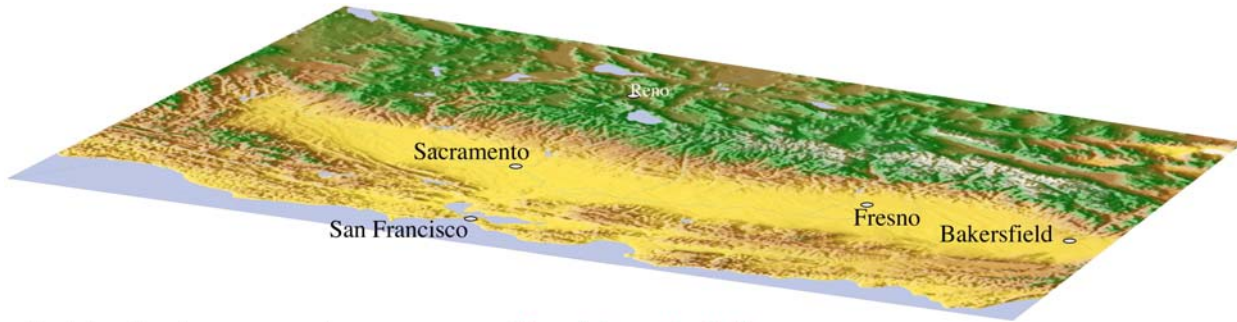
By Craig H. Jones Dept. Geological Sciences, University of Colorado, Boulder

The presence of the Sierra Nevada became much more puzzling when seismic studies in the southern Sierra revealed that the crust was only about 35 km thick. Petrologic studies of xenoliths and their host basalts led to the suggestion that dense lithosphere was removed from beneath the range about 3.5 to 5 Ma. Such removal of dense material has long been proposed both for developing a silica-rich continental crust and for driving so-called post-orogenic collapse of orogens, but observations of the process have been lacking. The most direct consequence of the removal of dense material is uplift, which now (once again) seems to have occurred between about 8 and 3 Ma. Such uplift should produce extensional stresses and

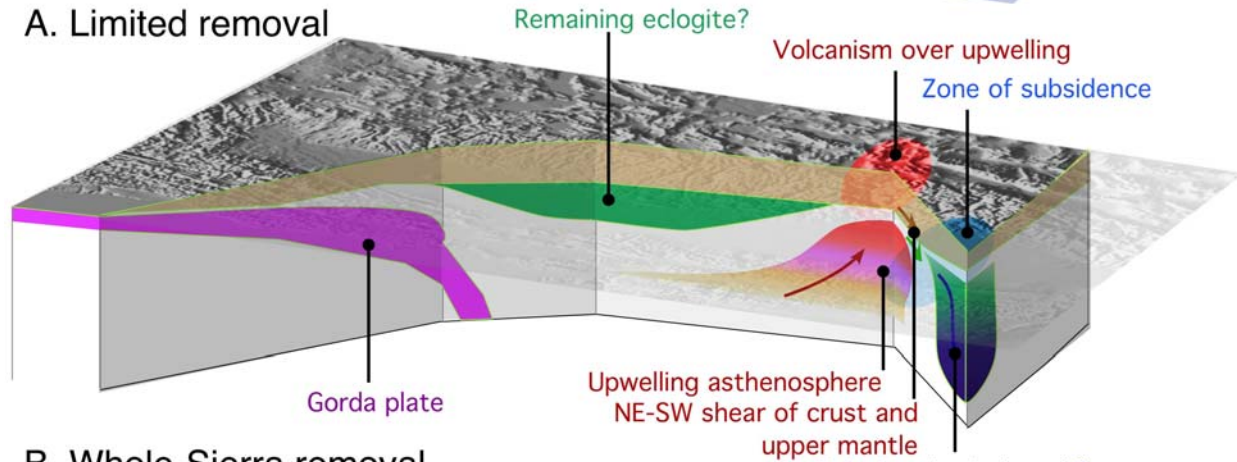
potentially normal faulting; basin and range topography in the 50-100 km just east of the Sierra developed since 5 Ma. As Pacific-North America motion has been unchanged since about 10 Ma, increased extension in the westernmost Great Basin should cause contraction elsewhere or a decrease in extension elsewhere. The California Coast Ranges developed starting about 3-5 Ma, possibly in response to the extension. Finally, narrowing the rigid Sierra-Great Valley block should permit an increase in the strike-slip motion on its east side; available evidence incompatible with a decrease in San Andreas slip and an increase in the slip rate of the Eastern California Shear Zone about 4-5 Ma.

Although an appealing integration, the scenario above predicts that material was removed along the length of the Sierra, a prediction in need of testing. If this did occur, it appears that the downwelling material got focused into "drains" at either end of the Sierra. This geometry has not been

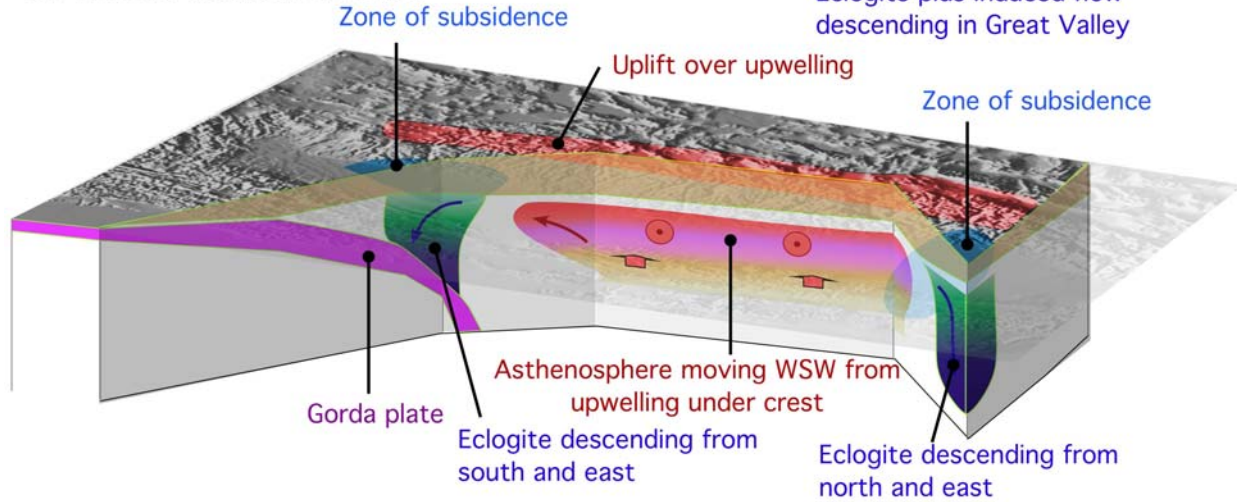
anticipated by numerical models of lithospheric removal and so suggests that our understanding of the dynamics of lithospheric foundering is incomplete. These issues are hopefully to be tested as part of EarthScope in the coming years.



A. Limited removal



B. Whole-Sierra removal



Colorado Scientific Society President's Note—January 2005

By Vince Matthews

It is an honor to serve as your president this year. I have always considered CSS to be an unusual society in that it has quality speakers on a wide variety of earth science topics, as well as wonderful field trips. However, even more unusual is the excellent group of people with whom to network at our meetings. Let's work to keep this tradition strong.

In that vein, I urge each of you to become a member of the Membership Committee. We will be trying a number of tactics to draw more members. But, the most important recruiting tool is YOU. If

each of us would bring a new person to CSS at every one of our meetings, it is quite likely that we could easily double our membership. Once someone visits and sees what we have to offer, we should have them hooked.

This society is too important to let it slowly waste away just because we haven't made the effort to recruit new members. Make a conscious effort to ask your co-workers to attend. Invite a neighbor. Bring your kids or grandkids. Sponsor a student. And, send me any ideas you have for gaining members.

Treasurer's Report for 2004

By Don Sweetkind

At the December business meeting of the Colorado Scientific Society, I summarized the status of the CSS finances for 2004. This year we took in about \$3,650 in member dues.

Our society expenses may be broken out into two categories: those activities that are purely expenditures and activities that are "revenue neutral". The major items that are purely expenditures include: insurance, \$720; rental of meeting space at the American Mountaineering Center and at the Colorado School of Mines, \$680; student night awards, \$700; newsletter expenses, \$520; speaker honorarium for the Emmons Lecture, \$540; State-level Science Fair awards, \$300; and website costs, \$264. Our total expenditures for the year were about \$4275.

Activities for which we spent money but also received revenue were: field trips, \$6,051 income, \$6,037 expenditure; Past President's Dinner, \$546 income, \$803 expenditure; Family Night, \$318 income, \$220 expenditure; and the geological road sign project where we spent \$5280; we had accumulated \$5,080 for this project. In

total, our "revenue neutral" items came out \$281 in the black. This year we distributed \$9,425 in student research grants. This money is generated as interest from our Memorial Funds investments.

In summary, we showed a deficit of \$344 this year (expenses exceed income). I made up the shortfall (and then some) by transferring \$1000 from our Endowment Fund to defray expenses.

As of December 2004, our Memorial Funds balance was \$218,917, our Endowment Funds balance was \$19,456. As of the December business meeting, we had \$6996 in contributions to the planned Charles Pillmore Memorial Fund. I have collected an additional \$1375 from members who have paid their dues since mid-December.

Thanks to all members who have already paid their 2005 membership dues and have made contributions to the Memorial and Endowment Funds. I will mail an official receipt for tax purposes to all those who made charitable contributions in 2004.

Mark Your Calendars!

The S. F. Emmons Lecture for 2005 will be held on February 17th, rather than the traditional January time slot. This year's lecturer is Dr. Richard S. Fiske former Director of the National Museum of Natural History of the Smithsonian Institution who will be speaking on **The Last**

Job Listing

Lisbon Valley Mining Co. is seeking a mine geologist (and several mining engineers if any of you are MEs) at its open pit heap leach copper operation located in San Juan County Utah, roughly half-way between the towns of Moab and Monticello, which is currently under construction with mine start-up expected this coming summer. The Lisbon Valley copper deposits are sandstone-hosted deposits contained within the lower Cretaceous Burro Canyon and Dakota Formations.

Frontier of Silicic Pyroclastic Volcanism. Dr. Fiske will be describing his underwater studies of a string of calderas off the coast of Japan, one of which has a large and actively growing deposit rich in gold and silver.

Preference will be given to candidates with mine geology experience, or geologic mapping at similar scales, and/or sedimentary geology, ideally a combination of the above. Responsibilities will include pit mapping, ore control, and regional exploration.

Interested candidates should contact Claudia Berner, Human Resources, Lisbon Valley Mining Co., P.O. Box 847, Moab, UT 84532 FAX: 435-259-8320.



Bob Weimer at CSM stop, Front Range field trip, April 2004.



Lisa Fisher (Lytle) discussing Coal Creek Quartzite, Front Range field trip April 2004.



**Pawnee Buttes field trip with
Emmett Evanoff, 2004**



**Fossil turtle shell in White River
Formation**





Earth Science Meetings and Talks



Newsletter items must be received by the 25th of each month. Items may include special events, open houses, etc...thanks!

Colorado Scientific Society's regular meetings are held the 3rd Thursday of the month at the American Mountaineering Center in Golden (unless otherwise advertised). Social time begins at 6:30 p.m. and talks start at 7:00 p.m. For more information, contact Vince Matthews at 303-866-3028 or vince.matthews@state.co.us

Denver Mining Club meets every Monday (except when noted) at Country Buffet near Bowles and Wadsworth (at 8100 W. Crestline Ave.) 11:30 a.m.-1:00 p.m. Jan 24, "A new American gold company on the horizon", Steve Alfery, NewWest Resources. Jan. 31, "The hanging flume near Uravan, Colorado-a marvel of mining engineering", Ron Anthony, Anthony and Associates.

Denver International Petroleum Society meets the second Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Streets. Reception begins at 11:30 a.m., luncheon at 12 p.m., program at 12:30 p.m. Make reservations (required) by leaving message at (303) 623-5396. Reservations accepted after 8 a.m. on Friday until 10:30 a.m. on Wednesday prior to the meeting. Cancellations accepted until 11:00 am Wednesday prior to the meeting. Cost: \$15 for lunches; talk only is available for \$2 (make checks payable to "D.I.P.S."). Contact Keith Murray at (303) 986-8554 for information.

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water Building, 12700 West 27th Avenue, Lakewood. Social hour 6:00-7:00 p.m. Technical presentation at 7:00 p.m. Meetings are normally scheduled for the first Monday of each month. For information contact Jim Piper, (303) 932-0137, or the website <http://www.dregs.org>.

Denver Well Logging Society (DWLS) meets on the third Tuesday of each month, Sept. through May. Lunch and a technical talk at the Wynkoop Brewery begins at 11:30 a.m., 18th and Wynkoop Sts. in Denver. Subject matter usually deals with the application of well logs to oil and gas exploration. **TBA**—Dec. 21, 2004. Call Elice Wickham at 303-573-2781 for reservations. Web page: <http://dwls.spwla.org>.

Rocky Mountain Association of Geologists (RMAG) Reception at 11:30 a.m., lunch at 12:00 p.m., talk at 12:30 p.m. Reservations are taken by recording at 303-623-5396 until 10:30 a.m., Wed. before the luncheon. Cancellations are taken until 11:00 a.m. on Wed. at 303-573-8621. Luncheon cost is \$20 payable to RMAG at the door. Reservations are not required for talk only—cost is \$3. Meeting location: Denver Petroleum Club, Anaconda Tower, 555-17th St, 37th floor. Web page: <http://www.rmag.org>. Jan.25 "Controls on Alluvial Architecture on Intermediate Time Scales", Paul Heller.

University of Colorado at Boulder, Geological Sciences Colloquium Wednesdays, 4:00-5:30 p.m., Rm. 180.Refreshments at 3:30 pm on the 3rd floor. For more information, call 303-492-8141. **TBA**, Jan. 2005. Web page: <http://www.colorado.edu/GeolSci>.

Friends of Dinosaur Ridge meets at 7:00 pm at Red Rocks Elementary School in Morrison, Colorado. Join now. Web page: <http://www.dinoridge.org>. Admission is free, but donations are welcome. For more information please contact the FODR Visitor Center at (303) 697-3466.

Colorado School of Mines, Van Tuyl Lectures Fridays from 3:00PM to 4:00PM in Berthoud Hall room 108. **TBA**—Jan. 2005 For further information, check <http://www.mines.edu/academic/geology.html>

USGS Geologic Division Colloquium. Thursdays, 1:30 p.m., Foord Room, Building 20, Denver Federal Center. For more information contact: Peter J. Modreski, U.S. Geological Survey, Denver, Colorado tel. 303-202-4766, fax 303-202-4767 email pmodreski@usgs.gov. Jan. 13, "Nondetects and data analysis: Statistics for Environmental Data" by Dennis Helsel.

Friends of Mineralogy "EarthScope – a national science project to investigate North America" by Susan Eriksson, UNAVCO, Jan.13, Denver Museum of Nature and Science. (A talk on earthquakes, volcanoes, plate tectonics). 303-202-4766.

Florissant Fossil Beds National Monument "A mammoth find in Florissant". Jan. 23, noon. 719-748-3253 for reservations.

For a constantly updated, online geo-calendar, visit the Colorado Geological Survey at
<http://geosurvey.state.co.us>

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