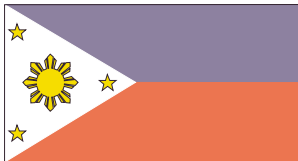


## Colorado Scientific Society

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

“Aerogeophysical measurements of collapse-prone  
hydrothermally altered zones at Mount Rainier volcano”

*by Carol Finn, USGS*



“Science in the international hot seat:  
Assessing mining-related environmental issues  
on Marinduque Island, The Philippines”

*by Geoffrey S. Plumlee, U.S. Geological Survey*

Thursday, March 15, 2001

Colorado Mountaineering Center  
710 10th Street (NE corner with Washington)  
Golden, Colorado  
Social half-hour – 7:00 pm  
Meeting time – 7:30 pm

## March Abstracts



### **Aerogeophysical measurements of collapse-prone hydrothermally altered zones at Mount Rainier volcano** by Carol Finn, USGS

Hydrothermally altered rocks can weaken volcanoes, increasing the potential for catastrophic sector collapses that can lead to far-travelling, destructive debris flows. Evaluating hazards due to alteration is uncertain because alteration has been mapped on few active volcanoes and because the distribution and severity of subsurface alteration is largely unknown on any active volcano. At Mount Rainier (Washington State, USA), collapses of hydrothermally altered edifice flanks have generated numerous far-travelled debris flows and future collapses would threaten now densely populated areas.

Preliminary geologic mapping and remote sensing indicate that exposed alteration is contained in a dike-controlled east-west belt passing through the summit. However, new helicopter-borne electromagnetic and magnetic data, combined with detailed geologic mapping, reveal that appreciable thicknesses of mostly buried altered rock lie mainly in the upper west flank of Mount Rainier, identifying this as the most likely source for future large debris flows. Negligible highly altered rock lies in the volcano's core, which may impede collapse retrogression and limit volumes and inundation areas of future debris flows. High-resolution geophysical and geologic observations yield an unprecedented view of the 3-D distribution of collapse-prone altered rock, and the approach has potential application to hazardous volcanoes world-wide.



### **Science in the international hot seat: Assessing mining-related environmental issues on Marinduque Island, The Philippines** by Geoffrey S. Plumlee, USGS

This talk will summarize a May, 2000, USGS-Armed Forces Institute of Pathology trip to examine the environmental impacts of recent large-scale, open-pit mining on Marinduque Island, Philippines, including the Marcopper Mine (operated from 1969-1996), and the CMI Mine (operated in the 1970's). Substantial further work is clearly needed to fully assess the extent of the mining-environmental problems and impacts of mining relative to pre-mining environmental conditions, and to develop scientifically strong remediation strategies.

The USGS-AFIP Marinduque visit underscored the need for impartial integrated science when assessing the environmental and health impacts of large-scale metal mining near the ocean. However, the visit also underscored the substantial political and cultural challenges faced by scientists who undertake such assessments.

The speaker acknowledges the great contributions of the other scientists who participated in the Marinduque trip, including: Bob Morton (coastal processes, USGS), Terry Boyle (aquatic ecotoxicology, USGS), Jack Medlin (USGS International Group), and José Centeno (human toxicology, Armed Forces Institute of Pathology). The contributions of Scott Carr (marine toxicology, USGS), who visited Marinduque in October, 2000, and collected data on the aquatic toxicology of tailings in the near-shore marine environment, are also gratefully acknowledged. A digital version of the group's trip report is available at: <http://geology.cr.usgs.gov/pub/open-file-reports/ofr-00-0397/>



#### **Why didn't I get an email reminder of the meeting on the meeting day?**



We are sending out on the day of our monthly meeting a reminder to all CSS members who have email. If you didn't get a reminder and have email, it may mean that we don't have the correct email address in the database for you. We had many "no delivery" errors last time. If you didn't get a reminder by email and would like one, please send your *current* email address to: [crice@usgs.gov](mailto:crice@usgs.gov) and we'll get you on the list. Thanks!!



### **Former CSS President Gerald M. Richmond dies**

Gerald Martin Richmond, a retired USGS geologist, died February 4<sup>th</sup> in Denver, Colorado. He was 86. Services were held Saturday, February 10<sup>th</sup>, at St. John's Episcopal Cathedral.

Gerald M. Richmond, was born on July 30, 1914 in Providence, Rhode Island. Gerry received his Bachelor of Arts degree from Brown University, his Masters from Harvard, and his Ph.D. from the University of Colorado. He began his studies of the Rocky Mountains in 1938, in the Wind River Range of Wyoming. Following a year of work in the Panama Canal Zone, he joined the U.S. Geological Survey in 1942. He resided in the Denver area since 1946. His main field of research, Pleistocene geology, has included studies in Rocky Mountain, Glacier, and Yellowstone National Parks, as well as the Cordilleran ice margin and Missoula floods in the Northern Rocky Mountains. His publications comprise more than 100 professional reports and geologic maps. A year of research in the Alps in 1961 resulted in a paper comparing the glacial stratigraphy of the Alps and Rocky Mountains. In 1965, he received the Geological Society of America's Kirk Bryan Award for a paper on the Quaternary Stratigraphy of the La Sal Mountains, Utah, which was the subject of his dissertation at CU. He served as president of the Colorado Scientific Society in 1953, and was elected an Honorary Life Member in 1971. He also served as chairman of the Geomorphology and Glacial Geology Division of the Geological Society of America, as Secretary-General of the VII Congress of the International Union for Quaternary Research, held in Boulder, Colorado, in 1965, and as president of the International Union from 1965 to 1969. He was a fellow of the Geological Society, as well as other scientific organizations.

In 1969, he was instrumental in forming the American Association for Quaternary Research. In 1978, he was awarded the Albrecht Penck Medal (a career award) by the German Quaternary Association. He worked for the US Geological Survey for more than 50 years and received the U.S. Department of Interior Award for Meritorious Service.

In 1994, he retired at age 80, but remained active in geological affairs until his wife, Amelie Zell Richmond, died about 4 years ago. His last major USGS project (other than ongoing fieldwork in the Wind River Mountains/Snake River region) was the Quaternary Atlas of the United States, which he initiated in 1974 and acted as chief.

He is survived by his children, Gerald Richmond, Jr. of Syracuse, NY; Marjorie Nichols of Kelso, WA; Tucker Richmond Stewart of Leadville, CO; Ann Crawford of Mascot, TN, and 8 grandchildren.

*Contributions may be made to St. John's Episcopal Cathedral, 1313 Clarkson St., Denver 80218; Camp Yawgoog Alumni Association Project Fund, Narragansett Council BSA, 175 Broad St., Providence, RI 02903; or St. Andrew's in the Pines Episcopal Church, P.O. Box 847, Pinedale, WY 82941.*

*For more information contact Gerald M. Richmond, Jr., 2674 E. Genesee St., Syracuse, N.Y., 13224. (315) 472-8099 work, (315) 446-1136 home (gmrichsyr@aol.com)*



## A View Through the Brown Cloud



March already? Yow! Some of us are still sending out Christmas presents! Yes, it must be March because in the name of “public safety”, GSA has been caught serving Fed Center prairie dogs their annual strychnine cocktail. Your editor happens to be a fan of cute brown-eyed mammals (although I have sworn off the H. sapiens type since my divorce), so huzzah! to the sign wielding protestors at Gate 1!



**THE DENVER PICK AND HAMMER CLUB  
OF  
FUTURISTIC AND FORWARD LOOKING  
GEO-HYDRO-ENVIRO-BIO-CHEMO-LOGISTS  
PRESENTS:**

**2001 (YET AGAIN) — A SPACED OUT ODYSSEY**  
*...wherein the USGS finally finds out what is on the other side  
of the BLACK HOLE of REORGANIZATION*

**SATURDAY  
March 31, 2001**

**Friedhoff Hall, Green Center, CSM  
16th and Cheyenne St., Golden**

*Cash bar opens at 5:30 p.m.  
Potluck Dinner begins at 6:00 p.m.  
Show starts at 7:30 p.m.*

If you want to eat dinner you **MUST** bring a dish to share.

Call me  
"Doctor", and  
pass the vittles!

**Tickets \$10**  
*(same price if you're eating or not)*

for **TICKETS** see:

Bldg	Name	Room	Phone
20	Pat Poole poole@usgs.gov	D1005A	236-5438

*Hevvvvv! You don't think those geologists said there was proof of life and water up here just so they could get co-op money?*





# Earth Science Meetings and Talks

Newsletter items must be received by the 4th of each month. This may include special events, open houses, etc...thanks!



**Colorado Scientific Society's** regular meetings are held the third Thursday of the month at the Colorado Mountaineering Center in Golden (unless otherwise advertised). Social time begins at 7:00 p.m. and talks start at 7:30 p.m. For info., contact Michele Tuttle at (303) 236-1944 or [mtuttle@usgs.gov](mailto:mtuttle@usgs.gov)

**Colorado School of Mines Lectures** For Heiland Lectures at 4:00 p.m. on Fridays, contact Michelle Szobody (303) 273-3451. For Van Tuyl Lectures, call the Dept. of Geology at (303) 273-3800.

**Colorado State University Geology Lectures** Mondays, 4:10 p.m., room 316 of the Natural Resources Bldg. Call the Dept. of Earth Resources at (970) 491-5661 for details, or go to: <http://www.cnr.colostate.edu/ER/> (main page, click *seminars*). **March 19:** Kristin Bunte, CSU, *Measuring gravel bedload transport rates and initiation of motion using portable traps*; **March 26:** Dave Theobald, CSU, *Mapping sprawl*.

**Denver International Petroleum Society (DIPS)** meets the 2<sup>nd</sup> Friday of each month at the Wynkoop Brewing Co., 18<sup>th</sup> and Wynkoop Sts. Reception begins at 11:30 a.m., lunch 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 Wed. 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 27<sup>th</sup> 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) 932-0134, 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., 18<sup>th</sup> and Wynkoop Sts. in Denver. Subject matter usually deals with the application of well logs to oil and gas exploration. Call Elice Wickham at 303-573-2781 for reservations. Web page: <http://dwls.spwla.org>

**Friends of Dinosaur Ridge and the Morrison Natural History Museum** Lutheran Church of the Master @ Jewell and Alameda, **March 20**, 7 p.m., T. Caneer, retired CSM geologist, *T-Rex Tracks*.

**Rocky Mountain Association of Geologists (RMAG)** Reception at 11:30 a.m., lunch at 12:00 p.m., talk at 12:25 p.m. Reservations 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, 555-17<sup>th</sup> St, 37<sup>th</sup> floor. *Next talk: March 16:* Joseph C. Tempel, Colorado Dept. of Trans., *"Dinosaur Ridge: Past Successes and Future Plans"*.

## **University of Colorado at Boulder, Geological Sciences Colloquium**

Wednesdays, 4:00-5:30 p.m., Rm. 180. For schedule, contact Kathy Madsen 303-492-8141.

**University of Northern Colorado, Greeley, Earth Science Seminar** Fridays, 4:00-5:00 p.m., Ross Hall, Rm. 3310. For a schedule, call UNC Dept. of Earth Sciences: 970-351-2647.

**U.S. Geological Survey, Geologic Division Colloquium** Foord Conference Room, Bldg, 20, Denver Federal Center. For more information contact Laura Strickland: (303) 236-5302.

**Spring Show in the Rockies** Attend the Rocky Mountain's 2<sup>nd</sup> largest gem and mineral show, **April 20-22** at the Holiday Inn-Denver North and Best Western-Central (where I-25 meets I-70). Free admission. For info.: [www.mineralshow.com](http://www.mineralshow.com); GeoExpositions, Karen Wenrich: 303-278-1218.



## RESULTS OF FIELD TRIP QUESTIONNAIRE

*by Sherman Marsh*

First, let me thank those of you who responded to the “Field Trip Questionnaire”. We had 26 responses (more than the average field trip attendance) and it is unanimous that we continue the field trips. From that point the responses are somewhat mixed (see below) but the majority of responding members seem to like the present arrangement with some modifications. As you can see from the totals, not all members responded to all the questions and some responses were somewhat contradictory (for example, some members liked the food and transportation but found the trips “expensive”). Most members would like to see more one-day trips and more science and discussion. I have been aware that there has been a shortage of “science and discussion” on some of the last trips but, this relates to my difficulty in finding trip leaders (hint, hint!).

My problems have been two-fold; finding trips that appeal to the membership and then finding trip leaders. If any of you would like to volunteer to lead a field trip or have expertise in an area that is part of a field trip, *please let me know*. Many of you sent suggestions for future field trips and I have compiled them below. These suggestions will be used by me and future field trip Chairpersons when planning new CSS adventures. The two field trips suggested for this summer-fall seem to be popular with those responding although some noted that they had already been to the Sweet Home Mine and this trip has been offered by several other societies in the Denver area. I will proceed with plans for these field trips. The Sweet Home mine trip will be in late May or early June and the Wyoming trip will be in mid-late August so plan ahead and mark your calendars. I plan to include the new Nahcolite deposit, the Ranglely oil field, Dinosaur Natl. Park, and the Medicine Bow Mtns. We will need some leaders or people with knowledge of these areas. Volunteers??????? *Please* contact me.

### CSS FIELD TRIP QUESTIONNAIRE

	YES	NO
1. Should the Colorado Scientific Society have field trips? .....	26	0
2. Are the current field trips too long? .....	1	14
A. Would you attend more often if the trips were 1 day? .....	12	3
B. Do you prefer a mix of short and longer trips? .....	15	2
3. Are the trips too expensive? .....	4	13
A. If so, should we give up the food? .....	4	8
B. Should we give up transportation (go by car-pool)? .....	5	11
C. Eliminate over-night trips? .....	3	15
4. Are there too many or to few field trips?		
A. Too few? <u>  5  </u> Too many? <u>  1  </u> Just right? <u> 12 </u>		
5. Are the field trips interesting or appealing? .....	11	0
A. Should there be more “science” on the trips? .....	13	5
B. Should there be more discussion (narration) on the trips? .....	13	2
C. Should trips be more narrowly focused on a single topic or area? .....	11	6
D. Should trips be more broadly focused on regional topics or areas? .....	13	5



YES NO

6. Would a major field trip (3-5 days) every 2 years alternating with short, one-day trips to local areas, be more appealing to you? ..... 16 4
7. Would you go on the field trips if they were scheduled at different times? ..... 4 3
- A. Spring ..... 12 1
- B. Summer ..... 12 2
- C. Fall ..... 13 1
- D. Winter ..... 4 7
8. I have 2 proposals for next year: (1) a one day tour of the Sweet Home mine above Alma, CO, where the spectacular red rhodochrosite comes from; and (2) a 3 day trip to tour the fossil fish locality near Kemmerer, WY.
- Would you go on trip 1? ..... 16 5
- Would you go on trip 2? ..... 12 8

### Suggested Field Trips

- Moffat tunnel and Rollins Pass
- Front Range geology
- Colorado Mineral Belt
- Henderson mine
- Rangley oil field
- Hot springs of Colorado
- Pawnee Buttes
- Marble, Colorado
- Tertiary and Quaternary of eastern Colorado
- Mining districts in the Idaho Springs area
- Water issues from Aurora to Sterling, Colorado
- Yellowstone National Park (3-4 day trip)
- Homestake gold mine, Bonanza, Colorado
- Diamond occurrences in Colorado and Wyoming
- Geology and history of Colorado Plateau
- Geology of the North Park area
- Southern Colorado sand dunes and loess
- Summitville Mine and the environmental problems
- Dinosaur tracks along the Purgatoire River
- Coal mining in the Trinidad and Walsenburg area
- McCoy-Burns State Bridge area (Paleozoic rocks and fossils)
- Ancient courses of the South Plate River and Ogallala FM
- Dipping beds in the Pierre Shale and bentonite problems (Green Mtn.)
- Yampa volcanics and geologic section from Wolcott to Yampa on Hwy 131



*Note from the editor: Sponsor a student on our next field trip and have them carry your rocks!*

Colorado Scientific Society  
P.O. Box 150495  
Lakewood, CO 80215-0495

<http://shell.rmi.net/~css/>



## Colorado Scientific Society Officers, Councilors, and Chairpersons

### OFFICERS

**President:** Michele Tuttle, USGS, 303-236-1944  
**President-Elect:** Eric Nelson, CSM, 303-273-3811  
**Treasurer:** Michael N. Machette, USGS, 303-273-8612  
**Secretary:** Stephen F. Personius, USGS, 303-273-8611  
**Past President:** Mark Hudson, USGS, 303-236-7446

### COUNCILORS

**1999-2001:** Emmett Evanoff, CU, 303-492-8069  
**1999-2001:** Steve Sonnenberg, 303-839-3012  
**2000-2002:** Bob Fleming, 303-279-8122  
**2000-2002:** Scott Lundstrom, USGS, 303-236-7944  
**2001-2003:** Graham Closs, CSM, 303-273-3856  
**2001-2003:** Parker Calkin, CU, 303-442-2184

### COMMITTEE CHAIRPERSONS

<b>Best Paper Award:</b>	<b>Karl Kellogg, USGS, 303-236-1305</b>
<b>Database Manager:</b>	<b>Cyndi Rice, USGS, 303-236-1989</b>
<b>Email distribution:</b>	<b>Randy Schumann, USGS, 303-236-1525</b>
<b>Field Trips:</b>	<b>Sherm Marsh, USGS-retired, 303-986-0939</b>
<b>Graphics:</b>	<b>Lee-Ann Bradley, USGS, 303-273-8613</b>
<b>History:</b>	<b>Marjorie E. MacLachlan, USGS-retired, 303-986-7192</b>
<b>Membership:</b>	<b>Jim Yount, USGS, 303-236-5397</b>
<b>Memorial Funds:</b>	<b>Mark Hudson, USGS, 303-236-7446</b>
<b>Memorial Funds Treasurer:</b>	<b>Michael N. Machette, USGS, 303-273-8612</b>
<b>Newsletter Editor:</b>	<b>Lisa Ramirez Bader, USGS, 303-236-5547</b>
<b>Outreach:</b>	<b>Pete Modreski, USGS, 303-236-5639</b>
<b>Program:</b>	<b>Martin Goldhaber, CSM, 303-236-1921</b>
<b>Publicity:</b>	<b>Libby Prueher, <a href="mailto:rckoi@eudoramail.com">rckoi@eudoramail.com</a></b>
<b>Science Fair:</b>	<b>Chuck Weisenberg, 303-238-8806</b>
<b>Webmaster:</b>	<b>Bill Wingle, Qubit Technology, <a href="mailto:wwingle@qubit.net">wwingle@qubit.net</a>, 303-716-7826</b>



**\*\* STOP!** Don't recycle this until after the talk! Please help us with publicity by posting at least the front page of this Newsletter on a bulletin board. *Thank you!!*