



Colorado Scientific Society

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

October Meeting, Thursday, Oct. 19, 2017, 7:00 p.m.

Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood

Social time, 6:30; program at 7:00

Using Geoscience to Augment Environmental Public Health Studies

Suzette Morman, Crustal Imaging and Characterization, USGS

For many years, health studies related to the environment were sometimes limited in their focus like those in other science disciplines. For example, epidemiological studies of lung cancer in uranium mine workers in Europe and the Southwestern United States (1950's and 60's) concluded radioactive radon daughters were likely responsible. But these studies did not examine any possible contribution from exposure to other toxic elements present in the ore such as arsenic. The application of geoscience knowledge, methods and techniques to environmental health related studies have provided important information over the past few decades. Interdisciplinary research, more common in the past decade, is essential to solve complex environmental issues.



Suzette Morman is a geologist in the Crustal Geophysics and Geochemistry Science Center, U.S. Geological Survey, Denver. Her current research involves the interface between minerals and human health, examining concerns such as bioaccessibility and biodurability of earth materials. She uses both analytical and experimental techniques to investigate geochemical and physiological processes that play a role in the health effects of earth materials. Other interests include exposure science and natural disasters. Prior to graduate studies in geological sciences, Suzette was a nurse clinician who provided acute, chronic, and hospice care and undertook management roles as well. Thus, she is uniquely qualified to synthesize the geochemical and medical aspects of earth materials and human health. Her publications include studies on mineral dust and human health, potential health effects of folk remedies, and bioaccessibility of trace metals in mine wastes.

October 2017 President's Message, Marith Reheis, Scientist Emeritus, U.S. Geological Survey

In thinking about this month's message, I have not been able to turn my mind away from the events of the past month. September 2017 was far too exciting and disturbing in terms of catastrophic storms and major earthquakes striking North America. Although there is no solid evidence that links hurricane frequency in any given year to global warming, the amount and intensity of rainfall during the three events of September are consistent with predictions from climate modeling. This should inform policy decisions for building resilience into our coastlines and structures in the face of rising sea levels, just as we have applied the understanding gained from several decades of research on seismic hazards to engineer buildings and other infrastructure to withstand earthquakes.



We were treated to several excellent talks with a wide range of topics during Student Night at the Arbor House in September. Surely one or more would have appealed to you! I learned a lot, and appreciated hearing from such a variety of engaging speakers. The subjects ranged from modeling potential causes of seismicity in the Raton basin to the interaction of snow surfaces and wind to astrogeology (super-puffy exoplanets!) to a new method of prospecting for placer diamonds to the history of ice cover in the Arctic. The Golden City Brewery donated some very good beer, which certainly helped lubricate the socializing and conversation. The Council will consider a proposal of throwing open the poster part of Student Night to posters contributed by our members in the future, to encourage greater participation.

We hope to see you all at the rest of our fall meetings. The October 19 talk at the Shepherd of the Hills church by Suzette Morman (USGS) should be important to us all, as it is on the topic of geology and health—who among us is not concerned with human health! Much has been learned in the last decade or two on the potentially toxic effects of earth materials on biological systems in general, and on humans in particular. Bio-accessibility is the interaction of minerals and elements with organic systems, and this varies with the path of uptake—for example, some materials are readily absorbed through human lung fluid but are insoluble if swallowed, and vice versa, due to variation in pH. Some materials, if swallowed, are readily excreted whereas others are concentrated in hair and fingernails. Suzette is superbly qualified to speak on this topic as she has married a prior career in nursing to her current one in geochemistry.

--- Marith

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Corporate Sponsorship of the Colorado Scientific Society (we'll repeat this from last month!)

Corporate sponsorship helps the Society continue to provide earth science-related talks, field trips, and other events to a broad cross-section of Front Range geologists and interested people. Please accept an invitation from the Colorado Scientific Society to become a corporate sponsor, enabling us to continue and expand our programs.

Cost: The annual rate for corporate sponsorship is \$200. Alternatively, sponsors may wish to support a specific event, such as underwrite the cash prizes at our annual Student Night competition, our awards to students at the Colorado State Science Fair, or support a field trip.

Benefits of sponsorship: All sponsors receive public acknowledgment for their support, including your company logo, name, and web address displayed in the CSS monthly newsletter and on our web page.

How to donate: The Colorado Scientific Society is a 501(c)(3) exempt organization, and contributions to it are tax deductible as charitable gifts and contributions. To donate and become a corporate sponsor, contact our Treasurer: Don Sweetkind, CSS Treasurer, email dsweetkind@usgs.gov.

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CSS outreach to non-science groups (repeating this too... please contact us if you would like to be on our list of volunteer speakers!)

As a follow-up to our participation in the March for Science, we'd like to compile a list of members who would be willing to give an occasional lecture or presentation to non-science audiences. Groups such as neighborhood organizations, churches, social groups (Elks, Rotary, etc.) sometimes ask for speakers and it would be wonderful to have a list of knowledgeable people on whom to call. We'd like to post willing speakers and their topics on our website, so that visitors to the site could see what topics might be easily available. If you'd like to participate, please email your name and topic to Pete Modreski, pmodeski@usgs.gov.

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COLORADO SCIENTIFIC SOCIETY, REMAINING TALKS AND TOPICS FOR 2017

Thur. Oct. 19 Suzette Morman, Crustal Imaging and Characterization, USGS: **Using Geoscience to Augment Environmental Public Health Studies**, 7:00 p.m., Shepherd of the Hills Church

Thur. Nov. 16 Simone Marchi, Southwest Research Institute, Boulder, **The Early Evolution of Earth—Fire from Above, Fire from Below**, 7:00 p.m., Shepherd of the Hills Church

Sun., Nov. 19 **Colo. Sci. Soc. Family Night at the Museum**, open house at the CSM Geology Museum, 4 to 7 p.m., hosted by Museum Director (and CSS Councilor) Dr. Bruce Geller.

Wed. Dec. 13 Marith Reheis, Emeritus USGS: **President's address**, at the CSS Annual Meeting and Holiday Potluck Dinner, starting at 5:30 p.m., Arbor House, Maple Grove Park

Our meetings are normally held at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood (May, September, and December will be exceptions this year). All are always welcome. Social time 6:30, meeting begins at 7. See www.coloscisoc.org for more info.

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Colorado Scientific Society dues are \$25 for regular members, **\$20 if dues renewals are paid before Jan. 31 of each year**, \$10 for corresponding members (outside the Colorado Front Range area) and only \$5 for students. A Lifetime Membership is now available, for \$395.00. Mail a check to the CSS or pay with a credit card using PayPal on the CSS website. Please contact CSS Treasurer Don Sweetkind at 303-236-1828 or dsweetkind@usgs.gov if you are uncertain of your dues or membership status. Extra payments to contribute to our Memorial Funds or Endowment Fund are always most welcome; you'll see a list of them on the membership form attached to this newsletter, or see our website at <http://www.coloscisoc.org/membership/dues.html>.

Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495 <http://www.coloscisoc.org>

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For more news & information about the Society, always check our website, www.coloscisoc.org, or search for us, Colorado Scientific Society, and “like” us on Facebook. Anyone can view our facebook page, whether you have an account or not, at <https://www.facebook.com/groups/511533159044226/>.

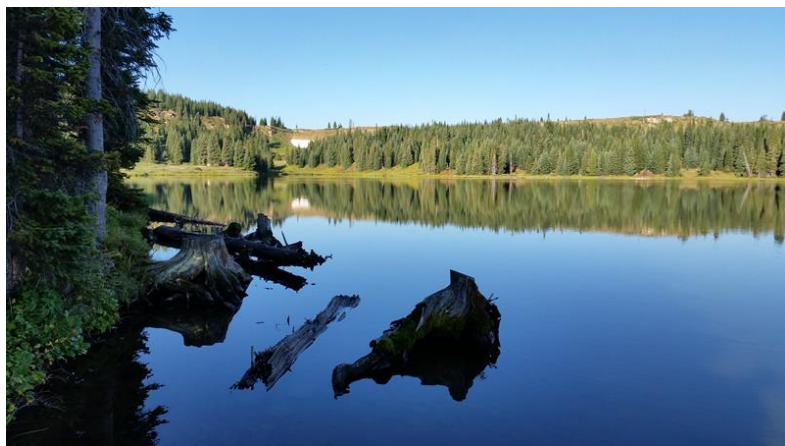


Your picture here! The CSS still has a number of Colorado Scientific Society March For Science Earth Day Shirts left from the 2016 event in which we participated. A collectors item! You can buy one, to wear proudly at CSS meetings, public events, or on your favorite field trip! Cost is \$20. If you contact one of our officers before the next meeting and tell them you want one, we'll make sure that the person who has them, brings some to our next meeting. I believe that that sizes L, XL, and XXL are available.

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August 26-27 Flat Tops – Devonian Field Trip

CSS had a successful (if fraught with some unforeseen crises) field trip to look at Devonian strata and fossils in the White River Plateau – Flat Tops area of Garfield County in August. First, the problem; erstwhile trip leader James Hagadorn, Geology Curator at the Denver Museum of Nature & Science “ran into a herd of deer” (literally) on I-70 near Eagle, on his way to the field trip. James was unhurt, though his vehicle was totaled. Having no idea what had happened to James, when he didn’t show up at the meeting place up on the White River Plateau (no cell phone service there), DMNS volunteer and colleague Linda Soar [center, in photo below] ably stepped up and filled in for him and led the trip. (Later, when someone drove down off the plateau into cell phone range, they were able to learn about his accident.) The weather was great and the fossils were doing their Devonian best to give our field trip party insights into “the end-Devonian event that snuffed out marine communities as well as land-going ones” [James Hagadorn, “Just the Facts”, The Aspen Times, Mar. 26, 2017]



From camp on White Owl Lake↑ Lew photographs a crinoid→

More photos, from this summer's earlier field trip. Peter Barkmann led this trip in South Park (around Hartsel) on June 25 for the CSS plus friends from the Florissant Scientific Society. (these photos, and the ones above from Flat Tops, courtesy of Cal Ruleman)



To quote from what Peter said about the Hartsel Quadrangle in the abstract of his 2016 CSS Presidential Address,
“Not only does the quadrangle sit at the geographic center of the basin, it is a nexus of major structural boundaries that define distinct blocks. One block is the prominent northwest-trending Precambrian basement-cored Hartsel uplift, while a second, Paleozoic sediment-cored block, meets it just to the north across a major fault. Mapping has help delineate the edge of the Central Colorado Trough

along the Hartsel block with evidence of fault boundaries, on-lap relationships, and proximal fan facies. The quadrangle also straddles a complex belt of deformation characterized by primary low angle west-directed thrust faults. ...”

(You can go back and read Peter's full abstract, with a map, in our December 2016 newsletter.)

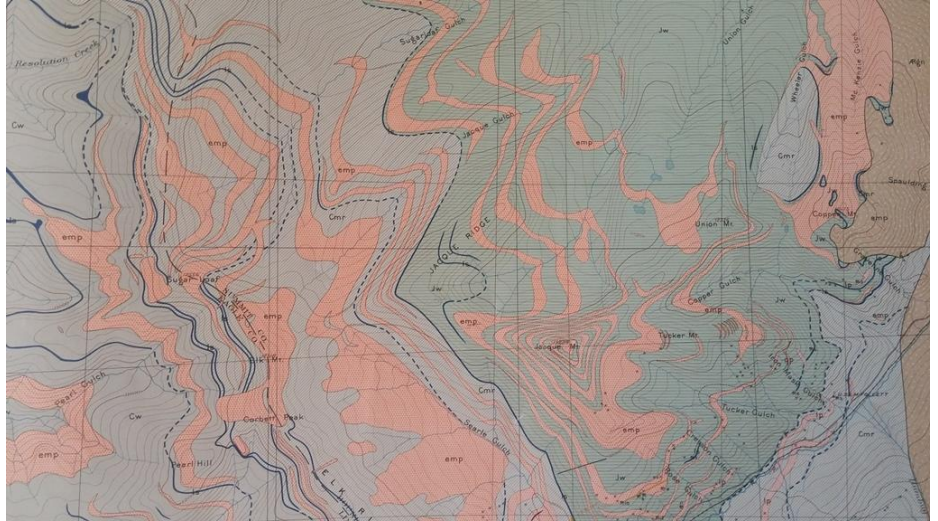


May & October's "Where is this rock?" Our May newsletter featured this image from a geologic map, and I asked who could tell where this what and what it showed. I skipped putting the followup in the September newsletter, so here it is, now. And if you happen to be reading this on Friday, Oct. 13 it will be particularly appropriate, because Oct. 13 is **Geologic Map Day** (a part of Earth Science Week). So, our answer. I'm guessing that many of recognized the area with this distinctive map pattern, but here's a reply that I received from CSS member Bob Kirkham:



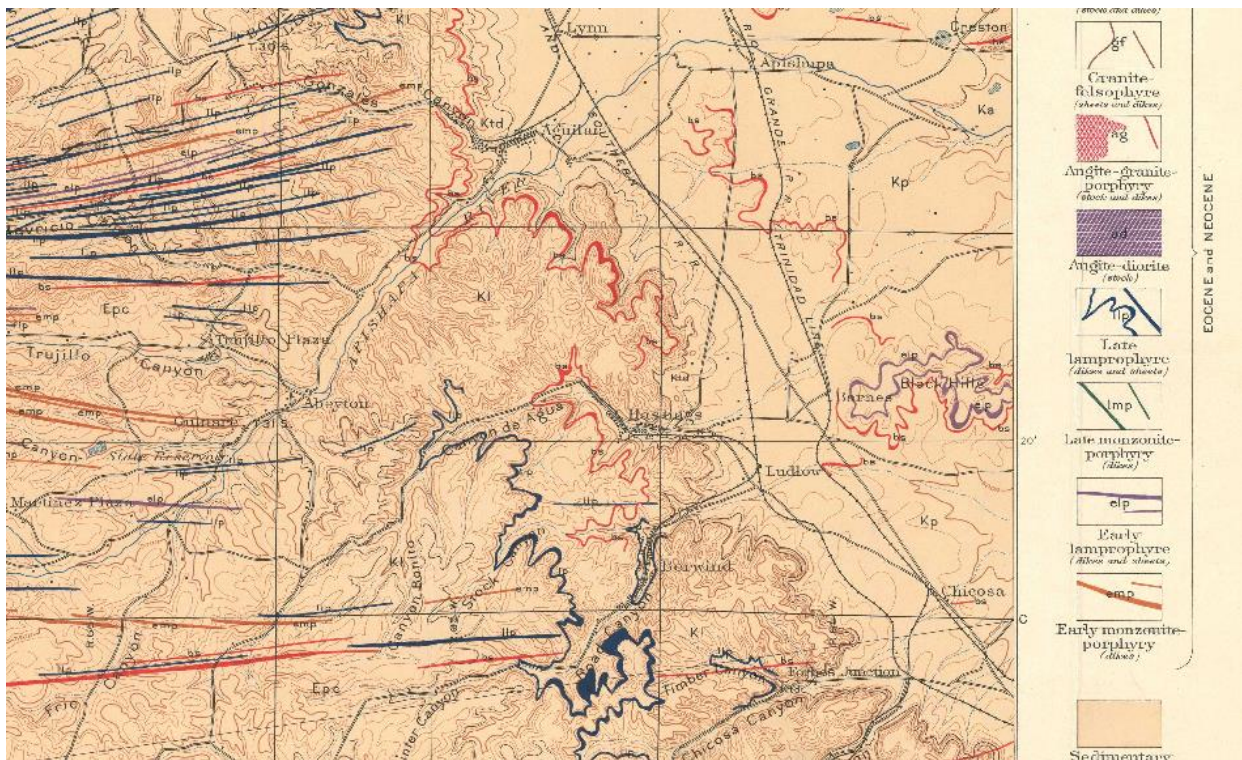
"The location is easy: southern end of Gore Range, north of the Climax tailings ponds & south of Copper Mtn ski area.

"Geologic significance: that depends on each person's interest. The striking thing about this map to me are the abundant, mostly Laramide age, igneous sills in the sedimentary section. Interesting that the seds in Jacque Ridge area are mapped as Juratriassic Wyoming Fm, now called the Penn/Perm Maroon, and that what now is the Penn Minturn was mapped as Carboniferous Maroon and Weber. The other interesting aspect is the numerous limestone beds in these rocks, including the Jacque Mtn limestone type locality.



"The Map: Emmons 1898 USGS Geologic Atlas Folio GF-48."

Bob got it all exactly right, of course. I really was impressed by the mapped outcrop pattern of these sills! I had purchased a copy of this atlas (Tenmile District Special Folio) at the "Garage Sale" of books, maps, and rocks that the CSM Geology Museum held last spring—I'm happy to have it! And so, continuing the geologic map theme, what can you say about my guess-the-map for this month, below? I'll even include part of the legend! ---Pete Modreski, CSS newsletter editor, pmodreski@usgs.gov



Theme days for Earth Science Week—half of these are past, but let me list them all. For full ESW information, see <http://www.earthsciweek.org/>.

Sunday, October 8

International Earthcache Day. Explore the world with this GPS scavenger hunt!

Monday, October 9

Earth Science Literacy Day. Learn the fundamentals of geosciences with *Earth Science: Big Idea*, a video series developed to explain why Earth science literacy is important.

Tuesday, October 10

No Child Left Inside Day. NCLI Day encourages students to go outside and research Earth science in the field like a professional geoscientist.

Earth Observation Day. Engage students and teachers in remote sensing as an exciting and powerful educational tool.

Wednesday, October 11

National Fossil Day. The fifth annual National Fossil Day is dedicated to promoting the understanding and appreciation of fossils.

Thursday, October 12

Geoscience for Everyone Day. Do your part to help young people from underrepresented communities explore exciting careers in the geosciences.

Friday, October 13

Geologic Map Day. Hosted by the U.S. Geological Survey, Association of American State Geologists, National Park Service, Geological Society of America, and Esri in partnership with AGI, this special event promotes awareness of the study, uses, importance of geologic mapping for education, science, business, and a variety of public policy concerns.

Saturday, October 14

International Archaeology Day. Hosted by the Archaeological Institute of America, this special event is a celebration of archaeology and the thrill of discovery.

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PREVIEW: Sunday, Nov. 19, Colo. Sci. Soc. Family Night at the Museum, An open house at the CSM Geology Museum, 4 to 7 p.m., hosted by Museum Director (and CSS Councilor) Dr. Bruce Geller. We'll have some special activities for kids and for adults. More in next month's newsletter!



Calendar of Coming Events

Oct. 8-14 is Earth Science Week, sponsored by the American Geoscience Institute and many cooperators (including the USGS). See more about it at <http://www.earthsciweek.org/>, including about public activities taking place in many towns throughout the U.S. One of these will be a **Geology Hike** on Green Mountain, Sunday, Oct. 15 led by Pete Modreski, in conjunction with a meeting of the Florissant Scientific Society, but all are welcome to join us for both the potluck lunch meeting and the hike (details below).

Sat., Oct. 14, Dinosaur Discovery Day, public tour day at Dinosaur Ridge, featuring **Girl Scout Day/National Fossil Day**, 10 a.m. – 2 p.m. “Girl Scouts of all levels can earn badge requirements. Girl Scout registration information will be posted as soon as the event is finalized. We’ll also be celebrating National Fossil Day with the National Park Service and many other special guests! Hands-on activities at the Visitor Center for all ages, and scientists will be along the Ridge interpreting fossils and geology for all attendees. Public welcome!” **Contact: Erin LaCount – tours@dinoridge.org**

Sat., Oct. 14, 8 a.m. – 5 p.m., Bighorn Sheep Canyon Geology Bus Tour , Arkansas River between Salida & Cañon City. Arkansas Headwaters Recreation Area (AHRA) Volunteer Geologist Bob Hickey will narrate an all-day bus tour on the geology of Bighorn Sheep Canyon between Salida and Cañon City on Saturday, October 14, 2017. The bus will depart Cañon City at 8:00 AM on US-50 and travel up the Arkansas River to the Salida East Recreation Site, then begin a slow return trip that will include a narrative description of the canyon’s unique geologic features as well as several stops where tour participants may get off the bus to view the geology up-close. A Public-Address system will be used and a printed tour-guide provided to aid in understanding.

The event, part of Fremont Fall Heritage Days, is sponsored by the Fremont County Historical Society (FCHS) with cooperation from the Arkansas Headwaters Recreation Area (AHRA) and the support of Raft Masters, who is providing the bus. Registration fee for the tour is \$40, which may be paid by check to FCHS, PO Box 965, Cañon City, CO 81215. Lunch will be available but it is priced separately. The tour is limited to 43 participants.

Registration information, itinerary, tour details and additional information is available at <https://www.fremontheritage.com/>. Look for the Bighorn Sheep Canyon Geology Bus Tour under Events. Further information is available from FCHS and (719) 285-8284.

Sunday, Oct. 15, 1:00 p.m., Earth Science Week Geology Hike on Green Mountain, Lakewood, CO

This hike, led by USGS geologist Pete Modreski, will be jointly held for members of the Florissant Scientific Society (FSS) and anyone from the public who wants to join us. The FSS is an informal group that holds monthly meetings or field trips, usually not actually in Florissant but at varied locations anywhere in the Front Range area. On this date, they will be meeting at the Dinosaur Ridge Visitors Center, 16831 W. Alameda Parkway, between Morrison, Golden, and Lakewood. The group will meet first at 12 noon for a shared potluck lunch (anyone is welcome to join us for this)—meeting in the upstairs level of the “barn” at the Visitors Center. After finishing lunch at about 1 p.m., we will say a few words about local geology, then drive to the Hayden Green Mountain Park trailhead on W. Alameda Parkway (opposite W. Florida Drive, about 2.5 miles east of the Visitors Center). We’ll hike up the trails to the top of Green Mountain, ultimately going to see some large petrified logs. The total (round trip) hiking distance will be a little less than 5 miles (it’s about 2.3 miles each way); if we begin the hike at about 1:30 p.m., we should be back by about 5:30. We will not leave cars at Dinosaur Ridge, because the Visitors Center and parking lot close and are locked up at 5:00 p.m. For the final part of the hike to reach the petrified logs, we have a permit from Lakewood Parks & Recreation to follow a normally blocked-off “social trail” along a ridge top and to walk off the established trails. The trail climbs about 600 feet in elevation from the trailhead to the highest point we’ll reach, by the radio tower. We’ll then be descending about 250 feet to reach the sites of the petrified logs—so, counting the return trip, the total elevation climb will be about 850 feet. On the way to Green Mountain, we’ll look at the location of some of the geologic contacts we pass between the Visitors Center and the trailhead, including the approximate location of the K-T boundary.

Please note, if the trails on Green Mountain remain excessively muddy due to the snow that we had we will NOT do this hike; instead, we’ll look at some of the newly observed fossil features along the road on Dinosaur Ridge. However, the forecast for the rest of the week and weekend is sunny and dry, so it looks like the trails should be OK for our hike.

All who wish to come on this hike are welcome to join us. It is not necessary to register in advance, but for questions or directions or uncertainty about the weather conditions on the 15th, please call or email Pete Modreski, cell 720-205-2553, email pmodreski@usgs.gov (weekdays) or pmodreski@aol.com (weekend).

USGS has available free copies of the **2017 Earth Science Week Teachers Packet**, containing classroom material (posters, calendars, activity ideas, etc.) for school or other educational use. The theme of the 2017 packet is “**Earth and Human Activity**”. Educators can pick up a copy at the USGS Library, Building 41, Denver Federal Center, Lakewood, CO, at the Reference Desk. The library is open 8 to 4 p.m. weekdays (closed on Federal holidays); see <https://library.usgs.gov/denlib.html> for directions. Most of the material in the packet is aimed at middle to high school level students.

Tues., Oct. 17, 7:00 p.m., Diversity in Cannabis sativa (a bit of what we know so far), by Dr. Daniela Vergara, Ecology and Evolutionary Biology, CU Boulder. CU Museum of Natural History, Paleontology Hall, University of Colorado, 1030 Broadway, Boulder. “Dr. Daniela Vergara will talk about some of our results on the diversity in multiple Cannabis varieties, including the variation we see in the whole genome, in the chemotypes (phytochemicals produced by the Cannabis plant) and in the genes related to cannabinoid production. This program is in conjunction with the exhibition Cannabis: A Visual Perspective, currently on display in the BioLounge.”

Thurs., Oct. 19, 7:00 p.m., Colorado Scientific Society October meeting, Suzette Morman, USGS, **Using Geoscience to Augment Environmental Public Health Studies**, at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood.

Fri., Oct. 20, 7:30 p.m., Colorado's newest mass extinctions, by James Hagadorn, DMNS. At the monthly meeting of the Littleton Gem and Mineral Club, Columbine Hills Church, 9700 Old Coal Mine Avenue, Littleton, CO 80123. “Colorado's sedimentary record likely warehouses three of earth's five mass extinctions, including the end Devonian, Permian-Triassic, and Cretaceous-Tertiary events. Although the K-T is well known, the end Devonian and P-T have been more challenging to identify in outcrop and in core. Recent stratigraphic, geochemical, and paleontological work in Dyer and Lykins Formations reveals the signatures of these two events, tracks them across Colorado's depositional basins, and hints at an untapped record of unusual environments, faunas, and signals across these intervals of time.”

Thurs., Oct. 26, 4:00 p.m., Colorado Stratigraphy, by Bob Reynolds, Denver Museum of Nature and Science. Colorado School of Mines, Berthoud Hall Room 241. See http://inside.mines.edu/GE_Lecture-Series for the full fall schedule.

Wed., Nov. 1, 4:00 p.m., A theoretical model of drumlin formation based on observations at Múlajökull, Iceland, by Neal Iverson, Iowa State. CU Geological Sciences Colloquium, Benson Earth Sciences 180; refreshments follow lecture. See <http://www.colorado.edu/geologicalsciences/colloquium> for the full fall schedule.

Thurs., Nov. 2, Jaelyn Eberle (University of Colorado, Boulder), Life at the Top of the Eocene Greenhouse World. Denver Museum of Nature & Science Earth Science Colloquium Series; VIP Room, DMNS

Fri., Nov. 10, 3:00 p.m., Raymond Rogers (Macalester College), Twenty Years of Paleontological Adventure & Discovery on the Great Red Island, Madagascar. Denver Museum of Nature & Science Earth Science Colloquium Series; VIP Room, DMNS; all are welcome, and museum admission is not required to attend. *[this talk had originally been scheduled for Sept. 22; data was changed]*

Thurs., Nov. 16, 7:00 p.m., Colorado Scientific Society November meeting, Simone Marchi, Southwest Research Institute, **The Early Evolution of Earth—Fire from Above, Fire from Below**, at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood.

Fri., Nov. 17, Colorado Science Teachers' Conference (full name: Colorado Science Conference for Professional Development). Held at the Denver Mart, 451 E. 58th Ave., and sponsored by the Colorado Association of Science Teachers (CAST) and other science educators organizations. For full info see <http://www.coloradoscienceconference.org/>

Fri.-Sun., Nov. 17-19, Denver Area Mineral Dealers Show, Jefferson County Fairgrounds, Golden CO.

Sun., Nov. 19, Colorado Scientific Society Family Night at the Museum, open house at the CSM Geology Museum, 4 to 7 p.m., hosted by Museum Director (and CSS Councilor) Dr. Bruce Geller.

Fri.-Sun., Dec. 8-10, Flatirons Mineral Club annual Gem and Mineral Show, “Rocks and Rails”. Boulder County Fairgrounds, Main Exhibit Building, 9595 Nelson Rd., Longmont, CO. Combined Gem and Mineral Show + Boulder Model Railroad Club Exposition; 10 a.m. – 5 p.m. each day. See <https://flatironsmineralclub.org/about/annual-fmc-gem-and-mineral-show/>.

Wed., Dec. 13, 5:30 p.m., Colorado Scientific Society Annual Meeting, Potluck Dinner, and President's Address, by Marith Reheis. At the Arbor House, in Maple Grove Park, 14600 W. 32nd Ave., Golden. Social time begins at 5:30, dinner at 6:00, program begins at 7:00 p.m.

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2017 DMNS EARTH SCIENCES COLLOQUIUM SERIES

Location: Denver Museum of Nature & Science, VIP Room (Enter the museum and make a hard left, pass the gift shop on your right, bathrooms on the left, and then the TRex Café on the right; the VIP room is at the far NE corner of the museum, just past the set of 3 TRex Café cash registers). Time: 3:00 - 4:00pm. * Museum admission not required to attend; all are welcome. *

Thurs., Nov. 2, Jaelyn Eberle (University of Colorado, Boulder), **Life at the Top of the Eocene Greenhouse World**
Fri., Nov. 10, Raymond Rogers (Macalester College), **Twenty Years of Paleontological Adventure & Discovery on the Great Red Island, Madagascar**. [*this talk had originally been scheduled for Sept. 22; data was changed*]
Tues., Dec. 5, Ellen Currano (University of Wyoming), **Seeing the forest through the leaves - from Ethiopia to the Rocky Mountains**

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For more lecture series during the year see:

Colorado Café Scientifique in Denver, monthly lectures on science topics held either at Blake Street Station or Brooklyn's, Denver; open to the public, no charge other than refreshments you may choose to purchase; see <http://cafescicolorado.org/>.

CU Geological Science Colloquium (Wednesdays, 4 p.m.) see <http://www.colorado.edu/geologicalsciences/colloquium>

CSU Dept. of Geoscience Seminars (Fridays, 4 p.m.), see <https://warnercnr.colostate.edu/geosciences/geosciences-seminar-series/>

Van Tuyl Lecture Series, Colorado School of Mines, (Tuesdays, 4 p.m.): http://inside.mines.edu/GE_Lecture-Series

Denver Mining Club (Mondays, 11:30), see <http://www.denverminingclub.org/>

Denver Region Exploration Geologists Society (DREGS; 1st Monday, 7 p.m.), <http://www.dregs.org/index.html>

Florissant Scientific Society (FSS); meets monthly in various Front Range locations for a lecture or field trip; meeting locations vary, normally on Sundays at noon; all interested persons are welcome to attend the meetings and trips; see <http://www.fss-co.org/> for details and schedules.

Rocky Mountain Map Society (RMMS; Denver Public Library, Gates Room, 3rd Tuesday, 5:30 p.m.), <http://rmmaps.org/>

Western Interior Paleontology Society (WIPS; Denver Museum of Nature & Science, 1st Monday, 7 p.m.), <http://westernpaleo.org/>.

CSS Officers for 2017

President..... Marith Reheis, 303-277-1843, marith16@gmail.com
President Elect..... Bob Raynolds, bob.raynolds@dmns.org
Past President..... Peter Barkmann, 303-384-2642, barkmann@mines.edu
Secretary..... Lisa Fisher, 303-215-0480, lisa.fisher@alumni.mines.edu
Treasurer..... Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov

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2016-2018: Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484
2017-2019: Jim Reed, jim@rockware.com
2017-2019: Chris Morrison, chris-morrison@comcast.net

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GSA Meeting Co-chairs, Lisa Fisher & Libby Prueher
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Hospitality Chair: Linda Barton Cronoble, 720-338-1237, lbarton1611@gmail.com
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