



Colorado Scientific Society

Newsletter of the Society

Sept.-Oct. 2019 (*revised*)

October meeting, Thursday, Oct. 17, 7:00 p.m.

social time 6:30 p.m., program at 7:00

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

Geology: It's not just for scenery anymore...

The National Park Service Geologic Resources Inventory

Tim Connors

National Park Service Geologic Resources Division,
Lakewood, Colorado

Many units of the National Park Service were set aside because of their unique geologic features and processes. Examples that come readily to mind are Yellowstone, Arches, Grand Canyon, Badlands, Mammoth Cave, and Mount Rainier. However, often a park's basic "geology" is overlooked as a significant natural resource and regarded as merely static features responsible only for the scenery. Aficionados of geology in the National Park Service and the Geologic Resources Division are making strides to change this perception and to promote the concept that geology is indeed, the "bedrock of the ecosystem". This talk will outline our inventory efforts since 1998 with products (digital geologic GIS maps, report PDFs, and list of park specific features, issues and processes) and overall status of progress for achieving this for some 270 NPS areas.



and

***Brooklyn Mine Geophysical Investigations,
Bonita Peak Mining District, Silverton, Colorado***

Beth Burton

U.S. Geological Survey

see more, following page!

The Bonita Peak Mining District was added to the Superfund National Priority List in September 2016 and includes 48 sites where mining-related contamination exists in the drainages of Mineral Creek, Cement Creek, and Upper Animas River in San Juan County, Colorado. The regional mineralization and ore emplacement are associated with the San Juan and Silverton caldera complex in the western San Juan Mountains. A once active gold mining district for decades, the presence of these mines and associated waste rock and tailings piles contribute to high heavy metal loads and acidity in surface and groundwater in the region.



The U.S. Geological Survey (USGS) and U.S. Army Corps of Engineers (USACE) collaborated on a pilot study at Brooklyn Mine, situated on U.S. Forest Service (USFS) land, to demonstrate the utility of selected ground-based geophysical methods to aid in characterizing abandoned mine lands (AML). This information will be used to inform remediation design strategies by USFS and to help prioritize strategies for other AML. Specific priorities for geophysical characterization at this site include: (1) identification of shallow groundwater seepage from settling ponds and through waste rock piles, (2) mapping of mine adits from the surface and determination of whether they are air- or water-filled, and (3) determination of the volume of waste rock that has accumulated and been reworked over time outside of the adit entrances. Preliminary results of the geophysical studies as well as an overview of the newly acquired airborne electromagnetic and magnetic survey acquired over the entire mining district will be discussed.

* * * * *



Bethany Burton is a geophysicist with the USGS Geology, Geophysics, and Geochemistry Science Center in Denver, Colorado. Since joining the USGS in 2002, she has been involved in applying geophysics to infrastructure, mineral and water resources, and environmental remediation studies both domestically and internationally as well as leading the potential field acquisition for several climate change-related airborne projects in Greenland and Antarctica. She is a past President of the Environmental and Engineering Geophysical Society and currently serves on the Geoscientists Without Borders technical committee. Beth received a B.S. in Geophysical Engineering and M.Sc. in Geophysics from the Colorado School of Mines.

* * * * *

Tim Connors is a geologist for the National Park Service Geologic Resources Division in Lakewood, Colorado since 1997. He joined the NPS after completing a B.S in Geology in 1991 and M.S in Geology in 1996, both from the University of Toledo (Ohio). He has also been a lecturer and has taught undergraduate geology courses at the University of Colorado Denver since 2008 (Physical Geology and Geology of Colorado), and a member of the Board of Directors for the Friends of Dinosaur Ridge (Morrison, Colorado; 1999-2014).

Tim's work takes him to NPS areas in Alaska, Hawaii / Pacific Islands, Virgin Islands, and the lower 48 states, allowing him to become familiar with numerous geologic terranes, processes and features of our wonderful planet and how they are often showcased in our National Park areas. He also works to develop digital GIS-based maps of our parks as well as developing databases to relay important information on geologic features, issues and processes that feed park planning strategies.

*We regret to announce... CSS Fall Field Trip, **CANCELLED** for insufficient registrants.*
We hope to reschedule the Oct. 5-6 trip, “Geology and Geoheritage of Florissant, Canon City, Garden Park, and Cripple Creek”, for some time next year—please look for announcements about it!

* * * * *

November meeting preview:

Archaeology of Peru’s North Coast: The Moche Culture and Beyond

Michele Koons, Denver Museum of Nature and Science

Thursday, November 14, 7:00 p.m. (social time 6:30)

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



December meeting preview:

CSS Annual Meeting & Potluck Dinner & President’s Address

Geological heritage: a new frontier for the Earth Sciences

Dr. Tom Casadevall, Scientist Emeritus, U.S. Geological Survey

Thursday, December 19, 5:30 p.m.

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



October's "Where is this rock?" Formerly a regular feature of this newsletter, I have neglected to include one for pretty much the whole past year. Let's give it a try this month! This photo shows an igneous dike, somewhere in Colorado, and to me, the most unusual thing about it is its juxtaposition with the country rock unit through which it cuts. Does anyone recognize it? Send your best guess to the editor, Pete Modreski, pmodreski@usgs.gov, or pmodreski@aol.com (use that address, and I'll be able to see your response over the weekend). Answer—and hopefully a new quiz photo—next month.



* * * * *

From the editor: I hope you all had a great summer! If you did not attend yourself, our Poster and Student Paper Night, held Sept. 19 at the Arbor House, went very well. It was great to see a good crowd of “younger” people at the meeting; the posters were interesting and provocative, the oral presentations were great, the sub sandwiches and other snacks were tasty, and the ale from Golden City Brewery was satisfying! Special thanks to Melissa Foster for arranging and introducing the program of presentations, and to Linda Barton Cronoble (assisted by Jim Cronoble) for arranging for and bringing the refreshments including especially the beer; and of course, to all the student and other presenters. Each student presenter, poster or oral, received an honorarium from CSS as well as a CSS commemorative mug or pilsner glass.

Calendar of Coming Events

Sat., Sept. 28, 9 a.m. – 3 p.m., **“Scout Day” at Dinosaur Ridge.** “Join us for Scout Day at Dinosaur Ridge. Scouts of all ages will have a fun-filled day of geology and paleontology. Cub Scouts and Webelos will be able to earn belt loops and academic pins. Boy Scouts will be able to earn their Geology Merit Badges. There will be amazing vendors such as: Mr. Bones, Western Interior Paleontological Society, USGS, Wildlife Experience, Rocky Mountain Bird Observatory plus Dinosaur Ridge volunteers at the paleontological sites along the Ridge AND manning hands-on activities such as gold panning, metal detecting, track painting, and fossil sifting at our Main Visitor Center. For more info, and to register in advance (\$6 for Scouts, \$5 for non-Scout accompanying friends/family) see <http://dinoridge.org/scout-day/> .

Wed., Oct. 2, 4:00-5:00 p.m., CU Geological Sciences Colloquium Series, Benson Earth Science Building Room 180, **“Origins of Evolutionary Innovation”** by Michael Travisano, University of Minnesota. Abstract:

“Innovation in biological systems is fundamental to life. The origin of life, multicellular organisms, species, and sexual reproduction all involve innovations. Understanding the basis for these and other major innovations is challenging. Many of them occurred billions of years ago, involve complex interactions and are not obviously experimentally tractable. The modern theory of natural selection appears to provide a sufficient basis for understanding these innovations, that innovations are largely the consequence of adaptation. This answer is appealing because biological innovations are clearly adaptive, as they provide benefits to the organisms that possess them. Numerous investigations have documented that living systems are the consequences of adaptive innovation, whether considering the fit of an species to its specific environment, the benefits provided by microbiomes to their hosts or even the basis for protein folding. But this begs the question: if the theory of natural selection is generally sufficient for understanding biological innovation, then how do major innovations arise? For example, how does life evolve from non-life?

All are also welcome at the Colloquium Social Hour after the Colloquium, 5 to 6 p.m., BESC 185, “An hour of science, socialization, and good food and drink!”

Thurs., Oct. 3, 4:00-5:00 p.m., **“Challenges in Returning Samples from Cold Solar System Environments,** by Julie Mitchell, NASA. Van Tuyl Lecture Series at Colorado School of Mines. Free and open to the public, every Thursday (except during term breaks) at 4 p.m., in Berthoud Hall Room 241. For the full Fall schedule see <https://geology.mines.edu/events-calendar/lectures/>.

Sat.-Sun., Oct. 5-6, the Colorado Scientific Society will host a weekend field trip, **“Geology and Geoheritage of the Florissant-Cañon City-Florence area”**. It will include Florissant Fossil Beds National Monument; Skyline Drive by Cañon City; the Cope-Marsh quarries at Garden Park; the “Shelf Road” to Victor; and the Cripple Creek and Victor Gold Mine. Travel will be by van; cost, \$30 for the trip, plus overnight motel lodging. You must be a CSS member to take part, but anyone may join the Society if they wish to go on the trip; see <http://coloscisoc.org/> or contact Cal Ruleman, cruleman@usgs.gov.

Tues., Oct. 8, 7:00-9:00 p.m. Western Museum of Mining and Industry Speakers' Bureau Lecture: **“Cripple Creek’s Cresson Mine: The Untold Stories”**, by Ben Elick. WMMI, 225 North Gate Rd., Colorado Springs. \$5 per person, free to museum members. RSVP to 718-488-0880 or rsvp@wmmi.org; to book in advance: <https://fareharbor.com/embeds/book/wmmi/items/108438/calendar/?flow=41147>

Thurs., Oct. 10, 4:00-5:00 p.m., **“The Problem of Predicting the Size Distribution of Sediment Supplied by Hillslopes to Rivers,** by Leonard Sklar, Concordia University. Van Tuyl Lecture Series at Colorado School of Mines. Free and open to the public, every Thursday (except during term breaks) at 4 p.m., in Berthoud Hall Room 241. For the full Fall schedule see <https://geology.mines.edu/events-calendar/lectures/>.

Sat., Oct. 12, 4-7 p.m., **Mines Museum Spooktacular** at the CSM Geology Museum (it’s now called simply the **Mines Museum**), Free, Family Friendly, Wear a Costume, Free Parking, Treat Bag Provided!

Oct. 13-19 is **2019 Earth Science Week**, sponsored by the American Geosciences Institute (AGI) and numerous sponsor and partner organizations, including the USGS. We at USGS have copies of a free ESW Teacher Packet (contains posters, calendar, booklets, etc.; the 2019 ESW theme is “Geoscience for Everyone”)

to give to teachers or anyone involved in some aspect of formal or informal earth science education. Sorry, we are not able to mail these out, but some are available at the USGS Library, or they can also be ordered directly from AGI, see www.earthsciweek.org, free but with a \$8.50 postage & handling charge.

Tues, Oct. 15, “Golden Beer Talks” at the Buffalo Rose, 1119 Washington Ave., Golden. Held on (usually?) 2nd Tuesdays. Doors open at 6; Talk begins at 6:35; Intermission – 7-7:15; Q&A/clean up 7:15-8. Here is the rest of the schedule for the Fall:

Oct 15, Donald Sweetkind, Geologist, USGS, “**From Uravan to Rulison: Tales from Colorado’s Nuclear Past**”

Nov 12, Bob Reynolds, Geologist, CSM Adjunct Prof and DMNS Research Associate, “**Australopithecines to the Anthropocene: A Geologist’s View of Where We Came from and Where We Are Going**”

Dec 10, Barb Warden, Goldentoday.com, “**Funiculars of Golden Colorado**”.

Thurs., Oct. 17, 4:00-5:00 p.m., “**Critical Metals for the Future**”, Yasushi Watanabe, SEG International Lecturer, Akita University. Van Tuyl Lecture Series at Colorado School of Mines. Free and open to the public, every Thursday (except during term breaks) at 4 p.m., in Berthoud Hall Room 241. For the full Fall schedule see <https://geology.mines.edu/events-calendar/lectures/>.

Thurs., Oct. 17, 7:00 p.m., **Geology: It's not just for scenery anymore... The National Park Service Geologic Resources Inventory**, by Tim Connors, National Park Service. Colorado Scientific Society monthly meeting, Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood; social time at 6:30; all welcome.

Sat., Oct. 19, 9 a.m. – 3 p.m., “**Girl Scout Day**” at **Dinosaur Ridge**. An event similar to Scout Day on Sept. 28; more info about this day will be forthcoming.

Sat., Oct. 19, 12 noon-3:30 p.m., **Littleton Gem and Mineral Club Silent Auction**, at Heritage United Methodist Church [new location], 7077 S. Simms St., Littleton. All are welcome. Seller setup at 11 a.m., silent auction begins at noon, verbal auction at 1 p.m., checkout starts at 3:30 p.m.

Mon., Oct. 28, 3:00-4:00 p.m., Denver Museum of Nature & Science Earth Sciences Colloquium, **Physical processes in carbonate sediments: Ooids, mud, hurricanes, and more**, by Lizzy Trower, CU Boulder. All are welcome. VIP Room at DMNS.

Thur., Nov. 7, 3:00-4:00 p.m., **Evolution of topography in the southern and Patagonian Andes**, by Mark Brandon, Yale. Denver Museum of Nature & Science Earth Sciences Colloquium. All are welcome. VIP Room at DMNS.

Tues. Nov. 12, 3:00-4:00 p.m., Denver Museum of Nature & Science Earth Sciences Colloquium, **400 Million Years on Six Legs: Evolution of the Insects**, by Michael Engel (University of Kansas); see <https://eeb.ku.edu/michael-s-engel#link3>. VIP Room, all welcome.

Thurs., Nov. 14, 7:00 p.m., **Archaeology of Peru’s North Coast: The Moche Culture and Beyond**, by Michele Koons, Denver Museum of Nature and Science. Colorado Scientific Society monthly meeting, Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood; social time at 6:30; all welcome.

Thurs., Dec. 19, 5:30 p.m., **Colorado Scientific Society Annual Meeting**, 2019 President’s Address (Tom Casadevall, USGS), and potluck dinner. Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood; all welcome.

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/>.

Colorado Scientific Society (3rd Thursday, 7 p.m.), see <http://coloscisoc.org/>. Meets at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood CO, except when noted.

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, (Thursdays, 4 p.m.): <https://geology.mines.edu/events-calendar/lectures/>

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

Denver Museum of Nature and Science, Earth Science Colloquium series, 3:00-4:00 p.m., VIP Room unless noted, day of the week varies. Museum admission is not required; see <http://www.dmns.org/science/research/earth-sciences/>

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.

Golden Beer Talks (2nd Tuesday, 6-8 p.m.), at the Buffalo Rose, 1119 Washington Ave., Golden. Doors open at 6; Talk begins at 6:35; Intermission – 7-7:15; Q&A/clean up 7:15-8. “Golden’s grassroots version of TED talks, Expand your mind with a beer in your hand”, <http://goldenbeertalks.org/>

Nerd Night Denver is a theater-style evening featuring usually 3 short (20-minute) TED-style talks on science or related topics; held more-or-less monthly at the Oriental Theater, 4335 W. 44th Ave., Denver; drinks are available; for ages 18+. Admission is \$6 online in advance, \$10 at the door. See <https://www.nerdnitedenver.com/>.

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

Western Interior Paleontological Society (WIPS); beginning January 2019, WIPS will meet on the 1st Monday of the month, 7 p.m., at Lowry Conference Center, 1061 Akron Way, Denver. See <http://westernpaleo.org/>.

* * * * *

2019 Colorado Scientific Society Officers, Councilors, and Committee Chairs

Officers

President..... Tom Casadevall, tcasadev@gmail.com, 720-244-7052

President-elect Jim Paces, jamespaces@comcast.net

Past President..... Bob Raynolds, bob.raynolds@dmns.org

Secretary..... Lisa Fisher, 303-215-0480, lisa.fisher@alumni.mines.edu

Treasurer..... Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov, or
dsweetkind@gmail.com

Councilors

2017-2019: Jim Reed, jim@rockware.com

2017-2019: Chris Morrison, chris-morrison@comcast.net

2018-2020: Pete Modreski, pmodreski@aol.com, 720-205-2553

2018-2020: Matt Rhoades, rhoadesgeo1@gmail.com

2019-2021: Linda Barton Cronoble, lbarton1611@gmail.com, 720-338-1237

2019-2021: Yvette Kuiper, ykuiper@mines.edu, 303-273-3105

Committee Chairs

Database Manager: Paul Morgan, 303-384-2648, morgan@mines.edu

Field Trip Chair: Cal Ruleman, 303-236-7804, cruleman@usgs.gov

GSA Meeting Co-chairs, Lisa Fisher & Libby Prueher
History Chair: Beth Simmons, cloverknoll@comcast.net
Hospitality Chair: Mary-Margaret Coates, geotechedit@gmail.com
Membership Chair: Bob Raynolds, bob.raynolds@dmns.org
Newsletter & Publicity: Pete Modreski, office 303-202-4766, cell 720-205-2553, pmodreski@aol.com
Outreach: Linda Barton Cronoble, lbarton1611@gmail.com, 720-338-1237
Past Presidents' Best Paper Award: Bob Raynolds, bob.raynolds@dmns.org
State Science Fair Awards: Chuck Weisenberg, 303-238-8806, cweisnbg@msn.com
Student Programs Chair: Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484
Student Research Grants Chair: Bob Raynolds, bob.raynolds@dmns.org
Webmaster: Chris Morrison, chris-morrison@comcast.net

* * * * *

The CSS website is www.coloscisoc.org. Anyone can also view our facebook page, whether you have a facebook account or not, at <https://www.facebook.com/groups/511533159044226/>. If you use facebook—please go there and “like” the CSS! (Just search there for Colorado Scientific Society.)

To pay dues online, please go to:

<http://coloscisoc.org/membership-payment/> Thank you!

* * * * *

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://coloscisoc.org/membership-payment/>. Or see <http://www.coloscisoc.org>. To pay by mail, send payments to: **Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495**



Above: at the April 18, 2019 CSS Past Presidents' Dinner, Mt. Vernon Canyon Club; Kilauea and Unmanned Aircraft Systems!