



Colorado Scientific Society

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

CSS Newsletter, April 2021 Meeting, Thursday, April 15

***Fluvial deposits of the Raton Basin:
Implications for Late Cretaceous-Paleocene
paleogeography and climate in the southern Rockies***

***Theresa Schwartz
U.S. Geological Survey and Colorado School of Mines***

Join our Zoom meetings after 6:45 Mountain Time, with short social time first; the meeting and program will begin at 7:00. The link to join our CSS April Zoom meeting will be:

<https://mines.zoom.us/j/99954259408?pwd=QW8vRDhjME9aMHI2djVsYTFXRmRIUT09>

Meeting ID: 999 5425 9408

Password (if needed): 895383

Or Telephone: Dial: +1 669 900 6833 (US Toll) or +1 253 215 8782 (US Toll)

This information is also posted on the CSS website; www.coloscisoc.org.



Abstract: The Raton Basin of Colorado-New Mexico, USA, is the southeasternmost basin of the Laramide intraforeland province of North America. It hosts a thick succession (4.5 km or 15,000 ft) of Upper Cretaceous to Paleogene marine and continental strata that were deposited in response to the final regression of the Western Interior Seaway and the onset of Laramide intraforeland deformation. The Upper Cretaceous-Paleogene Raton and Poison Canyon Formations were previously described as meandering and braided river deposits that

represented distal and proximal members of rivers that drained the basin-bounding Sangre de Cristo-Culebra uplift. This talk presents new observations of fluvial channel architecture that show that both formations contain the deposits of sinuous fluvial channels. However, they differ: Fluvial channels of the Raton Formation formed in ever-wet environments and were affected by steady discharge, whereas channels of the overlying Poison Canyon Formation formed in drier environments and were affected by variable discharge. The apparent transition in fluvial discharge characteristics was coeval with the progradation of fluvial fans across the Raton Basin during the Paleocene, emanating from the ancestral Sangre de Cristo-Culebra uplift. The construction of fluvial fans, coupled with the sedimentary features observed within, highlights the dual control of Laramide deformation and early Cenozoic climate patterns on the sedimentary evolution of the Raton Basin.



Biography: Theresa Schwartz is a research geologist at the U.S. Geological Survey in Denver, Colorado, housed in the Geosciences & Environmental Change Science Center. She is a clastic sedimentary geologist interested in tectonics and sedimentary basins with a broad research program that focuses on (1) sedimentology and stratigraphy of depositional environments, (2) understanding sediment routing within and between those settings, and (3) understanding tectonic and climatic drivers of sedimentation and paleoenvironmental change. To address these topics, Theresa uses a combination of field and geochemical methods including field mapping at various scales, sediment provenance techniques (e.g., petrography, detrital zircon analysis, bulk rock geochemistry), and paleoenvironmental analysis (e.g., stable isotope stratigraphy). Theresa received her BS in Geology at Allegheny College and her PhD in Geological & Environmental Sciences at Stanford University.

You can read more about all CSS programs and activities on our website, <https://coloscisoc.org/> . [Have you also looked at, and “liked”, our facebook site, and joined our CSS facebook group?]

Recent CSS presentations are recorded on Zoom. Follow the links on the website for each presentation to see abstracts, biographies of the speakers and video recordings of our meetings. [Note: Please ignore the “Transcript” text. It is wrong too often. Just listen to the narration on the video!]

Future Colorado Scientific Society Meetings and Field Trips

Our meetings will remain virtual for the spring months because of the COVID-19 pandemic. We hope to resume in-person meetings in the Fall, first a Past Presidents’ dinner meeting, and then back to Berthoud Hall at the Colorado School of Mines.

Thurs, May 13, Speaker and topic TBA *[note change from usual 3rd Thursday date]*

Thurs., Sept. 16: Past President’s Dinner/first planned F2F* meeting of 2021; at the Mt. Vernon Canyon Club

Thurs., Oct. 21: Emmons Lecture, tentative date; planned as a F2F meeting at CSM, Berthoud Hall

Thurs., Nov. 18: F2F at CSM, topic TBA

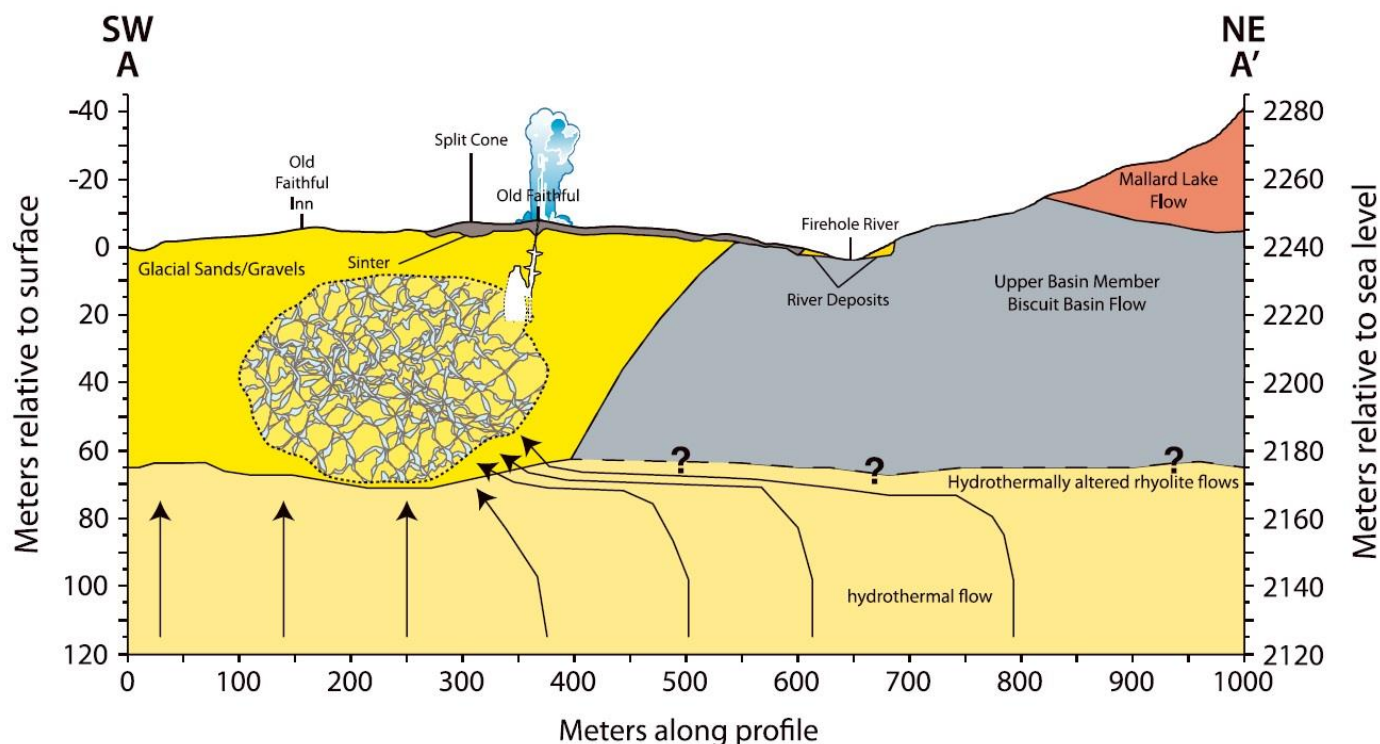
Thurs., Dec. 16: CSS Annual Meeting and President’s Address: F2F at CSM

**Your newsletter editor had to google to find out what F2F stands for. Face-to-face!*

Several field trips for CSS members are tentatively planned for this summer and fall, possibly beginning in August, including a trip to Marshall Mesa and the White Rocks Open Space areas (Cretaceous stratigraphy and

structure) in Boulder County. We'll keep you informed via our emails, newsletter, and the CSS website (and facebook page as well!).

Our March 25 meeting, an outstanding presentation by Robert B. Smith, "Old Faithful Anatomy and Magma from Earth's Core Fueling the Volcanism of Yellowstone, its Geysers and Hot Springs", was exceptionally well attended. Below is a reproduction of one of the figures from his presentation. A link to the archived presentation is given on our CSS website.



Old Faithful Geyser plumbing system

Colorado Scientific Society 2021 Memorial Fund Student Research Grants

The CSS awards a series of student research grants for field-oriented geoscience research projects, which may go to either graduate or undergraduate students. This year, we have received 20 grant applications from students at 13 universities nationwide. Our Student Grants committee is reviewing the applications, and the awardees will be notified by the end of April. Grants are made from the investment income from our five different Memorial Funds; typically, about 12-15 grants are awarded annually, in amounts ranging from about \$600-\$1000. You can read about the Memorial Funds and grants program on our website at <http://coloscisoc.org/grants/>.

If you have not yet done so, please pay your dues for 2021 to CSS! You may pay dues online, or print out a pdf of the membership form and mail it to us with a check. Continuing your membership in CSS will enable us to continue all our ongoing programs, including our field trips, virtual meetings, Student Research Grants, and more. We invite renewing members to consider making an additional donation to one or more of our Memorial Funds and Endowment Fund.

See <https://coloscisoc.org/join-donate/> for the online link to our membership & dues form. Regular CSS dues are \$25 (paid after Jan. 31; \$20 if paid before the end of January each year); Corresponding Membership (outside of the Front Range area) \$10; Student Membership (any level) \$5; Life Membership, \$395. Send your membership payment, if not done online through PayPal, to Colorado Scientific Society P.O. Box 150495 Lakewood, CO 80215-0495. Thank you!

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The Colorado Scientific Society officers and councilors:

President, Bruce Trudgill, Colorado School of Mines

President-elect, Ned Sterne, consulting geologist

Past-president, Jim Paces, U.S. Geological Survey

Secretary, Lisa Fisher, Escalante Mines, Inc.

Treasurer, Don Sweetkind, U.S. Geological Survey

Councilors: 2019-2021: Linda Barton Cronoble

2019-2021: Yvette Kuiper, Colorado School of Mines

2020-2022: Joe Sertich, Denver Museum of Nature & Science

2020-2022: Warren Day, U.S. Geological Survey

2021-2023: Lew Kleinhans, independent geologist

2021-2023: Karen Berry, Director, Colorado Geological Survey

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February and March - Where's That Rock? For the February picture I posted two photos of a stream gaging station and asked if anyone knew where and what this was. Here's a third photo of that site, that includes the sign posted at the roadside pulloff on NM-68, across the Rio Grande from it. It's the USGS stream gage at Embudo, NM, and as the sign says, it's "special". Established in 1889, it is the very "first gaging station established by U.S. Geological Survey". Established at the direction of USGS Director John Wesley Powell, with its classy cobblestone construction and red tile roof, you can read about it and see some historic photos at:



<https://www.usgs.gov/news/first-usgs-streamgage-records-125-years-measuring-new-mexico%E2%80%99s-vital-water-resources> . As you'll read there, "Ten years following the USGS's birth in 1879, and under the advisement of John Wesley Powell, the proposition to inventory the flow of all streams in the arid West and evaluate the potential for crop irrigation came to fruition in Embudo, N.M., on Jan. 1, 1889."

I don't believe anyone submitted a correct guess as to the location of the gage (please correct me if I'm wrong, and I missed seeing your email!).



Our **March Where's that Rock** award goes to **Chris Morrison** for the first correct reply received for this photo: "I think the picture is of Wagon Mound on I-25 and the Cimarron Cutoff of the Santa Fe Trail. Looking on Google Maps and online, I found Santa Clara Springs, NNW of the town, where a party of 10 was massacred by Indians in 1850. This led to the construction of Fort Union a little further SW along the

trail in 1851. Wagon Mound obviously has a basalt cap." Also to **Lynn Peyton**, who gets another award for giving a little more geologic detail: "I'm pretty sure that's Wagon Mound, NM, looking to the south. A basalt flow (~6 Ma) that's part of the Ocate volcanic field according to the New Mexico Natural History museum (<http://www.nmnaturalhistory.org/volcanoes/ocate-volcanic-field#:~:text=The%20ridge%20called%20Wagon%20Mound,%2C%20east%20of%20I%2D25>). I'm guessing that you will get many responses this month – there can't be too many geologists in town who haven't driven past and admired it on their way to Santa Fe or Albuquerque!"

Actually, these were the only two responses I received; but yes, I'm sure many of us have seen this distinctively-shaped lava-capped mesa, named as I've always been told, because its saddle shape reminds one of the top of a Conestoga wagon. I've been seeing it often, on trips back and forth to Albuquerque. The mesa cliffs show very nice columnar jointing. I once took the time to stop and hike up to it and around the base of the mesa; getting to the summit looked like more of a rock-climbing scramble than I was willing to do.



April quiz - Where's That Rock?

Lisa Fisher had posted this picture of an Amtrak train on facebook, from an article in OutThere Colorado on "Bill introduced to create passenger rail line

along Colorado's Front Range". Who recognizes where this is, and the geology of the rock formation visible here? Write your answer back to editor Pete Modreski, at pmodreski@aol.com .

