Colorado Scientific Society – Earth Sciences since 1882
The oldest scientific society in the Rocky Mountain region

Founded in 1882, the objective of the Society is to promote the knowledge and understanding of Earth science, and its application to human needs. Samuel Franklin Emmons, 1841-1911, was "Geologist in Charge" of the Colorado Division of the U.S. Geological Survey when it was established in 1879 and was the first president of the Society. We focus primarily on earth science, welcoming members with interests in all fields of science. **Learn more**.

March 2025 Colorado Scientific Society Newsletter

CSS March Meeting
Thursday, March 20, 2025 at 7:00 p.m.

Lava dams, Footprints, and Faults: some vignettes from the USGS luminescence dating lab in Denver, Colorado

Thursday, March 20, 2025
Harrison Gray, U. S. Geological Survey, Luminescence Dating lab

All are welcome – no admission charge
6:30 pm. – Come for our in-person social time
6:45 pm. – Join our online Zoom meetings
7:00 pm – Meeting and Program begin

Link to Join CSS March Meeting via Zoom

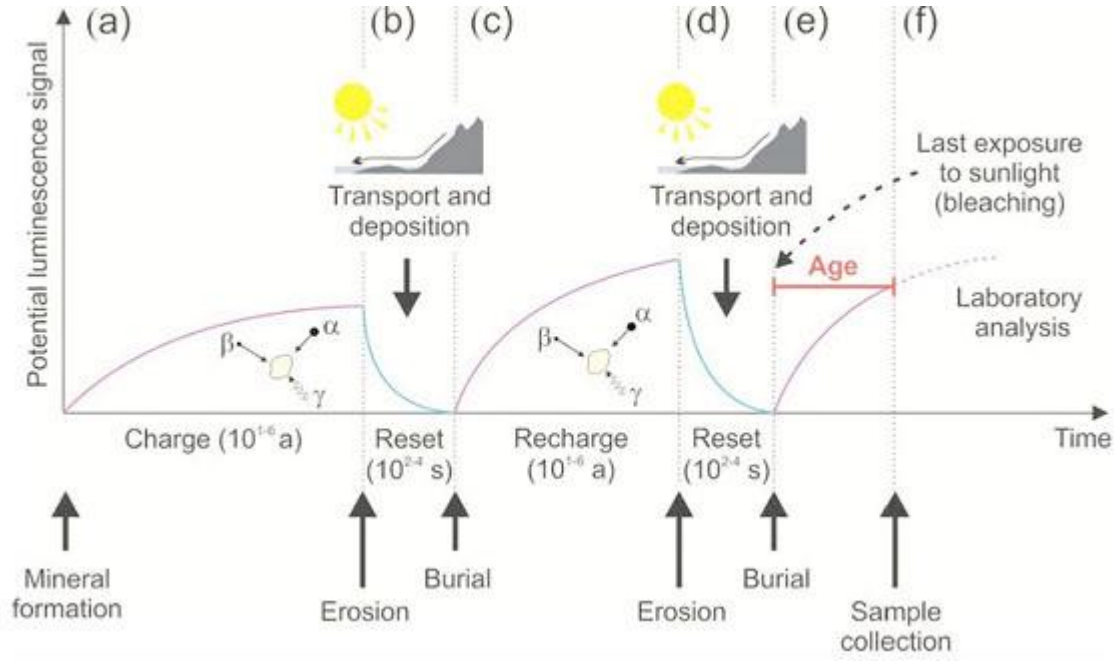
CSS invites you to our Zoom meeting on Thursday, March 20th at 6:45 pm.

Click to Join CSS Zoom Meeting
from PC, Mac, Linux, iOS or Android

Meeting ID: 844 3007 7095
Passcode: 431602

The details about attending the meeting in person at the Golden Calvary Episcopal Church follow the details about the talk.

Lava dams, Footprints, and Faults: some vignettes from the USGS luminescence dating lab in Denver, Colorado



How luminescence signals vary over time

Abstract: A lot has happened on planet earth over the past 200,000 years. Climate, erosion, and the distribution of people have all changed radically over that period. As scientists, we wish to know how, when, and why these changes occurred and to use this knowledge going forward. At the USGS luminescence dating lab, we use the physics of light, electrons, and minerals to figure out the "when." In this presentation, I start off with a primer on how quartz and feldspar sand can store electrons within their crystal structure and how we can measure these electrons to figure out how old a sample is. With this knowledge, we then consider some recent projects such as the enigmatic Chemehuevi Formation of the Colorado River, the use of luminescence dating towards the footprints at White Sands National Park, and how the erosion of meters-tall fault scarps reveals the hidden physics of erosion on Earth's surface. Each vignette is meant to give a thought-provoking snapshot into Earth's dynamic past for discussion and further speculation!

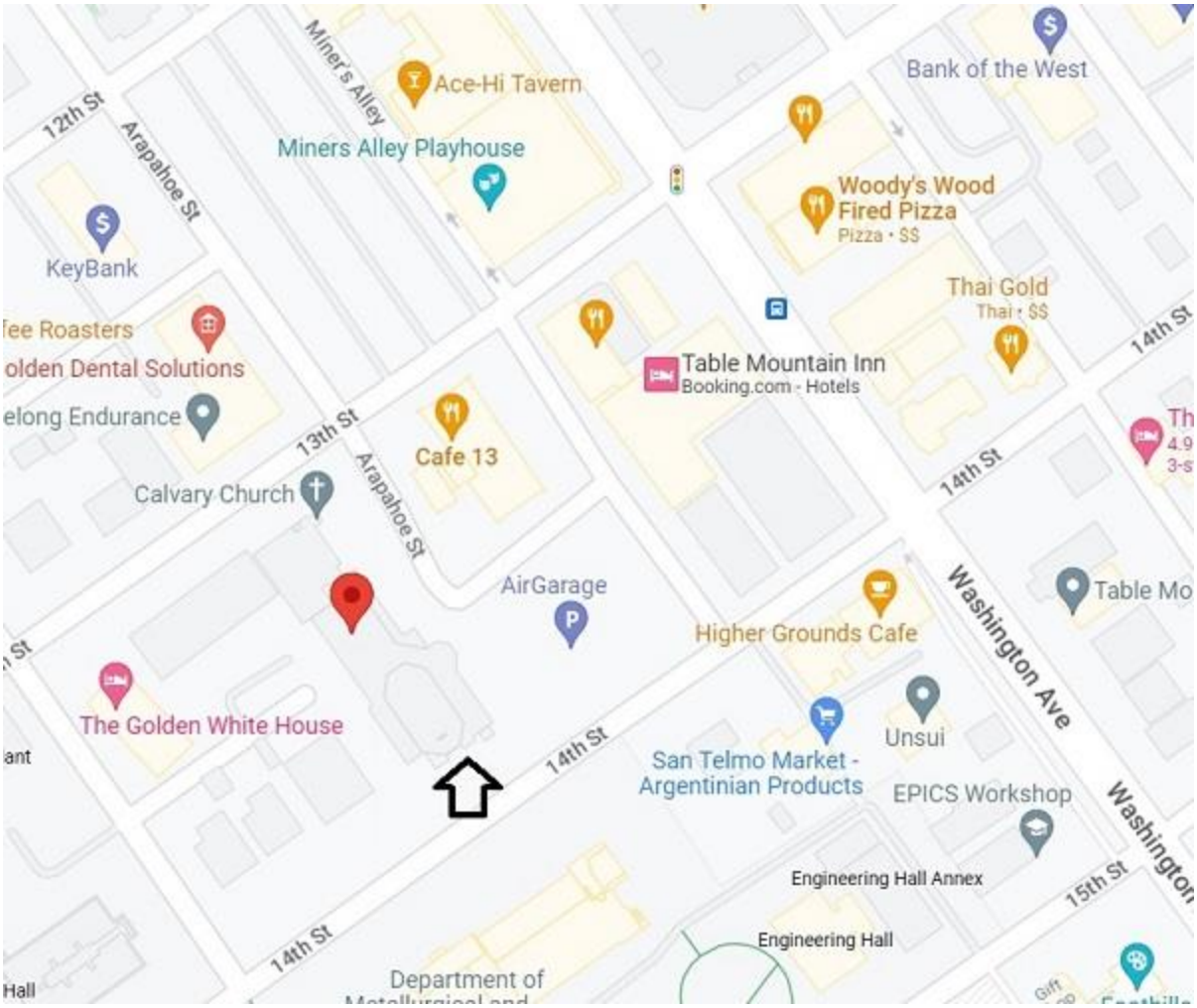

Harrison Gray

Harrison Gray, PhD is a Research Geologist at the USGS Luminescence dating lab in Denver, Colorado. Harrison applies luminescence dating to various USGS projects including geologic maps, natural hazards and beyond. Recent projects include dating sand deposits of the Colorado River in and downstream of the Grand Canyon, creating new two-dimensional “age maps” using a portable luminescence reader, and helping determine the age of footprints at White Sands National Park.

In-person Meeting at Golden Calvary Episcopal Church

All are welcome – no admission charge

6:30 pm – Social time begins at Golden Calvary Episcopal Church. Enter off 14th St.
6:45 pm – Join Zoom meeting, if attending remotely
7:00 PM – Meeting starts.
Please arrive early. Church doors are locked, and **no one will be at the door to let you in after 7:00 pm.**



Calvary Church in Golden. Enter at arrow on map.

1320 Arapahoe St, Golden, CO 80401
Click on link to open a Google map.
Enter off 14th St., going in via the main glass doors on 14th St.
Do **not** enter the old church above 13th St.
Go through building following the CSS signs to the Community Rooms 1 and 2, where we meet.
The church doors must stay locked, and we will have a person to let you in at the doors off 14th st.
They want to see the presentation too, so **please arrive before 7:00 pm.**
There will be a phone number that you can text to be let in if you arrive late.

Parking On street parking is available close by, west of Washington Ave in downtown Golden.
The AirGarage parking structure, which can be entered from Arapahoe St., is $3.00 for three hours.

Copies of ***The Geology of Boulder County*** by Raymond Bridge (2004) will be available for $20.

CSS April Meeting – Brunton in the 21st Century (Title TBD)

Thursday, April 17, 2025
Lauren Heerschap, Brunton Company

Standard Transit™ - Gold

Axis™ Transit - Orange

Brunton transits and compasses are made in Riverton, Wyoming, where Brunton has its headquarters.

See **Brunton.com** for more details about Brunton and their products.

Lauren Heerschap

Lauren Heerschap and her husband David are now co-owners of the Brunton Company. They developed and designed the Axis Transit. They are now co-owners of the Brunton Company. See more about their story at **https://www.brunton.com/pages/about-the-owners**
See this YouTube interview: **Measuring Rocks – Brunton CEO Lauren Heerschap** and find how Lauren became co-owner and CEO of Brunton.

David W. Brunton – Colorado Scientific Society Member


David W. Brunton

David W. Brunton was a Vice President of the Colorado Scientific Society from 1906-1908, and perhaps after that (records are incomplete). The following information is from ***History of the Colorado Scientific Society from 1882 through 2002*** (PDF) on page 17:

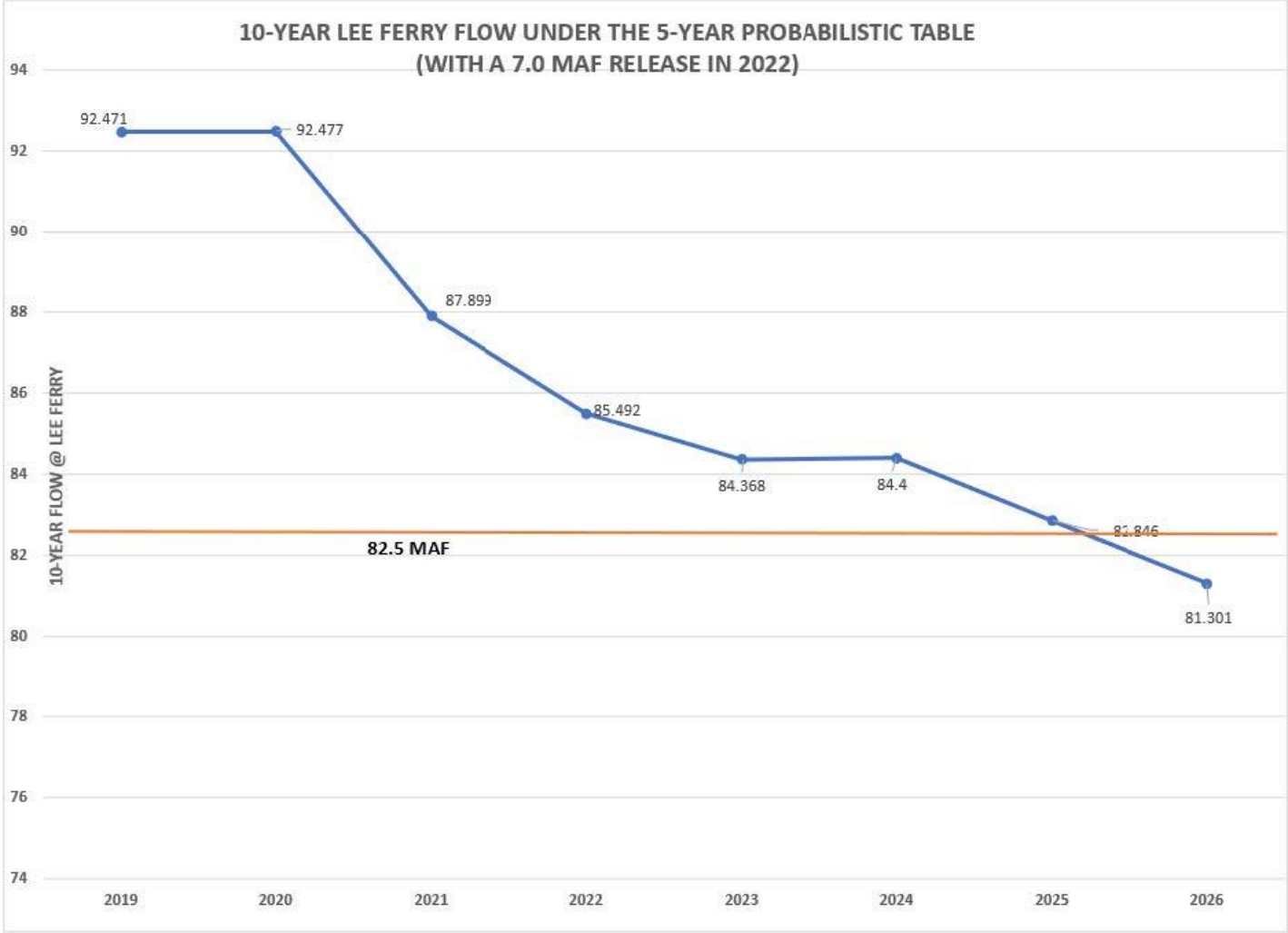
"David W. Brunton (1849-1927) was a mining engineer. He invented the pocket transit, or Brunton compass, for miners and mining engineers; it has been used for many years by geologists doing geologic mapping. Brunton worked on the Toronto and Nipissing Railroad and at surveying and plotting several Colorado towns. He served as chairman of the board of engineers of the Moffat-Evans Tunnel Commission. He wrote a book on tunneling and published several papers on mining districts. Brunton was a member of several mining organizations in the U.S. and Britain. He was awarded medals for his achievements in the mining industry."

Following the section about Brunton is a section on William Ainsworth, a watchmaker and jeweler. Brunton had Ainsworth manufacture his Brunton Pocket Transit under license. Ainsworth's company continued to make Brunton's transit, moving manufacturing to Wyoming in 1972.


Brunton Pocket Transit

CSS May Meeting and Emmons Lecture
"The Consequences of the Compact Remains with Us": Challenges and Opportunities for the Colorado River Upper Basin

Thursday, May 15, 2025
Eric Kuhn, retired general manager of the Colorado River Water Conservation District



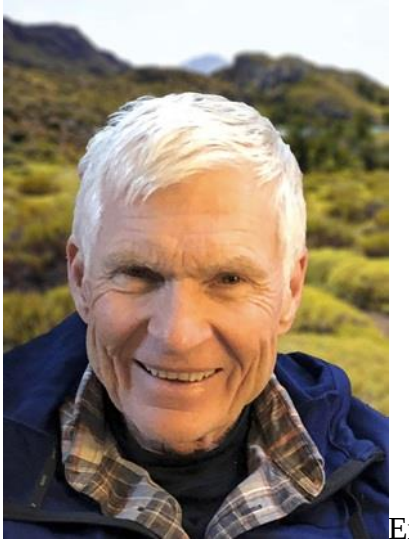
10-Year Lee Ferry Flow Under the 5-Year Probabilistic Table (With a 7.0 MAF Release in 2022)

Abstract:
Declining Colorado River flows are exposing critical ambiguities in the "Law of the River", the interlocking set of Compacts, statutes, and court decisions that frame management of the river and the allocation of its waters. Perhaps most important among those is an apparent conflict between Article I of the Colorado River Compact, which calls for the "equitable division" of the river's waters, and Article III, which is interpreted as creating a firm delivery obligation of water from the river's Upper Basin to the Lower Basin. This apparent conflict has been papered over for decades with surplus water deliveries, but with climate change depleting the flow of the river, we are approaching a point where that is no longer possible, and a continuation of current practice would place the bulk of the burden of responding to climate change on the Upper Basin. That would hardly be "equitable". We argue this places a burden on the Upper Basin to choose among a narrow set of paths forward – 1)

continuing with the status quo in hopes of negotiating more favorable near-term rules, 2) taking a hard line with the attendant risk of litigation, or 3) seeking a more equitable long term agreement.

Keywords: Colorado River, Colorado River Compact, demand management, curtailment, Upper Basin obligations, water conservation

Download *Science Be Dammed Working Paper Number 3*, Kuhn, Eric and Fleck, John, from: **https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4094375**


Eric Kuhn

Biography: Eric Kuhn is the retired general manager of the Colorado River Water Conservation District and co-author with John Fleck of *Science Be Dammed: How Ignoring Inconvenient Science Drained the Colorado River*, University of Arizona Press, 2019.

The Colorado River District is the largest and oldest of Colorado's four conservation districts. It covers most of the Colorado River Basin within Colorado. Almost two thirds of the flow at Lee Ferry originates in or flows through the district. Eric started employment with the Colorado River District in 1981 as Assistant Secretary-Engineer. In 1996 he was appointed General Manager, a position he held until his retirement in 2018.

From 1994 through 2001, he served on the Colorado Water Conservation Board representing the Colorado River mainstem. Eric served as an at-large representative on the Colorado Inter-basin Compact Committee, from 2005 – 2018. He also served on the Engineering Advisory Committee of the Upper Colorado River Compact Commission from 1982 -2019. Prior to working for the Colorado River District, he served as an engineer officer aboard nuclear submarines in the U.S. Navy and worked as a nuclear start-up engineer for Bechtel Power Corp. In addition to Science Be Dammed, a book about Colorado River hydrology and politics, Eric has authored or coauthored numerous other articles and papers about the Colorado River.

Research Interests: How climate change is impacting the operation of the major Colorado River system reservoirs and the rules and laws that govern Colorado River water use. How our understanding of the hydrology of the Colorado River has evolved with the law of the river.

Past Presidents' Dinner

Tarryall Valley: Gold, Glaciers, and Giants

Thursday, September 18, 2025
Mark Hanson

Mark Hanson is a geologist, historian, and author of the upcoming book ***Tarryall Gold: From Rush to Hush***. He profiles the miners, mines, cabins, and their resulting patina on today's Tarryall Valley. A resident and owner of several patented gold claims, Mark peels back 160 years of rust and reforestation to reveal a time capsule showcasing yesterday's rush, and today's hush.

CSS October Meeting – OPEN

Thursday, October 16, 2025

CSS November Meeting – Posters and Lightning Talks

Thursday, November 20, 2025

CSS December Potluck, Business Meeting, and Past President's Address

Whiskeytown boulder sampling to elucidate wildfire history and role in debris flows using luminescence

early December
Shannon Mahan, U. S. Geological Survey

Please pay your CSS dues for 2025!

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.

See **Membership and Donations** for the CSS membership PDF and our online membership payment form.
Regular CSS Membership is $25;
Student Membership, $5;
Life Membership, $395.
Send your membership payment, if not done through **our online membership payment form**, to Colorado Scientific Society P.O. Box 150495 Lakewood, CO 80215-0495.
Thank you!
New and renewal memberships in November and December are also good for the next year.

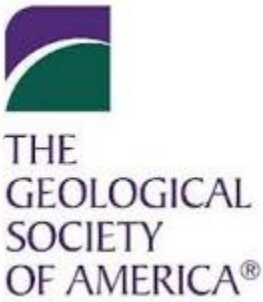
Read past Colorado Scientific Society Newsletters

Archive of Past Colorado Scientific Society Meetings

About the Colorado Scientific Society

The Colorado Scientific Society was founded in 1882 as a forum for the exchange of observations and ideas on the topics of earth science. Lecture topics largely focus on earth science, and are open to the public. In addition to our monthly lecture series, the society is also active in public service. We fund student research grants, construct and post signs that describe local geologic features, and organize and lead field trips.

The Colorado Scientific Society normally **meets on the third Thursday of the month from September through May**. (In the summer months of June-August, too many members are out in the field.)
6:30 – Social time at in-person meetings
6:45 – Join Zoom meetings
7:00 – Meeting and Program begin



The Colorado Scientific Society is an Associated Society of the **Geological Society of America**

Please send comments about the Colorado Scientific Society website to **ColoSciSoc.webmaster@gmail.com** .

We meet at the **Golden Calvary Church** and appreciate them sharing their facilities.

We have our December Business Meeting and Potluck Supper at **New Terrain Brewing Company** and appreciate their support.

We appreciate the support for our website by **Table Mountain Web Design**.