UTAH GEOLOGICAL ASSOCIATION NEWSLETTER

P.O. Box 526356 – Salt Lake City, UT 84152

The Utah Geological Association is a non-profit organization of geologists and other geoscientists that share a common interest in Utah's geology.

VOLUME 56, NUMBER 3 **MARCH 2024**

MARCH UGA LUNCHEON MEETING
11:30 am Lunch - 12:00 pm Presentation
MONDAY, MARCH 11, 2024
UTAH DEPARTMENT OF NATURAL RESOURCES BUILDING
1594 W N Temple St, Salt Lake City, 1st Floor; Room 1040/1050

DYNAMICS OF ROCK ARCHES AND TOWERS

Dr Jeffrey Moore
University of Utah

Utah's rock arches and towers are dynamic geological features constantly vibrating in response to natural and anthropogenic energy sources. Measured vibrational characteristics are, in turn, controlled by rock mechanical properties, forming the basis for a non-invasion method of structural health monitoring. We measure the resonance properties and vibration response of prominent landforms in Utah, establishing baseline data and searching for trends that indicate reversible and irreversible change. Our results help inform questions of

conservation and public safety for some of the world's most iconic geological features.

Biography: Dr. Jeffrey Moore is an associate professor of Geology & Geophysics at the University of Utah. His research interests focus on processes controlling rock slope failure, in-situ and remote monitoring for structural health sensing and investigating the hazard and impacts of large landslides. Dr. Moore spent several years studying rock slope hazard assessment and monitoring at ETH Zurich after completing his PhD in 2007 at the University of California, Berkeley.

****** **LUNCHEON LOCATION** ******

Please join us at 11:30 am on **Monday, March 11th** in the **Utah Geological Survey Core Center** (240 N Redwood Rd, SLC UT 84116). Lunch will be served at 11:30 followed by the speaker presentation at noon.

Please RSVP at the link below, so the UGA does not over order lunches, make sure to RSVP and pay for your lunch by **Thursday March 7th by 4 pm**. UGA will order enough food to cover those who RSVP. You are more than welcome to attend without having lunch.

https://utahgeology.org/events/july-2023-uga-luncheon

UGA Remote Meeting Information
Google Meet: https://meet.google.com/ihv-bxyx-xrh
Or dial: 1289 (US) +1 520
PIN: 196 674 907#

UGA PRESIDENT'S MESSAGE

March is a time of transition. In the northern Mid-Latitudes, as we welcome the arrival of the vernal equinox, we experience more sunlight hours, warming weather trends, and the emergence of floral and faunal life from a winter slumber. Every individual's verve for this change depends strongly on their preference for either skis or hiking boots, I suppose, and you can easily see Phoebe's fondness for the fluffy white stuff beneath her paws.

Never an organization to slumber, the UGA entered March in full stride, and I'm pleased to announce the winner of the 2024 Utah Earth Science Teacher of the Year (TOTY) Award: **Mr. Benjamin Ray** of Park City High School! Described by one of his nominators as a "powerful facilitator of learning" with a "servant's heart", Ben teaches Earth Science courses that focus on Utah's natural resources from groundwater to fossil fuels to geothermal to minerals. His curriculum includes science-based activities and case studies of real-world situations where the inherent worth of natural resources is balanced against considerations for sustainability and conservation. To demonstrate the value of empirical practice so important to geology, Ben even takes his students on a field trip to a local sandstone quarry.

I encourage all UGA members to join me in congratulating Ben Ray at our March Luncheon where we will host the TOTY winner and share more details about his teaching accomplishments. I even hope to encourage Ben to read aloud a few snippets from his teaching philosophy statement, which many of us found highly impactful to his application.

There are many people who work behind the scenes to make these moments happen and I would like to thank **Matthew Affolter** (TOTY Committee Chair) and the **UGA Officers** for their thoughtful and considerate assistance in selecting this year's winner. The **Utah Geological Foundation** has graciously agreed to begin funding the TOTY

award this year and will continue doing so in perpetuity in alignment with their mission.

With all that done, we still have more work to do. Because the UGA is part of a larger network of professional geologic societies throughout the country that participate in the Earth Science Teacher of the Year award program, the UGA TOTY recipient will be automatically entered into the "Section-Level Award" that is organized by the Rocky Mountain Section of societies. UGA nominees have had success at the next level in recent years, winning the Section-Level Award three times since 2018! For those of you who are interested, details on the Section-Level Award can be found at this website, which is a little outdated from 2021: https://www.aapgrms.org/rms-teacher-of-the-year/.

Looking ahead to April, the UGA will continue our core mission to recognize and celebrate geologists by announcing the winners of the **Utah Geology Field Camp Scholarships**. Stay tuned throughout the spring months as the UGA continues the tradition of celebrating all things geology and awarding those whose meritorious work is deserving of recognition.

UGA President
Eugene Szymanski
eugenes@utah.gov

2024 UGA TEACHER OF THE YEAR

The UGA Board is pleased to announce that Benjamin Ray is this year's recipient of the Utah Earth Science Teacher of the Year Award. Ben has been teaching for 18+ years and his current role is a Geology & Earth Science teacher of grades 10-12 at Park City High School. He also teaches other science courses—including physics, chemistry, and biology. Ben was nominated for this award by a former student who cited the impact that Ben had on their understanding and appreciation of the

natural world. According to his nomination package, Ben's philosophy in his high school curriculum focuses on meeting young adults where they are in their current understanding of the world. In addition to the basic science that underpins natural resource exploration and characterization, he teaches his students to be introspective, pondering their own interactions with these often finite resources and encourages them to consider their own consumption. Creatively, Ben uses popular media to drive home some of his teachings. In his teaching philosophy statement, he specifically cited student's excited reaction to the movie *Dune* with its focus on interplanetary strife caused by the limited and valuable "spice"—an interesting corollary to conflicts that we see in our modern world. Ben is also highly respected by his colleagues who have characterized him as *"flexible, patient, and resilient"* as well as *"committed and passionate"*. To share verbatim another of the many laudatory comments in each of his support letters, *"Mr. Ray is a master teacher who continues to love students and learning."* Therefore, it is with great pleasure that the UGA awards Ben Ray for his outstanding efforts in educating our youth on important earth science topics. Congratulations!

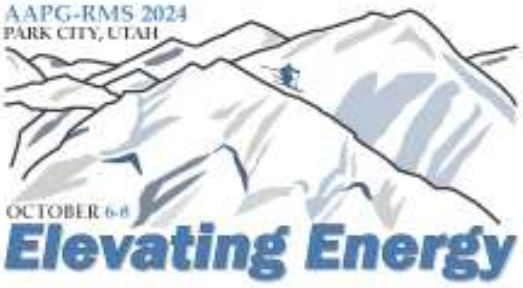
NEW MEMBERS APPROVED BY THE UGA BOARD

Matt Novak	Professional Member
Matthew Morris	Professional Member
Shawn Willsey	Professional Member (invited Speaker)
Marc Deshowitz	Professional Member
Peyton Fausett	Student Member
Tyler Knudsen	Professional Membership
Liz Mahon	Professional Membership
Lee Carly	Professional Member

Save the Date!

American Association of Petroleum Geologists
Rocky Mountain Section Annual Conference

Park City, Utah: The Yarrow October 6-8, 2024



Hosted by: UGA UTAH GEOLOGICAL ASSOCIATION

Visit the website! *www.rms-aapg2024utah.com/*

Technical Program Highlights

- Uinta Basin: The Basin that Keeps on Giving
- The Resurgence of the Paradox Basin
- Rocky Mtn. Basins: Don't Forget about Petroleum
- Geothermal in the West
- Geologic Aspects of Carbon Storage
- The Intersection of Petroleum & Critical Minerals
- 20 years after Covenant Field
- Energy and Environmental Justice

Field Trips

- Considerations for Carbon Storage in Eolian and Marine Siliciclastic Systems, San Rafael Swell
- Energy Exploration in Ancient Lacustrine Systems: A Focus on the Green River Fm. in the Uinta Basin
- A Geologic Transect through the Eastern Uinta Basin
- A Circumnavigation of the Great Salt Lake with Discussions on Critical Minerals, Geomicrobiology, and Lacustrine Evaporite Deposits

2024
Phase 2!

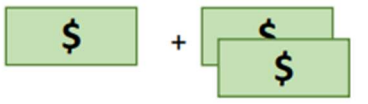
UGF
UTAH GEOLOGICAL FOUNDATION

Building an endowment to support Utah student scholarships!

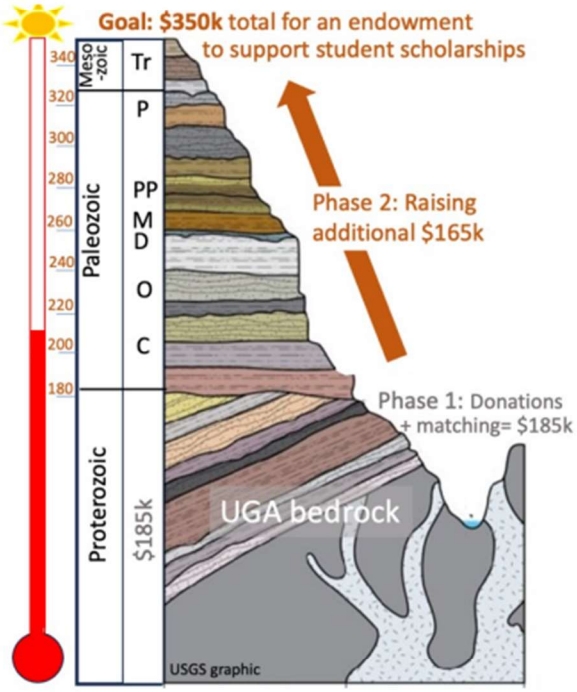
Thanks to many tremendous donations over last year, UGF's current endowment is at ~ $207k, putting us past the Phase 1 goal of $185k. The UGA board recently voted to put up an additional $70k matching to incentivize reaching our Phase 2 of a total endowment of $350k. This Phase 2 goal will position the UGF to be able to fund the current level of scholarships into the future. For the Phase 2 UGA 2:1 matching for every Phase 2 gift we receive, UGA will match it $2 for every single $1 donated.

Thus, in the goal graphic below, UGF has stepped over the "great unconformity" and is now in the lower Paleozoic, hoping to reach the top rim in the classic trail of time!

Please consider a 2024 gift. If we can achieve another $35k in donations, those gifts will be matched 2:1 with new UGA funds of $70k. This Phase 2 push will put us within reach of the making it to the very top!



= long-term scholarship for Utah students



https://utahgeology.org/foundation

Foundation to support Utah student scholarships
UGF Federal Tax ID number is 87-3778675.

Donation checks can be sent to:
Utah Geological Foundation
1244 E Spring Ridge Drive, Sandy UT 84094

SOUTHWEST UTAH GEOLOGICAL ASSOCIATION NEWS

The Southwest Utah Geological Association (SUGA) held its first meeting February 12 on the campus of Utah Tech University (UT). Twelve geoscientists were in attendance. Craig Morgan made a presentation on the history of the Utah Geological Association (UGA) and the many activities the association is involved with. There was a short discussion about the relation between SUGA and UGA and how we hope to interact. We then streamed the UGA presentation by Eytan Bos Orent of the University of Arizona. Following the presentation Alex Tye led the business meeting during which we decided what offices we want to make up the SUGA Board. We then encouraged people to volunteer to fill the positions.

The results are:
President: Craig Morgan
Treasurer: Jason Blake
Secretary: Jessica Castleton
UT Rep: Alex Tye
SUU Rep: Grant Shimer

The three offices (President, Treasurer, and Secretary) were filled with members that have extensive experience with UGA. Their experience will be helpful in getting SUGA up and running. Election of new officers will be at the beginning of the fall semester. We hope to fill some or all of the three offices with student members. The Office of UT Rep and SUU Rep are, and will be in the future, filled by university faculty members.

SUGA will not be holding a meeting in March due to spring break. Although many SUGA members may log in to the UGA presentation from their home computers. The April meeting will be hosted by SUU. Details will be provided in the April newsletter.

Association for Women Geoscientists

2024 Utah Chapter Scholarships & Awards

Student Scholarships

Susan Ekdale Undergraduate Field Camp Scholarship
up to $3000

Student Research Scholarship (conference travel for undergraduate and graduate)
up to $500

Professional & Nomination Awards

Lee Allison Professional Development Award
up to $800

Outstanding Student Award (undergraduate and graduate)
up to $750

Deadline to apply: March 15, 2024

All women studying in Utah, or researching Utah geology are eligible to apply. This includes cis-gender, transgender, gender fluid and non-binary persons

AWG UTAH CHAPTER

AWG

Information on how to apply:

TOBACCO ROOT GEOLOGICAL SOCIETY
49th ANNUAL FIELD CONFERENCE
COLUMBUS, MONTANA JULY 25 – 28, 2024

View to the southeast of the deformed rocks of the Stillwater Complex, Beartooth Mountains, Montana. Photo by USGS

CALL FOR FIELD TRIP LOGS, PAPERS, AND CONFERENCE/SYMPOSIUM VOLUNTEERS

Join us for the 2024 TRGS Field Conference in Columbus, Montana, July 25-28. We seek field trip logs, papers, and trip leaders to address specific geologic topics of the Yellowstone and Stillwater valleys, the Beartooth Mountains, and the regional geology of south-central Montana. Current tentative field trips include (but are not limited to):

Stillwater Complex Traverse (full day): Visit the layered metal deposits of the Stillwater Complex and discuss new age determinations, Lidar surveys, and interpretations of the origins of mineralized deposits.

East End Stillwater Complex Structural Traverse (full day): Revisit the east

end of the Stillwater Complex with new insights into the structure based on exploration drilling and compare to outcrop mapping on surface.
Sliderock Mountain Stratovolcano (half day): Visit the rocks at the core of this Cretaceous stratovolcano (including Stillwater Complex inclusions!) with a side trip to Cartwright Crystal Spar calcite mine.

Please contact conference co-chair Ennis Geraghty (ennis.geraghty@gmail.com) *with additional field trip ideas ASAP.*

Field guides, abstracts, and papers will be published in *Northwest Geology*, the annual publication of TRGS. Submission guidelines are posted at https://www.trgs.org/northwest-geology. All manuscripts and road logs must be received by **April 15, 2024**.

Want to help with the conference? Contact Emily Geraghty Ward (emgward@gmail.com)

UTAH FRIENDS OF PALEONTOLGY

Join the Great Basin Chapter of Utah Friends of Paleontology for an online meeting, **March 14 at 7:00 PM MT.**

Amelia R. Zietlow, PhD Candidate at the Richard Gilder Graduate School, American Museum of Natural History will present: ***The Serpent Rises on the Waves: on the Origin of Mosasaurus*** This talk is an overview of mosasaur biology and evolution in the light of recent discoveries, with an emphasis on how mosasaurs came to be the gigantic sea serpents we typically associate with them.

Amelia Zietlow is a PhD Candidate at the Richard Gilder Graduate School at the American Museum of Natural History in New York, NY. Her dissertation research is focused on mosasaur morphology & systematics. Amelia is originally from Milwaukee, WI and received a B.A. in Biology from Carthage College in Kenosha, WI. She is also part of the **Skeleton Crew**, a paleontology-focused scicomm YouTube channel.

https://utahpaleo.org/2024/02/27/march-14-700-p-m-great-basin-chapter-online-meeting-talk-by-amelia-r-zietlow/

NEW FROM THE UTAH GEOLOGICAL SURVEY

Interim Geologic Map of the Clifton Quadrangle, Tooele County, Utah, by Stephanie E. Mills, Andrew Rupke, and Donald L. Clark, 22 p., 2 plates, scale 1:24,000, **OFR-752DM**, https://doi.org/10.34191/OFR-752DM

Summary
The Clifton 7.5' quadrangle geology was mapped at 1:24,000 scale to assist with critical mineral evaluation of the Gold Hill district area under a U.S. Geological Survey Earth Mapping Resources Initiative project. The quadrangle lies in northwest Utah straddling the south end of the Gold Hill mining district and northern Deep Creek Range/Mountains. The geology consists of Paleozoic sedimentary bedrock (Cambrian through Permian) that has been intruded by a Jurassic granitic pluton and intruded and overlain by Tertiary igneous, volcanic and sedimentary rocks of varying composition. The bedrock is mantled by Tertiary and Quaternary surficial deposits largely from Lake Bonneville and alluvial environments. The complex structural framework throughout the quadrangle reflects tectonic compressional and extensional periods associated with formation of the hinterland of the North American Cordilleran orogenic system and subsequent development of the northeastern Basin and Range. New geochemical analyses and geochronological dating of igneous and volcanic rocks are presented.

Guide for the Preparation of Reports for the Utah Geological Survey, Fourth Edition, by Stephanie M. Carney, Michael D. Hylland, William R. Lund, and Robert Ressetar, 63 p., 6 appendices, **C-137**, https://doi.org/10.34191/C-137

Summary
Reports prepared for publication by the Utah Geological Survey (UGS) are expected to be of the highest technical and editorial quality. This guide establishes policies governing the publication of UGS reports and provides editorial standards necessary for preparing publications of the desired quality. Information in this guide includes (1) a description of the UGS publication series, including unpublished documents and UGS Web-site material, (2) a description of the UGS publication process and the responsibilities of the individuals involved in the review of manuscripts (author, peer reviewers, program manager, technical reviewer, deputy director, director, and publications manager), (3) a discussion of ethical considerations associated with the publication process, (4) a general

description of the parts of a UGS report, (5) rules for preparing manuscripts, (6) style requirements for UGS reports, (7) writing tips, (8) a selected bibliography that includes writing resources as well as geologic references cited in the text, and (9) appendices that present resources and information useful in the report preparation process.

Characterization of Groundwater in Johns and Emery Valleys, Garfield and Kane County, Utah, With Emphasis on the Groundwater Budget and Groundwater–Surface-Water Interaction, by Janae Wallace, Trevor Schlossnagle, Kathryn Ladig, Paul C. Inkenbrandt, Hugh Hurlow, and Christian Hardwick, 76 p., 7 appendices, **SS-172**, https://doi.org/10.34191/SS-172

Summary

Johns and Emery Valley are located in Southwestern Utah in a scenic and beautiful area with a Pristine Classified aquifer (TDS < 500 mg/L) that serves nearby Bryce Canyon National Park. Water quality, quantity, and the potential for water-quality degradation are critical elements that may determine the extent and nature of future tourism-driven development in these valleys. Our data show a connection between surface water and groundwater in the valley-fill aquifer based on shared geochemical characteristics, isotopic tracer signatures, increases in water levels in wells in direct response to heavy precipitation seasons, and seepage run measurements showing streams with distinct gaining and losing reaches. A soil-water balance model shows the interaction between surface water and the sediments of the valley-fill aquifer. A basin-wide SWB shows the greatest source of recharge is from adjacent mountain bedrock and surrounding runoff followed by precipitation; discharge is dominantly from groundwater seepage to the East Fork Sevier River at the northern boundary followed by ET and well water withdrawals; average recharge to the valley-fill aquifer is ~ 9200 acre-feet/yr and average net loss is ~ 11,000 acre-feet/yr from 2017 to 2021, a time period characterized by drought. Although the long-term change in storage has been close to zero, we recommend careful water resource management for future development given the observed quick response of groundwater levels to climate conditions on shorter timescales. Because of the potential increase in growth from tourism-related development, an increased demand for drinking water warrants continuous monitoring that will assist land-use planning and resource management to maintain local water resources.

Interim Geologic Map of the Browns Hole Quadrangle, Weber and Cache Counties, Utah, by Zachary W. Anderson, Greg N. McDonald, Elizabeth A. Balgord, and W. Adolph Yonkee, 13 p., 2 plates, **OFR-760**, https://doi.org/10.34191/OFR-760

Summary

The Browns Hole quadrangle is in Weber and Cache Counties of northern Utah and covers the eastern part of Ogden Valley, a rapidly developing area of the Wasatch Range. The Middle and South Forks of the Ogden River bisect the quadrangle and are important watersheds and recreational areas to the communities of Ogden Valley and the Wasatch Front. The towns of Huntsville and Eden are just west of the quadrangle and unincorporated communities with year-round residents are present throughout the area. A portion of Powder Mountain ski resort is present in the northwest corner. The quadrangle contains the Willard thrust, a major thrust fault that was active during the Cretaceous-Eocene Sevier orogeny. The Willard thrust places Neoproterozoic through Ordovician strata in the hanging wall over a fault-bounded block of Cambrian strata. Neoproterozoic strata comprise a succession of mostly clastic rocks that locally include a volcaniclastic sequence and basalt flows deposited during rifting of western North America and breakup of the supercontinent Rodinia. Cambrian strata in the hanging wall include a thick basal clastic sequence overlain by a thick sequence of interbedded limestone, shale, and dolomite. Footwall rocks of the Willard thrust include highly deformed Cambrian strata within a fault-bounded lozenge. The synorogenic Paleocene-Eocene Wasatch Formation unconformably overlies older rocks and was deposited over considerable paleotopography. The southwest part of the quadrangle is cut by a southwest-dipping normal fault system that bounds the east side of Ogden Valley. This fault is interpreted to have experienced an early phase of slip during late Eocene to Oligocene collapse of the Sevier belt and a younger phase of slip during Neogene Basin and Range extension. Lacustrine deposits and shorelines of Pleistocene-age Lake Bonneville are present in the lower elevations of the southwest corner. Pleistocene glacial deposits, present in the northwest corner, are likely related to the Pinedale glaciation. Numerous incised alluvial deposits and geomorphic surfaces are present along major drainages and record pre- and post-Lake Bonneville aggradational and degradational alluvial and colluvial sequences. Mass-movement deposits, including historically active landslides, are present throughout the quadrangle.

deposits, including historically active landslides, are present throughout the quadrangle.

UGA VOLUNTEERS

UGA Board

(Unless otherwise indicated, area code is 801)

2024 President	Eugene Szymanski, eugenes@utah.gov	537-3364
2024 President-Elect	Keilee Higgs; keileeann@utah.gov	678-3683
2024 Program Chair	Chris Stallard; cstallard@utah.gov	386-0976
2024 Treasurer	Aubry DeReuil, aubry@zanskar.us	850-572-2543
2024 Secretary	Trae Boman; tboman@teamues.com	648-5206
2024 Past-President	Rick Ford, rford@weber.edu	915-3188

UGA Committees

Environmental Affairs	Craig Eaton, eaton@ihi-env.com	633-9396
Geologic Road Signs	Greg Gavin, greggavin@gmail.com	513-509-1509
Historian	Paul Anderson, paul@pbageo.com	364-6613
Outreach	Greg Nielsen, gnielsen@weber.edu	626-6394
Public Education	Zach Anderson, zanderson@utah.gov Matt Affolter, qfl247@yahoo.com	537-3300
Publications	Paul Inkenbrandt, paulinkenbrandt@utah.gov	537-3361
Publicity	Paul Inkenbrandt, paulinkenbrandt@utah.gov	537-3361
Social/Recreation	Roger Bon, rogerbon@xmission.com	580-1331

Geology of the Intermountain West (UGA's open-access journal)

Chief Editor	Doug Sprinkel, dsprinkel@gmail.com.	391-1977
Editorial Team	Bart Kowallis, Tom Chidsey, Steve Schamel, and John Foster	

AAPG House of Delegates

David A. Wavrek, dwavrek@petroleumsystems.com 801-322-2915

State Mapping Advisory Committee

Bill Loughlin, bill@loughlinwater.com 435-649-4005

Earthquake Safety Committee

Chair — Grant Willis, grantwillis@utah.gov 537-3355

UGA Web Site
http://www.utahgeology.org

Webmaster — Paul Inkenbrandt, paulinkenbrandt@utah.gov 537-3361

Scholarship Golf Tournament

Rick Ford, rford@weber.edu 915-3188
John South, jsouth@utah.gov 385-266-2113

UGA Newsletter

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