

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.

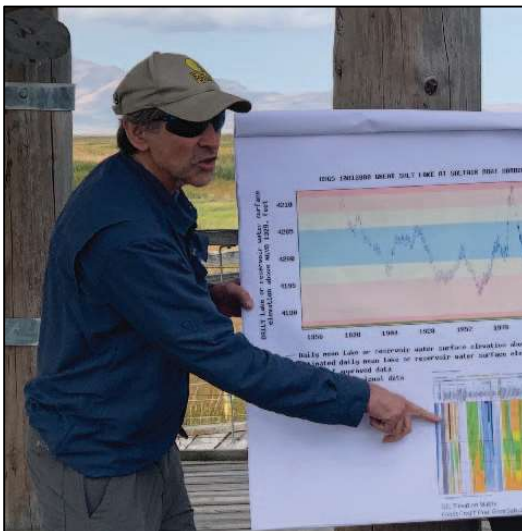
VOLUME 55, NUMBER 7

JULY 2023

JULY UGA LUNCHEON MEETING
11:30 am Lunch - 12:00 pm Presentation
MONDAY, JULY 10, 2023
DNR Building Auditorium
1594 W N Temple St, Salt Lake City, UT 84116
1st Floor; Room 1040/1050

Great Salt Lake Wetlands and Groundwater
Investigations by the Utah Geological Survey's
Groundwater and Wetlands Program

Hugh Harlow and Becka Downard
Utah Geological Survey



The Great Salt Lake, Utah (GSL) and its wetlands are a critical stopover for migratory birds on the Pacific Flyway and support several critical industries. However, prolonged drought caused by climate change and exacerbated by human water use brought the lake to its lowest recorded level in November 2022 and raised the temperature and salinity of this terminal, hypersaline lake. Wetland managers around GSL have a century worth of practice managing to protect against seasonal drought, but the unprecedented mega-drought gripping the West is testing the resilience of this ecosystem. In drought, wetlands plants produce fewer seeds and aquatic macroinvertebrate populations decline, so there is less fuel for bird migrations. Concentrated bird habitat in turn increases the impact of diseases. Drought also creates favorable conditions for the expansion of the invasive grass *Phragmites australis*. Things are dire for GSL, but the critical situation has garnered more attention for the lake that has led to legislative changes that may bring more water to the lake.

The role of streamflow in the lake's water and salt budget is well monitored and understood, but the role of groundwater in these budgets remains unquantified, which hampers restoration and management efforts. Two recent UGS projects analyzed existing well data to characterize the water chemistry, solute load, and groundwater levels in the GSL basin-fill aquifer. Groundwater chemistry adjoining GSL spans a significant range of compositions and concentrations. Most samples along the west shore of GSL are Na-Cl water type, whereas along the east shore Ca-HCO₃ water type is common. These variations in water type and total dissolved solids are likely controlled by relative amounts of recharge and water-rock interaction surrounding GSL. Concentrations of select trace constituents in groundwater, including As and Se, are generally low, but locally may contain elevated concentrations that could be contributed to GSL. Concentrations of B and Li may indicate localized geothermal contributions to the groundwater system. Nutrients including nitrate and phosphorus occur in low concentrations in groundwater near GSL and may only locally contribute high nutrient concentrations.

Analysis of existing well data shows groundwater-level declines in most of the basin-fill wells in basins adjacent to GSL from the 1980s to 2010s. These declines are consistent with historical groundwater level trends in the Salt Lake, Tooele, Curlew, and Weber valleys and are the combined effects of groundwater pumping and less than average precipitation after the late 1980s. Using the Darcy flux equation, with

hydraulic gradients calculated from our groundwater-level compilations and estimates of saturated thickness and aquifer parameters, we calculated a groundwater flux to GSL of 347,800 acre-feet per year. This estimate is nearly five times the previous estimates derived from water balance studies but is consistent with estimates derived from geochemical modeling of GSL water chemistry. We calculated a salt contribution from groundwater to GSL of 1.18 million metric tons per year which represents about 10% of the solutes derived from surface flows to GSL in 2013.

A wetland water budget study for the TNC Shorelands Preserve on the east side of GSL is in the third year of data collection, taking advantage of the extraordinary high and low water years in 2022 and 2023. This study is paired with a vegetation mapping study and will provide the preserve's stewards with actionable water management data.

Biography: Hugh Hurlow is a hydrogeologist and the Program Manager for the Groundwater & Wetlands Program at the Utah Geological Survey, joining the Survey in 1995. He has a Ph.D. from the University of Washington (1992), a M.S. from the University of Wyoming (1987), and a Sc.B. from Brown University (1984), all in geological sciences. He was a Visiting Assistant Professor at the University of Montana for two years prior to moving to Utah.

Becka Downard is a Wetland Ecologist for the Groundwater & Wetlands Program. Before joining the UGS, she was the wetland coordinator for the Utah Division of Water Quality. She received a Ph.D. in ecology from Utah State University in 2017 studying the impacts of impounded wetland management on wetland health around Great Salt Lake. She received her M.S. degree in human dimensions of ecosystem science and management from USU as well, researching strategies for acquiring water for wetlands.

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

Please join us at 11:30 am on **Monday July 10th** in the DNR Building Auditorium (*1594 W N Temple St, Salt Lake City, 1st Floor; Room 1040/1050.*) 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 July 6th 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 Lunch Meeting and Talk (Google Meet)

Monday, July 10 · 12:00 – 1:30pm

Google Meet: <https://meet.google.com/ihv-bxyx-xrh>

Or dial: (US) +1 520-815-1289 PIN: 196 674 907#

UGA PRESIDENT'S MESSAGE

I hope everyone's summer is off to a great start and that everyone will enjoy the upcoming Independence Day traditions and celebrations. For the UGA leadership, this is the time of year when plans are being laid for various end-of-year events. Please see the announcements in this newsletter for the **Summer Picnic** in Big Cottonwood Canyon (Saturday, August 19), the **Scholarship Golf Tournament** at the Stonebridge Golf Club (Thursday, September 21), and the **annual field trip** (Friday-Saturday, October 20-21) – this year focused on Great Salt Lake. Lead Editor Michael Vanden Berg (UGS) is pleased to announce that very good progress is being made toward completing the associated **2023 Guidebook** – *Great Salt Lake and the Bonneville Basin: Geologic History and Anthropocene Issues* (UGA Publication 51). Later this year, Pub 51 will be available as a free, open-source publication. This is a “first” for a UGA numbered guidebook. This month's newsletter also includes a call for nominations for the **Lehi Hintze Award**, given jointly by the UGA and the Utah Geological Survey. The Utah geoscience community includes many individuals who have made significant contributions to our knowledge of

Utah's geology and in supporting the UGA and the community it serves. You know these people; they're amazing. Please, please consider nominating one of these deserving individuals for this prestigious award.

Many of you know that UGA is an affiliated society of the **Rocky Mountain Section-AAPG**. The UGA Board recently completed an annual report on our association's activities that will be shared with the RMS executive committee during a future committee meeting. Seeing this compilation in writing, the Board was taken aback, blown away, by all that our relatively small, all-volunteer, professional association accomplishes each year. The paragraph above is only a partial listing. A bit of very good news from our report – as of June 2023, the UGA has 266 members in the following categories: 112 Professional; 14 Associate; 32 Student; and 108 combined Lifetime, Charter, Emeritus, and Honorary memberships. In March 2019, pre-pandemic, we had 226 total members. Thus, UGA's membership has rebounded, **and increased**, post-pandemic.

The RMS-AAPG held a successful annual meeting last month in Bismarck, ND. **UGA will be the host association for the 2024 RMS meeting in Park City, UT (October 6-8, 2024)**. RMS President and former UGA President Riley Brinkerhoff (Wasatch Energy Management) is leading the effort to organize and convene this meeting. Michael Vanden Berg is assisting Riley and recently made this appeal to UGA members – “If you have a vested interest in the success of UGA, in creating an opportunity to bring hundreds of energy geologists to Utah, in giving students a platform to present their work, and in the general promotion of Utah geology, then please consider helping with this effort.” Please contact Riley (riley.brinkerhoff@gmail.com) or Mike (michaelvandenbergh@utah.gov) if you can lend a hand.

In addition to planning for the events mentioned above, the UGA Board is actively working to put together a slate of **candidates for the 2023-2024 Governing Board**. Our association will be in very good hands as President-Elect Eugene Syzmanski (UGS) assumes the presidency following our annual meeting in October. The Board has also identified very qualified candidates for treasurer, secretary, and program chair. **However, we are still working to identify a candidate for the key position of President-Elect**. This is a three-year commitment with a built-in year of on-the-job training [President-Elect (2024), President (2025), Past President (2026)]. In the past, the President-Elect has proposed the theme for the

annual guidebook and lead the effort to recruit the editors and organize the associated fall field trip. I have previously mentioned in this column that the Board was seeking input from members about the future of UGA publications. A good number of members with publication experience have provided insight and suggestions. As a result, the Board has decided to de-emphasize the annual numbered publication. Going forward, the President-Elect, in consultation with the rest of the Board, will be expected to propose the annual field trip to be held during their presidential year and to lead the effort identify trip leaders, with the field trip guide and/or road log to be published in *Geology of the Intermountain West*, UGA's open-source journal. (If a group of members are interested in producing a major themed guidebook related to their research, the Board would consider such a proposal on a case-by-case basis). Hopefully, these changes will make it easier for members to take on the presidency. **With that in mind, please consider standing for President-Elect during the upcoming election cycle.** We need dedicated members to step up and provide leadership. Take it from me, this is an important, gratifying, and fun professional service.

On July 1, Great Salt Lake's elevation was 4193.8 feet at the Saltair Marina. This is the same elevation I reported last month for June 2. There were a few readings mid-June of 4194+ feet. Perhaps evaporation now exceeds inflow? Time will tell. The CO₂ reading at Mauna Loa was 423 ppm. It appears that Northern Hemisphere photosynthesis has kicked in and is drawing down CO₂ a bit (preliminary data, subject to revision).

Rick Ford
UGA President
rford@weber.edu

NEW MEMBERS APPROVED BY THE UGA BOARD

Robert Cushman, retired (UGA Professional)

CANDIDATES NEEDED – UGA GOVERNING BOARD (2023-2024)

The Utah Geological Association (UGA) is a non-profit organization of geologists and other geoscientists that share a common interest in Utah's geology. The purpose of the UGA is to increase and disseminate geological information to the scientific community and promote public awareness of the usefulness of geology in general. The UGA accomplishes its mission through the voluntary efforts of its members, with leadership provided by its volunteer Governing Board. The Governing Board manages all activities, funds, committees, and affairs of the Association, thus providing important professional service to Utah's geoscience community.

The Election Committee and the current Board have identified qualified candidates for the positions of Treasurer, Secretary, and Program Chair – but the Election Committee would welcome additional candidates for these positions.

We are still working to identify a candidate for the President-Elect position. This is a three-year commitment with a built-in year of on-the-job training [President-Elect (2024), President (2025), Past President (2026)]. Please consider standing for election or speaking to a colleague about this important position. The President-Elect, and the other new officers, will be installed during our October annual meeting.

Questions? Please reach out to any member of the current Board and/or consult our constitution < <https://utahgeology.org/resources/uga-constitution> >.



WE WANT YOU!



SAVE THE DATE...

The **SPE/UGA/SME Scholarship Golf Tournament** will be held at the Stonebridge Golf Club (WVC) on **Thursday, September 21, 2023.**

4-person-scramble format; fun for all golfing abilities.

Watch this space over the coming months for details and sign-up forms.

Last year's event raised \$4800!

Fore!
Rick Ford &
John South
UGA Golf Co-Chairs



SAVE THE DATE **2023 UGA Annual Picnic**

August 19, 11:30 AM – 3:30 PM

Spruces Campground, Group Site 8

Big Cottonwood Canyon

Mark your calendars and join us for food, fun, and a relaxing afternoon in Big Cottonwood Canyon. UGA will provide the main course and beverages. Please bring a desert or salad to share with the group – show off your culinary talents 😊.

The site is reserved all day, so feel free to come early and stay late.

Campground hours are from 7 AM to 10 PM.

We are limited to 10 vehicles inside the campground. Parking is available, but limited, outside the campground.

Spruces Campground is 9.7 miles up Big Cottonwood Canyon and we have reserved the same group site as last year's picnic.

Details to Follow

CALL FOR NOMINATIONS LEHI HINTZE AWARD For Outstanding Contributions to the Geology of Utah

UGA Members:

The prestigious Lehi Hintze Award recognizes outstanding contributions related to the discovery and dissemination of knowledge about the geology of Utah. This annual award is given jointly by the Utah Geological Association and the Utah Geological Survey, with the recipient being honored at our November luncheon meeting.

"Outstanding Contributions" is to be interpreted broadly and may include work in all areas of the geosciences. Nominations typically include a letter of nomination that summarizes the nominee's outstanding contributions, with specific reference to work related to the geology of Utah. Letters of support, testimonials, and a CV may also be included in support of the nomination.

If you know a geoscientist who has significantly advanced the knowledge of Utah's geology through their applied work, research, teaching, and/or service, please consider nominating her or him.

Nominations must be received by **Friday, September 8, 2023**, and may be sent physically or through email.

Snail mail: Director, Utah Geological Survey, P.O. Box 146100, Salt Lake City UT 84114-6100

Email to: billkeach@utah.gov

Utah Geological Association

Field Trip

October 20 & 21, 2023



In association with the upcoming UGA
Publication 51

**Great Salt Lake & the Bonneville Basin:
Geologic History & Anthropocene
Issues**

More details coming soon...

Utahgeology.org

Questions? Contact the trip coordinator
Rick Ford (rford@weber.edu)

Oct. 20 – Circumnavigation of the South Arm of GSL

Trip Leader: Michael D. Vanden Berg (and others)

GSL Shorelands Preserve, Promontory Point, modern microbialites, megapolygons, a drive across the causeway, north arm salt, causeway bridge, Lakeside tufas and microbialites

Oct. 21 – Bonneville Salt Flats and surrounding geology

Trip Leader: Jeremiah Bernau (and others)

Knolls sand dunes, Juke Box trench, Danger Cave, Bonneville Salt Flats, Silver Island Mtns.



UGF News & Announcements

UGF milestones!

Thank you to all who have generously contributed to the UGF! We **met our initial milestone of raising \$60,000** to achieve the 2:1 match of \$120,000 from the Utah Geological Association, for a total to-date contribution of \$180,000. This exciting success moves us towards our larger goal of reaching a total of \$350,000 in the UGF endowment. This amount should allow us to give out scholarships in perpetuity, based on holding the principal intact and only spending the fund's interest for scholarships (~\$10,000 per year with a little leeway for inflation). Through the generous support of UGA members and friends, past and present, we will keep awarding scholarships well into the future. Please join us in the continuing efforts towards this important goal!

Companies and individuals are invited to support the UGF:

- **DONATE BY MAIL:** Write a tax-deductible check made out to the **Utah Geological Foundation** and mail it to: Utah Geological Foundation, 1244 E Spring Ridge Drive, Sandy, UT 84094.
- **DONATE ONLINE:** Visit <https://utahgeology.org/foundation> and follow the easy onscreen instructions to make a tax-deductible payment.

Through December 31, 2023, all individuals donating \$1,000 or more become permanent members of the Foundation's **Founders Circle**. Companies donating \$5,000 or more also become members of the **Corporate Founders Circle**.

Donations in any amounts are gratefully accepted. UGF is an **IRS 501(c)(3) charitable entity** and will acknowledge your donation in writing. Direct any questions to <http://advancement@utahgeologicalfoundation.org>.

UGF Board: **Paul Anderson** (President), **Grant Willis** (Treasurer), **Leslie Heppler** (Secretary), **Marjorie Chan**, **Elise Erler**, and **Rick Ford** (Ex Officio - UGA President).

AMERICAN GROUND WATER TRUST
PRESENTS THE

2023

UTAH GROUNDWATER CONFERENCE

AUGUST 15 & 16

CALL FOR PRESENTATIONS

Interested in sharing your Utah groundwater work and knowledge? The AGWT is accepting abstracts for our upcoming Utah Groundwater Conference.

Please submit abstracts to sara@agwt.org no later than June 9, 2023.

Utah Valley
Convention Center

220 West Center Street,
Suite 200
Provo, Utah

For more information visit agwt.org/events

**BELT SYMPOSIUM VI and TOBACCO ROOT GEOLOGICAL SOCIETY 48th
ANNUAL FIELD CONFERENCE, SALMON, IDAHO, JULY 27 – 30, 2023**



*Mesoproterozoic Swauger Formation quartzite with darker, fine-grained beds near
Taylor Mountain, Salmon River Mountains, Idaho. Photo by Russ Burmester*

Salmon Area Details, Conference Schedule, and Registration

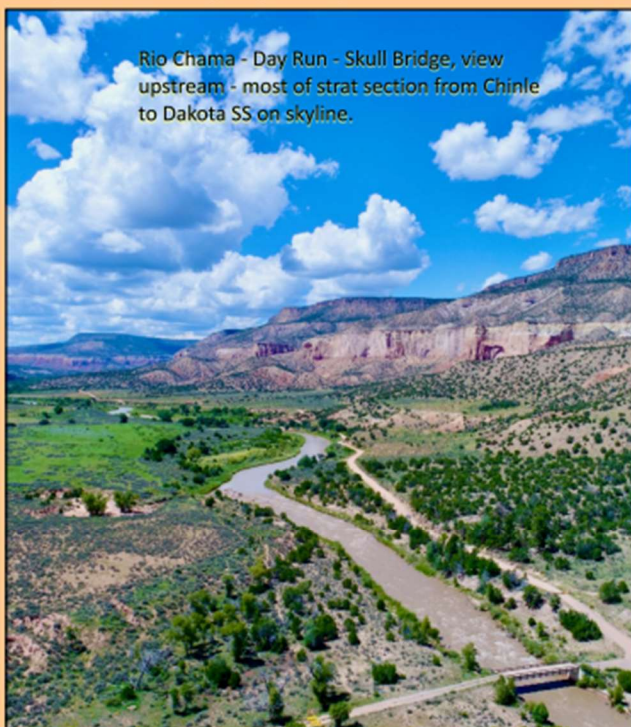
Belt Symposia are held once every ten years and this is the 6th installment. This year's symposium is being held in conjunction with the 48th Annual Tobacco Root Geological Society Field Conference in Salmon, Idaho. The conference activities begin on late Thursday afternoon and extend through Sunday afternoon (July 27–July 30, 2023). Pre- and post-meeting field trips are also offered.

The symposia are organized by the Belt Association and are dedicated to geologic research on all aspects of the Belt Basin, an important Mesoproterozoic sedimentary body in the Northern Rockies. The basin covers a large region in Montana, Idaho, Washington, British Columbia, and Alberta. It is one of the thickest, best exposed, most accessible, and well-studied Mesoproterozoic basins in the world. The Belt Symposia draw international researchers in Precambrian stratigraphy, tectonics, geodynamics, paleomagnetism, ore deposits, paleoclimate, paleontology, sedimentology, geochronology, and other disciplines.

FCGS FLOAT TRIP ON THE CHAMA RIVER (31 MILES)

- Dates:** Friday, July 21 - Sunday, July 23.
Leaders: Dr. Paul Bauer and Dr. Matt Zimmerer, NMBGMR. - **THEY WROTE THE GUIDEBOOK!!**
Organizer: David Schiowitz.
Transportation: Fort Lewis College vans from the campus and back.
Cost: \$750 FCGS members / \$780 non-members.
Includes: Transportation to and from Fort Lewis College in Durango, CO., all meals, guidebook, river guides & rafting equipment and most camping gear.
Limit: 13 participants.
Registration: Open now ONLINE ONLY.
<https://fourcornersgeologicalsociety.org/event/float-trip-the-chama-river-new-mexico/>
Cancellation: Full refund if cancel by June 20th.
Drop Dead Date: Trip will be cancelled if minimum registration not reached by July 1st.

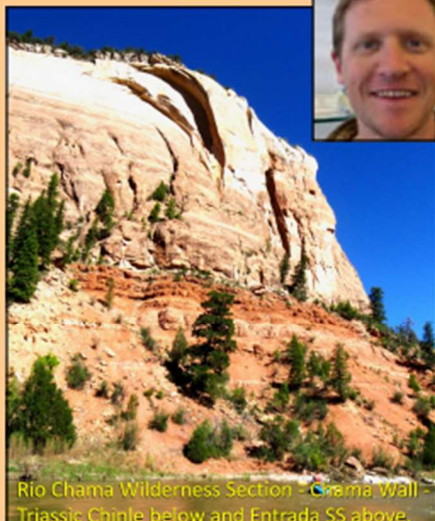
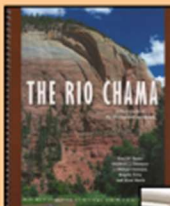
Trip Description: The Chama River, in northwestern New Mexico, is a tributary of the Rio Grande, flowing south from headwaters in the San Juan Mountains of Colorado to Abiquiu, then east around the Jemez volcanics into the Rio Grande rift zone. This trip runs from below the El Vado dam through a designated Wild and Scenic River section to the Big Eddy take-out above Abiquiu Reservoir. The exposed geologic section on this stretch is entirely Mesozoic, cutting down from the Cretaceous, Dakota Sandstone to the Triassic, upper Chinle Formation as we travel south. This trip will be led by Paul Bauer and Matt Zimmerer from the New Mexico Bureau of Geology and Mineral Resources (NMBGMR), who published a new geologic river guidebook for the Chama in 2021.



Rio Chama - Day Run - Skull Bridge, view upstream - most of strat section from Chinle to Dakota SS on skyline.



Photos by Paul Bauer



Rio Chama Wilderness Section - Chama Wall - Triassic Chinle below and Entrada SS above.

Save the Date

2023 Montana Mining & Mineral Symposium



Chalcocite; Butte, MT

September 27-30; Montana Tech University
Butte, MT


Sept. 27 - Short course: "Portable Analytical Field Methods"
Sept. 28-29: Oral and Poster Sessions
Sept. 30: Field Trip

Keynote Talks: EarthMRI Program Overview with Examples from our NW Region: Allen Andersen, USGS
EarthMRI - a Montana Perspective: Eric Anderson, USGS



Online registration coming soon: mbmg.mtech.edu/symposium



Chis Summers,
CEO, Burgex Mining Consultants 

Speaker: Chis Summers

Topic: *Leveraging GIS in Mining*

Date: Thursday, July 20th

Schedule:

- Social Hour and Dinner : 6:00 to 7:00 pm
- Technical Presentation: 7:00 to 8:00 pm

Location: FLSmidth Inc.

[7158 S FLSmidth Drive, Midvale, UT 84047-5559](https://doi.org/10.34191/OFR-749)

(<https://goo.gl/maps/H1QfsSpx2fQV76127>)

NEW FROM THE UTAH GEOLOGICAL SURVEY

Cobalt Database of Utah, by Jake Alexander, 5 p., 1 plate, OFR-749,
<https://doi.org/10.34191/OFR-749>

Summary:

This report and accompanying database collate known cobalt mineral occurrences and geochemical data for the state of Utah.

Sediment Logs Compiled From the Great Salt Lake Desert, Western Utah, With a Focus on the Bonneville Salt Flats Area, by, Jeremiah A. Bernau, Charles G. Oviatt, Donald L. Clark, and Brenda B. Bowen, 24 p., 3 appendices, OFR-754, <https://doi.org/10.34191/OFR-754>

Summary:

This report presents a compilation of previously published sediment logs and unpublished water well logs from the Bonneville Salt Flats area and reports new data from several trench exposures.

UGA VOLUNTEERS

UGA Board

(Unless otherwise indicated, area code is 801)

2023 President	Rick Ford, rford@weber.edu	915-3188
2023 President-Elect	Eugene Szymanski, eugenese@utah.gov	537-3364
2023 Program Chair	Megan Crocker, meganlynncrocker@gmail.com	538-5290
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2023 Secretary	Tom Chidsey, robinfults@gmail.com	971-4986
2022 Past-President	John South, john.south@dominionenergy.com	385-266-2113

UGA Committees

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Geologic Road Signs	Greg Gavin, greggavin@gmail.com	513-509-1509
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Public Education	Zach Anderson, zanderson@utah.gov	537-3300
	Matt Affolter, qfl247@yahoo.com	
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
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State Mapping Advisory Committee

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

Chair	Grant Willis, grantwillis@utah.gov	537-3355
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<http://www.utahgeology.org>

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UGA Newsletter

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