

UGS BOARD MEETING
Department of Natural Resources
Utah Geological Survey, Utah Core Research Center
240 N. Redwood Road, Salt Lake City
Wednesday, August 9, 2023

The meeting of the UGS Board was called to order at 8:33 a.m.

ATTENDANCE

Board members: Elissa Richards – Chair, Ken Fleck – Vice Chair, Becky Hammond, David Garbrecht, Sam Quigley and Rick Chesnut. Tyler Wiseman from School and Institutional Trust Lands Administration attended remotely. Riley Brinkerhoff was not in attendance.

UGS Staff: Bill Keach, Mike Hylland, Jodi Thacker, Cheryl Wing, Hollie Brown, Jay Hill, and Michael Vanden Berg. Ammon McDonald, Emily Jainarain, Patrick Engberson were in attendance for staff introductions. Kristi Rasmussen, Abby Mangum, Sofia Agopian, and Stormie Elmer attended remotely for staff introductions. Ben Erickson joined to make his presentation.

ACTION ITEMS

Approval of Minutes from Previous Meeting

Sam Quigley motioned to approve the minutes of the April 12, 2023, UGS Board meeting. Ken Fleck seconded the motion. The Board voted unanimous, and the motion carried.

Formal Approval of Project Proposals

Enclosed in the materials is the Contract Proposal spreadsheet from 2019 forward. This is a good indicator of how the survey is doing with outside funding awards, both federal funds and dedicated credits, and what's on the horizon. Although contract proposals for external funding are provisionally approved by the Board by email, they require formal approval at the next Board meeting. The proposals are:

Recovery of Critical Metals from Oil and Gas Produced Water in Rocky Mountain Basins; funding from EGI; new funding to the UGS \$120,000; total project funding \$150,000; estimated start date 9/1/2023; estimated end date 9/30/2026.

Phragmites Mapping and modeling at Bear River Migratory Bird Refuge; funding from DNR – Forestry, Fire, and State Lands; new funding to the UGS \$33,172; total project funding \$44,230; estimated start date 7/1/2023; estimated end date 6/30/2024.

Water flow to a Marginal Great Salt Lake Wetlands Complex during a High-Runoff Year; funding from DNR – Forestry, Fire, and State Lands; new funding to the UGS \$16,930; total project funding \$22,573; estimated start date 7/1/2023; estimated end date 6/30/2024.

Detailed Mapping of Late Quaternary Active Traces of the Sevier Fault Zone and other regional

faults in central Utah; funding from the USGS; new funding to the UGS \$27,016; total project funding \$67,541; estimated start date 1/1/2024; estimated end date 12/31/2024.

Working Group on Utah Earthquake Probabilities II: Collaborative Research between Lettis Consultants International and the Utah Geological Survey; funding from the USGS; new funding to the UGS \$55,763; total project funding \$111,525; estimated start date 1/1/2024; estimated end date 12/31/2025.

Great Salt Lake Seismicity and Loading; funding from NASA; new funding to the UGS \$671,693; total project funding \$895,591; estimated start date 1/1/2024; estimated end date 12/31/2026.

Fractured Rock Study – Southern Duchesne County; funding from Tri-county Health Department; new funding to the UGS \$14,423.12; total project funding \$28,846.24; estimated start date 7/1/2023; estimated end date 6/30/2024.

Greenfield EGS Pilot Demonstration Project in Southern Utah; funding from Fervo Energy Company (from DOE); new funding to the UGS \$485,632; total project funding \$485,632; estimated start date 1/2024; estimated end date 12/2026.

Septic-Tank Density Analysis for Rockville, Washington County, Utah; new funding from the Town of Rockville; new funding to the UGS \$38,041; total project funding \$54,344; estimated start date 7/1/2023; estimated end date 6/30/2024.

Hydrologic Monitoring of Environmental Restoration Projects – Year 8; new funding from Utah’s Watershed Restoration Initiative; new funding to the UGS \$175,000; total project funding \$233,333; estimated start date 7/1/2023; estimated end date 6/30/2024.

Dave Garbrecht motioned to formally approve the project proposals. Becky Hammond seconded the motion. The Board voted, and the motion carried.

Director’s Report – August 2023

Personnel Changes

Retirements:

None known at this time

Resignations:

Katie Cummings – UCRC Curator, Energy and Minerals

Jeremiah Bernau – Geologist, Groundwater and Wetlands

Hector Zamora – Geologist, Groundwater and Wetlands

New positions:

Torri Duncan – Bookstore Manager, Geologic Information and Outreach

Ben Erickson – Promoted to Sr Geologist, Hazards

Kristi Rasmussen – Promoted to GIS Analyst, Hazards

Stormie Elmer – Promoted to Sr Geotech, Hazards

Janae Wallace – Supervisor, Groundwater and Wetlands

Paul Inkenbrandt – Supervisor, Groundwater and Wetlands

Greg McDonald – Supervisor, Hazards

Tyler Knudsen – Supervisor, Hazards

New hires:

Kiersten Winwood – GIS Analyst, Data Management

Josh Dustin – GIS Analyst, Mapping

Abby Mangum – GIS Analyst, Data Management

Emily Jainarain – Geologist, Groundwater and Wetlands

Ammon McDonald – UCRC Curator, Energy and Minerals

Patrick Engbersen – Media Specialist, Geologic Information Outreach

Sofia Agopian – Project Geologist, Hazards

Joel Ferry (DNR Executive Director) joined to introduce himself and thank the board for the work that they do.

Recent Activities – Looking Forward

For the UGS, several accomplishments are worth mentioning.

All program managers participated in leadership training offered by DNR. The program, Lead In 30, was a month-long program that featured communication and learning to focus on things that are most important.

The majority of UGS staff, beginning July 1, received targeted raises of 10-15%, on top of the 5% COLA all state employees received.

Mike Hylland and Bill Keach attended the annual meeting of the Association of American State Geologists in Colorado. Next June the UGS will host the meeting in Park City.

A number of new hires along with new positions/responsibilities for many of our current staff.

Energy and Minerals

DOE has "recommended for award" our proposal to perform a state-wide CO₂ storage assessment. The proposal was written by Energy and Minerals staff along with some outside collaborators from U of U: Geology, Energy and Geoscience Institute and the SPARC Environment Justice Lab. Total project will be \$1.1 million, which includes a 20% cost share (shared by UGS and U of U). The project will be headed by our new Project Geologist, Gabby St. Pierre.

Ammon McDonald recently started as the new UCRC curator. Ammon previously worked for the UGS E&M group (2008-2011) and has been at OGM for the past 13 years. We are excited to have him back at UGS.

Elliot Jagniecki has been very busy publishing papers in several outside journals;

- “A Mars-analog Sulfate Mineral, Mirabilite, Preserves Biosignatures” - published in *Geology*
- “Holocene Water Balance Variations in Great Salt Lake, Utah: Application of GDGT Indices and the ACE Salinity Proxy” – published in *Paleoceanography & Paleoclimatology* – with cover photo by Christian Hardwick!
- “Sulfate-rich Spring Seeps and Seasonal Formation of Terraced, Crystalline Mirabilite Mounds Along the Shores of Great Salt Lake, Utah: Hydrologic and Chemical Expression of Declining Lake Elevation” - published in *Chemical Geology*

The bathymetric lidar data for the GSL pilot study was collected in late June. Mike Vanden Berg will be sharing later in the meeting a presentation he gave to the Great Salt Lake Advisory Council on the progress and showing preliminary results. Early analysis shows laser depth penetration between 2 and 4.5 meters, which is great. Final analysis will be delivered from the company in late August. We are also working on an MOU with FFSL to get access to the \$1.8 million set aside by the legislature to acquire additional data.

The INGENIOUS (geothermal research project) team, led by Eugene Szymanski and Christian Hardwick, scoped out four different sites in SW Utah for a possible blind geothermal system and the feasibility of drilling a research well to determine the potential geothermal resource. Final site selection will take place later this fall and a possible stratigraphic well could be drilled as part of a subsequent phase of the project.

Geologic Hazards

The Geologic Hazards Program recently sponsored two University of Utah education major students with work experience related to our Indiana Avenue (West Valley fault zone) paleoseismic investigation. For their individual projects, one student is using Structure from Motion techniques to develop orthophoto images of the area over various time periods and the other student is working with the paleoseismic and geochronology data. Emily Kleber attended an NSF-sponsored advanced lidar processing techniques workshop (invited keynote speaker) and Steve Bowman attended the Alaska Satellite Facility/NASA User Working Group meetings (invited member) related to SAR data and InSAR processing. The Utah Aerial Imagery Database (<https://imagery.geology.utah.gov>) surpassed 400,000 images and related items in early July and more images are being added weekly. The spring 2023 landslide and flooding events have mostly ended; photos from our emergency response activities are available in the UGS GeoData Archive (https://geodata.geology.utah.gov/pages/collections_featured.php?parent=184933); some photos are still being added to the archive. We also reorganized the program, now having Tyler Knudsen and Greg McDonald supervise three staff each, Ben Erickson was promoted to our Landslide Hazards Geologist, Kristi Rasmussen was promoted to our GIS Analyst, Stormie Elmer was promoted to Sr. Geological Technician, and we are working to fill a position for an InSAR Specialist.

Groundwater & Wetlands

The Groundwater team is finishing revisions to our full report on the hydrogeology, water budget, septic system density analysis, and water quality evaluation of Emery and southern Johns Valley and the Bryce Canyon City area. We have hired a new GIS Analyst, Kiersten Winwood, to replace Nate Payne who transferred to DM; and Emily Jainarain, who is working on the new groundwater dashboard and our hydrologic monitoring of watershed restoration projects. The Wetlands team recently finished their Wasatch Back Valley wetland mapping project, which is in review. They have drafted a building block funding request to establish an In-Lieu Fee wetlands mitigation program. The Program was awarded three new grants from the Division of Forestry, Fire and State Lands to study phragmites mapping and groundwater issues for Great Salt Lake. Becka Downard and Hugh Hurlow presented to the Utah Geological Association on GSL wetland and groundwater issues.

Geologic Mapping & Paleontology

Mapping: The Geologic Mapping group has completely restaffed from our recent retirements and added a GIS position. We are creating new map review and GIS workflows to speed up our publication process. So far this has yielded 9 new maps that will be published soon. We hope to further refine our process to facilitate publishing a long backlog of old maps that are very near completion.

In late April the Mapping group finalized the largest ever STATEMAP grant award to the UGS. Based on discussions with the STATEMAP staff our proposal was ranked 2nd in the nation. This is due to the hard work and skills of our amazing staff and the thoughtful oversight of the State Mapping Advisory Committee. New projects funded include 7.5' quad mapping of 4 maps on the Wasatch Front and Back as well as a 7.5' quad near Blanding. We will also be revising the Panguitch 30' by 60' quad, addressing edits on the Utah State Geologic Map, working on 3D cross sections of existing quads, a statewide geoheritage site inventory, and an important stratigraphic study of the Wasatch, Flagstaff, and Colton Formations within and adjoining the Uinta Basin.

Paleontology: The Paleontology group hosted the Mesozoic Terrestrial Ecosystems (MTE) conference in early June. MTE is an episodic meeting of paleontologists that is held at various locations around the world. This is the first time that this conference has been held in the U.S. and it attracted nearly 200 scientists from points across the globe. The meeting and associated field trips were well received and came off without a hitch thanks to significant backend work by the UGS Paleo and GIO staff members. Many talks were presented including interesting new discoveries in Utah, specifically intact dinosaur nests! near Emery and new stratigraphy and age control for parts of the Cretaceous section on the Colorado Plateau. Jim Kirkland was recognized at this conference for 50 years in the paleo industry.

Geologic Information & Outreach

GIO experienced (and survived) a large uptick in inquiries due to the wet, landslide-prone spring. In response to the multitude of landslides this spring, we collaborated with the Data Management Program to quickly create a new landslide current events web page.

GIO helped run the 14th Conference on Mesozoic Terrestrial Ecosystems (MTE14). The bookstore coordinated with the meeting and saw increased sales from purchases by attendees.

The bookstore continues to earn high praise from customers, with 92% five-star Google reviews in the last year (25 total reviews, 23—five stars, 2—four stars). New bookstore items of note: a waterproof, tear-resistant paper option for all print-on-demand maps, and Utah geologic map T-shirts and totes.

On the people front:

- Torri Duncan stepped up from assistant manager to manager of the bookstore.
- Geologist Peter Nielsen transferred from Oil, Gas and Mining to the bookstore and has received multiple fantastic reviews from customers on Google and in person. He completed his first *Survey Notes* article—“GeoSights, Palisade State Park in Sanpete County.”
- Patrick Engberson started on July 17 as our new videographer. He has been busy on a video tutorial of the newly updated Rockhounder app and bookstore sales floor panoramas.
- Jackson Smith (recently promoted from the bookstore to Geologist) finished his first *Survey Notes* article—“Glad You Asked, Cinder Cones of Southwestern Utah, What Exactly Are They and How Did They Get Here?” Jackson also presented to the Northern Utah Prospectors Association about the geologic history of Utah.

Collaborations:

- Jessica Castleton (Hazards Program), to create a new Shallow Groundwater non-technical booklet (PI series publication). It is in final review.
- Jeremiah Bernau (formerly Groundwater & Wetlands Program), to create a non-technical booklet (PI series publication) about the Bonneville Salt Flats. It is almost ready for review.
- The Utah STEM Action Center on a shared teaching kit, which is currently being field tested with teachers in classrooms before final rollout.

Photographs have been selected and the 2024 Calendar of Utah Geology is in layout.

Data Management

The Data Management Program continues to be busy. During landslide season they kept busy posting images and information for each of the 25+ sites the Hazards group visited. The DM program is a key component in providing information to the public on current events. Other accomplishments include:

- Releasing an updated version of the Rockhounder app in July
- Providing assistance to the Division of Emergency Management’s flood hazards website
- Improving the Office of Energy Development’s web experience
- Updates to earthquakes.utah.gov
- Providing assistance with the onboarding of many new staff
- Assisting the Bookstore with the creation and printing of on-demand topo maps

Funding was received for FY24 to build a new “dashboard” that will archive and share data about Utah’s groundwater across the state. This project will be done in cooperation with the Utah

Division of Water Rights.

Website activity and usage continue to be high.

Cedar City office – Please see the separate report from Tyler and Lance

Funding and Budget

Financially, the UGS is in relatively good shape. Federal and other outside funding is strong. The UGS' challenge to pursuing additional outside funding is limited by its ability to fund internal staff to satisfy “match” requirements.

Once again Mineral Lease revenues proved to be volatile. Final revenue to the UGS for FY23 was \$3,034,447, much higher than our original appropriation of \$1,471,600. Unfortunately, we lapsed nearly \$750,000 back to the state at the end of the fiscal year. Looking forward, our current forecast is about \$1,600,000, which is less than our FY24 appropriation of \$2,286,600. Unexpected extremely high prices for natural gas during winter account for much of the volatility.

The UGS plans to submit five building block requests for the upcoming budget cycle. In order of priority:

Mineral Lease Royalty Recovery – \$750,000, One-time funding for FY24 (current year) a request to restore the amount the UGS lapsed to the state at the end of FY23.

Landslide Mapping of Utah’s Rapidly Growing Areas to Reduce Risk - \$224,500, mostly ongoing funding for FY25. This proposal has been made for the last two years. In light of the many landslides experienced this year, we feel it is important to ask again.

Enhanced Wetland Mitigation, Coordination, and Restoration - \$155,000, mostly ongoing funding for FY25. This is an outcome of the report that GWW did for the legislature on the possibility of implementing an In-Lieu Fee program for wetlands.

Data Collection for More Efficient Geologic Hazard Mapping - \$79,500, mostly ongoing funding for FY25. This request would require state and local agencies that gather geological data to submit it to the UGS. Will also require statutory change.

Implementation of Internal AI for Data Extraction Collection & Delivery – \$173,400, One-time funding to research and utilize AI as a part of our research and outreach efforts.

Board discussion:

Mineral Lease payments: UGS would like to explore the possibility of having future Mineral Lease payments be made to a restricted account instead of directly to our budget. This would allow the funds to carry over year to year, thus having the potential to save some funds during good years for use during lean years.

The Board agrees with this idea and realizes that geologic demands fluctuate so this type of account would be greatly beneficial for the UGS. Sam Quigley motioned to have some sort of statement written up so UGS can take it to their next meeting with the Governor’s Office. Rick Chesnut seconded the motion and the Board voted unanimously to write a letter of support for the legislature to change the statute to create a restricted account and have future mineral lease

royalty payments deposited to this account.

Funding for professional licensing: The majority of geology career track positions require a Professional Geologist license from the State of Utah. The costs for testing have risen significantly in recent years, now at \$600. It has been suggested by staff that the UGS consider covering these costs.

The Board feels it is important from a public view that UGS geologists obtain the license and would agree with UGS reimbursing a portion of the testing fees. The Board will readdress this issue at the next meeting and decide what the next step will be for this to happen. Jodi Thacker will assess current policies and decide how UGS can proceed with this type of reimbursement.

Financial Update

Financial documents in the Board packet include the Contract Proposals Tracking and UGS FY23 Closing Reports.

Mineral Lease was trending higher than the \$1,471,600 appropriated early in the fiscal year and therefore we asked the Legislature for a supplemental appropriation of \$628,400 to raise it to \$2,106,900 (the forecast at the time). It continued to trend higher, with Mike Vanden Berg increasing the forecast in March, April and May to an eventual \$3,000,000. In the end we collected \$3,034,447.

We carried over \$427,304 from fiscal year 2022 for the Bonneville Salt Flats Restoration project and spent \$94,211 in fiscal year 2023. It has a balance of \$333,093 which will be carried into fiscal year 2024. The project started with a \$1 million appropriation.

We carried over \$724,304 from fiscal year 2022 for the Great Salt Lake Groundwater Studies project and spent \$213,070 in fiscal year 2023. It has a balance of \$511,234 which will be carried into fiscal year 2024.

We carried over \$834,317 general funds for operating expenses from fiscal year 2022. In fiscal year 2023, we built upon that, and we will non-lapse \$1,212,073 into fiscal year 2024.

This was the second fiscal year of the new UGS Oil, Gas & Mining restricted account (Fund 1137). It was appropriated at \$640,100. The Utah State Tax Commission (USTC) has transferred that full amount. I am still waiting for the USTC to process the 4th quarter actual earnings and interest. Therefore, currently I am not able to report on the total fund earnings for the fiscal year or the fund balance.

We were able to accomplish many equipment purchases again and will continue to set aside funds for this each year.

Total grant and contract revenue collected totaled \$3,155,642.47. Around \$500,000 of this was for a large equipment purchase for the grant with the Colorado River Authority of Utah (which also explains why our capital expenses are a lot higher this year). However, this is still a large amount for the Survey. It did keep our employees very busy, and we did have to hire some

temporary help.

We will now start on the fiscal year 2024 operating budget. Then next month, we will prepare the fiscal year 2025 budget request for the Legislature.

UGS has agreed to host the 2024 AASG meeting next June 2-7, in Park City. UGS is looking for recommendations of sponsors.

Board field trip will take place September 14-15, 2023, and a draft itinerary has been completed.

Staff Presentations:

Ben Erickson presented on the 2023 Spring Landslide Response.

Michael Vanden Berg presented on Mapping the Floor of Great Salt Lake Using Bathymetric Lidar: A Pilot Study

Board adjourned 12:10 pm.