

**UGS BOARD MEETING**  
**Department of Natural Resources**  
**Utah Geological Survey, Utah Core Research Center**  
**240 N. Redwood Road, Salt Lake City**  
**Wednesday, April 13, 2022**

The meeting of the UGS Board was called to order at 8:30 a.m.

**ATTENDANCE**

**Board members:** Elissa Richards – Chair, Ken Fleck – Vice-Chair, David Garbrecht, Riley Brinkerhoff, Becky Hammond, Sam Quigley, and Rick Chesnut. Tom Faddies (SITLA) was not in attendance.

**UGS Staff:** Bill Keach, Mike Hylland, Jodi Patterson, Cheryl Wing, Jay Hill, Hollie Brown, and Steve Bowman. Subigya Shah and Skadi Kobe attended until after the new staff introductions. John Baza (OGM) and Rich Giraud joined for the presentations.

**APPROVAL OF MINUTES**

Elissa Richards motioned to approve the minutes of the January 19, 2022, UGS Board meeting. Riley Brinkerhoff seconded the motion. The Board voted, and the motion carried.

**ACTION ITEM**

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:

*Geochemical Sampling of the West Desert Indium-Bearing Zinc-Copper Skarn;* funding from the USGS; new funding to the UGS \$300,000; total project \$375,000; estimated start date 7/1/2022; estimated end date 6/30/2025.

*Phosphoria Formation Geochemical Reconnaissance;* funding from the Idaho Geological Survey (from USGS); new funding to the UGS \$63,500; total project \$79,000; estimated start date 7/1/2022; estimated end date 6/30/2025.

*Pahvant Valley Recharge Study;* funding from the Division of Water Rights, DNR; new funding to the UGS \$109,991; total project \$211,721; estimated start date 2/1/2022; estimated end date 6/30/2024.

*Hydrologic Monitoring of Environment Restoration Projects – Year 7;* funding from the Utah Watershed Restoration Initiative; new funding to the UGS \$175,000; total project \$233,333; estimated start date 7/1/2022; estimated end date 6/30/2023.

*Provo River Wetland Mapping to Support Sensitive Species & Aquatic Habitat Assessment;* funding from the Endangered Species Mitigation Fund, DNR; new funding to the UGS \$26,025; total project \$34,701; estimated start date 7/1/2022; estimated end date 6/30/2023.

*Provo River Wetland Mapping to Support Sensitive Species & Aquatic Habitat Assessment*; funding from Heber City; new funding to the UGS \$3,005; total project \$4,007; estimated start date 4/1/2022; estimated end date 6/30/2023.

*Geologic Data Preservation Project, Federal Fiscal Year 2022*; funding from the USGS; new funding to the UGS \$245,225; total project \$490,560; estimated start date 7/1/2022; estimated end date 6/30/2023.

*Project Effectiveness Monitoring – Water Quality Benefits of Large-Scale Pinyon-Juniper Treatments, Montezuma Creek, Utah*; funding from Utah Division of Water Quality Nonpoint Source Program; new funding to the UGS \$15,000; total project \$20,000; estimated start date 7/1/2022; estimated end date 6/30/2023.

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

## **DIRECTOR'S REPORT: COVID-19 Update**

With the decline in COVID-19 cases, most UGS staff have returned to normal working schedules. Some still prefer to work from home. Fieldwork is in full swing with an increased focus on personal safety. Going forward, staff are encouraged to implement whatever personal safety measures that are important to them.

## **Crawford Award**

The nomination process will begin in mid-April. Members of the Board will receive digital copies in mid-May. The goal is to complete by the end of May. Award will be presented at the annual UGS picnic to be held on June 9, Canyon Rim Park.

## **Personnel Changes**

### *Retirements:*

Bob Biek, Senior Scientist in the Mapping program, will be retiring effective June 1<sup>st</sup>, 2022, after 26 years of service.

Linda Bennett – Accounting Technician III, retires effective April 15<sup>th</sup>, 2022, after 27 years of service.

Grant Willis anticipates retiring in the coming year. We anticipate 1-2 others to retire from the Mapping program in the next six months.

*New hires:*

Subigya Shah – GIS Analyst in Mapping

Kristi Conley – Geotech, assisting in Hazards

Skadi Kobe – Geotech, assisting in Energy and Minerals

*Positions to fill in the near future:*

*Financial Analyst – to replace Linda*

*Mapper – Mapping, to replace Bob*

*GIS Analyst or 3D Geo – Mapping*

*Hydrogeologist – Offer accepted, will start in May, replacing Stefan*

*Hydrogeologist – new position funded by Legislature*

*Wetlands Mapper – new position funded by Legislature*

## **Recent Activities – Looking Forward**

*Energy and Minerals –*

The Energy and Minerals Program received permission to write final proposals (pretty much a guarantee for funding) for two large USGS-funded EarthMRI projects: one focusing on a geochemical sampling program in the West Desert Zn-Cu-In skarn which is part of the Fish Springs mining district (\$375k for 3 years, PI: Stephanie Mills), and the other focuses on the REE potential of the Phosphoria Formation (\$79k for 3 years, PI: Andrew Rupke). The Phosphoria project is in partnership with the Idaho, Wyoming, and Montana Geological Surveys. The EarthMRI program also set money aside to conduct an extensive aeromagnetic and aerogravity survey in the West Desert, as well as money for additional lidar surveys in the state.

Funding for the Iron Mountain carbon sequestration project was finally approved by DOE (\$192k for 2.5 years) and the project started in mid-March. This project is a partnership between UGS, New Mexico Tech, EGI, Los Alamos, and the Oklahoma Geological Survey. Eugene Szymanski will act as PI for UGS and lead the geology team charged with characterizing possible CO<sub>2</sub> sequestration reservoir/seals in Iron County, west of Cedar City. In particular, we will be looking at the Navajo Sandstone for reservoir potential, with the Carmel Formation and Three Peaks laccolith as sealing units.

In addition, research continues on several other projects (geothermal, CORE-CM, Cane Creek, Gold Hill, etc.). The E&M team also submitted several abstracts (8+) to the upcoming AAPG Rocky Mountain Section meeting, to be held in Denver in July 2022.

### *Geologic Hazards –*

Before the COVID-19 pandemic, Geologic Hazards Program staff were doing springtime checks in northern Utah for landslide movement on about 80 landslides. In 2022 we are planning on monitoring these landslides again. Currently, survey-grade GPS landslide monitoring is being conducted on landslide in the Snowbasin area, Spring Creek Road (Riverdale), and Parkway Drive (North Salt Lake). We are also monitoring the progress and funding levels of the National Landslide Preparedness Act to look for federal funding for landslide inventory mapping.

We have recently completed detailed surficial fault mapping for the Washington, Hurricane, and Sevier fault zones in southern Utah. Mapping was completed at 1:10,000 scale and includes special-study zones for each mapped fault trace. This mapping is currently available in the Utah Geologic Hazards Portal, and we are continuing to refine and improve the mapping and plan on releasing it as a UGS Report of Investigation.

We are nearing completion of a second edition of *Putting Down Roots in Earthquake Country—Your Handbook for Earthquakes in Utah*. Updates include mention of recent publications (UGS earthquake probabilities report, EERI M7.0 scenario report, FEMA URM report, FEMA schools report, etc.), adding pages about the Magna earthquake, fault hazards in Cache Valley and southern Utah, and addition of QR codes. The goal is to have an online version available for the Great Utah Shakeout (April 21), with a print version following shortly after. We are working on securing funding for translation into a Spanish language version.

Geologic hazard mapping is progressing in northern and southeastern Utah, specifically in the Cedar Fort, Saratoga Springs, Jordan Narrows, Antelope Island South, Baileys Lake, and Saltair 7.5' quadrangles in northern Utah and in the Kane Springs and Rill Creek 7.5' quadrangles near Moab. The goal is to release this mapping before new large-scale development begins.

In the recent 2022 Utah Legislative General Session, the UGS was appropriated \$150,000 for FY2023 to conduct a study of the effectiveness and potential cost of an Earthquake Early Warning system in Utah. This study will be a collaborative effort between the UGS, the University of Utah Seismograph Stations, and the Utah Division of Emergency Management. It is anticipated that a report will be available for an interim session of the Utah Legislature in late 2023.

Hazards is also working with Energy and Minerals, and Groundwater and Wetlands on the INGENIOUS (INnovative Geothermal Exploration through Novel Investigations Of Undiscovered Systems) project. This is a large project funded by the Department of Energy and includes state, federal, and academic partners. Using data input to geologic databases, play-fairway analytics will be used to accelerate discoveries of new, commercially viable but hidden geothermal systems in the Basin and Range Province.

### *Groundwater & Wetlands–*

The Groundwater and Wetlands Program is changing and growing rapidly.

In the Groundwater section, we are in the process of hiring Stefan Kirby's replacement and a second hydrogeologist to fill the groundwater half of the building block award. Jeremiah Bernau, who is currently finalizing his Ph.D. at the University of Utah, has formally agreed to join us in early August to lead the Bonneville Salt Flats project. Paul Inkenbrandt is leading a new water budget project in Pahvant Valley, a high priority for the Division of Water Rights. Work continues on projects in Emery Valley northwest of Bryce Canyon N.P. (Janae Wallace PI), Matheson Wetlands Preserve in Moab (Kathryn Ladig PI with Trevor Schlossnagle), Great Salt Lake Shorelands Preserve in Layton (Claire Spangenberg, Pete Goodwin, Rebecca Molinari, Nathan Payne, and Hugh Hurlow), watershed restoration monitoring projects statewide (Lucy Jordan, Janae Wallace, Trevor, Claire, and myself PIs), and the Utah Flux Network statewide (Paul Inkenbrandt and Kathryn Ladig PIs). During FY23 with an increased staff, we will expand the latter two projects and address groundwater inflow to Great Salt Lake. Trevor is working hard on the Emery Valley project, a water quality study in Iron County, and watershed restoration monitoring, and is scoping an interesting new project using shallow geophysics to map a subsurface fault and evaluate its possible role as a groundwater barrier.

In the Wetlands section, Diane Menuz continues her excellence in leading and growing that program. Peter Goodwin, Rebecca Molinari, and Elisabeth Stimmel recently completed their wetland mapping of Cache County and have started their work on Utah Lake. Rebecca is evolving into the Program expert on imagery analysis and statistical analysis of time series data. Elisabeth will be a crew chief and lead botanist for Diane's montane wetlands assessment and Diane, Pete, and Becka Downard are busy hiring field assistants and an additional mapper. Miles McCoy-Sulentic continues excellent botany and wetlands assessment work and will also co-lead the montane wetlands project. Becka spent her first months at UGS completing a report for the EPA Wetlands Program Development Grant she completed while at the Division of Water Quality, to be distilled as a Utah Geological Association paper in the upcoming volume on Great Salt Lake (Mike Vanden Berg chief editor, Hugh assistant editor). She is now fully engaged in her new EPA-funded project, and I am highly impressed every time I stop by to see what she is working on. Becka does great work and is a fine colleague; and along with Claire Spangenberg, Hugh Hurlow, the new building block hydrogeologist, and personnel from E & M will form a multidisciplinary team to address major issues in Great Salt Lake groundwater, wetlands, and salinity during the next 3 to 5 years.

### *Geologic Mapping & Paleontology –*

#### Mapping

Stefan Kirby has started as the new program manager.

In the last quarter the mapping program completed significant work on this year's STATEMAP projects. This work has included new mapping of several 7.5' quadrangles in the Ogden Valley area, and reviewing of the Park City East, Park City West, and Heber City quads. Revisions, new mapping and edits have also been made to several 30' x 60' quadrangles that include the NE 1/4 of the Beaver quad, the Bonneville Salt Flats quad, and the Salina quad. Significant remapping and editing of the 1:500k state geologic map has also been completed. Edits to the state map will provide an important refresh of one of our most popular products. These edits include a greatly refined Tertiary stratigraphy and fixing of a host of map fit and geologic problems. Other important maps that are nearing completion include the Duchesne and Rush Valley 30' x 60' quadrangles. GeMS and GIS processing of various 7.5' and 30' x 60' quadrangles has been completed. We have added four GIS Analysts to help carry this load. This year's commitment to STATEMAP is very GIS intensive.

Important discussions concerning the future of MapBIB (UGS' internal geologic map database and archive) were held with various UGS stakeholders. The goal here is to modernize the database and interface to provide UGS users and the general public better access to this authoritative database of geologic maps in Utah.

STATEMAP funding for FY23 in the amount of \$604,272 (\$1,208,544 in projects) was just awarded. This is an increase of about \$25,000 over last year's funding. We had proposed \$903,450. The amount we received should be manageable and achievable.

### Paleontology

The Paleontology group received another round of grant funding from the NPS. Work on this grant will focus on the survey of fossil resources in the Island in the Sky and Maze districts of Canyonlands National Park. The Paleontology group, with the help of several new temporary employees, has begun the process of archiving and updating their extensive files of paleontological data and resources. We are also having a full-scale, 3D model of the Megablock printed. This 3D model will then serve as a mold for various interpretive displays at the new Utahraptor State Park, the Natural History Museum of Utah, and elsewhere.

The State Paleontologist and State Geologist visited the Mill Canyon Dinosaur Track Site in early February to investigate potential damage to the fossils preserved there. They met Dr. Brent Breithaupt, a BLM paleontologist. Fortunately the damage is much less than originally reported.

### *Geologic Information & Outreach –*

The Geologic Information and Outreach Program (GIO) has been busy for the first quarter of the calendar year interfacing with the public and working on a variety of collaborative efforts with other UGS programs. With the Data Management Program, we have updated UGS's Popular Geology web pages, which are in final review and should be live within a month. With the Hazards Program, we have provided content and layout artwork for the completely updated

version of *Putting Down Roots in Earthquake Country*. With the Data Management and Energy and Minerals Programs, we are working on an updated web app version of *A Collector's Guide to Rock, Mineral, and Fossil Localities of Utah*, which is a primary resource for rockhounds that UGS published in 1995. This is a big project that started with tentatively locating sites on a GIS map. We are now field checking site localities and taking photographs. We have created a collector app that uses smartphones for consistent data collection by multiple staff members. Jackson Smith, our new bookstore manager, who is a geologist with field experience, was the first to beta test the collector app in the field. Part of this work is funded by BLM through a project managed by our Energy and Minerals Program. Finally, GIO is collaborating with the Mapping Program on basic geologic training for non-geologist staff. We are planning a half-day lecture and full-day field trip in June, focusing on what geologic maps show in the real world. Hopefully this will be especially helpful for staff that do GIS, cartography, and artwork on geologic maps.

The bookstore continues to sell a significant number of Utah State Park annual passes. However, the State Parks Board changed the passes from one year from purchase month, to calendar-year passes. We are currently allowed to prorate the new passes, which keeps customers happy but reduces income. Next year we will not be able to prorate them, which may make for a busy start to the year for the bookstore. The bookstore's new geotech, Torri Duncan, who has a geology degree, completed fieldwork for a future GeoSights article on Fremont Island. This is the first time we have utilized bookstore staff for a nontechnical geologic writing assignment. Torri is also helping the Groundwater Program with water sampling near Moab. Such duties utilize the new bookstore staff's geologic training and hopefully will increase their job satisfaction.

With the decline in COVID-19 cases, GIO is again scheduling in-person outreach activities. In collaboration with Utah State Parks, Jim Davis signed up to talk about geology for the July Mt. Wilson Hike at Wasatch Mountain State Park, which was canceled the past two years. We have scheduled Earth Science Week, which was also canceled the past two years, for the first two weeks of October. We look forward to again meeting face-to-face with 700–800 school kids.

Hollie Brown, UGS PIO, put out a press release and coordinated a field visit with an AP reporter, on UGS work on the Bonneville Salt Flats: <https://geology.utah.gov/press-release-groundwater-study-bonneville-salt-flats/>.

### *Data Management*

The Data Management Program continues to collect and manage a significant amount of data with the aim of making it available to the public as quickly as possible. To that end, some accomplishments achieved in the past few months include:

- The Utah Wetlands web application was upgraded with new data (wetland conditions and wetland landscape by ecoregion) and new features (dynamic attribute tables for displaying large, tabular data).
- Server migration necessitated repair of the Groundwater Monitoring Portal, and during the development process it was upgraded with a new user interface.
- The Publications Repository webpage was upgraded with a new user interface that makes more items available for download and preview than before.
- New web content accessibility options include links to landing pages, lithologic columns, cross sections, and a map preview that takes users directly to the Geologic Map Portal.
- The Geologic Map Portal web application received many new features.
- Created a shareable link that takes users directly to a specific geologic map.
- Ability to download older/historical geologic maps.
- Old, static publication lists were converted to dynamically-populated lists.
- All UGS servers were migrated to Google Cloud which required lots of working together with the Division of Technology Services to troubleshoot and test.
- ArcGIS Portal was installed and is getting tested with paleo data by Cyndi Andersen and Martha Jensen.
- New GIS Analyst was hired and is currently training with Cyndi to work on the Ogden 7.5' STATEMAP project.
- Mackenzie Cope is learning with Jackie DeWolfe how to build "Experiences" (aka web applications without writing code) using ArcGIS "Experience Builder"; the new RockHounder web application will use this application-building method.

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

### **Funding and Budget –**

The State of Utah weathered well the economic challenges related to the COVID-19 pandemic. The economic challenges of the past two years underscore the need for the UGS to obtain stable resources to ensure the UGS can continue providing critical services to the State of Utah.

Financially, the UGS is in better shape than it has been for several years. Mineral Lease revenues to the UGS rebounded in 2021, ending up at about \$1,000,000, slightly less than 2020, once again proving the volatility in this revenue source. On the good news side, Mineral Lease revenues have continued to rebound in 2022. Current forecasts suggest we may end up with \$1,500,000\*, a 50% increase over 2021. USGS grants continue to grow with an increased federal emphasis on better understanding the mineral resources in the United States.

The Governor's FY23 budget included two new positions for the UGS: 1) a groundwater geologist and 2) an earthquake hazards geologist. Additionally, the Governor included a recommendation for \$150,000 of one-time funding to do a feasibility study for an Earthquake

Early Warning (EEW) system. Ultimately, the legislature chose to fund the groundwater geologist and the one-time funding for the EEW feasibility study.

UGS leadership continues to believe that Mineral Lease funds are not a sustainable, reliable funding source for core operating expenses. To that end the UGS continues to seek the stability of state General Funds to maintain core services and seeks to use Mineral Lease funds as a mechanism to balance fluctuations in outside funding, while still maintaining the mineral-related objectives tied to Mineral Lease funds.

We continue to pursue other funding options to maintain services to the State at current levels.

We are closely monitoring the revenue from oil, gas and mining severance taxes being deposited in the new restricted account created by Senate Bill 133 in last year's legislature. Being only three quarters into this new revenue source, it is still too early to know if this will be an effective and sufficient funding mechanism for the UGS. However, we are hopeful that it will build a reserve account that we can draw on in future years. Time will tell.

\*Two primary factors affect the amount earned: 1) volume of production on Federal lands, and 2) oil price. The second factor is probably having the largest impact on FY22 numbers. We are not yet seeing a significant increase in production on federal lands.

### **Financial Update –**

Financial documents in the Board packet include the funding bill summary and FY23 targeted increases from the 2022 Legislative Session, the FY22 UGS Budget-Actual-Forecast Summary (through February 2022) and the contracts tracking summary through March 28, 2022.

The UGS is currently forecasting a 2022 fiscal year surplus of \$1,946,677. Part of that surplus estimate is \$730,000 obligated for the Great Salt Lake Groundwater studies and \$477,900 obligated for the Bonneville Salt Flats Restoration project. Therefore, the balance of \$738,777 is what we estimate carrying over from FY22 to next FY23 for general operating items and future match. We have requested non-lapse authority up to \$1,000,000 for general operating items. We started FY22 with a carry-forward from last fiscal year (2021) of \$2,253,648 (\$750,000 Great Salt Lake Groundwater studies, \$997,648 Bonneville Salt Flats Restoration, and \$506,000 general operating).

After December's financials, we conducted a mid-year, detailed review of project and operating budgets and made forecast adjustments as necessary. This resulted in adjusting revenue estimates down by \$285,578. February represents 67% of the fiscal year completed. Total percentage of outside revenue billed is about 50%. Fieldwork will be picking up again in Spring.

### **Legislative Update –**

The 2022 Utah Legislature General Session is now over and the UGS has completed its evaluation of the fiscal and statutory changes coming. While most of our Building Block

requests were not included in the Governor's Proposed Budget to the Legislature, we were funded by the Legislature for an Earthquake Early Warning study (\$150,000 one-time), a study of the viability of an in-lieu fee program for wetland mitigation (\$25,000 one-time), and one groundwater staff FTE (\$140,300 ongoing). With the ongoing drought in Utah and significant federal funding available to the state, water issues generally took center stage with the Legislature this year. The Legislature also funded a 3.5% labor market increase, a 6.7% increase in health insurance, a 1% increase in dental insurance, and the usual \$26/pay period retirement match for all employees, along with targeted pay increases. Some inequities may result from the targeted pay increases and further adjustments will likely be needed in future fiscal years.

The Legislature passed House Bill 104 (State Employment Amendments) that creates a Pay-for-Performance system to replace the current pay system. This new system will require employee written reviews each quarter (four per year), recommending the same, an increased, or a decreased salary (however, the Legislature has not provided any new funding for pay increases). The bill also converts all supervisory employees (those performing performance reviews) from Schedule B (career service) to a new Schedule AX (at-will, exempt from the career service provisions; removal from any appointive position under schedule A, unless otherwise regulated by statute, is at the pleasure of the appointing officers without regard to tenure). Supervisory employees in Schedule B before July 1, 2022, will be able to retain their Schedule B status while in the same position or may voluntarily convert to Schedule AX and receive a 5% salary increase. Longevity and promotion salary increases are also repealed. More details will become available in the coming months, as the Utah Division of Human Resource Management develops guidelines and rules to implement HB104.

See separate chart from Steve Bowman.

### **Staff Presentations –**

John Baza, Director, Oil, Gas, and Mining presented “Common Goals – How we work together”.

Rich Giraud presented “Landslide Hazards: Types, Problems, and Risk Reduction”.

Board adjourned at 11:47 am.