Elden Mountain is a Pleistocene-age exogenous dacitic lava dome of the San Francisco volcanic field of northern Arizona. Prominent lava flow lobes are numbered on the shaded relief image and the Google Earth image. For geologic units/descriptions see Dick Holm’s ‘Geologic map of San Francisco Mountain, Elden Mountain, and Dry Lake Hills, Coconino County, Arizona’ (USGS Map I-1663 | https://pubs.er.usgs.gov/publication/i1663).

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AGS Summer Hiatus & Social Mixers

The Arizona Geological Society’s 2024 presentation series is taking a break in June, July, and August. In lieu of formal presentations, AGS’ Executive Committee is hosting evening social mixers on the 3rd Thursday of June, July, and August at Borderlands Brewing’s downtown taproom at 119 E. Toole Avenue. We purchased 25 taco plates from Borderlands, so come hungry. The beer is on you.

Schedule & Sponsor

✓ 20 June, Thursday | Orologic
✓ 20 July, Thursday | Ruen Drilling, Inc. www.ruendrilling.com
✓ 20 August, Thursday | Pending

Arizona Geological Society
Social Mixer  Thurs 20 June 2024
6:30-9 p.m
BORDERLANDS
Brewing Company
119 E Toole Ave, Tucson, AZ

AGS will spring for 25 taco plates. Beer/wine is on you.

RSVP online at https://www.arizonageologicalsoc.org/

Join AGS’ Executive Committee &
• Meet with colleagues – old & new
• Dine out on veggie tacos
• Partake of locally brewed beer
• Participate in our 1st GeoTrivia contest

Orologic
AGS Executive Committee thanks Paul Jensen (Orologic) For underwriting the June 2024 mixer.
An Echo from Deep Time

How Volunteer Organizations Thrive
Eric Seedorff

This column is one of an occasional series of articles about the Arizona Geological Society contributed by AGS members.

Organizations of all stripes require people to make them work, and professional organizations rely heavily (entirely, in the case of AGS) on volunteers. These consist of people in formal positions, plus others who perform regular tasks or assist with one-off events. When AGS functions, the following occur—frequently monthly—because of volunteers:

- members join, membership rolls are maintained; dues are accepted;
- field trips and leaders are sought, organized, planned, and implemented;
- Executive Committee and other committee meetings are scheduled and held;
- meeting notes are taken, approved, and filed;
- newsletters are written, assembled, and distributed;
- web pages are updated;
- corporate donors are solicited and donations accepted;
- monthly meeting venues are scheduled, food is acquired, speakers are solicited and scheduled, abstracts for the talks are submitted, and speakers are introduced and thanked;
- scholarships are advertised, applications are reviewed, and winners are selected, paid, and thanked;
- social events are planned, scheduled, organized, and implemented;
- special projects such as symposia may be undertaken (more on this in later columns);
- publications are produced, sold, and distributed;
- legal requirements (e.g., filing tax forms) are met; and
- bills are paid.

Most of this is accomplished by members of the Executive Committee, especially officers. AGS currently has eight officers and six councilors (check them out on the web page).

AGS makes a major, largely overlooked, contribution to the broader geologic community. Just note the role that AGS publications from symposia and field trips have made to government, academia, and mining companies; consider Arizona Geological Society Digests 17 and 20 and the Arizona Highway Geologic Map.

An adequate number of dues-paying members is a necessary but insufficient requirement for a volunteer organization to thrive. Without a core group of people who will volunteer to participate, generally partially in person, the society can no longer function adequately.
Regardless of the size of the membership, if there are no leaders, there will be no talks, no field trips, etc., i.e., the society risks entering a death spiral, and death spirals are difficult to reverse.

AGS needs a constant flow of new volunteers. A few positions ideally require a special background or skill (e.g., VP Programs) and thus are harder to fill. Likewise, newcomers to the Executive Committee (“ExComm”) generally are not suited to starting out as President—but it does not take long until you are qualified! Certain positions benefit from having continuity over several years. Others benefit from having certain personality traits, training, or skills such as field experience, enthusiasm, communication, leadership, and attention to detail. Nonetheless, most positions are available to newcomers of any age, especially if they are willing to be trained. Most members travel, and “perfect attendance” is not required, but some degree of in-person involvement in Tucson is beneficial.

Regardless of how successful we have been, the society—for at least the last decade—has sought to get a younger and more diverse Executive Committee (diverse in many dimensions). One way for the Executive Committee to gauge that you might be interested is that you already attend some society functions. Volunteer organizations are great ways to diversify and enrich your life, make professional connections, and develop new friendships. Please contact any Executive Committee member to convey your interest in volunteering. The society will soon be soliciting people to fill positions for next year. Join the fun and make a difference to your community!

Current activities and news from the Arizona Geological Survey

By Phil Peartree, Arizona Geological Survey Director & State Geologist 16 June 2024

AZGS staff are engaged in many important research activities and investigations in Arizona, supported by a combination of funding from our state appropriation and external sources. These are some highlights:

*Post-Wildfire Hazards* – Flooding and debris flows are obvious hazards in Arizona in the wake of our frequent and sometimes large wildfires. AZGS staff have conducted numerous studies of post-wildfire debris flow hazards over the past decades and have several active projects to assess potential post-fire debris flow hazards and assess the effectiveness of post-fire engineering efforts. Ann Youberg was one of the organizers of the “Establishing Directions in Postfire Debris-flow Science”, held in May in South Lake Tahoe. This meeting brought together
90+ scientists (including Ann Youberg and Rebecca Beers of the AZGS) to consider current and future research to better understand and predict potential post-fire hazards.

Landslide mapping – AZGS staff recently completed and released a strip map of landslides in the SR 87 and 260 corridor, from Mesa through Payson to the Mogollon Rim. Geologists Joe Cook and Chad Kwiatkowski discovered numerous previously unmapped landslides during this project. The project complements an earlier map of the I-17 corridor, and the AZGS has received funding for a third landslide mapping project along US 60 from Apache Junction to Show Low, and will begin work later this year.

Earth MRI projects – The amount of federal funding available to investigate mineral resources (primarily critical minerals) is unprecedented in the modern era. The AZGS is leading or cooperating on 4 USGS Earth MRI-funded projects, including investigating the geochemistry of Laramide porphyry deposits, reassessing NURE data from the Colorado Plateau, geochemical reconnaissance of molybdenum-tungsten deposits across Arizona, and sample Proterozoic mineral deposits in Arizona for geochemical and geochronological analyses.

Orphaned wells – AZGS staff are working with the Arizona Department of Environmental Quality to identify and characterize orphaned wells – wells that were abandoned without proper plugging and remediation. The primary purpose of this project is to reduce emissions of methane and other gases.

Geologic Mapping – We are nearing completion of a 2-year detailed mapping effort in the Duncan area of southeastern Arizona; these maps will be released later this year. We are continuing to map at 1:24,000 scale in the US 93/I-11 corridor east of Kingman. A parallel track of development of digital 1:100,000-scale geologic maps covering a swath from west of Phoenix through the Tucson metropolitan area continues. Our new compilation of the Phoenix North 1:100,000-scale map will be released in September 2024. All geodatabases associated with these geologic maps meet the current Geologic Mapping Standards developed by the USGS.

USGS – Federal Advisory Committee Nominations

Steve Semken, AGS member & Prof. School of Earth and Space Exploration, Arizona State University, submitted the note below regarding a fresh US Geological Survey Federal Advisory Committee on science quality and integrity. Nominations are due no later than 17 June 2024. Follow the link for more information. “The USGS is standing up a new federal advisory committee focused on science quality and integrity. Would you mind sharing the announcement with anyone (or any organization) who might be interested in making a nomination? It’s been a tricky FACA body to find nominees for – the call for nominations is currently in its second extension, closing June 17”

Federal Register :: Advisory Committee for Science Quality and Integrity; Call for Nominations; Second Extension

Some recent USGS Publications: Southwestern United States

Enumerated below are some recent US Geological Survey publications pertinent to geology and natural hazards encountered in the southwestern U.S.

1) Thomas, M.A., Michaelis, A.C., Oakley, N.S. et al. Rainfall intensification amplifies exposure of American Southwest to conditions that trigger postfire debris flows. npj Nat. Hazards 1, 14 (2024). https://doi.org/10.1038/s44304-024-00017-8


Bootprints of the Membership  Chad Kwiatkowski

Geology has always been my destiny, but it took me a while to realize that. I was born in 1994 in Bellevue, Washington, about 50 km above the top of the subducting Juan de Fuca tectonic plate. In the first few years of my life, my family lived in various towns in Washington and Oregon, mostly within the Columbia River Gorge. One of these towns, Stevenson, Washington, is built on a large landslide complex! Among the landslides, the Cascade volcanoes, and with the omnipresent possibility of an earthquake, geologic hazards have always been near and dear to me.

My family relocated to Cave Creek, Arizona, in the summer of 1997. Growing up in the Sonoran Desert, I was fascinated by the majestic mountains and the stunning biodiversity. My mom pushed me in a stroller through Browns Ranch in the McDowell Sonoran Preserve and brought me along on other local hikes. When my friends and I were of driving age, we spent our weekends further exploring the surrounding mountains, canyons, and creeks.

My favorite place in Nature that I came to know is Spur Cross Conservation Area north of Cave Creek. Nestled at the southern boundary of Arizona’s Transition Zone, Spur Cross is riddled with enough canyons, hills, and mesas to entertain a lifetime of exploration. I was
fascinated by the various landforms and the rocks that comprise them, and wanted to learn more about how it all came to be.

**Feet in the waters of Cave Creek at my favorite place in Nature, Spur Cross Conservation Area. Skull Mesa looms in the background.**

In 2014, I enrolled in a geology class at Paradise Valley Community College. My first day of class was cancelled due to extreme flooding on August 19, 2014; geology in action! By the second day of class, I knew I had found my life calling. The next semester, I participated in a field course to the Grand Canyon and San Francisco volcanic field. This unbelievable experience cemented in my mind that geology is the field for me.

From 2015 to 2018, I was at Arizona State University. Here, I learned that geology is relevant everywhere, even right beneath the urban cityscape. The subtle rises in elevation I skated up on my way to class were risers onto Pleistocene terraces of the Salt River! At ASU, I also taught an introductory geology lab, which of all places, was centered around Spur Cross Conservation Area, my favorite place in Nature!

My next move was north to Flagstaff for a master’s at Northern Arizona University. I studied the Triassic Moenkopi Formation, specifically the metasedimentary equivalent strata in the Mojave and Sonoran Deserts. I spent a lot of time in the field making observations and collecting samples, and even more time in the lab crushing the rocks and extracting the zircon grains for U-Pb isotopic dating. The results of the zircon dating revealed that the early stages of the Cordilleran magmatic arc contributed detritus to the Moenkopi depositional system in its southwestern extent.
Flagstaff was a wonderful place to live, and while I was there, I worked a few internships that helped guide my future path. One was with The Nature Conservancy, measuring the flow of the Verde River and tributaries. This position fully affirmed my love for Arizona’s riparian oases. Another internship I did was at Wupatki National Monument, where I conducted a paleontology survey of the Moenkopi Formation within the park. I discovered nearly twenty new reptile footprint track sites, mostly of the ichnogenus *Chirotherium* (hand beast)! Some of the tracks include delicate details such as scale impressions, claw impressions, and tail-drag marks. These sites can now be preserved and protected into the future!

After defending my master’s in December 2021, I started a GIS position with United States Geological Survey (USGS). I enjoyed the work and most of all the wonderful USGS geoscientists I worked with, but I knew that my calling was in the field. I started with Arizona Geological Survey (AZGS) in October of 2022, and time has flown by since! My work with AZGS is centered around geologic hazards and surficial geologic mapping. A few current and recent projects I am involved with include landslide mapping along the Beeline Highway, Holocene alluvium mapping in the Little Colorado River watershed, and surficial geologic mapping in the Tin Mountain NW quadrangle east of Kingman. A few upcoming projects include landslide mapping along the US-60 corridor from Florence Junction to Show Low, a study of the Big Chino fault system near Paulden, and mapping of debris-flow deposits in the mountains around metropolitan Phoenix.

Since moving to Tucson, I have become more involved with Arizona Geological Society. I enjoyed meeting my fellow AGS members, and look forward to getting to know you all better at both the in-town events and fun future field trips!
Photo of the Month