



EARTHQUAKE

e-Newsletter about what's movin' and shakin' at the Earth Science Museum

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May 2016
Volume 5, Issue 5

ESM Outreach Update:

By Mardy Zimmermann

April was a good month for school outreach visits, despite it being a month of testing with AZ Merit, and Aims for many grade levels. We reached 890 students, bringing our year to date total to 6,934 with a projected school year-end total to well into 7,000 +. Outreach volunteer Lynne Wheeler of Payson has provided rock, mineral and fossil information to students at the Payson High School, which is a first for our Outreach Program and our Middle School student numbers keep growing also. Community Outreach is slower at this time of year, but we will be selling some egg cartons at events in May.

I recently tested our Plate Tectonics presentation with 4th and 6th graders with great success. Our presentations are easily adapted to different grade levels, which makes meeting teachers' needs and requests easy.

ESM Annual Meeting

The Annual Meeting of the Earth Science Museum (ESM) was held on May 17. A brief review of ESM's key accomplishments for the past year was presented. Voting for members of the Board of Trustees followed, and candidates on the ballot were re-elected for another year. The newly-elected board members later voted on officers. Current officers were nominated for another term, and the board unanimously approved the nominations.

Legislative Efforts to Restore the Mineral Museum

An initial bill to reopen the mineral museum, Senate Bill 1440, was introduced in February. It passed the Senate by a vote of 24-2 in March. The bill, however, was not voted on by the House since the Appropriations and the Energy, Environment, and Natural Resources Committees did not schedule public hearings. As a result, the measure was later considered as a part of the state budget. Specifically, it was included as a floor amendment to Senate Bill 1530 (SB 1530) which dealt with the consolidation of state agencies. Both the House and Senate passed this bill on May 4, while the Governor signed the legislation on May 10. Here is a summary of SB1530:

SB1530 transfers authority over the State Geologist and Geological Survey from the Governor to the Arizona Board of Regents and transfers administration of the Mining Mineral and Natural Resources Educational Museum from the Historical Society to the Geological Survey within the University of Arizona

The bill restructures the Mining Mineral and Natural Resources Educational Museum Advisory Council to:

1. The state geologist or the state geologist's designee.
2. One member representing the livestock industry.
3. Two members representing the mining industry.

4. One member representing the agriculture industry.
5. One member representing the tourism industry.
6. One member representing the timber industry.
7. One member who is knowledgeable in gems and minerals.
8. Two members representing the public.
9. One member of the House of Representatives who is appointed by the speaker of the House of Representatives.
10. One member of the Senate who is appointed by the president of the Senate.

This bill transfers \$428,300 and one FTE from the Historical Society to the Geological Survey for Museum operations.

The bill transfers to AZGS all unspent and unencumbered funds received by the AHS for Mining Museum operations and future revenues of the Centennial Special Plate Fund to the museum account in the AZGS, retroactive to May 1, 2016. *(Note: A proviso in SB1530 called for it to be retroactive to May 1, but it failed to include the emergency statute that would allow that.)*

Requires the Arizona Historical Society to fulfill existing Mining Museum obligations, provide AZGS with a list of inventory and assist in the transfer of the inventory.

Allows the State Geologist to accept and oversee volunteers' services; apply for and accept grants, gifts, donations or other contributions for use in accordance with the direction of the donor or as prescribed by the AZGS; accept restricted and unrestricted monies from federal, state or local governments.

The bill states that the legislature's intent is that the AZGS maintain the current level of

service and approximately 15 full time employees.

This bill also stipulates that the Arizona Historical Society regains authority of the Mining Museum if the Museum is unopened by July 1, 2018.

UPDATE

Lee Allison's, AZGS, Blog

Friday, May 20, 2016

AZGS moving to U of A by June 30

The Arizona Geological Survey will move out of our state offices in Tucson by June 30 and move into the office space recently vacated by the Arid Lands Resource Sciences on the east end of the University of Arizona campus. This is a result of the Governor's consolidation of state agencies. AZGS is transferred to UA effective July 1.



The space will be considerably smaller than what we currently occupy so we are looking at moving some library materials to the UA libraries, some into storage in the Phoenix museum we are taking over, and some will likely be given away or tossed. Our Arizona Experience retail store will be closed. We will be sharing the space with other UA programs.

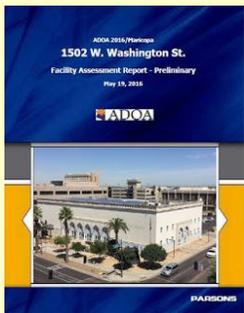
We also are looking at moving the core repository to the museum as well to preserve that material.

One advantage of the Arid Lands building is that there it is off campus and does have a limited amount of free parking for visitors.

AZGS will operate as a research center in the UA College of Science. The State appropriation to AZGS is zeroed out June 30. UA is providing one-time funding to cover a portion of our operations for the next year as part of the transition. After that, it will be up to the Survey to raise all of its own funding. There are plans by UA to develop a fee for services program to help underwrite activities.

Mineral Museum transfer will occur in August

The former Mining & Mineral Museum in Phoenix will transfer to the Arizona Geological Survey sometime in August. A proviso in SB1530, the Agency Consolidation bill, called for it to be retroactive to May 1, but it failed to include the emergency statute that would allow that.



We also got a 65-page preliminary Facility Assessment prepared for the Dept. of Administration describing in detail the status and requirements for opening the building.

The conclusion is that the building will need ~700K in priority 1 remodels and repairs (which is close to the estimates made in 2014) and perhaps another \$200K as the flooring on the main floor needs to be replaced. Over 5 years, they identify a total of \$2.86 million to make the building like new. (It was built in 1921).

At present, the building cannot be occupied.

However, we are able to store materials there, and we plan on moving the extensive mining files and library from our Phoenix branch there in the next 10 days. We have to vacate our current office which is commercial space sublet from AZ Dept. of Water Resources by May 30. In addition, AZGS is being transferred to the University of Arizona which has no space available in Phoenix for our operations.

Similarly, UA has little or no storage space on campus for our Tucson office. So we are looking at moving files, library materials, and cores to the museum in order to preserve them. Otherwise, they would all be disposed.

Relevant section of Lee Allison's Blog Sunday, 5/22/16

SB1530 eliminates state funding for the AZGS and transfers the duties of the Survey to the UA. The Governor's staff said this is part of his efforts to consolidate state government.

There was no additional funding provided to UA, so they are expected to fund the Survey from their own funds. AZGS has been told that the UA will provide one-time funding of \$941,000 which is equal to the last state appropriation. After this coming year, AZGS will be responsible for finding 100% of its funding from grants and contracts.

AZGS will also give up most of its overhead on existing grants to the UA. These funds had been about as much as our state appropriation, and used to support our core mission, so the net result will be a 40-50% reduction in funds for state services. We have started notifying staff members whose jobs will be eliminated as of July due to the loss of funding.

AZ Rock & Gem Shows

Sedona Spring Mineral & Jewelry

Expo and Sale

May 28-29, 2016

Sat. 10-5, Sun. 10-4

Admission \$3

Children under 12 free

Sedona Red Rock High School

995 Upper Red Rock Loop

Sedona, AZ

Coconino Lapidary Club

Gem Mineral & Jewelry Show

June 3-5, 2016

Fri. & Sat. 9-7, Sun. 9-4

Admission \$5, Seniors/Students \$4

Children under 12 Free

Silver Saddle Outdoor Market

Highway 89N & Silver Saddle Road

Flagstaff, AZ

Prescott Gem and Mineral Show and Sale

August 5-7, 2016

Fri. & Sat. 9-5, Sun. 9-4

Admission Fee

Free Parking

Prescott Valley Event Center

Prescott, AZ

West Valley Rock & Mineral Club Helzarockin' Gem & Mineral Show Friday - Sunday, October 7-9, 2016

9-4 daily

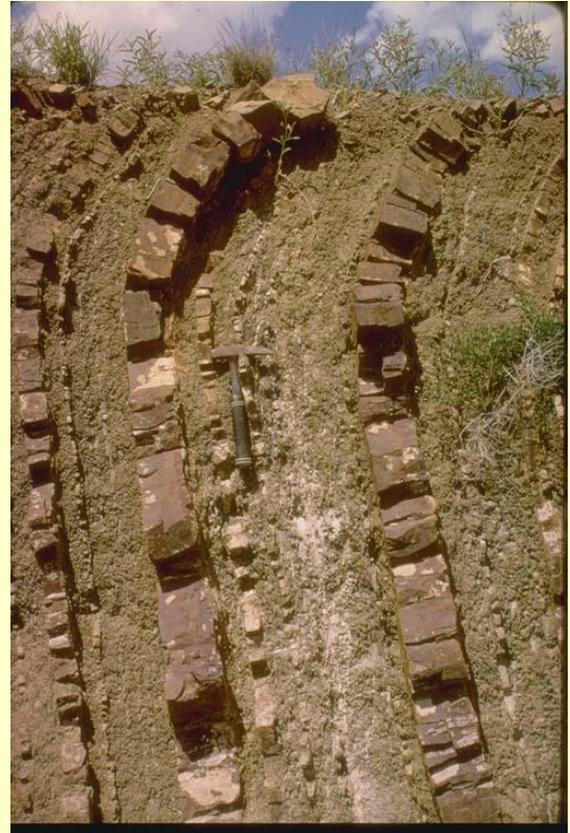
Admission \$3

Children under 12 free

Helzapoppin' Arena

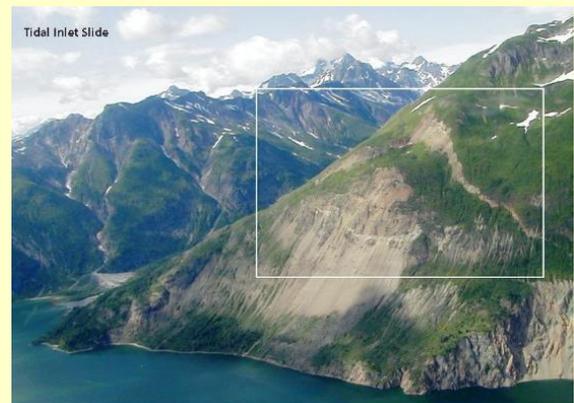
802 N. 1st Street (Miller Road)

Buckeye, AZ



Creep in Haymond Formation (sandstone and shale) near Marathon, Texas. The apparent bending of sandstone beds is actually produced when beds fracture into small vertical sections. These sections are then moved down slope at differing rates depending on depth from the surface. The blocks closest to the surface are displaced down slope to the greatest extent.

Photo by B. Bradley. University of Colorado via NOAA.gov



Tidal Inlet landslide at Glacier Bay National Park and Preserve in Alaska
NPS photo



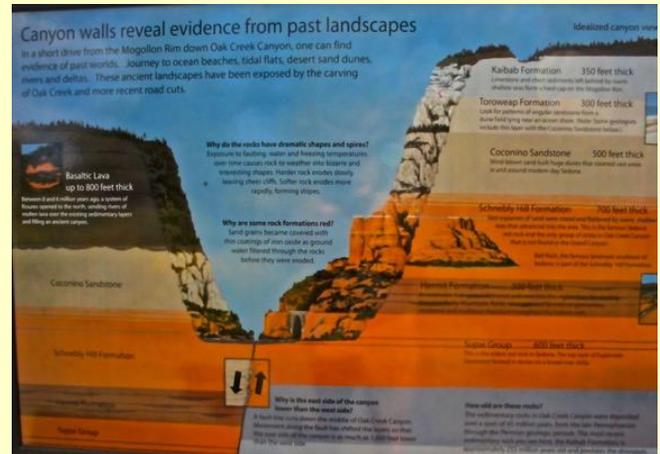
Arizona Rocks 36

Text and photos by Ray Grant

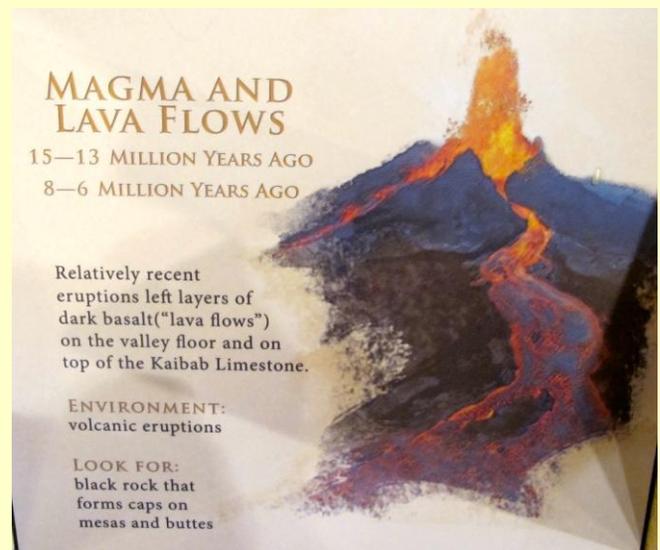
Oak Creek Canyon is a popular Arizona destination in the summer; places like Slide Rock can get very crowded. The geology of the canyon is like that of the upper part of the Grand Canyon with a few differences. The main rocks forming Oak Creek Canyon are the same Paleozoic sedimentary formations present at the top of the Grand Canyon, the Kaibab Limestone, the Toroweap Formation, the Coconino Sandstone, the Hermit Shale, and the Supai Group rocks. On the rim of the canyon at Oak Creek there are basalt lava flows that are 6 to 8 million years old, and there is one additional sedimentary formation the Schnebly Hill Formation. It is between the Coconino Sandstone and the Hermit Shale and represents a coastal area with sand dunes mixed with tidal and shallow marine sediments.

The Red Rock Ranger District Visitor Center that is six miles north of Interstate 17 on route 179 just before the Village of Oak Creek has a very good exhibit about the geology around Sedona. It has descriptions and samples for all the formations. It is well worth a stop if you are in the area. There is also signage about the geology at the Canyon overlook.

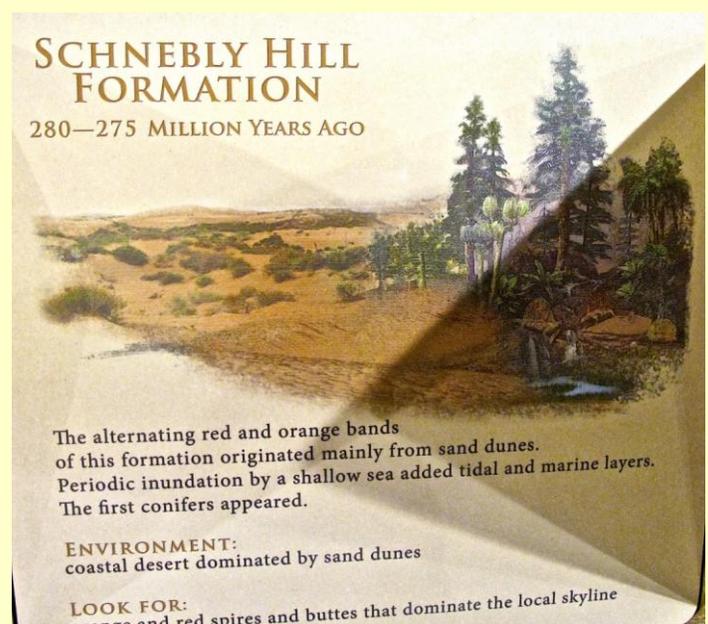
Description of Schnebly Hill Formation at Red Rock Visitors Center



Sign at the Oak Creek Canyon overlook with a geological cross-section.



Description of basalt on Canyon rim at the Red Rock Visitors Center



WHY ARE THE ROCKS RED?

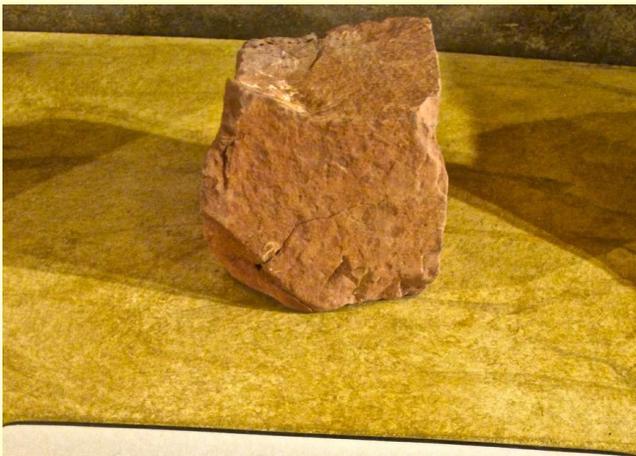
The short answer: Rust.

Sedona's red rocks contain hematite, a reddish form of iron oxide similar to rust. Water carrying dissolved iron oxide deposited the hematite as it seeped through porous layers of sandstone. The sandstone originated in ancient dunes.

The grayish or buff-colored rocks are limestone that formed (mostly from shells) on the floor of a prehistoric ocean.



Why the Sedona is Red Rock Country at the Red Rock Visitors Center



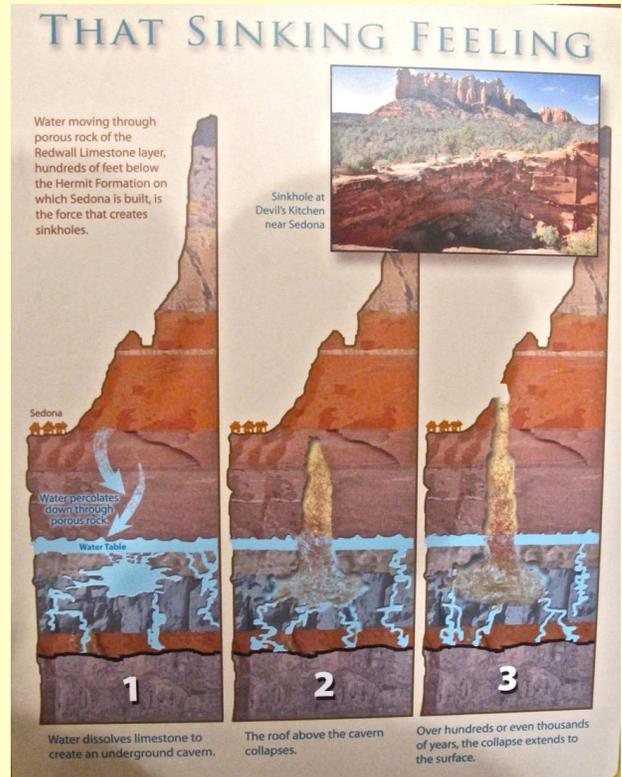
SUPAI GROUP
320-290 MILLION YEARS AGO

The Supai Group contains a variety of rock types deposited as the ocean came and went. The local environment changed from shallow seas to shoreline swamps, river deltas and sand dunes.

ENVIRONMENT:
coastal plain

LOOK FOR:
alternating cliffs and slopes of red sandstone, conglomerates, mudstones and limestones

Example of exhibits for each of the formations at the Red Rock Visitors Center



The Red Wall Limestone is just under the Supai Group, but is only seen one place in the very bottom of the Canyon. There are caves in the Redwall where ever it is found.



Oak Creek Canyon



Pinal Gem & Mineral Society

UPDATE



Allosaurus dinosaur
guarding the mineral
display
Dr. Ray Grant photo

The Pinal Geology and Mineral Museum's recently acquired model of an Allosaurus dinosaur now has a name. The name was chosen, from a list of previously suggested names, at the May 18, 2016, meeting of the Pinal Gem & Mineral Society. When all the votes were tallied, a three-way tie was announced and the members decided to keep all three names. Her/his name is Allie, Albert, Sharpie. This has got to be a first, a dinosaur with a first, middle and last name.



Allosaurus dinosaur
Dr. Ray Grant photo

The May 18th program was given by retired Mesa Community College chemistry professor John Weide and featured John's mineral specialty quartz. Attendees learned that quartz can have many forms and varieties and can be found as twinned crystals that are either right handed, left handed or both. John brought with him the specimens that were pictured in his presentation for everyone to admire and drool over. One of my favorites was a slice of quartz that showed asterism. Another of my favorites was a large Japan Law twinned specimen that John said he bought for only \$3.50 and actually had to pay more to have it shipped than its cost.

ESM's Upcoming Meeting

The Earth Science Museum's next scheduled Board meeting on June 21, 2016, at the Burton Barr Library, located near Central Ave. and McDowel in Phoenix at 6:30 p.m. in Rm. B. Everyone is welcome to attend.

BECOME A MEMBER!
Join the Earth Science Museum's



IS IT TIME TO RENEW YOUR MEMBERSHIP?
Please renew today!

----- cut here -----
**ESM Earth Science Investigation
 Team Membership Form**
 _____ **New Member** _____ **Renewal**

Membership levels:
 _____ **ESI Family \$20**
 _____ **ESI Individual \$10**

Membership benefits:

- ◆ Monthly e-newsletter *Earthquake*
- ◆ Official team membership card
- ◆ Knowledge that your contribution is making a difference in earth science education.

MANY THANKS TO OUR MAJOR DONORS!

- AZ Leaverite Rock & Gem Society
- Flagg Mineral Foundation
www.flaggmineralfoundation.org
- Friends of the AZ Mining & Mineral Museum
- Maricopa Lapidary Society
<http://maricopalapidarysociety.com/>
- Mineralogical Society of AZ
www.mineralogicalsocietyarizona.org
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www.whitemountain-azrockclub.org
- Wickenburg Gem & Mineral Society
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Mission

Our Mission is to excite and inspire all generations about earth sciences through educational outreach.

Vision

We envision a community where students and the general public have curiosity about, passion for, and understanding of the underlying principles of earth sciences.

For more information about the ESM, how to become a member or how to arrange for a school visit or Community function, go to:
www.earthsciencemuseum.org.

We're on the Web!

Visit us on  and at:
www.earthsciencemuseum.org

Please join us at the next ESM Board meeting Tuesday, June 21, 2016, at the Burton Barr Library in Phoenix at 6:30 p.m. Rm. B.

THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

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