



Arizona Geological Society Newsletter

APRIL 2016

April 5, 2016 DINNER MEETING

Who: **Jordon Bright** will present “Looking for an Ocean in the Desert, the Enigmatic Bouse Formation of Southwestern Arizona and Southeastern California”

Where: Sheraton Tucson Hotel and Suites, 5151 East Grant Road, (at the intersection of Grant and Rosemont on the North side of Grant in the *PIMA BALLROOM* (enter at northwest corner of the building) and go upstairs to the meeting room.

When: Cash Bar at 6 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.

Cost: Members \$30, Guests \$33, Students Members free with on-line reservation (\$10 without).

RESERVATIONS ARE REQUIRED: Reserve on the AGS website (www.arizonageologicalsoc.org) by **11 a.m. Friday, April 1st**. Please indicate Regular (24hr Braised Short Ribs), Vegetarian, or Cobb Salad meal preference. Please cancel by **Friday, April 1st at 11 a.m.** if you are unable to attend - no shows and late cancellations will be invoiced.

The Arizona Geological Society is looking for sponsors for this and other monthly dinner meetings. [More information about dinner meeting sponsorship can be found on our website.](#)

The AGS is grateful for our sponsors, who help offset the increasing costs of our dinner meetings and other activities of the society.

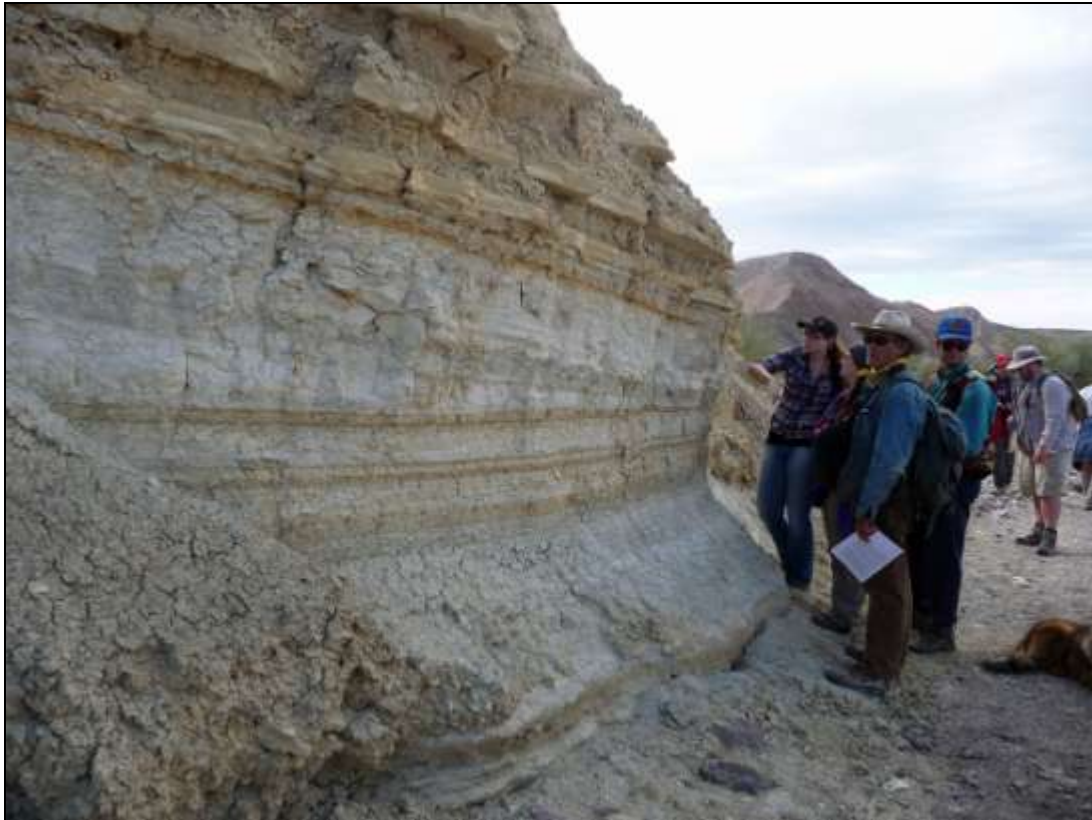
Looking for an Ocean in the Desert, the Enigmatic Bouse Formation of Southwestern Arizona and Southeastern California by Jordon Bright, Graduate Student, University of Arizona

The southern Bouse Formation (late Miocene-early Pliocene) contains a controversial record of either marine, marine-estuarine, or lacustrine conditions in Blythe basin just prior to the ancestral Colorado River reaching the Gulf of California. Ostracode assemblages (microscopic crustaceans) and stable oxygen ($\delta^{18}\text{O}$) and stable

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carbon ($\delta^{13}\text{C}$) values in fine grained sediment (micrite) and ostracode valves from the lacustrine northern Bouse Formation and contested southern Bouse Formation were studied to determine depositional environments. Faunal and stable isotopic analogs from well-studied marine basins, marine-to-lacustrine transitions, estuaries, and over-spilling terminal lakes will be briefly discussed and applied to the southern Bouse Formation controversy. The expected fill-and-spill lacustrine origin for the northern Bouse Formation is observed as a rapid shift from a saline tolerant *Cyprideis-Limnocythere* ostracode assemblage with coincident high $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values in paired ostracode valve and micrite samples to a fresher water *Candona-Darwinula* ostracode assemblage with coincident low $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values in paired ostracode calcite and micrite samples. An identical and coincident shift from more saline tolerant to fresher water ostracode species and from high to low stable isotope values occurs in the southern Bouse Formation, suggesting a similar fill-and-spill lacustrine environment. The $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values in *Candona* valves from the northern and southern Bouse Formations are nearly identical, suggesting similar environments. Two exposures of southern Bouse Formation sediments, located at the northern and southern margin of Blythe basin and separated by nearly 100 km along what might have been a “Bouse estuary”, contain the freshwater ostracode *Candona* and contain ostracode valves and micrite with nearly identical $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values. This similarity in freshwater continental ostracode species and stable isotope values at both ends of a potential “Bouse estuary” is incompatible with a marine or an estuarine interpretation. The *Candona*-bearing ostracode faunas and $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values of the lacustrine northern and contested southern Bouse Formations are surprisingly similar, suggesting the southern Bouse Formation sediments featured in this talk are lacustrine in origin.



Participants of the 2015 AGS Fall Field Trip examine the Bouse Formation in southwestern Arizona (Photo Provided by Dave Wahl).

About the April Dinner Speaker



Jordon Bright was born and raised in Ottawa, Ontario, Canada. He received his BS in Geology from Utah State University in 1996. At Utah State University, he began working as a student employee in Dr. Darrell Kaufman's Amino Acid Geochronology Lab. In 1998, Jordon followed Dr. Kaufman to Northern Arizona University, Flagstaff. He returned to school in 2000 and received his Master's degree in Quaternary Sciences from N.A.U. in 2003, mentored by Dr. Kaufman and the late Rick Forester (U.S.G.S., Denver). His Master's thesis focused on a 120-m-long core recovered from Bear Lake, Utah & Idaho. He used ostracode faunas and stable isotopes to create a 240,000-year-long paleoclimatic and paleohydrologic record for the Bear Lake watershed. He remained at N.A.U. after receiving his Master's degree, managing Dr. Kaufman's lab, and working with several U.S.G.S scientists and academics who were unrav-

elling the integration history of the Mojave River, and later, the Amargosa River of southern California. He returned to school in 2011 at the University of Arizona to pursue a Ph.D. in Geosciences under Dr. Andy Cohen. While at the University of Arizona, he has been involved with paleohydrology studies at Willcox Playa, here in Arizona, at the Snowmastodon Project™, through the Denver Museum of Nature and Science, and at the Térapa fossil vertebrate site in Sonora, Mexico. His dissertation focuses on two topics: the micropaleontology and stable isotope record from a 166-m-long core recovered by the Smithsonian Institution from the Olorgesailie Hominin Site in Kenya; and the topic of this talk - what the micropaleontology and stable isotope record from the enigmatic Bouse Formation, here in southwestern Arizona and southeastern California, can tell us about the development and integration of the late Miocene-early Pliocene lower Colorado River.

2016 Arizona Geological Society Spring Trip

The Spring AGS field trip will take place over the weekend of April 30-May 1 and will be led by Ar-end Meijer, who will provide us an introduction to the Paleoproterozoic Pinal Schist, which he interprets as a subduction complex.

The trip will start in Tucson Saturday morning, over-night in Globe, where there are reasonably priced motels and camping, and return to Tucson late afternoon Sunday.

[Click on this link for more information about the 2016 Spring Field Trip.](#)



3-5 May 2016 - IDEAS 2016

[Expo Discover Mining Innovations](#) @ Port of Tucson, 7000 East Century Park Drive, Tucson, Arizona. To register or for additional information contact Stefan Baumann (stefan@portoftucson.com; 520.668.6667).

National Landslide Loss Reduction Act

Landslides result in an estimated 25 to 50 deaths and \$3 billion in damage each year. Substantial work needs to be done to gain better knowledge of landslides and their potential impacts in order to reduce losses of life and property.

There is no one collective landslide inventory for most counties, states or the United States. Nor is there an agreed upon methodology of creating one. In an effort to get a handle on this public safety issue, there has been a Bill introduced before U. S. Congress to establish a program to address landslide risk as well as provide increased funding for mapping, education and risk assessment of areas that may be prone to landslides. The proposed National Landslide Hazards Reduction Program will:

- establish a national strategy to identify landslide hazards through a uniform assessment system, database and through close coordination with state entities to ensure better preparedness.
- authorize \$8 million in competitive grant funds for state and local government to map and assess landslide hazards.
- authorize \$10.4 million in competitive grant funds for institutions of higher education, state and local governments and non-governmental entities to conduct research on landslides.



Damage to road from a debris flow in Sabino Canyon. (Photo from Arizona Geological Survey Open File Report 08-05)

Arizona Geological Society Membership Stats (3/23/2016)

Total Membership	Professional Members	Student Members	Organizational Members
469	374	88	7

Up-coming Arizona Geological Society Dinner Meetings

Date	Speaker	Title of Presentation
5/3/2016	Peter Modreski	Pegmatites: Mineralogy, Gemstones, Economic Geology, and maybe not quite the same Giant-Crystal Rocks you always thought they were
6/7/2016	Robert Hildebrand	Collisions, Slab Failure Magmatism, and the Development of Cordilleran Batholiths
7/5/2016	Don Applebee	Geology and Genesis of the Chilito Porphyry Copper Deposit, Hayden, Arizona

Geology in the News

[Public Comments on Superior Copper Mine Sought](#); by Ryan Randazzo, Arizona Central, March 18, 2016.

[Historic Designation of Mining Site Provokes Lawmakers' Anger](#); by Emily Bregel, Arizona Daily Star, March 14, 2016.

[Inside the Billion-Dollar Dig to America's Biggest Copper Deposit](#); by Mathew Phillips, Bloomberg Business, March 14, 2016.

[Arizona Geological Survey: A Small but Important Agency](#); by David F. Briggs, Arizona Daily Independent, March 22, 2016.

[Mining Day Brings Huge Gear to Arizona Capitol](#): by Jen Wahl, 12 News, March 2, 2016.

[Hydraulic Fracturing Accounts for about Half of Current U. S. Crude Oil Production](#); U. S. Energy Information Administration, Today in Energy, March 15, 2016.

[Obama Administration will not Allow Atlantic Offshore Drilling](#); National Public Radio, March 15, 2016.

[Clinton Doubles Down Against Fracking in Debate, Raising Alarms](#); by Jennifer Dlouhy, Bloomberg Business, March 7, 2016.

[Huge Minnesota Copper-Nickel Mine Clears Environmental Hurdle](#); by Andrew Topf, Mining.com, March 6, 2015.

[Cardero Finds Gold, Silver at Zonia Copper Project](#); Arizona Daily Independent, March 23, 2016.



University of Arizona Geodaze Symposium

The [44th Annual Geodaze Symposium](#) will be held on March 31– April 1, 2016 at the University of Arizona's Student Union Memorial Center on 1303 East University Blvd. Organized by the Department of Geosciences, this event allows graduate and undergraduate students an opportunity to showcase their research.

This symposium covers a wide variety of topics including: climate, paleoclimatology, geophysics, geochemistry, tectonics, economic geology and structural geology. The Geodaze Keynote address will be "The Origin of Plate Tectonics" presented by Professor David Bercovici of Yale University.

The best student presentations and posters will be awarded prizes contributed by the event's sponsors, which include the Arizona Geological Society.

Update on HB 2613

The Senate Commerce Committee heard HB 2613 on March 14, 2016 and passed it along party lines. Several senators expressed concern about the bill, when they passed it.

The next step is for the Bill to go to the Senate floor - first for Committee of the Whole, where there could be additional amendments considered, then to a 3rd read where they would officially vote on the engrossed version. If any amendments are adopted where the Bill is different from the House version, it would need to go back to the House, where the Bill sponsor could either concur with the amendments or not concur. If he concurs with the amendments it would need a final vote in the House. If he does not concur, it would then get thrown into conference committee.

Bottom line is those opposing deregulation of geologists are hoping for a floor amendment in the Senate Committee of the Whole that would remove sections F and G from HB 2613.

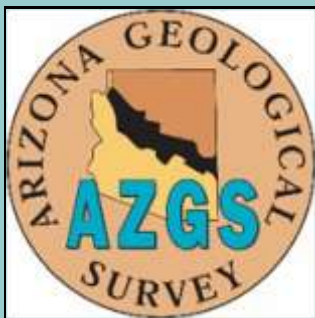
- Section F - A trained geologist may engage in geological practice without being registered under this chapter.
- Section G - Trained geologist means a person who has: 1) earned a geology degree from an accredited educational institution and 2) participated in geologic work experience outside of an educational institution for at least 4 years.

As of March 22, 2016, the Bill is not on any agendas or calendars for this week. The Senate President is out until Thursday and then everyone heads home for Good Friday/Easter weekend so it is doubtful anything will happen on an agenda for this week, which buys us some time to work votes.

Our lobbyists are working on a floor amendment to remove sections F and G and have that amendment drafted. If F and G stay on, as you know we need at least three Republicans to vote no on the Bill. At this point, our lobbyists have identified targeted Senators, who we think are possibilities and have had meetings with those targets. So far we have received positive feedback and it seems like more have expressed concerns over geologists.

The Senate Rules Committee is scheduled to meet on Thursday, March 24, 2016. That is the next step on HB 2613 before it heads to the floor. So, no official action until then at the soonest. Unless of course they change the schedule. And there is no certainty that HB 2613 will be on that Rules agenda.

Members of the AGS, who oppose deregulation of geologists, are urged to write or e-mail your representatives in the Arizona Senate saying you are opposed to Sections F and G of the Bill.



Underwriting Arizona Mining Review

The Arizona Mining Review, the premier e-Video Magazine addressing mining in the Southwestern U. S., is seeking underwriters for 2016 to help offset production and broadcasting costs.

Please contact Mike Conway (Michael.conway@azgs.az.gov | 520.209.4146) for additional information and to discuss the benefits of underwriting.

Arizona Geological Survey News Brief



[Arizona Mining Review](#) (AMR) e-Video Magazine's "Mining Day at the Capitol" episode will be released at 10:00 AM on 30 March.

- Uranium mining in northern Arizona with Donn Pillmore, Director of Operations, Energy Fuels
- Driving the big trucks with Dennis Sorensen, CAT Dealership Empire Southwest
- Mining education and outreach for middle schoolers with Pam Wilkinson, Lowell Institute for Mineral Resources, University of Arizona
- Launching Arizona Geological Survey Mining Data website with Nyal Niemuth, Chief of Economic Geology, Arizona Geological Survey

AZGS News

The University of Arizona and Governor's Ducey's staff continue to discuss and shape the consolidation of the Arizona Geological Survey with the University of Arizona. Governor Ducey's 2017 budget zeros out AZGS funding and recommends consolidating the Arizona Geological Survey with the University of Arizona. AZGS' 2016 state allocation was \$941,000.

Stay tuned to Lee Allison's [Arizona Geology blog](#) or our [AZGS Facebook](#) page for updates on AZGS going forward in 2016.

New AZGS Publications: Online at the [AZGS Document Repository](#)

[Arizona Geological Survey Mining Data](#) site now complete comprises more than 20,000 documents from Arizona's mining and mineral history that are online, geolocated, discoverable and accessible.

New Publications

Carter, C.S., [Communication of Lava Flow Hazards at the San Francisco Volcanic Field, Flagstaff, Arizona](#). Arizona Geological Survey Contributed Report CR-16-A, 61 p.

Alter, M., Grant, R. Williams, P. and Sherratt, D., 2016, [Structural Geology and Hydrogeology of the Grandview Breccia Pipe, Grand Canyon National Park, Arizona](#). Arizona Geological Survey Contributed Report CR-16-b, 23 p, 1 appendix (16 p.).

Allison M.L. and others, [Arizona Geological Survey Briefing Book](#). Arizona Geological Survey Open-File Report OFR-16-01, 21 p.

To be Released the Week of March 28th

Pearthree, P.A., Gootee, B.F., Richard, S.M. and Spencer, J.E., 2015, Geologic Map Database for Aggregate Resource Assessment in the Phoenix Metropolitan Area and Surrounding Regions, Arizona v. 2.0. Arizona Geological Survey Digital Information DI-43, 11 p., map sheet, Shapefiles, ArcGIS Map Packages, polygons and geologic features.

Gootee, B.F., Pearthree, P.A., House, P.K., Youberg, A., Spencer, J.E. and O'Connell, B., 2016, Report to accompany the Geologic Map of the Cibola Area, La Paz County, Arizona, and Imperial County, California. Arizona Geological Survey Digital. FIXED USGS StateMap acknowledgment (3/25)

Arizona Experience Bookstore – the sole source for AGS publications. Stop in! (416 W. Congress; 8-5 M-F)

ANNOUNCEMENTS

Welcome New AGS Members

Triffon Tatarin

Arizona Geological Society is grateful to Freeport-McMoRan, Inc. for their generous support of our student members!



FREEPORT-McMoRAN

Freeport-McMoRan sponsors student dinners for the 2016 AGS monthly meetings.

2016 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, PO Box 40952, Tucson, AZ 85717

Dues (check box) 1 year: \$20; 2 years, \$35; 3 years: \$50; full-time student (membership is free)

NEW MEMBER or RENEWAL? (circle one) Date of submittal _____

Name: _____ Position: _____

Company: _____

Mailing Address: _____

Street: _____ City: _____ State: _____ Zip Code: _____

Work Phone: _____ Home Phone: _____

Fax Number: _____ Cellular Phone: _____

E-mail: _____ Check this box if you do not have an email address

All newsletters will be sent by email. If you do not have an email address, we will mail a hard copy to you, but we cannot guarantee timeliness.

If registered geologist/engineer, indicate registration number and State: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright or the Arizona Geological Society Scholarship Funds.