



Arizona Geological Society Newsletter

DECEMBER 2014

December 2, 2014 DINNER MEETING

Who: Victor R. Baker will speak about “Megafloods on Earth, Mars, and Beyond”.

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 \$27, Guests \$30, Students Members free with online reservation (\$10 without).

RESERVATIONS ARE REQUIRED: CALL (520) 663-5295 or reserve on the AGS website (www.arizonageologicalsoc.org) by 8 a.m. by Friday, November 28th. Please indicate regular (Chicken Marsala over linguini), vegetarian, or Cobb salad meal preference. Please cancel by 8 a.m. Friday, November 28th if you are unable to attend - no shows and late cancellations will be invoiced.

The December dinner meeting is sponsored by Montgomery & Associates



AGS is grateful for Montgomery & Associates' sponsorship, which helps us to offset dinner meeting costs

Abstract

Megafloods on Earth, Mars, and Beyond

by Victor R. Baker

Megafloods (terrestrial water flows with discharges exceeding one million cubic meters per second) are the largest known freshwater floods, with flows comparable in scale to (though of shorter duration than) ocean currents. Although there are no modern examples of megafloods, such flows occurred during major periods of glaciation. A prominent example is the paleoflooding caused by late Pleistocene outbursts from Glacial Lake Missoula, which formed when the Purcell Lobe of the Cordilleran Ice Sheet extended south from British Columbia to the basin of modern Pend Oreille Lake in northern Idaho. The ice thereby impounded the Clark Fork River drainage to the east, forming a lake extending into western Montana with a water volume of about 2500 cubic kilometers and a depth of 600 m at the dam. The largest Lake Missoula outbursts were in the range of 10 to 20 sverdrups (one sverdrup equals one million cubic meters per second) and involved flows that lasted for

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several days. The Missoula Floods were responsible for generating the Channeled Scabland of east-central Washington state -- a complex of anatomizing rock-cut fluvial channels, cataracts, loess "islands," rock basins, broad gravel deposits, and immense gravel bars. These flows deeply inundated the Columbia Gorge and the Willamette Valley before discharging into the eastern Pacific Ocean. Other late-glacial megafloods occurred along the margins of the great ice sheets that formed during the Pleistocene in North America, Eurasia, and southern South America (Patagonia). The greatest known megafloods of water occurred on the planet Mars, where the immense outpourings resulted in temporary bodies of water, even generating a kind of ocean that facilitated environmental conditions on Mars that may have been similar to those of an ice-age on Earth. These discoveries are showing that Mars, like Earth, had a long-term cycle of water circulation that produced a habitable planet, and these are exactly the kinds of processes to seek out in the newly initiated search for the other habitable planets of the universe.

About the December Dinner Speaker

Victor R. Baker is Regents' Professor of Hydrology and Water Resources, Professor of Geosciences, and Professor of Planetary Sciences at the University of Arizona. His B.S. in geology is from Rensselaer Polytechnic Institute (1967) and his Ph.D. in geology is from the University of Colorado (1971). Professor Baker has authored or co-authored about 400 research papers and chapters and authored or edited 18 books on topics that include the geology and paleohydrology of Mars, Quaternary paleohydrology and geology, flood geomorphology, and history/philosophy of Earth and planetary sciences. He has been President of the Geological Society of America (1998), and he has chaired that society's Divisions for History and Philosophy of Geology (2010), Quaternary Geology and Geomorphology (1987), and Planetary Geology (1986). He has also served as Chair of the American Association for the Advancement of Science Section on Geology and Geography (1992-93 and 2008-2009). Among his honors are Foreign Membership in the Polish Academy of Sciences (1994); Honorary Fellowship in the European Union of Geosciences (1999); the David Linton Award of the British Society for Geomorphology (1995); the Distinguished Scientist Award (2002) and Distinguished Career Award (2010), both from the Geological Society of America Quaternary Geology and Geomorphology Division; a Fulbright-Hays Senior Research Fellowship; an Indo-American Fellowship; and professional society Fellowships respectively in the American Geophysical Union, the American Association for the Advancement of Science, the Geological Society of America, and the British Society for Geomorphology. Dr. Baker was the Inaugural International Lecturer for the Geological Society of America, delivering 25 lectures on the topics of *Megafloods on Earth, Mars, and Beyond* and *Geological History of Water on an Earth-like Planet* at 23 academic venues in Europe and the Middle East. His work on megafloods has been featured in multiple television documentaries for PBS, BBC, and the National Geographic, Discovery, and History Channels, including the 2005 NOVA production "Mystery of the Megaflood."

In Memoriam

P. K. (Rana) Medhi

Long-time AGS member **P. K. (Rana) Medhi** passed away Nov. 7, 2014 at his home in Casa Grande. Medhi, former chairman of the Board of Governors of the Arizona Dept. of Mines and Mineral Resources, former adjunct professor of geology at Central Arizona College, and former Governor of the Mining Foundation of the Southwest retired in 1994 after 28 years at Cyprus Amax Minerals Company. He had a M.S. degree from the University of Arizona and was a certified professional geologist and an Arizona-registered geologist; he worked as an independent mining and exploration geologist after his retirement.



Arizona Geological Society’s November Dinner Meeting in Tempe a Smashing Success

November’s AGS dinner meeting at Tempe’s Sheraton Phoenix Airport Hotel was a great success. Fifty people, mostly Phoenix-based members of AGS turned out to hear Isabel Fay Barton present a historical view of geologic research in the Central African Copperbelt. Isabel took the long view – in terms of human scale – beginning with prehistoric artifacts “mined, smelted, and traded” by the Congolese people ca. 6th century A.D. In 45-minutes, she walked us through the spectrum of geologic ideas that arose to explain the ore genesis from the 18th century to the present day. It was a masterful performance.

Tuesday night’s crowd was enthusiastic and receptive to holding future AGS dinners in the Phoenix area. The Executive Committee will be mulling this over as we schedule our 2015 speaker series. Please feel free to share your thoughts and ideas with us.

Future Event

The Arizona Conference of the Society of Mining, Metallurgy & Exploration will hold its annual meeting at the JW Marriot Tucson Starr Pass Resort & Spa on December 7-8, 2014. For more information go to the [Arizona Conference 2014 website](#).



Arizona Geological Society Membership Stats

Total Membership	Professional Members	Student Members	Organizational Members
526	361	158	7

2014 Scholarship Winners

The AGS Scholarship Committee has chosen these students to receive the 2014 scholarships. The awards will be presented at the December AGS dinner meeting.

AGS Scholarship and Executive committees would like to thank all the students, who applied for the scholarships. We would also like to thank everyone, who donated to the scholarship funds; your donations help make the scholarships possible. To learn more about the Arizona Geological Society's scholarship program and how to make a tax-deductible contribution, please visit the [AGS website's student outreach page](#).

J. D. Mizer – 2014 Courtright Scholarship Recipient

After serving eight years in the U.S. Navy, J.D. received both his B.S. in Geology and a PSM in Economic Geology from the Geosciences Department at the University of Arizona. For his Masters, J.D. studied igneous geochronology in the Central Mining District, New Mexico and he is now working toward a Ph.D. in Economic Geology at the U of A. In research for his dissertation, "Geology of the Cerro Colorado and Las Guijas Districts, Pima County, Arizona", J.D. is trying to better understand the emplacement of silver-bearing veins in the Cerro Colorado District and of tungsten-bearing veins in the Las Guijas District, and whether these veins systems are related to the emplacement of porphyry copper (-moly) intrusions at depth. He has served as president of the Society of Economic Geologist's Student Chapter at the University of Arizona. J.D. was born in Arizona and is a claim-holder and conservator at the Glove mine in the Santa Rita Mountains and the Flux mine near Patagonia. He hopes to have a Tucson-based career in mining-related geology.

Kathleen Compton – 2014 Arizona Geological Society Recipient

Kathleen graduated *Magna cum Laude* from Whitman College in 2008, receiving her B.A. in Geology with Honors. She is pursuing her Ph.D. in Geophysics in the Department of Geosciences, University of Arizona. Her research focuses on the ways in which weather and climate can change the physical shape of the Earth, in particular using GPS data from Iceland to measure uplift patterns of glacial rebound as the ice cap there melts. The first chapter, entitled "Vertical acceleration of Icelandic crust measured by continuous GPS geodesy" is in review with *Geophysical Research Letters*. In the first half of this year, Kathleen served as a Public Affairs Intern in the Science Policy Office at the American Geophysical Union. Currently, she is on the AGU Whitten Medal Committee and is Co-Chair of the GeoDaze Symposium of the U of A Department of Geosciences. Kathleen's career goal is to combine her research background and her communication and media-relations skills to facilitate interaction among the scientific community, policy makers, and the public.

Looking for Christmas Presents for Your Favorite Geologist or Yourself?

- **In-print AGS publications** are available for sale at the Arizona Experience Store, located at 416 West Congress Street, Tucson. Copies of current AGS Guidebooks and Digests are also for sale at a reduced price at AGS monthly dinner meetings. A list of in-print publications can be found on the [AGS website](#).
- **Out-of Print AGS Digests and Guidebooks** are provided by free download for the personal use and research by AGS members and the public. They can be found on the [AGS website's publications archive page](#).

Fall 2014 Arizona Geological Society Fieldtrip

Debris flows shape the Sabino Canyon landscape – look out below!

Field Trip Leaders - Ann Youberg and Phil Pearthree

Field Trip Organizer - Ralph Stegen, AGS VP Field Trips

On Saturday, November 15, 2014, Ann Youberg and Phil Pearthree lead a half-day field trip to examine the geologic hazards of Sabino Canyon. Twenty AGS members and two non-members joined Ann and Phil on a picture-perfect day to examine and discuss the nature of debris flow processes and deposits.



Our first stop at Rattlesnake Wash included before and after photography to show the impact of debris flows proximal to the tram road. The trip ended at tram stop 8 with an overview of debris flow chutes scarring the steep walls of Sabino Canyon.



For those of you with Facebook accounts, visit <http://tinyurl.com/lf9frd2> for a short video of Ann Youberg discussing debris flow processes, or visit AZGS Facebook and page down to November 16 post.

Register Soon! Only 5 Spaces are Left for the 2015 Grand Canyon Geology Raft Trip



Alison Jones and Fred Beck are organizing another geology raft trip through 188 miles of the Grand Canyon for July 6-12, 2015. As in the past, our outfitter is Hatch River Expeditions, and we will be using 2 motorized 34-foot inflatable rafts. After launching at Lee's Ferry, we will go "down section" from the late Permian into the Precambrian, and making numerous geologic and fun stops along the way. Hatch provides all camping gear and food, and three licensed experienced guides, who run the boats, do the cooking, and assure that everyone will have the experience of a lifetime. On the last day, we be lifted out by helicopter to Bar 10 Ranch on the North rim, and from there we will fly back to Marble

Canyon (or Las Vegas if you prefer). This trip is very popular, and it will probably fill up soon. A deposit of \$500 per person is required to hold a spot. The balance of \$2,450 is due in March. In case of cancellation, the deposit will be returned if we can fill the spot. For more detailed information, contact Alison Jones at ajones@clearcreekassociates.com.



Future Event

The Geological Society of Nevada will host its New Concepts and Discoveries Symposium on May 14-21, 2015. It will be held at John Ascuaga's Nugget in Reno/Sparks, Nevada. Co-hosts for this event include the Society of Economic Geologists, Nevada Bureau of Mines and Geology and the U. S. Geological Survey. For more information about this event visit the [Geological Society of Nevada's website](#).

Arizona Geological Survey News Brief



[Arizona Mining Review](#) e-Video Magazine (11/26/2014)

The November episode will be broadcast at 10:00 am MST on 26 November on LiveStream (<http://new.livestream.com/accounts/2496466/azminingreview>) and will be available immediately thereafter at [AZGS YouTube Channel](#) , along with episodes from January 2013 through October 2014.

TOPICS

- AZGS's Nyal Niemuth on the latest in Arizona mining.
- Northern Vertex's Joe Bardswich on progress at the Moss Mine Gold-Silver Project, western Arizona.
- Arizona Mining Association's (AMA) Kelly Norton with an economic and election update and what it means to the mining industry.

New Publications

Singleton, J., Bird, E., and Hatfield, M., 2014, [Geologic map of the southern Lincoln Ranch basin, Buckskin Mountains, west-central Arizona](#). Arizona Geological Survey Contributed Map CM-14-B, Map scale 1:10,000.

Now available online - Cunningham, W.D., 1985, [Geologic Map of the Northwest Granite Wash Mountains, La Paz County, Arizona](#). Arizona Geological Survey Miscellaneous Map MM-86-B, 2 plates.

Conway, M., [Social Media: a conduit for communicating earthquake information](#). Arizona Geology e-Magazine.

AZGS Backpages

AZGS's **Phoenix Branch** office is now open for business on the 4th floor at [3550 N Central, Phoenix, AZ 85012](#). Phone and fax numbers remain the same.

ANNOUNCEMENTS

Welcome New AGS Members

Katherine Boot

Zachary Keller

Sydney Steele

Alysia Cox

Aaron Patterson

Matthew Steele-MacInnis

Chris Hanson

Barrett Salisbury

Stephanie Wayne

Arizona Geological Society is grateful to Freeport-McMoRan Copper and Gold for their generous support of our student members!



Freeport-McMoRan is sponsoring student dinners for the 2014 AGS monthly meetings.

2014 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 Scholarship Fund.