

July 2017



MONTANA GEOLOGICAL SOCIETY

NEWSLETTER

Vol. 61 No. 10



Inside this Issue:



P2 / PRESIDENT'S LETTER

In this issue, our President comments on rock hounding as a family sport.



P5 / RMS-AAPG

Review the highlights of the 2017 Section Meeting as told by General Chairman Robert Schalla.



P9 / MSU GEOLOGY

Immerse yourself in the geology of Bridger Creek with this article written by MSU's Caden Howlett.



P11 / EARTHQUAKE

Explore the details of the recent earthquake near Lincoln explained by the Montana Bureau of Mines and Geology.

Upcoming Events:

Aug 2 - Luncheon with Patrick Hayes of Traceco (Texas)

Aug 3 - Billings Gem & Mineral Club Annual Picnic

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President's Letter

Dear Membership,

I hope the hot weather isn't stopping you from getting out and enjoying Montana. I have more plans than I have time at this point, but hope to get into the mountains or on the rivers as much as possible. Our Last backpacking trip made me realize that maybe I'm not a good role model for my children. When we got home and started to unpack, my son produced a 10 lb chunk of a leopardite or leopard rock he carried out of the Stillwater drainage. Many of the folks living up here on the Stillwater River collect these rocks, they call "puddin rocks," but this was an unusual specimen. It had not been rounded by years of water transport, evidence



that we were close to the source. The origin of the porphyritic gabbro is commonly debated and when we found the angular chunks about five miles upstream from the trailhead, I jokingly said we should take some home. I guess I shouldn't be surprised by his behavior.

After years of instruction to stand on or near a rock for scale, do my children know anything different?

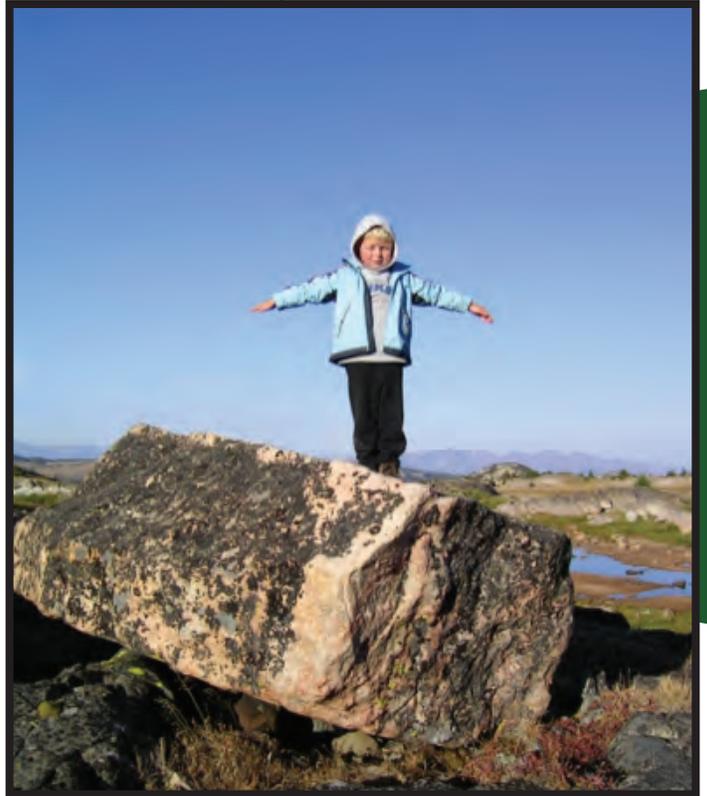
They don't question our trips on the river, where we start with a cooler full of food and drinks and end with a cooler full of rocks. The clunk in the dryer is often caused by rocks left in our pockets.

I did a quick search on Google for the downfalls of rock hounding, but only found why it's good:

- No experience needed
- It's cheap
- Good way to get kids out and about
- Good excuse to get out and get fresh air
-and so on.

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So when is “enough, enough”? My wife even seems to have given into my collections, and fewer of them are ending up in the flower bed. Have I stoned my family into my heavy hobby? I guess when my upstairs office at MBMG ends up downstairs, I will need to find a new home for some of my rocks. Feel free to stop by and talk rocks and take some if you wish. I hope to see you at the upcoming MGS events this summer, and to hear about your adventures. Each rock has a story that’s worth telling.

Kevin Chandler
MGS President



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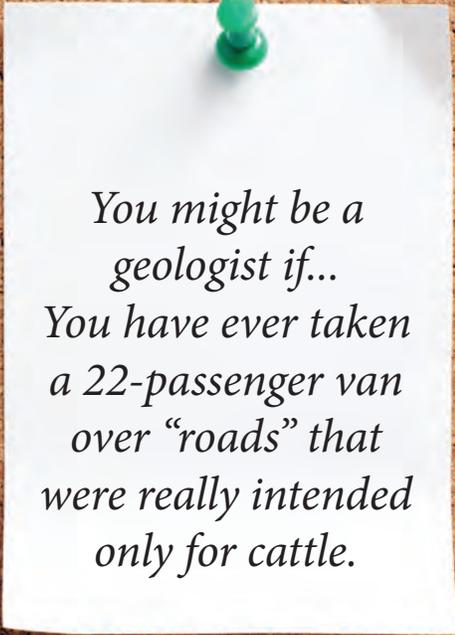
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geologist if...
You have ever taken
a 22-passenger van
over "roads" that
were really intended
only for cattle.*

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RMS-AAPG 2017

Section Meeting Review



The 2017 AAPG-Rocky Mountain Section Meeting was held in Billings, Sunday June 25 to Tuesday June 27. Technically, the meeting started on Friday June 23, when the first field trip departed for Three Forks, Montana, with 14 people anxious to see the Bakken and Three Forks formations in outcrop. This was followed by another field trip departure on Saturday to Cody, Wyoming and Yellowstone Park, along with the first of four short courses held at the DoubleTree Hotel.

The meeting proper kicked off on Sunday afternoon with an opening ceremony and awards presentation in the Ballroom of the DoubleTree Hotel. 2017 award recipients included Ronald Johnson from the USGS, who received the Robert J. Weimer Lifetime Contribution Award. Retired Billings geologist Robert Schalla received the RMS-AAPG Distinguished Service Award and Anna Phelps, with SM Energy, received the Outstanding Young Professional Award.

Award recipients for 2016 included Julie Mitchell, the RMS Teacher of the Year, Cat Campbell and Mark Toby, who received the Levorsen Award for best oral presentation at the RMS Las Vegas meeting, Jingqi Xu, who received the Steve Champlin Award for best poster presentation and Ben Dellenbach, who received the Runge Award for best student presentation. There was also a presentation of the inaugural Julie Lefever Memorial Award given to Richard and Julie Lefever.

The awards ceremony was followed by the opening of the Exhibit Hall and a great icebreaker party that featured some fabulous hors d'oeuvres and a selection of Montana craft beers along with other beverages.



Bob Schalla accepting the RMS-AAPG Distinguished Service Award



Anna Phelps accepting the Outstanding Young Professional Award



Julie Mitchell accepting the 2016 RMS Teacher of the Year Award

The Exhibit Hall



Monday's technical program was well attended and included a luncheon talk by Dr. Jake Lowenstern, the Scientist-in-Charge of the Yellowstone Volcano Observatory. For his efforts, Dr. Lowenstern received not only a silver MGS rock hammer lapel pin, but also two bottles of very special beer from Thirsty Street Brewing Company in Billings. The day's activities were topped off by an evening get together at The Billings Depot where local historian Kevin Kooistra gave a brief talk about how the railroad shaped Billings' early development, followed by music and a selection of local beers paired with specially selected food items prepared by Top-Notch Catering of Shepard, Montana.

Tuesday continued the great technical presentations and an interesting luncheon talk by Robbie Gries, Priority Oil & Gas, Denver, about pioneering women in petroleum geology. Robbie's presentation was tied to a sixty foot long banner that was displayed at the DoubleTree Ballroom depicting 100 women who contributed to the early years of petroleum exploration. Tuesday finished off with a Pub Crawl to the various breweries in downtown Billings. The event was marred by the early breakdown of the Billings Trolley that was supposed to be providing transportation, but the evening was redeemed somewhat when Chairman Bob Schalla got to hand out free drink tickets to every geologist he recognized in downtown Billings that night.





Poster Session

Post-meeting events included field trips to the Pryor Mountains and the Crazy Mountains Basin, as well as a final short course on core analysis.

Overall the meeting was a great success. Total attendance, including spouses and guests, topped out at about 430. With bills still trickling in the final financials are not yet know, but based on preliminary estimates this meeting should definitely give a boost to the MGS treasury.

Robert Schalla



RMS-AAPG

2017 JUNE 25-28
BILLINGS MONTANA



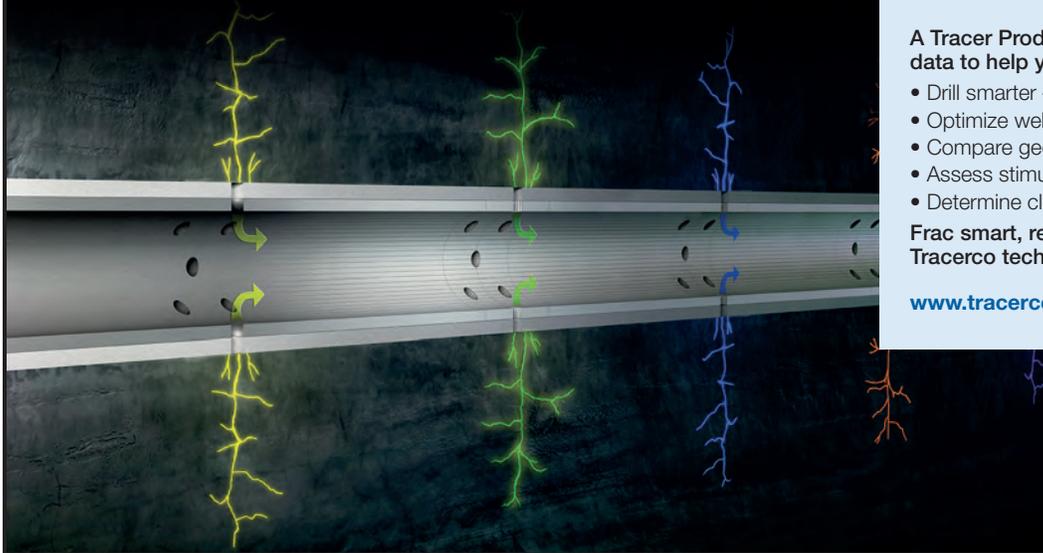
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MSU Geology Club

Bridger Canyon Exploration

The purpose of the Montana State University Geology Club is to further the understanding, exploration, and to promote Earth Sciences to our members and the community through field trips, guest speakers, and other club activities. We take full advantage of Bozeman and the surrounding area to gain experience in the field.

On an unusually warm April day, the MSU Geology Club took a field trip only five miles out of town into Bridger Canyon. Just passed the “M” trailhead, we pulled over to begin our exploration of the thick sequence of Mississippian carbonate known as the Madison Limestone. This formation is well known to those familiar with the geology of Montana, and there are few places better to study and learn about the sequence than southwest Montana. Our first stop consisted of exploring landslide remnants on the south side of the road. The landslide was the result of blasting and removal of material during road cutting and quarrying at the entrance of Bridger Canyon in the 1950’s. In the spring of 1975, surface run-off and heavy precipitation led to reactivation of the landslide, and a substantial amount of material moved onto the highway. Bridger Canyon Rd. (MT 86) was rerouted around the debris and that route is still in use today. A short scramble up the landslide remnants led our group to many spectacular views, as well as a few prismatic calcite specimens (Photos 1 & 2).

cont. on page 10



Photo 1. Prismatic calcite crystals found within landslide remnants in Bridger Canyon.



Photo 2. Overturned limb of Mississippian Madison Limestone exposed along MT 86 at the south end of the Bridger Mountain Range. Photo Credit: Isabelle Brenes



Photo 3. Optical calcite crystal found within landslide remnants in Bridger Canyon.



*Photo 4. Unknown fossils within the Thermopolis Formation, Bridger Canyon.
Photo Credit: Isabelle Brenes*

After a few hours of picking our way through the debris looking at slickenlines and practicing strike and dip measurements, we headed a few minutes up the road to look at a different formation exposed in Bridger Canyon. We came to an outcrop equally satisfying for both our paleontology and geology majors. The Cretaceous black shale known as the Thermopolis Formation is exposed beautifully along the highway, displaying overturned s-folds and (upon further observation) was found to contain fossils. Even after consulting many friends and professionals, our group still cannot confidently identify this fossil (Photo 4). After collecting a fossil sample and observing a right-lateral fault associated with the uplift of the Bridgers, the day was coming to an end.

When immersed in the beauty and elegance of the Earth sciences, days seem to fly by. In what felt like an hour, our club had spent the entire day in the field. As much as we enjoy the classroom, our club most enjoys being outdoors, applying what we learn inside to nature.

We look forward to gathering many more times in the near future to explore the geology around Montana.

*Submission written by:
Caden Howlett*

If you'd like to share a geological experience (trip, hike, etc.) or an upcoming event in next month's newsletter, please submit your text & images to jess.renstrom@gmail.com.

EARTHQUAKE in Lincoln, Montana

The Montana

Bureau of Mines and Geology's

Regional Seismograph Network (MRSN) recorded a

magnitude 5.8 earthquake at 12:30:16.9 a.m. on July 6th. The quake occurred

12.9 km (8.0 miles) east-southeast of Lincoln, Montana, just north of the Stemple Pass Road.

The earthquake hypocenter was 15.4 km (9.6 miles) below the earth's surface. The fault plane solution of the main shock indicates strike slip faulting, with either right-lateral slip on a WNW-trending plane or left-lateral slip on a NNE-trending plane. More than 3,900 residents reported feeling the earthquake in the region between Spokane, WA eastward to Lewistown, MT and from southern Alberta, Canada southward to southeast ID.

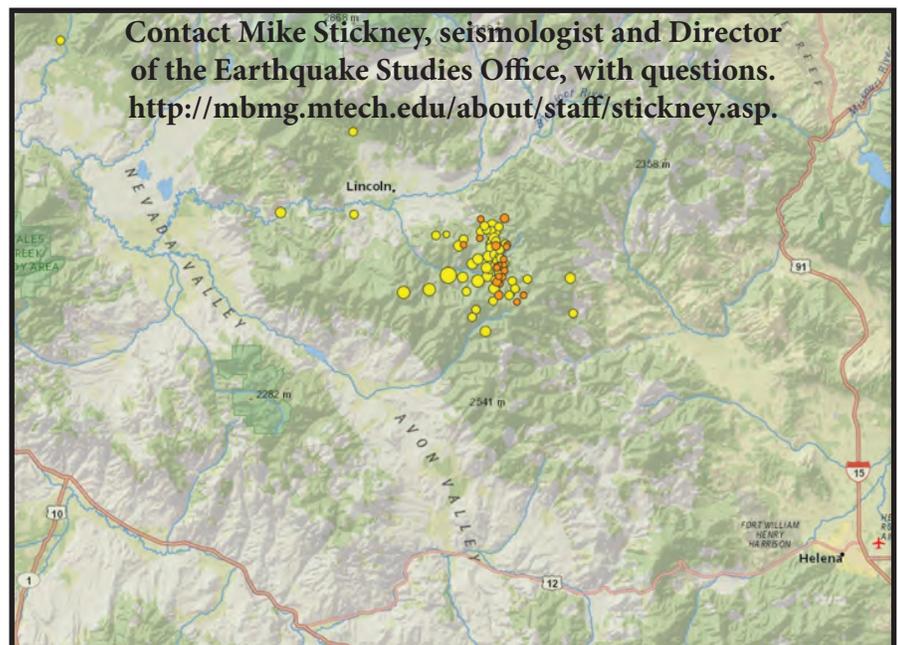
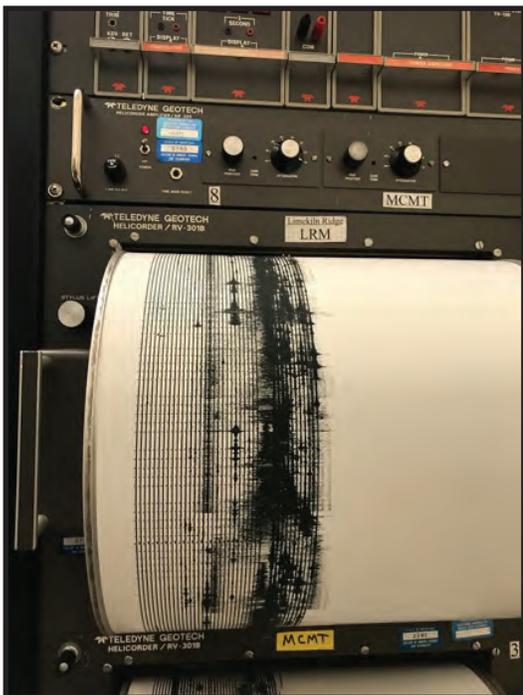


An energetic aftershock sequence followed the main shock. The MRSN has triggered on over 1200 events over the past six days [as of July 8]. Most of these events have not yet been analyzed in detail but will be as time allows. From our preliminary analysis together with automatic solutions produced by the seismic analysis system, we have recorded four aftershocks in the magnitude 4.9 to 4.0 range, 34 in the magnitude 3.9 to 3.0 range, about 150 in the 2.9 to 2.0 range, and hundreds of smaller events. These numbers will change as data are analyzed and the aftershock sequence evolves. The hypocenter depths of well-located aftershocks range between 10 and 15 km below sea level, with most in the 11 to 13 km range.

The US Geological Survey installed three temporary stations near Lincoln to improve coverage of aftershock locations and depths. The MBMG is using data from these newly deployed stations to improve hypocenter locations, which are being posted on the USGS earthquake website here.

The MBMG is Montana's state geological survey, and home of the seismograph network. Learn more here:

<http://www.mbg.mtech.edu/quakes/quake.asp>.



ROAD TRIP!

*Where are you headed this summer?
If your summer vacation includes Montana geology, we'd love to see it!*

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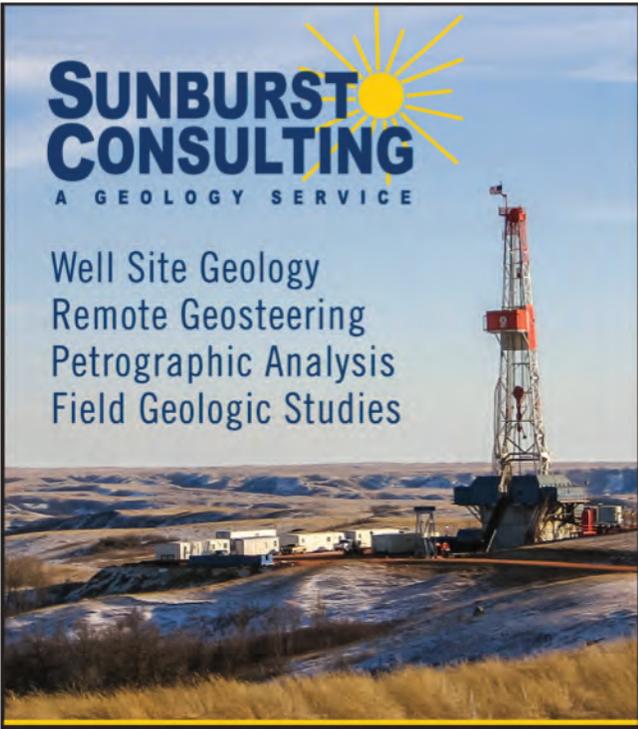
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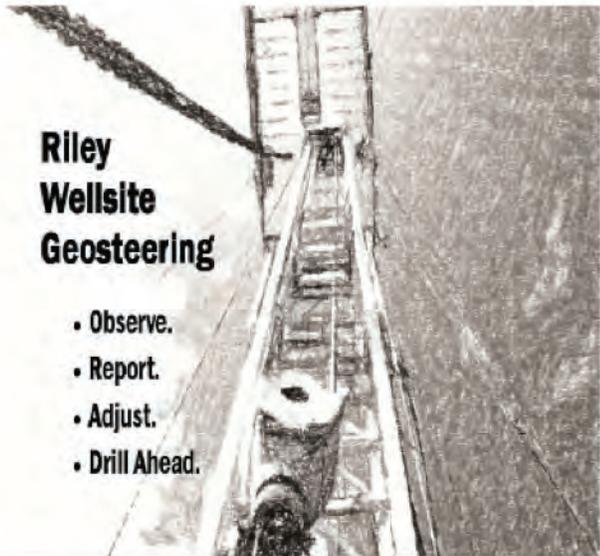
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Call for Speakers

In addition to papers, we are inviting people to present at a one-day technical session on topics related to this year's theme.

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