



MONTANA GEOLOGICAL SOCIETY

NEWSLETTER

May 2016

MGS Luncheons:

May 31st: Amy Singer

Members can RSVP by email or by calling Doretta Brush at Ballard Petroleum 406-259-8790

All meetings are held at the Billings Petroleum Club at 11:45 a.m. unless otherwise noted

MGS HOME PAGE:

<http://mtgeo.org>

MGS EMAIL:

montanageologicalsociety@gmail.com

Other

Announcements:

A note from the editor

page 2

MSU *page 3*

Rocky *page 4*

UoM *page 5*

MTech *page 6*

GIRLS ROCK! *page 7*

Adventures in

Learning *page 8*

Dear Membership,

It's spring! The grass is green, flowers are in bloom, and the trees are leafing out. All things being equal, fall is probably my favorite time of year but spring comes in close second because it is so much more comfortable than the season that precedes it.

With the increase in light and temperature I've been trying to get out, particularly with other geos. Safety in numbers! A few weekends ago, I found myself in Western Montana looking at core. While there, two geophysicist-types coerced me into crossing the border into Idaho and rafting the Lochsa. Since the weather has been so warm, the rivers on the western slope were running high. I should have known that this could be a mistake when they told me I would need to rent a dry suit.

Why would you want to play in a river that is so cold you have to wear a full dry suit just to ride on top of it? I'm not sure what we would have worn if we thought we would actually get in the river; a full submarine? The water did end up being as cold as advertised, somewhere between damn cold and ice. Whenever spray ended up flowing through my helmet to my head (which was often because we kept looking for bigger rapids to run), I would get the same kind of headache similar to eating a quart of ice cream in two minutes.

I grew up running rivers on the Colorado Plateau, an area justifiably famous for its river running. The rivers there keep things in perspective, there is a big rapid then the boater can rest for a while on flatter water before the next big rapid. The Lochsa however is nothing like this. The river runs at a pace much faster than water should ever flow. Highway 12 runs alongside the river, and no joke, we were going so fast on the river that we were semis and keeping pace with sport cars. Then we would come to another waterfall and the river would speed up. I was a little dismayed to learn from my "friends" that the first couple of big rapids we came to were too small to be named. The twelve named rapids that we were going to run were all much bigger. Unfortunately, they were not exaggerating; we would be speeding



were parked at key rapids all along the way to watch the carnage.

So get out while the weather is so nice. Soon it will be hot and smoky and it won't be nearly so pleasant to do fieldwork.

MGS Vol. 60 No. 4



Needless to say, no one flipped a raft or died (which in my case would have been the same thing), although I did need to wash certain items of clothing, repeatedly. The next day (yes, we ran the whole thing again the next day...it's strangely addicting) rafters and kayakers did flip and mostly seemed to be amused by the hyperthermia. Cars

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A Note from the Editor

Well I have to apologize for the delay as you may have noticed the April newsletter has become a bit more like a May newsletter but as our MGS President mentioned above, spring is here and with it....allergies and colds!

Even though I've been a little dazed and confused with Dayquil/Nyquil and allergy meds, I took some feedback that was provided a few months earlier as to how to improve our newsletter. Our "articles" tend to be announcements, advertisements and MGS Luncheon flier and typically focus around the Billings area....well I think we can do better, after all, we are now called the Montana Geologic Society right!? So in light of this welcomed feedback, I have reached out to some of the prestigious Montana universities with geology and earth science accredited programs and I am very excited to share what they've supplied for this month's newsletter.

I would like to remind our membership that if you have any geologic related stories or events, cool hikes around Montana, or feedback to enhance our MGS newsletter, I highly encourage you to submit your ideas/articles/photos to Sarah Edwards at sedwards@sm-energy.com or montanageologicalsociety@gmail.com before the 15th of each month.

A very special thanks to the following mentioned below who took the time write up the following articles.

John Zupanec (University of Montana), **Dr. Emily Geraghty Ward** (Rocky Mountain College), **Sara Edinberg** (Montana Tech), and **Cody Bodman** (Montana State University).

Your support is greatly appreciated and we look forward to reading more about your departments and geologic club events to come!

AND now without further ado, I will let those folks tell you a bit about the goings-on in their earth science departments and geology clubs.



Hello from the Department of Earth Sciences at Montana State University,

The MSU Department of Earth Sciences is a true reflection of the “Critical Zone” (where rock, soil, water, air, and living organisms meet). Students can pursue undergraduate and graduate degrees in geology, geography, snow science, paleoecology, and paleontology. The department is comprised of 13 tenure track faculty members, several research and adjunct faculty, over 200 undergraduates, and 50 graduate students pursuing both Masters and Ph.D. degrees, all lead by department head Dr. Mary Hubbard. The department will welcome a new faculty member in paleoecology for fall 2016 and will initiate a search for a sedimentologist/stratigrapher during the fall 2016. The department thanks Dr. Jim Schmitt for his many years of service to MSU as he transitions to “retirement” and becomes a research professor.

Spring 2016 saw the first incarnation of the Geology Club at Montana State University. The goal of the club is to foster a community with a passion for all things geology and promote exploring the wonderful geologically diverse areas in southwestern Montana. The club also hosts an AAPG student chapter for students interested in the petroleum industry. The growing club had the pleasure of visiting the Montana Bureau of Mining and Geology where members learned more about the research going on at “the Bureau” and the resources they provide to the public. To end the semester and ring in the summer the club will be hosting a student retreat to Tom Miner Campground in Paradise Valley. This retreat will have several road stops, including collecting petrified wood from the Gallatin Petrified Forest. If you are interested in getting involved in the Geology Club at Montana State University please contact Cody Bodman (cbodman505@gmail.com).



<http://www.montana.edu/earthsciences/>

The 11th Annual Earth Sciences Colloquium will take place on April 21st. This is an all-day mini-conference which welcomes student research from all disciplines and is completely organized by the graduate students of the MSU Department of Earth Sciences. This year Greg Stock, the first ever Yosemite Park Geologist, will deliver a keynote address which will appeal to a variety of earth scientists and the general public. For more information on the Earth Sciences Colloquium visit montanaesc.wordpress.com.

Written by: Cody Bodman



ROCKY MOUNTAIN COLLEGE

The Geology program at Rocky Mountain College consists of three faculty and approximately 20 student majors. The program began in the late 60s under Dr. Bill Ballard of Ballard Petroleum. The program offers concentrations in both Geology and Petroleum Systems. We have a Geology Club and AAPG student chapter on campus. Our faculty have a variety of areas of expertise that include:

- Structure and Tectonics, Igneous and Metamorphic Petrology, Geochronology/Thermochronology (Dr. Tom Kalakay)
- Sedimentology and Stratigraphy, Low Temperature Geochemistry, Petroleum Geology, and Paleoelevation/paleocirculation (Dr. Derek Sjostrom)
- Structural Geology and Geomechanics, Geomorphology/Hillslope processes, Geoscience Education (Dr. Emily Geraghty Ward)

Our students have been actively engaged in a variety of research projects depicted below:



Geology student Dan Bentley measuring section at Crooked Creek in the southern Pryor Mountains. This project is supervised by D. Sjostrom and focuses on detailed documentation of the Permian sediments and the Jurassic marine-to-non-marine transition in the northern Bighorn Basin. This project began as a collaboration between Rocky Mountain College and ExxonMobil.



Geology student Alethea Shaules and RMC geology graduate Stacy Hendricks (currently with MBMG) monitoring rock slab movement on the Rims. This project is co-advised by E. Geraghty Ward (RMC) and S. Kuzara (MBMG Billings) and is part of a long-term project focused on rock fall hazard assessment and mitigation along the Rimrocks in Billings.



Geology student Eirik "Hunter" Anderson is working with T. Kalakay on a project researching the structure, emplacement and petrography of mafic Leopard Dikes in the Beartooth Range, Montana. Hunter recently received grant funding from the Geological Society of America and Tobacco Root Geological Society to conduct field work this summer.

Written by: Dr. Emily Geraghty Ward

UNIVERSITY OF MONTANA

The University of Montana's Geosciences Department is a thriving group of students and faculty with a main foci on water science and solid earth science. We have department members working all over the globe from places like Greenland working on ice sheets, to Ethiopia working on extensional tectonics rift systems, and a plethora of work here in Montana focusing on different topics advancing our geological understanding of our Earth.

Our department has two active clubs. The Geology Club, led by President Wayne Bazo, is structured for the general geology student and plans activities and field trips that touch all aspects of geoscience. Their most recent trip was to Dillion, Montana where they looked at the structure and sedimentology in the Beaverhead Mountains. The second club is the AAPG Student Chapter, led by President John Zupanic. The student chapter focuses on the professional and specialized area of petroleum geosciences. With the help of AAPG's traveling geoscientist program the Chapter is able to bring in guest lecturers for additional colloquium presentations for the whole department. Recent lecturers include Riley Brinkerhoff and John McLeod of SM Energy. In addition to guest lecturers, the Chapter coordinates field trips to active drill sites and other industry operations. Last year's field trip, led by Professor Marc Hendrix and graduate student John Zupanic, took a group of students to the Powder River Basin for an outcrop to subsurface geology experience. The first day focused on Frontier Formation outcrop near Kaycee, Wyoming and the second day focused on a tour of an active drill rig, less than 30 miles away, drilling the same formation. Each student group address different interests within our department, but we all come together at the end of the year to host a joint picnic in celebration of all our graduating students and to rejoice in another year of excellence.



AAPG Officers Anna Phelps, Brianna Berg, and Will Wagner running the raffle table for the AAPG and Geology Club end of the year joint picnic.



University of Montana's very first IBA Team after winning the Rocky Mountain Regional Competition. (Left to Right) Brianna Berg (Undergraduate Senior), Cody Bomberger (2nd year PhD Student), John Zupanic (First year Masters' Student), Anna Phelps (Secon

In addition to the extracurricular activities of the two clubs, the geosciences department promotes student growth through programs such as the Imperial Barrel Award Competition (IBA) where a group of five students compete regionally and then nationally on an eight week basin analysis project. Last year our first ever IBA team competed in the Rocky Mountain Section of the competition and took home first prize and continued on to compete on the international level at the AAPG Annual Conference in Denver. This year SM Energy funded a Spring Break Fluvial Deltaic Short Course, led by Research Professor Michael Hofmann. The course took

Junior and Senior undergraduates on a week long field trip to the Book Cliffs in Utah to examine the outcrops that helped develop the Exxon sequence stratigraphic model. The next Montana Geological Society's Newsletter will include an article written by the students that recently returned from the Book Cliffs in Utah!

Written by: John Zupanic



MontanaTech

After a gap in activity over the past couple of years, the Montana Tech Geology Club is back in existence! Over the course of the 2015-2016 school year, efforts have been made to revive the club. The club meets once per month on the Montana Tech campus; meetings typically involve discussions and decisions about upcoming field trips and outreach activities. Several meetings have featured guest speakers,



including Dr. Kaleb Scarberry of the Montana Bureau of Mines and Geology, and Dr. Scott Rosenthal, Department Head of Mining Engineering. Field trips have been somewhat limited due to scheduling and funding conflicts, but have included a trip to a site west of



Butte to pan for sapphires. More field trips are in the works, including a summer camping/mineral collecting trip at the conclusion of the school year (TBA), and trips to various mineral shows in Montana.

The club also strives to work on community outreach, which has included tutoring sessions for Geology 101, a presentation about Montana Tech's geosciences program for the TRIO Outward Bound group, and hosting a booth at the Butte Gem and

Mineral Club's Scholarship Bazaar. Upcoming plans include assisting with a geology-themed event at The Science Mine in Butte (<https://www.facebook.com/TheScienceMine/>).

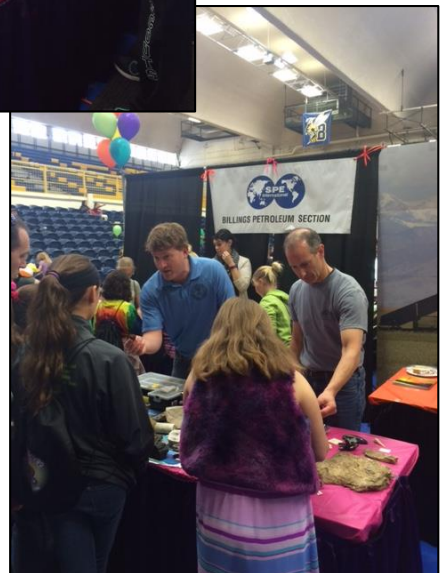
A new officer lineup was elected at April's meeting, so the club will continue to grow throughout the upcoming school year. For more information and updates on upcoming events, check out the Montana Tech Geology Club Facebook page at <https://www.facebook.com/groups/MontanaTechGeologyClub/>

Girls Rock!



Girls-n-Science (formerly Chicks in Science) was held Saturday, April 16 at MSUB. Girls-n-Science is an event for 4-8th grade girls in the Billings area that introduces girls to a wide range of STEM-related fields.

MGS had a combined MGS/SPE/SM Energy booth where members taught young girls about the formation of fossils and fossil fuels, looked at rock samples and talked about associated depositional environments, and decorated hard hats. A big thank you to MGS volunteers: Jack Warne, Sarah Edwards, Felipe Pimentel, Jeff Zawilia, Mike Alloway, and Anna Phelps and SPE volunteer Shawna Bonini!



Adventures in Learning

Trying to plan a fun family vacation this summer but don't know where to go? Want to set your inner paleontologist free? Are you a student looking to get a jump start in a career in earth science? Then look no further than **ADVENTURE 360**!

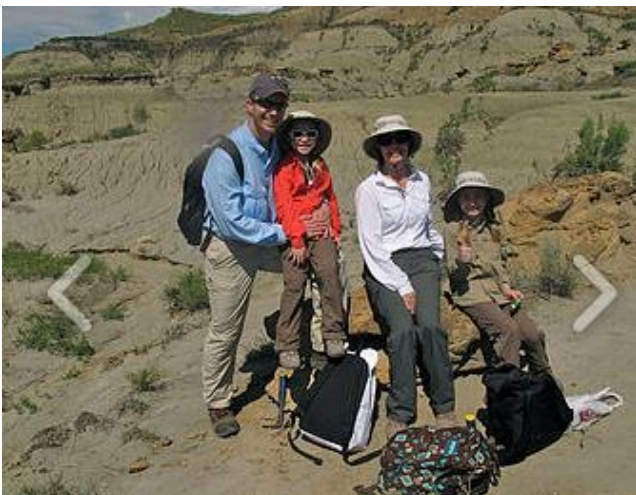
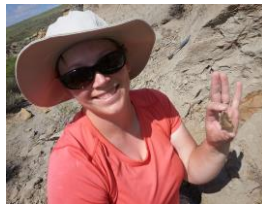
ADVENTURE 360 is a nonprofit organization promoting unique and authentic learning experiences for adults, families, students and educators. Participants can be scientists, researchers, college students studying in the field of earth science or just adults that want to realize their childhood dream as a paleontologist or archaeologist. It's families looking for vacation learning experiences and creating lasting memories. Or high school students interested in careers in science. Or educators wanting to expand their professional knowledge and curriculum to better engage today's youth. Most importantly, *people like you with an enthusiasm for unique adventures, exploring authentic learning opportunities and actively experiencing your world in new and exciting ways.*

ADVENTURE 360 has partnered with the [Bureau of Land Management](#) to offer the Paleo X Family Adventure days free for all Montana residents as part of the '[GET OUTSIDE MONTANA](#)' initiative.

So sign up today! Click on the website below to register for the dinosaur dig. It's free to the first 10 different people each day June 27 – July 1 through Get Outside Montana.

<http://www.adventure-360.com/#!paleo-x/cq4e>

Just think, this could be you!



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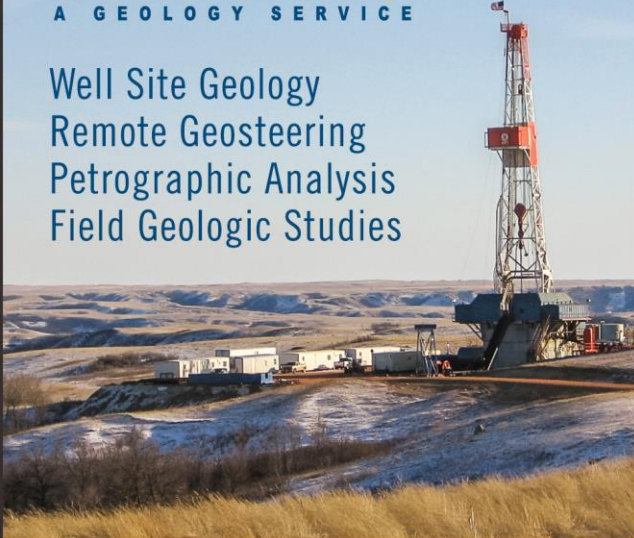
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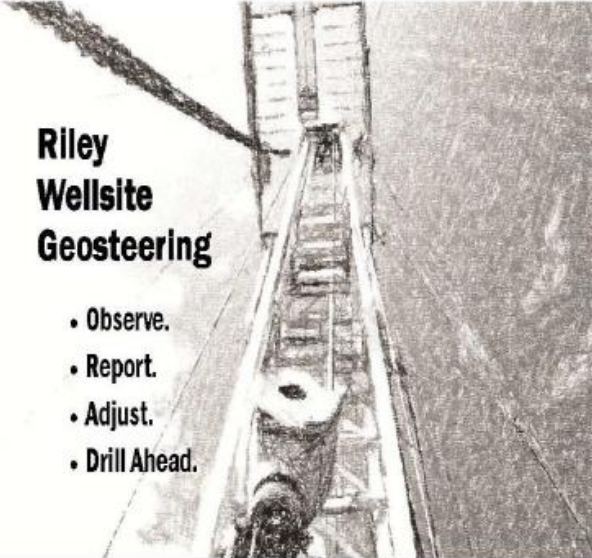
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2006 AAPG Datapages - MGS Publications DVD		\$180.00	
2006 AAPG Datapages - MGS Publications DVD (MGS Member price)		\$150.00	
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