MONTANA GEOLOGICAL SOCIETY NEWSLETTER

February 2020

Vol 64 No. 4

See this gorgeous submitted photo in its entirety on page 6.

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Mar 24 - Lecture - Sarah Friedman *(see page 10)*

Contact Us:
mtgeo.org / montanageologicalsociety@gmail.com
Find us on
Add our email address to your contacts so your Newsletters & Luncheon announcements don't end up in Spam!

PO Box 844
Billings, MT 59103

Letter from the Editor

Dear MGS Membership,

I hope you are all well! While we here in Billings are getting a much nicer winter (see below) than the past two, it seems to be making up for it on the sickness side. From the flu and sinus infections on down to a regular cold, my family has seen it all in the past month or so. While I had some forced downtime tending my wife and kids back to full health, I found myself contemplating how nice it was not seeing subzero temperatures on the gauge this year. This led me to wondering how this year so far compared to the last two record setting February's so I went looking for data…

A quick look around NOAA's website for Billings (https://www.weather.gov/BYZ) led me to their Climate Data Online portal (https://www.ncdc.noaa.gov/cdo-web/), where I was able to download the past two years daily data and put together the plots below. While we're definitely in winter with our temps hovering right around the freezing mark, it has been a milder one here in Billings and a welcome change for me (though my snowblower is feeling a little neglected).

Stay warm!

Tom Hewett
MGS President

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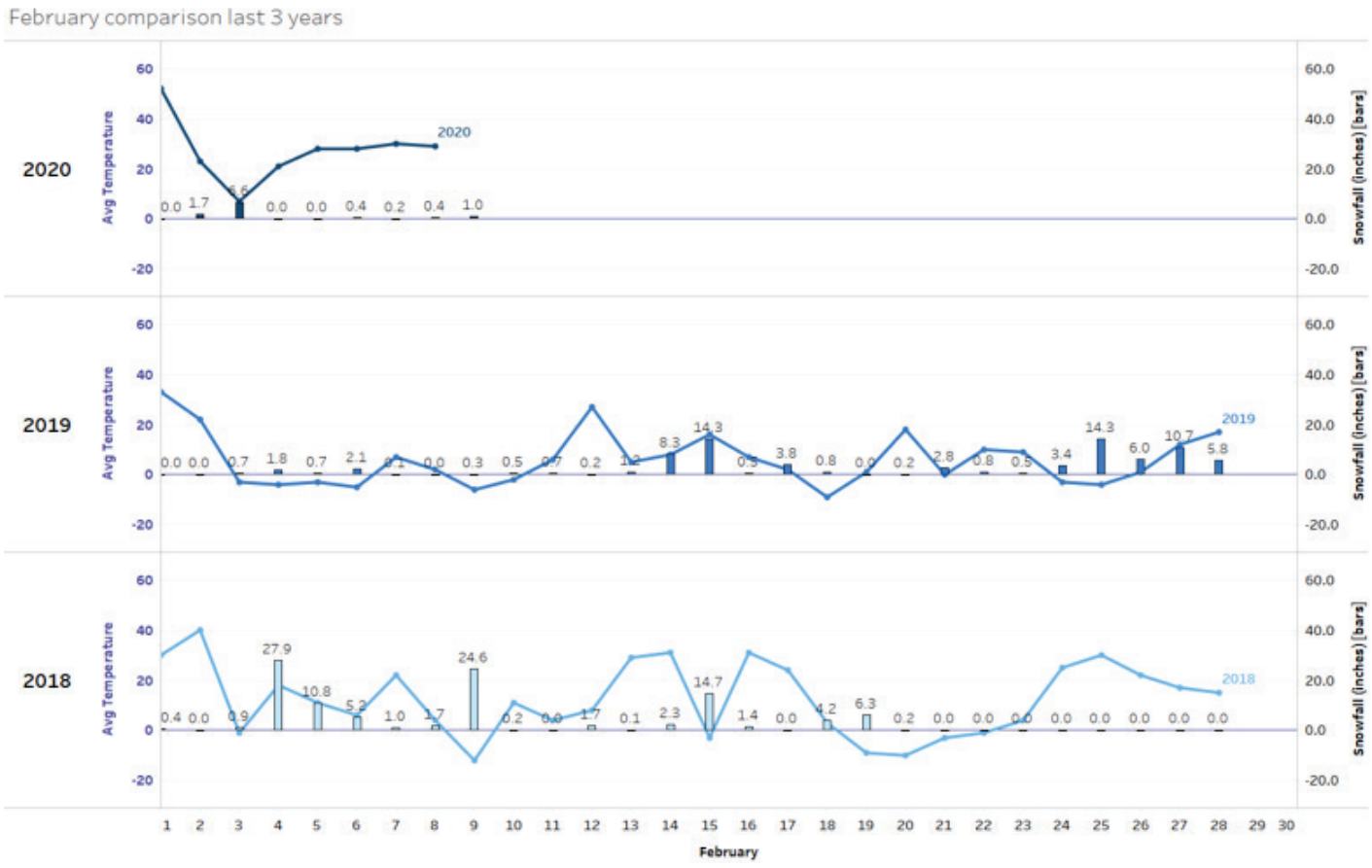
Past President
Sarah Friedman



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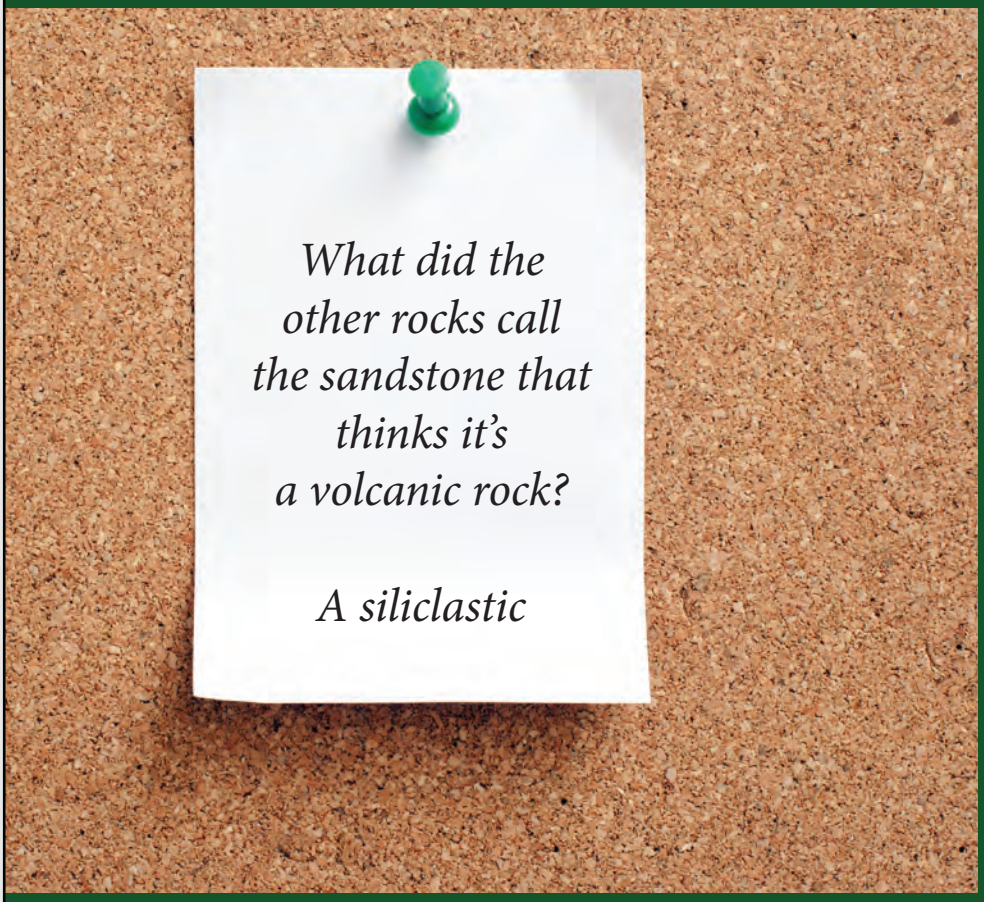

Have something geological to sell, give, or find?
Place a free ad in our MGS Classifieds!

Contact the Newsletter Editor for more information.

Montana Geologic Society

Wednesday, Feburary 26th

11:45 AM – Billings Petroleum Club

Please join us!

- **Lunch is $10 for MGS members**
- **$17 for non-members**
- **Talk is always free**

RSVP – montanageologicalsociety@gmail.com

NATALIE TOTH

CHIEF PREPARATOR, DENVER MUSEUM OF NATURE & SCIENCE

How to Dig up Dinosaurs – The Technical Geology and Paleogeography – For Geologists

The Earth Science Department at the Denver Museum of Nature & Science facilitates paleontological fieldwork across the entire Rocky Mountain region, from the Dakotas to the Texas-Mexico border. Fieldwork in the Rockies is diverse; it includes areas like the remote backcountry setting of Utah's Grand Staircase-Escalante National Monument, the San Juan Basin in New Mexico, and the badlands of North Dakota and Montana. Additionally, since Colorado is in the heart of the Rocky Mountains, fieldwork can happen locally, specifically in urban Denver. Over the past few decades, Denver and its suburbs have yielded significant paleontological finds, in addition to the less accessible areas in the Rocky Mountain west.

The logistics, planning, and execution of fieldwork in the settings mentioned above requires careful preparation and organization, and each environment comes with its own suite of challenges and successes. Working in remote areas with large (30+ persons) field crews demands detailed planning of all aspects of fieldwork. How do we get equipment, supplies, food, and people into backcountry localities where the nearest paved road is 20+ miles away? How do we prevent a bulldozer from destroying vertebrate fossils and keep crews safe while working in an active construction site? This talk will address some of the difficulties affiliated with facilitating fieldwork in some of the most remote and most urban areas in the United States, and highlight why and how we continue collect fossils in the midst of the perceived "adversity."

Biography

Natalie Toth joined the Earth Science Department at the Denver Museum of Nature & Science in 2017 as a fossil preparator. Prior to joining the Museum, Natalie worked as a field paleontologist at Petrified Forest National Park in Arizona, and spent six years digging fossils across the Rocky Mountain region with the Natural History Museum of Utah. Natalie received her bachelor's degree in geology from Eastern Illinois University, and her master's degree in paleontology from South Dakota School of Mines. In her role as Chief Preparator, Natalie supports the museum's research efforts by facilitating fieldwork across the Rockies and overseeing the day-to-day operations in the museum's fossil preparation lab.

Montana Geologic Society
Public Talk
Wednesday, Feburary 26th
7:15 PM – Billings Public Library

Please join us!

- **Open to the public!**

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CHIEF PREPARATOR, DENVER MUSEUM OF NATURE & SCIENCE

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Look At That: Photo Highlight

This gorgeous Colorado view of the Black Canyon of the Gunnison was submitted by MGS Treasurer Jim Suydam, who has described the view as follows:

The Gunnison River has incised a 48 mile long by 2,000+ feet deep canyon in central Colorado between Gunnison and Montrose. Laramide tectonism uplifted the 1.8 billion year old metamorphic rocks which were then buried by volcanic rocks ~30 Ma.
The Gunnison River cut through the volcanic rocks, then taking advantage of existing fractures, continued its incision forming the narrow and deep canyon.

Want to Share?

Do you have photos of past MGS events, MGS members, or Montana geology?
If so, we'd like to see them!

For a chance to have your photo featured in the MGS Newsletter & MGS Facebook page, please submit your high-resolution photograph(s) and full name to montanageologicalsociety@gmail.com

Upcoming:
Past President's Dinner

Save the Date for this year's

Past President's Dinner

Honoring Sarah Friedman
Friday, February 28
Billings Petroleum Club

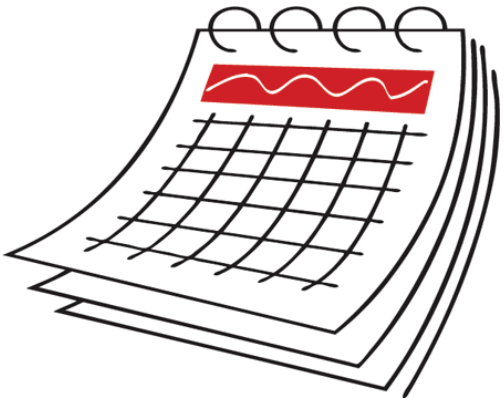
Cocktails at 6:00 p.m.; Dinner at 7:00 p.m.
Free for MGS Members and a guest.

Need to change your RSVP?
Please contact the MGS ASAP.

It's not too late! Don't forget to...

Renew your MGS Membership!

Use our convenient online renewal system at mtgeo.org, or print & complete the renewal form at the back of the Newsletter!



MGS Luncheon Meeting

Wednesday March 18th, 2020

11:45 am – Billings Petroleum Club

Please join us!

- **Lunch is $10 for MGS members, $17 for non-members**
- **Talk is always free**

RSVP – montanageologicalsociety@gmail.com

ERIC FERRÉ

DIRECTOR OF THE SCHOOL OF GEOSCIENCES

UNIVERSITY OF LOUISIANA AT LAFAYETTE

What is Magnetic in the Upper Mantle?

The launch of NASA's Magsat satellite in 1979 prompted several publications on the sources of magnetic anomalies. The results concluded that the mantle did not contribute to long wavelength magnetic anomalies. More recent studies, around 2005, began to question this conclusion, and the ESA was preparing to launch a high-resolution magnetic array. This led to the revisiting of the idea that the mantle is non-magnetic. Eric's team published results showing that under some mantle conditions the mantle can contribute to these satellite anomalies. One of these areas where the mantle would have the pressure, temperature and composition conditions to produce an anomaly is in subductions zones. Current work is compiling all existing data sets (maps, models, and experimental physical properties) to begin the search for even deeper sources. Looking specifically at the mantle around the subducted Farallon Plate it may be possible that deep garnet bearing xenoliths are also contributing to magnetic anomalies.

Biography

Eric obtained his BSc (1984), MSc (1985) and PhD (1989) from the Université Paul Sabatier, Toulouse, France. His post-graduate opportunities led him to Scotland, Nigeria, South Africa, and finally to the University of Wisconsin in 2001. He then moved onto working at Southern Illinois University (SIU) in 2002 where he established a rock magnetics laboratory. While serving at SIU he also participated as a shipboard scientist for 3 International Ocean Drilling Program (IODP) expeditions, has been lead PI on 6 NSF grants, and was the coordinator of the geology field camp which frequents Red Lodge, MT in the summers. Eric began serving as the Director of the School of Geosciences at the University of Louisiana in 2018. Hi research interests are vast and can range from seismic deformation and electormagnetism, deep lithospheric magnetic sources, heat transfer at the thermal boundary layer in the oceanic crust, to rheology and coupling in the upper mantle and lower cust.

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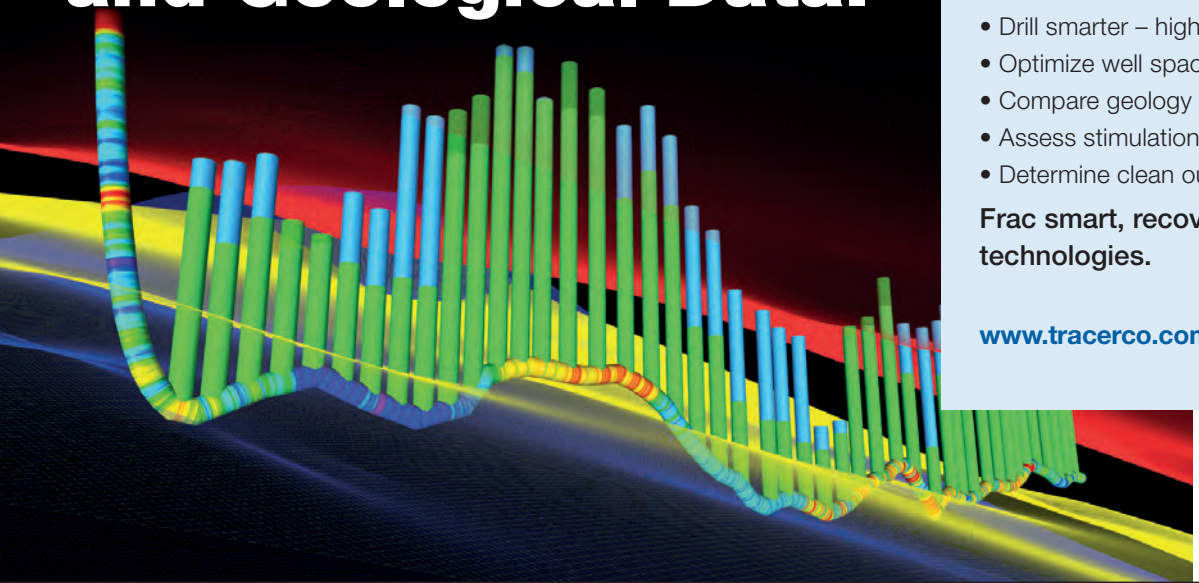

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MSUB Library Lecture Series!

Tuesday March 24th

6:30- 8:00 PM – MSUB Campus

LI – 148 (library building room 148)

Open to the public! Bring your friends and family!

Sarah Friedman

Associate Professor of Geology

Montana State University

The Shape of Montana – the geology behind the treasure state

Montana's variable landscapes are the result of many geologic events. Initial cooling of the Earth created the foundation for what will become Montana. From there Montana has been submerged under shallow ocean, and uplifted to the highest heights. Volcanoes have periodically dotted the landscape and are responsible for the creation of rich mineral resources that give Montana the nickname of "the Treasure State". All manner of creatures have called Montana home, from trilobites to dinosaurs to mammals as Montana travelled from the south pole to its current location in the Northern hemisphere.

Biography

Dr. Sarah Friedman currently teaches geology curriculum at Montana State University-Billings. She graduated from Eastern Illinois University in 2009 with a B.S. in Geology. From there she pursued an M.S. in Geology and PhD in Geosciences at Southern Illinois University in 2015.

Science Expo 2020

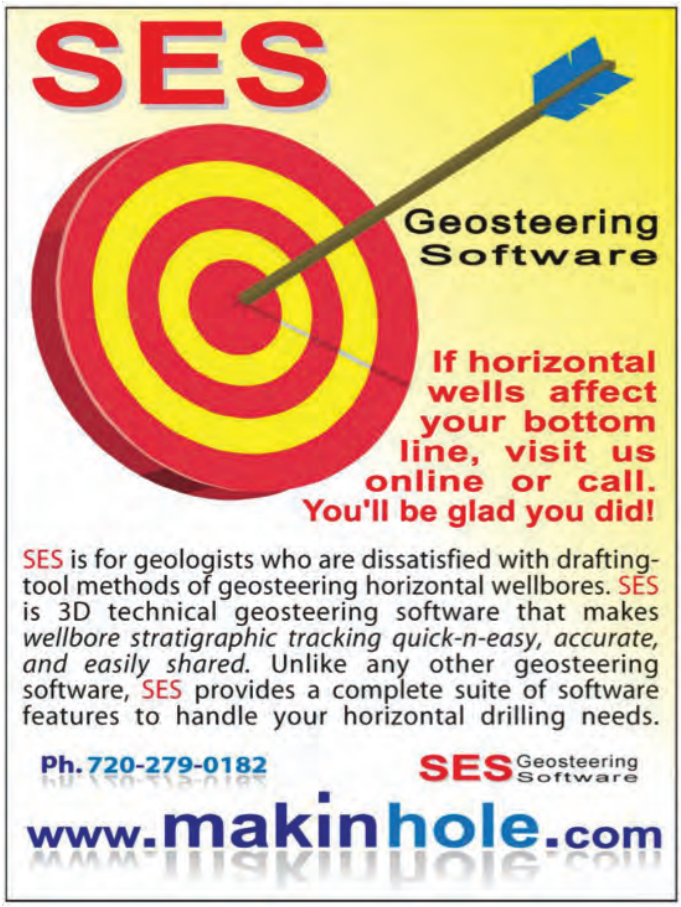
Call for Judges!

This year the Science Expo is introducing a new digital platform for judge registration. Judges can select their first 3 categories of interest, and the Science Expo staff asks that you denote in the comments box how many years you've served as a judge and if you are interested in judging Industry or Artistic Merit categories.

Judging Night: Friday, April 24th, 2020

Judges commit to serving from 5:00 – 9:30 pm
Montana State University - Billings

Please sign up to judge at: https://www.msubillings.edu/scienceexpo/.



Interested in placing an ad?

Contact Jessica Renstrom at montanageologicalsociety@gmail.com with your ad, or request pricing to create one for your business or event.

2020 Advertising Rates:
Full Page - $100/month
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Quarter Page - $25/month
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All ads must be prepaid.
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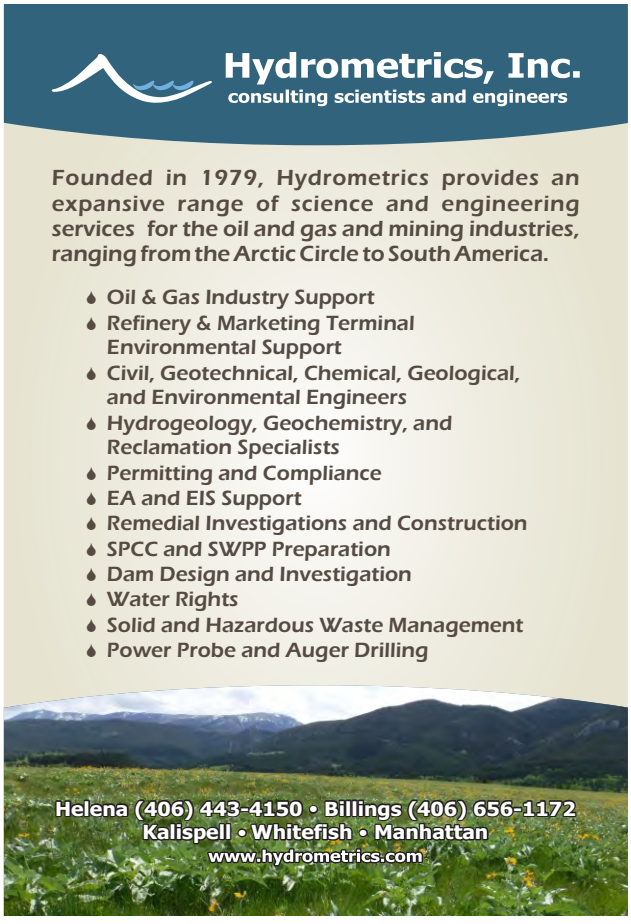

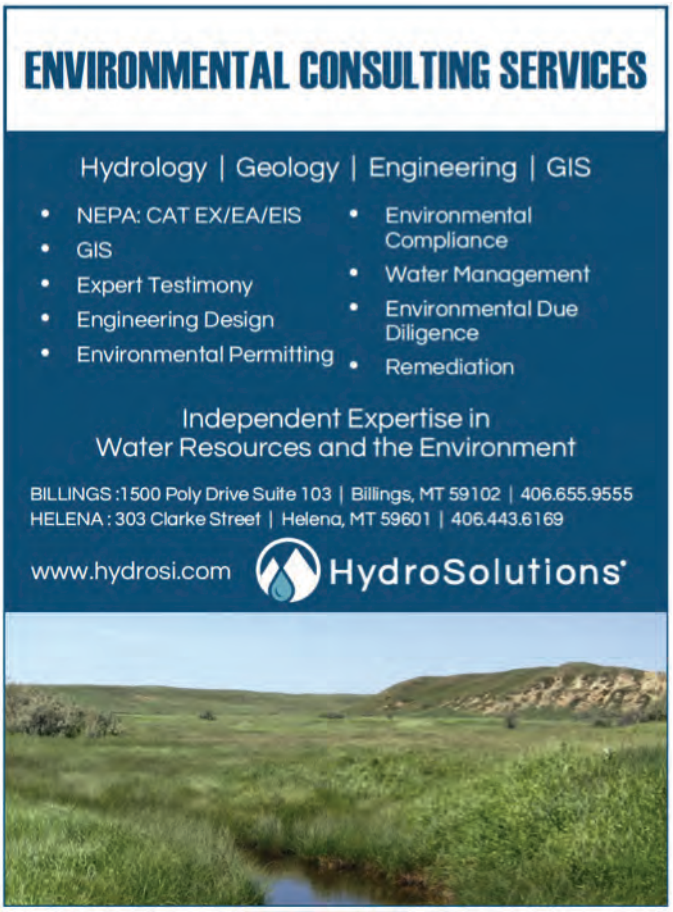

MONTANA GEOLOGICAL SOCIETY

P.O. Box 844 Billings, MT 59103

Membership Renewal

Last Name _____

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ANNUAL DUES:

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Degree #2 _____

Degree #3 _____

MONTANA GEOLOGICAL SOCIETY

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2006 Montana Oil & Gas Fields CD		$65.00	
2006 AAPG Datapages - MGS Publications DVD		$180.00	
2006 AAPG Datapages - MGS Publications DVD (MGS Member price)		$150.00	
2000 50th Anniversary Symposium		$20.00	
1999 Thrust Systems of the Helena Salient		$20.00	
1998 8th Int'l Williston Basin Symposium		$20.00	
1998 8th Int'l Williston Basin Symposium Core Workshop		$20.00	
1997 Big Horn Basin Symposium		$20.00	
1997 MGS-TRGS: The Edge of the Crazies		$20.00	
1997 AAPG - Rocky Mtn. Section Meeting / Abstract Volume		$10.00	
1996 AAPG - Rocky Mtn. Section Meeting / Abstract Volume		$10.00	
1993 Energy and Mineral Resources of Montana		$20.00	
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1991 Geology & Horizontal Drilling of the Bakken		$20.00	
1991 AAPG - RMS Field Trip: Beartooth Mountains		$7.50	
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1990 Bakken Workshop Short Course Study Notes #1		$10.00	
1989 Geologic Resources of Montana		$20.00	
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