



# MONTANA GEOLOGICAL SOCIETY

## NEWSLETTER

Vol 66 No. 10



### Inside this Issue:



#### **P2 / PRESIDENT'S LETTER**

Our President discusses the current annual election and upcoming Happy Hour.



#### **P4 / HAPPY HOUR & PRESENTATION**

Check out the upcoming MGS presentation at a new venue & time.



#### **P5 / IN THE NEWS**

Read up on all the latest geology news making headlines around the world.



#### **P6 / EARTH SCIENCE WEEK**

It's Earth Science Week! Check out a poster about Science & Sustainability.



Contact Us:

[mtgeo.org](http://mtgeo.org) / [montanageologicalsociety@gmail.com](mailto:montanageologicalsociety@gmail.com)



*Add our email address to your contacts so your Newsletters & Luncheon announcements don't end up in Spam!*

PO Box 844  
Billings, MT 59103

# President's Letter

Greetings MGS members!

It's the beginning of a new year at the Montana Geological Society and on behalf of the other officers and board, thank you for your contributions to earth science education and research through your membership last year!

Many of the current officers and board have agreed to serve again this year and we have a couple of new recruits as well. Ted Doughty (Prisem Geoscience) has agreed to be on the ballot for a Board position. Ted is a structural geologist (PhD Queens Univ. 1996) who has held positions in academia and the petroleum industry, is passionate about field work and is also a local tavern owner in Billings. Jacob Thacker (MSU-Billings) has agreed to be on the ballot for Secretary. Jacob is a structural geologist (PhD Univ. of New Mexico 2020) who places a high-priority on field work, enjoys teaching and outreach, is an avid photographer and enjoys outdoor sport pursuits. Please look for the online ballot which has been sent to your email and cast your vote in support of these volunteers!

With the new year we are exploring a change to the traditional lunch time speaker event. We are looking forward to hosting our first evening event of the season on Tuesday, October 18th, at Tiny's Tavern in Billings from 5:30 – 8:00, details are included in the following pages. Please consider joining us if you're in Billings as we take the MGS to prime time!

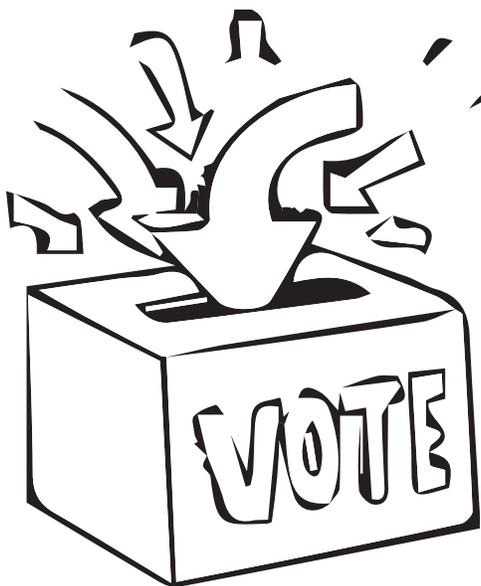
As always, we welcome your feedback. Send us an email or contact one of us directly if there's something you'd like to see or share.

Trick or treat!

Jim Suydam  
Geologist & MGS President

## 2021-2022 MGS Officers

<i>President</i>	<i>Jim Suydam</i>	<i>406-259-4124</i>
<i>Vice President/Speaker Coordinator</i>	<i>Michael Hofmann</i>	<i>406-926-1000</i>
<i>Treasurer</i>	<i>Brianna Berg</i>	<i>405-921-6649</i>
<i>Secretary</i>	<i>Andrew Keene</i>	<i>303-883-3261</i>
<i>Past President</i>	<i>Spenser Kuhn</i>	<i>406-696-0268</i>



## Annual Officer Elections are happening now!

Don't forget to submit your ballot, which has been sent via email.

*Didn't get an email?  
Let us know!*

## Who's Who of the MGS

### BOARD OF DIRECTORS

*Don French*  
*Sarah Friedman*  
*Debra Hanneman*  
*Spenser Kuhn*

### AAPG-ROCKY MOUNTAIN SECTION

*Delgate: John Pantano*  
*Alternate: Michael Hofmann*  
*Foundation: Rob Diedrich 303-830-5875*

### COMMITTEES

*Awards and Continuing Education:*  
*Jim Suydam*

*Field Trips:*  
*Gary Hughes 861-2072*

*University Liaison:*  
*Steven W. VanDelinder*

*Publications:*  
*Duncan McBane 252-3170*

*Montana Oil & Gas Fields Update:*  
*Jim Halvorson 656-0040*

### PUBLICATION SALES

*Doretta Brush 259-8790*

### CHAIRPERSON OF MEDIA & OUTREACH

*Jessica Renstrom 208-2504*

*What happens when  
you look up geology  
jokes?*

*You know you've hit  
rock bottom!*

*Have something geological to sell,  
give, or find?*

*Place a free ad in our MGS Classifieds!*

Contact the Newsletter Editor for more information.



We got something new for you this fall

Join us for

## MGS Happy Hour



When? Tuesday, October 18<sup>th</sup> 5:00PM – 8:00PM (talk starts at 6:30PM)

Where? Tiny's Tavern in downtown Billings (323 N. 24th Street)

What? Drinks, Presentation, Dinner (food orders need to be placed by 6pm)

RSVP to [montanageologicalsociety@gmail.com](mailto:montanageologicalsociety@gmail.com) by latest Monday October 17<sup>th</sup>

---

### **SPEAKER: MITCHELL LUKENS**

**ENERGY LABORATORIES, BILLINGS, MONTANA**

Mitchell Lukens is a recent graduate of Fort Hays State University in Hays, Kansas where he earned his Master's of Science in Geosciences with an emphasis Stable Isotope Geochemistry. He received his Bachelors of Science in Geology with an emphasis in Paleontology from the University of Wyoming in 2014. He has primarily worked as a paleontological field technician for SWCA Environmental Consultants, Quality Services, PaleoSolutions, and recently KLJ Engineering. He is currently working as a Chemical Analyst at Energy Laboratories in Billings, Montana.



---

### **Warm-Blooded Mosasaurs? How a Kansas Fossil May Reveal Ancient Physiologies**

The question of mosasaur physiology is important because of the ancient marine reptiles' dominance of the late Cretaceous oceans. An elevated body temperature would have enabled these animals to be active in many different aquatic environments. Stable isotope analysis of oxygen isotope ratios (expressed as  $\delta^{18}\text{O}$  values) preserved within fossil tissues can reveal temperature and physiological variances within skeletons but not differentiate between body temperature and water temperature. A rare specimen of a mosasaur with stomach contents presented an opportunity to resolve this problem.

Excavated from the Niobrara Chalk of Logan County, Kansas, "Belle," a *Platecarpus tympaniticus*, contains the remains of its last meal: belemnites, *Actinocamax sternbergi*. Belemnites, squid-like animals, had body temperatures equivalent to the ocean water they lived in, preserving the water temperature in their calcite-based rostrums. The entombing chalk, composed of coccolith tests, also recorded the surface water temperature. Preliminary results of calculated temperatures provide evidence that Belle's body temperature is elevated relative to both the belemnites and the coccoliths, suggesting an endothermic physiology. Examining intra-bone and inter-bone variation of oxygen isotope ratios across the skeleton indicates that the body temperature fluctuated throughout the body, implying this mosasaur was heterothermic. The belemnites' temperature entails they lived in colder waters, deeper in the water column or further north in the sea, perhaps indicating where Belle ate them before its death. The coccoliths confirm previous water temperature research for the Western Interior Seaway in Kansas during the late Cretaceous.

## **“Getting it to stick: Grabbing CO<sub>2</sub> out of the air”**

*“Direct air capture is hard to do. Researchers are now designing new materials that selectively catch carbon dioxide in the atmosphere.”*

To read the article, please visit:

<https://www.sciencedaily.com/releases/2022/10/221011161311.htm>

## **“An ocean inside Earth?**

### **Water hundreds of kilometers down”**

*“The transition zone between the Earth's upper and lower mantle contains considerable quantities of water, according to an international study. The research team analyzed a rare diamond formed 660 meters below the Earth's surface using techniques including Raman spectroscopy and FTIR spectrometry. The study confirmed something that for a long time was only a theory, namely that ocean water accompanies subducting slabs and thus enters the transition zone. This means that our planet's water cycle includes the Earth's interior..”*

To read the rest of the article, please visit:

<https://www.sciencedaily.com/releases/2022/09/220926200712.htm>

## **“Earth's newest secret: How volcanoes really work”**

*“Recent findings from Iceland's Fagradalsfjall eruptions change what we know about how volcanoes work.”*

To read the rest of the article, please visit:

<https://www.sciencedaily.com/releases/2022/09/220915165304.htm>

# It's Earth Science Week!



## EARTH SCIENCE WEEK

October 9–15

[www.earthsciweek.org](http://www.earthsciweek.org)

Organized by the American Geosciences Institute, Earth Science Week occurs each October and is designed to help the public better understand the importance of the Earth Sciences and feel inspired to care for our Earth. This year's Earth Science Week is themed "Earth Science for a Sustainable World." We have included a copy of a free poster from the AGI on the next two pages for you to print for your office or classroom. For a larger download size and more information on Earth Science Week, please visit: <https://www.earthsciweek.org/images-and-logos>

**SES**  
Geosteering  
Software

If horizontal wells affect your bottom line, visit us online or call. You'll be glad you did!

SES is for geologists who are dissatisfied with drafting-tool methods of geosteering horizontal wellbores. SES is 3D technical geosteering software that makes wellbore stratigraphic tracking quick-n-easy, accurate, and easily shared. Unlike any other geosteering software, SES provides a complete suite of software features to handle your horizontal drilling needs.

Ph. 720-279-0182  
**SES** Geosteering Software  
[www.makinhole.com](http://www.makinhole.com)

**SUNBURST CONSULTING**  
A GEOLOGY SERVICE

Providing geoscience expertise and technology to the field and office since 1981

Well Site Geology  
Geosteering - On site & Remote  
Rock Analytics  
Geologic Prognosis/Mapping  
Oil Field Safety Training - PEC  
Regulatory Representation

406.259.4124  
[sunburstconsulting.com](http://sunburstconsulting.com)

Find us on 

"Like" the Montana Geological Society to keep up-to-date with the MGS.

[www.earthsciweek.org](http://www.earthsciweek.org)



## Geoscience Supports the United Nations Sustainable Development Goals

This map shows the locations of a sample of initiatives that illustrate how the geosciences support specific Sustainable Development Goals (SDGs). Information about initiatives in these locations is provided through ArcGIS StoryMaps (see poster back).



9000  
4000  
2000  
0  
-6,000  
-12,000

Approximate elevations and depths in meters

Map: USGS/J. Cody, using an Esri dataset with data from Airbus, USGS, NGA, NASA, NOAA, CGIAR, GEBCO, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community.

<https://sdgs.un.org/goals>

### SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

**Ningde, China** — One of the largest lithium-ion battery manufacturing plants uses raw materials sourced from northern China, the Democratic Republic of the Congo, Chile, and Australia to produce rechargeable batteries. Recycling of lithium-ion batteries reduces the need for new raw materials.

### SDG 13: CLIMATE ACTION

**Hokkaido, Japan** — Natural and artificial wetlands used as rice farms could help combat climate change by increasing biodiversity and providing material for biofuel. Urbanization and modernization of farming techniques may impact the future of rice farms.

### SDG 14: LIFE BELOW WATER

**Illes Medes, Spain** — The Marine Ecosystem Restoration in Changing European Seas (MERCES) Project works to restore marine ecosystems and populations that have been negatively impacted by human activity. Illes Medes houses 9 of the 128 MERCES project sites across 12 European countries.

### SDG 15: LIFE ON LAND

**Kinshasa, Democratic Republic of the Congo** — Environmental “hot spots” within tropical forests affected by deforestation are identified using quantitative and spatial data. Actions are being taken to reduce the destruction. Mitigation efforts are also taking place in Brazil and Indonesia.

After reviewing these initiatives, think about additional ways the geosciences can support these SDGs and others shown below.

### SDG 2: ZERO HUNGER

**Chicago, Illinois, USA** — Innovative urban farming techniques expand agriculture and increase access to food while reducing human impacts on the environment. Urban farming projects are also occurring in New York City, New York, and Detroit, Michigan.

### SDG 6: CLEAN WATER AND SANITATION

**Santa Monica, California, USA** — Urban Waters Learning Network (UWLN) engages communities in the restoration of waterways and improving urban water quality. Other UWLN restoration projects take place in Denver, Colorado, and Matawan, New Jersey.

### SDG 7: AFFORDABLE AND CLEAN ENERGY

**Cerro Pabellon, Chile** — Multiple data sources have been used to locate areas that could harness and benefit from the use of geothermal energy as a renewable energy source. There is also data from Paraguay, Argentina, and Bolivia that supports the use of geothermal energy.

### SDG 11: SUSTAINABLE CITIES AND COMMUNITIES

**Sydney, Australia** — Urban greening has occurred over the past three decades which has resulted in benefits to both the environment and human health. There are still improvements to be made and targets to reach in the future.



### You're Invited

"Earth Science for a Sustainable World," the theme of Earth Science Week 2022 (October 9-15), emphasizes the essential role of Earth science in helping people make decisions that maintain and strengthen the planet's ability to support thriving life.



The United Nations adopted 17 Sustainable Development Goals (SDGs) in 2015 as a global call to action to solve humanity's biggest challenges. Some of these SDGs are supported by the geosciences and are highlighted on this year's Earth Science Week poster. More information about the SDGs can be found at <https://sdgs.un.org/goals>.

Resources and activities have been collected and developed to engage students with the SDGs, specifically looking at how work in the geosciences supports the SDGs. Each of us can contribute to improving sustainability in our communities and helping achieve the Sustainable Development Goals.

You are invited to join in the celebration of Earth Science Week 2022. Learning about and raising awareness of the SDGs can enable explorations of how individuals and communities can work to improve sustainability.

### About the Map

The map on the poster front is an elevation map, where the colors represent different depths and heights according to the key.

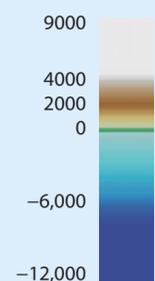
AGI appreciates the work from Jeannine Cody and others who put together this map and the topographic and bathymetric datasets to create it.

Front map by USGS/J. Cody using an Esri dataset with data from Airbus, USGS, NGA, NASA, NOAA, CGIAR, GEBCO, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community.

### Other Resources

For more information about the SDGs, classroom activities related to the SDGs, and other teacher resources described above, visit [www.earthsciweek.org/content/sustainable-world](http://www.earthsciweek.org/content/sustainable-world).

Please scan this QR code for an interactive online version of this poster.



The map on the poster front shows elevations (heights and depths) corresponding to these approximate key colors (measurements in meters).

**Earth Science Week Future Dates**  
October 8–14, 2023  
October 13–19, 2024  
October 12–18, 2025

American Geosciences Institute  
4220 King Street  
Alexandria, VA 22302  
(703) 379-2480  
[www.americangeosciences.org](http://www.americangeosciences.org)

### Your Vital Role

- **Schools and classrooms** can hold events, complete activities, and invite guest geoscientists to give presentations. Students can do projects, compete in Earth Science Week contests, watch webcasts, and go on field trips to museums or local parks.
- **Colleges and universities** can encourage Earth science departments, professors, and students to host an open house or conduct an event that educates the public about the geosciences.
- **Geoscience companies and other organizations** can reach out to communities by obtaining Earth Science Week Toolkits for local classrooms, hosting an open house, or sending a geoscientist to visit a local school.
- **Museums and science centers** can shine a spotlight on geoscience-related exhibits or create a program especially for Earth Science Week.
- **Families and citizen groups** can participate by planning an event or activity for their communities, youth groups, or schools.

### Learning Activities

#### SDG Initiatives in ArcGIS StoryMaps

The poster front introduces several SDGs and related projects that are supported by geoscience. Those projects are described using ArcGIS StoryMaps. To access the StoryMaps introduced on the poster front and other StoryMaps that highlight work related to the SDGs, visit an online version of the poster at [https://padlet.com/AGI\\_Education/SDGStoryMaps](https://padlet.com/AGI_Education/SDGStoryMaps).

Some of the locations featured in the StoryMaps are identified on the map on the poster front. Add additional locations to the map as they are introduced in each of the StoryMaps. A smaller, printable version of the map is located at [www.earthsciweek.org/content/sustainable-world](http://www.earthsciweek.org/content/sustainable-world), along with other resources.

#### SDGs and Earth's Systems

The geosciences help people understand the dynamic Earth systems that affect them, as well as how people affect those systems. As you review a StoryMap, identify when Earth systems are described, and consider their role in how people are working to support the SDGs. Use the Earth System Diagram at

<https://bit.ly/3ypg0DB> to show how the different Earth systems and their interactions in the initiative are related. Think beyond the StoryMap—in a different color, write down other ways the Earth systems are related to that initiative.

#### SDGs in Your Community — Create a Display

Consider the work your community is doing related to the SDGs. What are some initiatives in your community or region that support one or more of the SDGs? How can geoscience knowledge help that work? How might people be affected by these initiatives? How can you get involved?

Create a display by printing out the icons of the SDGs that relate to your community's initiatives (found at <https://bit.ly/3yp1X0D>) and posting articles, images, and/or ideas you write about your community's connections to the SDGs.

#### SDGs in Your Community — Focus on a Site

Observe or think about a location in your community. How could it be improved in terms of

### Find Out More

See the Earth Science Week 2022 Toolkit ([www.earthsciweek.org/materials](http://www.earthsciweek.org/materials)) and website ([www.earthsciweek.org/](http://www.earthsciweek.org/)) for instructional resources, newsletters, local events, and classroom activities. Have a great Earth Science Week!

### Get Connected

Where to start? Simply go online and explore some of the electronic resources available through the Earth Science Week website:

### Classroom Activities

([www.earthsciweek.org/classroom-activities](http://www.earthsciweek.org/classroom-activities)) Search a collection of more than 120 activities that offer a wide diversity of ways to explore Earth science.

### Focus Days

([www.earthsciweek.org/focus-days](http://www.earthsciweek.org/focus-days)) Special topics such as Minerals Day (Monday) and Geologic Map Day (Friday) are highlighted and more information, learning activities, and resources are provided.

### Contests

([www.earthsciweek.org/contests/](http://www.earthsciweek.org/contests/)) Guidelines are given on the program's annual video, photo, art, and essay contests. Prizes are awarded to students and others nationwide.



Earth Science Week 2021  
Visual Arts  
Contest entry by  
Justin Xu.

### Earth Science Week Program Partners

American Association of Petroleum Geologists  
American Association of Petroleum Geologists Foundation  
American Geophysical Union  
American Geosciences Institute  
American Institute of Professional Geologists  
American Meteorological Society  
AmericaView  
Association for Women Geoscientists  
Association of American State Geologists  
Climate Literacy & Energy Awareness Network (CLEAN)  
Consortium of Universities for the Advancement of Hydrologic Science  
Earth Science Information Partners  
ExxonMobil

### AGI Member Societies

AASP - The Palynological Society  
American Association of Geographers  
American Association of Petroleum Geologists  
American Geophysical Union  
American Institute of Hydrology  
American Institute of Professional Geologists  
American Meteorological Society  
American Rock Mechanics Association  
Association for the Sciences of Limnology and Oceanography  
Association for Women Geoscientists  
Association of American State Geologists  
Association of Earth Science Editors  
Association of Environmental & Engineering Geologists  
Clay Minerals Society  
Council on Undergraduate Research  
Geo-Institute of the American Society of Civil Engineers

©2022 American Geosciences Institute. Front map: USGS/J. Cody. SDG graphics: ©United Nations Department of Economic and Social

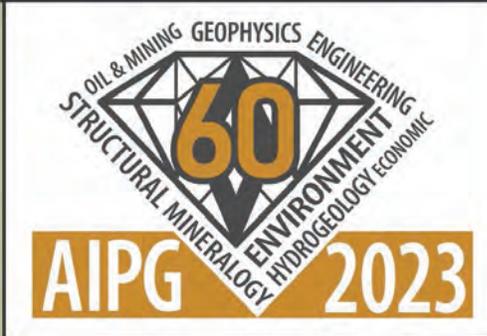
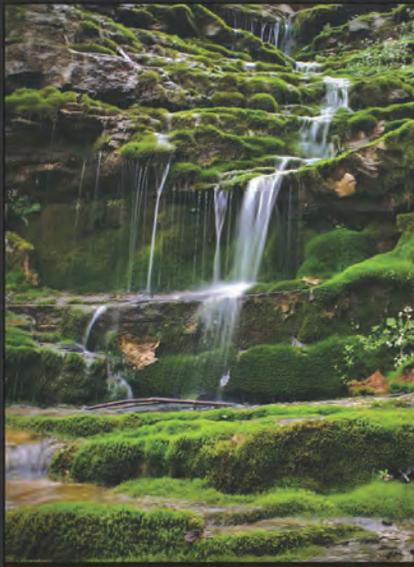


Geochemical Society  
Geological Association of Canada  
Geological Society of America  
Geological Society of London  
Geoscience Information Society  
History of Earth Sciences Society  
International Association of Hydrogeologists/U.S. National Chapter  
International Medical Geology Association  
Karst Waters Institute  
Mineralogical Society of America  
Mineralogical Society of Great Britain and Ireland  
National Association of Black Geoscientists  
National Association of Geoscience Teachers  
National Association of State Boards of Geology  
National Cave and Karst Research Institute  
National Earth Science Teachers Association

National Speleological Society  
Paleontological Research Institution  
Paleontological Society  
Petroleum History Institute  
Seismological Society of America  
SEPM (Society for Sedimentary Geology)  
Society for Mining, Metallurgy & Exploration  
Society of Economic Geologists  
Society of Exploration Geophysicists  
Society of Independent Professional Earth Scientists  
Society of Mineral Museum Professionals  
Society of Vertebrate Paleontology  
Soil Science Society of America  
United States Permafrost Association

Affairs. Learning Activities content: Lindsay Mossa and Lauren Brase/AGI. Earth Science Week Staff: Ed Robeck, Geoff Camphire, Lauren Brase, Sequoyah McGee, Lindsay Mossa. Design: Brenna Tobler/AGI. Printed in the USA by Goetz Printing.

# The Many Facets of Geology - Save the Date!



Join us for AIPG's 60<sup>th</sup> Anniversary Conference — September 16-19, 2023

Celebrating 60 years of professional geoscientists exchanging information and technology on the many facets of geoscience.

Covington, Kentucky | [www.aipg.org/Events](http://www.aipg.org/Events)



**Hydrometrics, Inc.**  
consulting scientists and engineers

Founded in 1979, Hydrometrics provides an expansive range of science and engineering services for the oil and gas and mining industries, ranging from the Arctic Circle to South America.

- ◆ Oil & Gas Industry Support
- ◆ Refinery & Marketing Terminal Environmental Support
- ◆ Civil, Geotechnical, Chemical, Geological, and Environmental Engineers
- ◆ Hydrogeology, Geochemistry, and Reclamation Specialists
- ◆ Permitting and Compliance
- ◆ EA and EIS Support
- ◆ Remedial Investigations and Construction
- ◆ SPCC and SWPP Preparation
- ◆ Dam Design and Investigation
- ◆ Water Rights
- ◆ Solid and Hazardous Waste Management
- ◆ Power Probe and Auger Drilling



Helena (406) 443-4150 • Billings (406) 656-1172  
Kalispell • Whitefish • Manhattan  
[www.hydrometrics.com](http://www.hydrometrics.com)

## ENVIRONMENTAL CONSULTING SERVICES

Hydrology | Geology | Engineering | GIS

- NEPA: CAT EX/EA/EIS
- Environmental Compliance
- GIS
- Water Management
- Expert Testimony
- Environmental Due Diligence
- Engineering Design
- Remediation
- Environmental Permitting

Independent Expertise in  
Water Resources and the Environment

BILLINGS: 1500 Poly Drive Suite 103 | Billings, MT 59102 | 406.655.9555  
HELENA: 303 Clarke Street | Helena, MT 59601 | 406.443.6169

[www.hydrosi.com](http://www.hydrosi.com)  **HydroSolutions**



# Become an MGS Sponsor

**If your business would like to help the MGS further its mission, consider becoming an MGS Sponsor!**

\*As an Annual Sponsor, businesses obtain the following perks:

- Custom ads included in each issue of the MGS Newsletter (minimum of 6 issues per year);
- Company logo or name included in a slide at the beginning of each MGS talk;
- Company logo or name and links to the sponsor's websites on the new "Sponsors" page of the MGS website;
- An annual posting of appreciation on the MGS Facebook page, with links to the sponsor's preferred social media page or website.

Rates for MGS Sponsorship are listed below. To become a sponsor or request more information, please email the MGS at [montanageologicalsociety@gmail.com](mailto:montanageologicalsociety@gmail.com)

**Diamond Sponsor:** (Full Page ad) - \$65.00/month (\$780/year, paid annually)

**Gold Sponsor:** (Half Page) - \$35.00/month (\$420/year, paid annually)

**Silver Sponsor:** (Quarter Page) - \$18.75/month (\$225/year, paid annually)

**Bronze Sponsor:** (Business Card) - \$8.50/month (\$102/year, paid annually)

*Interested in advertising, but not ready for Sponsorship?*

You can still advertise with the MGS without becoming an Annual Sponsor.

To advertise in a single issue of the Newsletter, rates are as follows:

Full Page - \$100/issue

Half Page - \$50/issue

Quarter Page - \$25/issue

Business Card - \$10/issue

# MONTANA GEOLOGICAL SOCIETY

PUBLICATION	QUANTITY	PRICE	TOTAL
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 Crazyes		\$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	
1991 6th International Williston Basin Symposium		\$20.00	
1991 Geology & Horizontal Drilling of the Bakken		\$20.00	
1991 AAPG - RMS Field Trip: Beartooth Mountains		\$7.50	
1991 AAPG - RMS Field Trip: Eagle Sandstone, Billings		\$7.50	
1991 RMS Field Trip #1 Nye-Bowler Linemont		\$7.50	
1991 Sequence Stratigraphy of Eagle Sandstone		\$7.50	
1990 Bakken Workshop Short Course Study Notes #1		\$10.00	
1989 Geologic Resources of Montana		\$20.00	
1986 Geology of the Beartooth Uplift		\$20.00	
1985 Montana Oil & Gas Fields		\$20.00	
1971 Stratigraphic Names of Montana		\$10.00	
1969 Economic Geology of Montana		\$20.00	
<b>Shipping and Handling charges - \$5.00 per CD/DVD \$8.00 per book</b>			
<b>Total Due</b>			

**Billing / Shipping Information**

Name \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_ City, State, Zip \_\_\_\_\_  
 Email Address \_\_\_\_\_

**Please make checks payable to: Montana Geological Society. Visa and MasterCard also accepted.**

Visa / MasterCard (circle one) \_\_\_\_\_ Expiration Date \_\_\_\_\_  
 Name as it appears on the Card \_\_\_\_\_  
 Phone Number (\_\_\_\_\_) \_\_\_\_\_

**Mail orders:** Montana Geological Society, PO Box 844, Billings, MT 59103  
**Email orders:** dbrush@ballardpetroleum.com  
**Phone orders:** Doretta Brush (406) 281-8228

**MONTANA GEOLOGICAL SOCIETY**

**P.O. Box 844**

**Billings, MT 59103**

**Membership Renewal**

**Last Name** \_\_\_\_\_

**First Name** \_\_\_\_\_ **Middle Initial** \_\_\_\_\_

**ANNUAL DUES:**

\_\_\_\_\_ **\$20.00 Regular**

\_\_\_\_\_ **\$10.00 Student**

\*\*\*\*\*

**Please update the information below if needed. Please leave blank if nothing has changed:**

**Company/Affiliation** \_\_\_\_\_

**Mailing Address (work or home)**

**Street** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Phone (w)** \_\_\_\_\_ **Phone (h)** \_\_\_\_\_ **Phone (c)** \_\_\_\_\_

**E-Mail** \_\_\_\_\_

**AAPG Member (please circle) YES NO**

**Education (School, Degree, Year)**

**Degree #1** \_\_\_\_\_

**Degree #2** \_\_\_\_\_

**Degree #3** \_\_\_\_\_