



**MONTANA GEOLOGICAL SOCIETY**

# NEWSLETTER

MGS Vol. 55 No. 4

**April 2011**

**MGS "Beer Thirty"  
Friday May 27<sup>th</sup>**

**Please join us for free  
beer and appetizers  
before, during and after  
the talk.**

**JAMES (JIM) STAUB, PHD  
Professor of Geology  
University of Montana**

**A regressive to  
transgressive wave  
dominated delta  
succession in the  
Eagle Sandstone  
In Billings**

Members who do not  
receive an e-mail reminder  
can RSVP 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:**  
[www.montanags.com](http://www.montanags.com)

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## **PRESIDENT'S LETTER**

**Andrew Urie**

*"Nothing makes the earth seem so spacious as to have friends at a distance;  
they make the latitudes and longitudes." ~ Henry David Thoreau*

I've been thinking a lot about friends and life the last several months and the quote above seemed to solidify what I was thinking. My life in Montana for the last 11 years has been better than I could have possibly imagined. I've met my wife, some of the best friends of my life, some amazing colleagues at SM Energy and also within the larger geological community of Billings and Montana through my service within the Montana Geological Society. I feel even more fortunate that I got to do all of this while living in a place as amazing as Montana. Only a small number of people in the petroleum industry or any industry for that matter ever have the opportunity to live and work in Montana and I count my blessings that I have been among the lucky few fortunate enough to call this great place home.

With the passage of the last eleven years and the changes to my life during that time, it's become increasingly obvious that it's time for something new. It's certainly not the people or the place that have made this change necessary but my personal growth and changes to my interests. With that realization my wife and I after much deliberation have made the deliberate decision (believe it or not!) to make the move to Houston.

So I am saying goodbye to Montana, goodbye to my friends, and goodbye to you the members of the Montana Geological Society. I thank you for the support and interest you have shown and I hope that we on the Board of Directors of the society have provided a great service to each of you. But this is certainly not goodbye forever. Megan and I have too many friends here in the state and the city of Billings and we will certainly be back to this northern latitude again and again in the future.

I have agreed to continue to serve the society, in a manner of speaking, for the remainder of my term as President of the MGS. You'll be reading letters from me as a regional correspondent of sorts from Texas, and I'll do my best to keep you entertained from afar once a month.

Now I say goodbye and I look forward to seeing you again further down the river of life.

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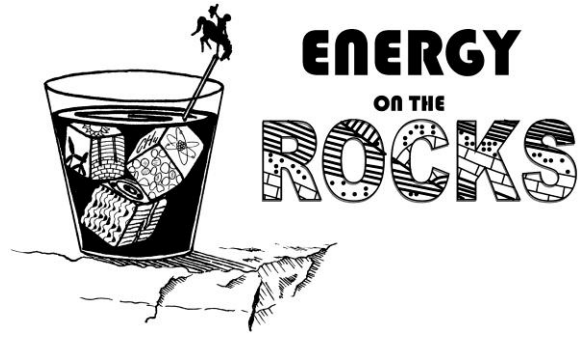
Doretta Brush 259-8790

# MGS Bulletin Board

*The MGS Roadlog Committee is looking for roadlogs not previously published in our Guidebooks so they can be included in our scanned collection, soon to be released on CD. Jay Gunderson and his student staff have completed scanning and converting to searchable pdf file format, all of the roadlogs they have acquired from MGS guidebooks. We need to expand the search to include Montana roadlogs from other publications and sources (or any MGS guidebooks that were missed). The current list of roadlogs can be viewed at the MGS website ([www.montanags.org](http://www.montanags.org)) If you have a roadlog that you would like to be part of the digital MGS archive, or additional information pertaining to the current list, please contact Jay at the MBMG (406-657-2702, [jgunderson@mtech.edu](mailto:jgunderson@mtech.edu)).*

*When Phase I of this project is complete, an index map and roadlogs will be available on CD or DVD. The second phase of the project will be to re-run selected routes and update the logs with color photos and modern terminology and interpretations. These new logs will become part of the MGS archive CD/DVD.*

**Stay tuned and start planning:  
MGS/MAPL Golf Tournament is scheduled for  
Friday, July 8<sup>th</sup> at the  
Laurel Country Club**



FOR IMMEDIATE RELEASE

Contact:

Lyn George, General Chair, AAPG Rocky Mountain 2011  
Section Meeting

[lgeorge@tribcsp.com](mailto:lgeorge@tribcsp.com)

(307) 265-6338 – office

(307) 267-4967 – cell

## **Rocky Mountain geologists focus on Niobrara for summer meeting**

CASPER – Wyoming’s newfound focus on the potential of the Niobrara shale play makes it the perfect setting for the AAPG Rocky Mountain Section meeting this summer. “Energy on the Rocks” is scheduled for June 25-29 in Cheyenne at the Little America Convention Center, and will highlight the Niobrara with many special events and features.

On the Niobrara schedule is a three-day field trip, a core workshop, two plenary sessions as well as a public session and a Niobrara core museum. The Rocky Mountain Association of Geologists also plans to release its new publication, “Revisiting and Revitalizing the Niobrara in the Central Rockies.” New and old research alike will be visited to give attendees an expanded level of understanding on this development.

“We’re excited to offer attendees such a rounded program on the Niobrara,” said Graeme Finley, president of the Wyoming Geological Association, which is hosting this year’s meeting. This is the 60<sup>th</sup> meeting, but it is the first time in Cheyenne.

While the meeting has a heavy Niobrara focus, the Rocky Mountain Section has planned a diverse technical program featuring CO2 EOR and sequestration; EMD including geothermal, uranium and coal; evaluation of unconventional plays; Rocky Mountain structure, stratigraphy and sedimentology; and more. Several short courses and field trips, which have limited attendance, are also offered. Early registration is encouraged.

The exhibit hall promises to be the place for the exchanging information on products and services. It is located in the center of the meeting area and will host coffee breaks and happy hours.

Rounding out this year’s program is a prospect expo. Prospect exhibitors are invited to showcase their ideas to attract potential partners and investors. Over 700 conference attendees are expected to attend and one-day passes will be available.

To register to attend or exhibit or for full details on the technical program, short course and field trip descriptions and other convention information, go to [www.rms-aapg.org/2011\\_meeting](http://www.rms-aapg.org/2011_meeting).



## MGS “Beer Thirty”

**Friday May 27th**

**4:30 pm – Billings Petroleum Club**

Please join us for free beer and appetizers before, during, and after the talk



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**JAMES (JIM) STAUB, PHD**

Professor of Geology

University of Montana, Missoula

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### **A regressive to transgressive wave dominated delta succession in the Eagle Sandstone in Billings**

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The lowermost cliff-forming sandstone that surrounds the downtown Billings area within the Eagle Formation is comprised of a 20 to 30 meter regressive to transgressive wave dominated delta succession. The lower part of the succession (~15 meters) is dominated by weakly stratified silty sandstone and interpreted to have been deposited in a distal delta slope or pro-delta setting. The upper part is comprised of laminated well sorted upper plane bed deposits interpreted as hyperpycnites initiated by combined flow processes (waves and density currents). The hyperpycnites are thought to have accumulated during the reworking of the delta and are directed to the south-southwest. These hyperpycnites are capped by a *Glossifungites* horizon.



# Yellowstone Supervolcano Bigger Than Thought

*OurAmazingPlanet Staff,*

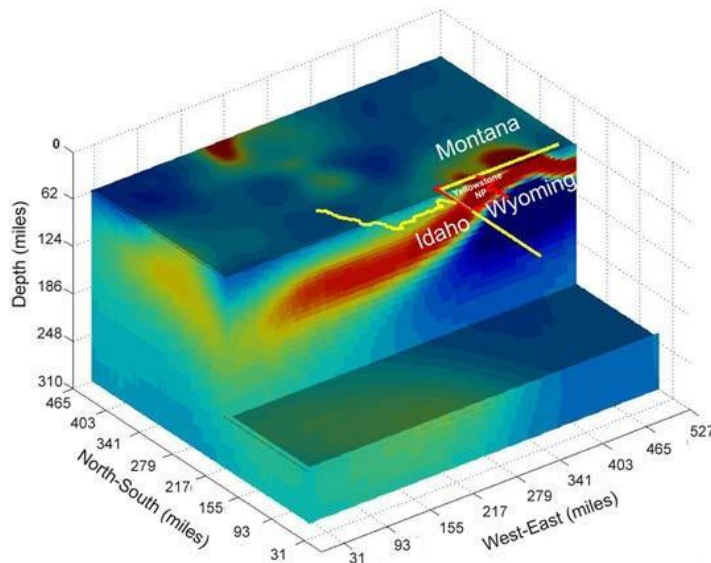
[LiveScience.com](http://www.livescience.com) *Ouramazingplanet Staff,*

[livescience.com](http://www.livescience.com) – Mon Apr 11, 4:50 pm ET

The gigantic underground plume of partly molten rock that feeds the Yellowstone supervolcano might be bigger than previously thought, a new image suggests.

The study says nothing about the chances of a cataclysmic eruption at Yellowstone, but it provides scientists with a valuable new perspective on the vast and deep reservoir of fiery material that feeds such eruptions, the last of which occurred more than 600,000 years ago. [Related: [Infographic - The Geology of Yellowstone.](#)]

Earlier measurements of the plume were produced by using seismic waves — the waves generated by earthquakes — to create a picture of the underground region. The new picture was produced by examining the Yellowstone plume's electrical conductivity, which is generated by molten silicate rocks and hot briny water that is naturally present and mixed in with partly molten rock.



*University of Utah*

"It's a totally new and different way of imaging and looking at the [volcanic roots of Yellowstone](#)," said study co-author Robert B. Smith, professor emeritus and research professor of geophysics at the University of Utah, and a coordinating scientist of the Yellowstone Volcano Observatory.

**Ancient eruptions**

Almost 17 million years ago, the deep plume of partly molten rock known as the Yellowstone hot spot first breached the surface in an eruption near what is now the Oregon-Idaho-Nevada border.

As North America drifted slowly southwest over the hot spot, there were more than 140 gargantuan caldera eruptions — the largest kind of eruption on Earth — along a northeast-trending path that is now [Idaho's Snake River Plain](#).

The hot spot finally reached Yellowstone about 2 million years ago, yielding three huge caldera eruptions about 2 million, 1.3 million and 642,000 years ago.

Two of the eruptions blanketed half of North America with volcanic ash, producing 2,500 times and 1,000 times more ash than the 1980 eruption of Mount St. Helens in Washington state. Smaller eruptions occurred at Yellowstone in between the big blasts and as recently as 70,000 years ago.

### **Underground images**

Smith said the geoelectric and seismic images of the [Yellowstone plume](#) look somewhat different because "we are imaging slightly different things." Seismic images highlight materials such as molten or partly molten rock that slow seismic waves, while the geoelectric image is sensitive to briny fluids that conduct electricity.

Seismic images of the plume made by Smith in 2009 showed the plume of molten rock dips downward from Yellowstone at a 60-degree angle and extends 150 miles (240 kilometers) west-northwest to a point at least 410 miles (660 km) under the Montana-Idaho border — as far as seismic imaging could "see."

The new electrical conductivity images show the conductive part of the plume dipping more gently, at an angle of perhaps 40 degrees to the west, and extending perhaps 400 miles (640 km) from east to west. The geoelectric image can "see" to a depth of only 200 miles (320 km).

The lesser tilt of the geoelectric plume image raises the possibility that the seismically imaged plume, shaped somewhat like a tilted tornado, may be enveloped by a broader, underground sheath of partly molten rock and liquids, Zhdanov and Smith say.

"It's a bigger size" in the geoelectric picture, Smith said. "We can infer there are more fluids" than shown by seismic images. Despite differences, he said, "this body that conducts electricity is in about the same location with similar geometry as the seismically imaged Yellowstone plume."

The new study has been accepted for publication in *Geophysical Research Letters*, a journal of the American Geophysical Union, which plans to publish it within the next few weeks.

Montana Geological Society  
PO Box 844  
Billings, MT 59103

## MGS PUBLICATIONS

2006 Montana Oil & Gas Fields CD-----	\$65.00
MGS - NRGDC Northwestern Geologic Service Sample Logs (MT, ND, SD) -----	\$2500.00
Over 2500 sample logs on CD-ROM, regional sets also available	
2000 Guidebook: Northern Montana & the Montana-Alberta Thrust Belt (2 Vol. Set) -----	\$125.00
50 <sup>th</sup> Anniversary Symposium	
1998 8 <sup>th</sup> International Williston Basin Symposium -----	\$55.00
1998 Core Workshop Guide for Williston Basin Symposium -----	\$30.00
1997 Bighorn Symposium Guidebook -----	\$50.00
1997 MGS-TRGS Field Conference Guide -----	\$25.00
"The Edge of the Crazy's: Where the Mountains Meet the Plains"	
1996 AAPG Rocky Mountain Section Meeting Expanded Abstracts Volume -----	\$25.00
1995 Guidebook: Seventh International Williston Basin Symposium -----	\$100.00
1993 Guidebook: Energy and Mineral Resources of Central Montana -----	\$54.00
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1991 Guidebook: Geology and Horizontal Drilling of the Bakken Formation -----	\$50.00
1991 Field Trip Guides: Beartooth Mountains -----	\$7.50
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1978 Economic Geology of the Williston Basin -----	\$100.00
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1951 BGS 2 <sup>nd</sup> Annual Central Montana Field Conference -----	\$12.50
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