

February 2018



MONTANA GEOLOGICAL SOCIETY NEWSLETTER

Vol. 62 No. 4



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P2 / PRESIDENT'S LETTER

Our President discusses a recent discovery influencing the western US & poses a riddle for you to solve.



P5 / TOTY AWARD

Applications are out for the MGS 2018 Teacher of the Year Award. Contact your favorite teacher about applying today!



P5 / SCIENCE EXPO

The 2018 Science Expo is quickly approaching. Will you consider volunteering as a judge for this year's event?



P8 / GEM&MINERAL

The Billings Gem & Mineral Club will be hosting an upcoming meeting soon & guests are welcome.

Upcoming Event:

Mar 8 - MGS Luncheon; Thomas Ewing (see page 6)

Contact Us:

mtgeo.org / montanageologicalsociety@gmail.com

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

Find us on 

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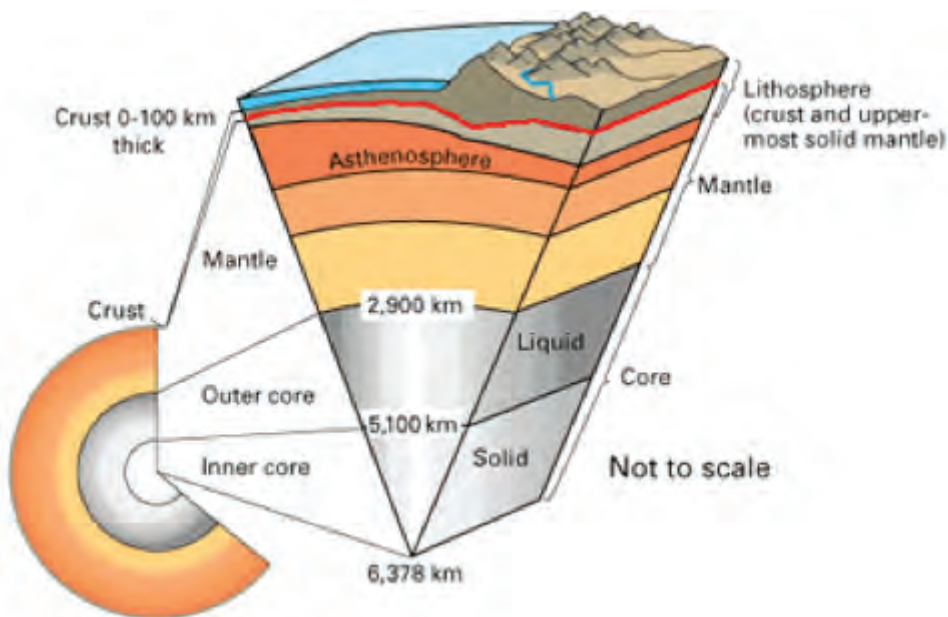
President's Letter

Membership,

As we near the end of February, this winter has brought difficulties to many of us including causing the year's first distinguished lecturer talk to be cancelled. We will have another opportunity in March so look for that announcement (see page 6). As the weather improves, we will have some volunteering opportunities come up including the regional Billings Clinic Science Expo the weekend of March 23rd-24th in Billings. There is always a great need for judges including regular math & science, artistic, and special industry judges. The MGS will also have a booth on the morning of Saturday, March 24th as usual. This is a great opportunity to interact with children and share our passion for geology with them. Please email the MGS account if you are interested in volunteering to either.

This month, I would like to highlight a recent discovery published in the latest issue of the GSA's publication, *Geology*. It caught my attention as it relates to our geographic region-specifically, lower crustal temperatures of the western U.S.

Researchers lead by a team from Colorado State University used P-wave velocity from the Mohorovičić (Moho) refracted phase to estimate temperature and viscosity of the uppermost few kilometers of the Western U.S. mantle. If you remember from Geo101, the Moho discontinuity is the compositional boundary between the crust and the uppermost solid mantle.



Moho boundary in red (source: Geology.com)

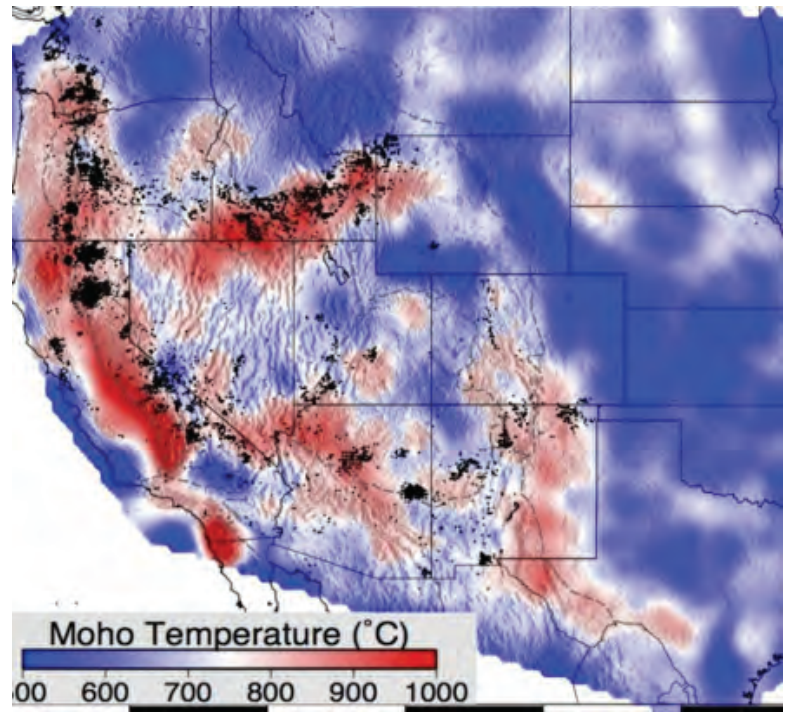
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What they discovered is that the temperature and viscosity of the lower crust across much of the western U.S. suggests it is near melting and therefore weak. To paraphrase lead author and associate professor at the CSU Department of Geosciences, Derek Schutt, having a temperature map allows inferences on the strength of the tectonic plates. What they found is that there are areas where the crust is not strong enough to support the topography above. This could lead to eventual flattening of the Rockies over millions of years.

The lowest temperatures were present in an arc extending from the High Lava Plains of Oregon through western Montana as well as the high-plains region of Wyoming and western Kansas & Nebraska. The highest temperatures were observed under young volcanic provinces. The high temperatures and lower viscosities allowed these hotter sections of crust to act as “ball bearings” by allowing slipping between the crust and the mantle. As a result, tectonic forces could be transferred large distances from their source. The lower crust of the western U.S. has been known to be hot but this study is the first to specifically map out the temperature variations and could lead to further research as to why there are mountains where high temperatures are present.

Felipe Pimentel
MGS President

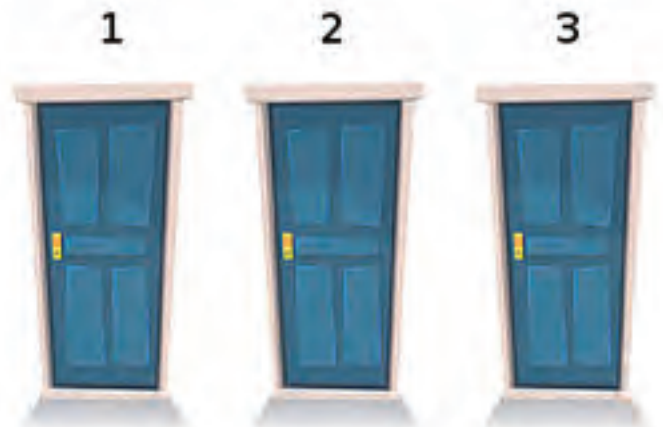


Source: Colorado State University

Riddle Zone: The Monty Hall Problem (Named after the host of Let's Make a Deal)

Suppose you're on a game show, and you're given the choice of three doors: Behind one door is a car; behind the others, goats. You pick a door, say No. 1, and the host, who knows what's behind the doors, opens another door, say No. 3, which has a goat. He then says to you, "Do you want to change your choice and pick door No. 2? Is it to your advantage to switch doors?"

Please respond via email if you want to give your solution and let us know if it's OK to include your response in the next newsletter!



Who's Who of the MGS

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Teacher of the Year

Now Accepting Applications!

K-12 Earth Science Teacher of the Year Award

*What better way to promote earth science in the state of Montana
than to recognize and reward those who do it every day?*

The MGS applauds the hard work of outstanding K-12 Earth Science Teachers in Montana. Each year Teacher of the Year (TOTY) applications are reviewed and the most deserving candidate is selected by the MGS Awards Committee to receive \$1000. The MGS winner is then eligible to apply for the regional Teacher of the Year Award (an additional \$2000) through the Rocky Mountain Section of the American Association of Petroleum Geologists (RMS-AAPG). The winner of the RMS-AAPG award becomes the RMS-AAPG nominee for the national American Association of Petroleum Geologists award, which is \$6000 (\$3000 for the teacher and \$3000 for their school). That's the potential for \$9000 in cash awards!

If you teach and promote Earth Science in your classroom or in the outdoors, the MGS encourages you to apply for the TOTY Award. Visit the MGS website at mtgeo.org for an application. The 2018 Application Deadline is May 31, 2018.

Calling All Judges!

2018 Science Expo

INFINITE POSSIBILITIES:
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March 23-24, 2018

If you're interested in volunteering as a
judge at this year's Science Expo,
please visit:

<http://www.msubillings.edu/scienceexpo/>

Judges will be provided with an evening
meal & training prior to judging on
Friday.

MGs Luncheon Meeting

Thursday, March 8th

2:00 PM at the Billings Public Library

Save the Date!

- Price to be announced in e-mail

RSVP – montanageologicalsociety@gmail.com

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The Billings Gem and Mineral Club is a non-profit organization devoted to the enjoyment of mineralogy, geology, paleontology and lapidary arts with specific attention to the Montana/Wyoming/Dakotas region.

Mark your calendar for our next meeting:

Thursday, Mar. 1, 7:00–8:30 pm
St. Bernard's Church (rear entrance)
226 Wicks Lane — Billings Heights

Anyone interested in rocks is welcome to attend as a guest.

MONTANA GEOLOGICAL SOCIETY

P.O. Box 844

Billings, MT 59103

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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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