



THE GEOLOGICAL SOCIETY OF MINNESOTA

News

*Volunteer
opportunities,
field trips,
lectures, and
public service,
since 1938*

From the President's Desk...

Hello, fellow lovers of geology. As I write this on Jan. 26, I am preparing to leave for a few weeks in New Zealand, just as a winter storm and arctic temperatures are approaching. My timing is great. I hope we can manage this winter without all the lecture delays of last, but time will tell. (Please review our lecture cancellation policy on the GSM web site, just in case.) Our lecture season has gotten off to a great start, with average attendance of 101, compared with 94 for fall of 2017. The attendance has included an average of 8 newbies for each lecture, which means we are getting the word out to the general public. All this speaks to the great program **Steve Erickson** has put together. If you have an idea for a lecture or lab, or know of a possible presenter, contact Steve with the information. He will soon start creating the 2019-2020 schedule, so now is the ideal time to approach him with your suggestions.

I am looking forward to being in the southern hemisphere and seeing all the wonders, geological and otherwise, that New Zealand has to offer. It has been on my bucket list for a few years, and I am expecting a great trip. Perhaps it will lead to a Newsletter article or two? BTW, this Newsletter is written by GSM members for GSM members. So if you have travelled somewhere geologically interesting recently, consider submitting an article to our editors, **Theresa Tweet** and **Mark Ryan**. They are always looking for material from new writers. The deadline for the next issue is **May 1**, with earlier submissions encouraged. See our web site for guidelines.

As with every new year, there is a partial change to the leadership on GSM's Board of Directors. **Wolf Bielefeld**, **Roxy Knuttila**, and **Frank Janezich**, the three members you elected at our Annual Meeting in September, became directors on January 1. On that same day, **Dan Japuntich**, **John Jensen**, and **Theresa Tweet** ended their terms after 4 years of service on the Board, but will continue in leadership roles that don't require Board membership. At the November meeting, the Board elected to continue with the officers from 2018: myself as President, **Deborah Naffziger** as Vice President, and **Dave Kelso** doing double duty as Treasurer and Secretary. I look forward to working with our three new members, and sincerely thank those leaving for their past and ongoing service. You can find the full list of Board members and chairpersons on page 2 of this Newsletter. If you wish to learn more about our Board, including meeting minutes from recent years, see our web site. The next Board meeting is **February 28**. As with all Board meetings, all members are invited to attend.

I especially want to thank **Sandy & Ed Steffner** for once again hosting a wonderful holiday party in their beautiful home. As always, the party was a great opportunity to socialize with fellow GSMers and their spouses, try delicious dishes that others have



GSM President, Dave Wilhelm

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*from the GSM archives:
Dresser Jct. WI 1940, looking
at Keewenawan basalt.*



made, and sing holiday tunes with words skewed toward geology. Not much new to report of the field trip front, but we did complete one more tour of the St. Anthony Falls Lab in late November, in which 11 participated. You can find a recap of our very full field trip schedule for 2018 (and many prior years) on our web site. And you can enjoy **Deborah Naffziger's** report on our great Thunder Bay field trip, elsewhere in this issue. Currently, we have no specific field trip plans drawn up yet for 2019, but that will come soon. In particular, **Randy Strobel** and **Joanie Furlong** would like to lead a trip to the Driftless Area of southeastern Minnesota and neighboring states sometime this summer. They and I scouted for this trip last May, but could not fit it into our busy field trip schedule last year. As always, you will be informed by e-mail about this trip and others as plans develop. And I am always looking for suggestions for field trip topics and locations. A few of you have mentioned ideas to me verbally, but it is always best to follow up with e-mail so it stays in my attention.

Enjoy the rest of winter as the days lengthen, and we are beckoned to enjoy nature by the warming sun.

Dave Wilhelm

GSM

Officers:

- Dave Wilhelm, President
- Deborah Naffziger, Vice President
- Dave Kelso, Treasurer
- Dave Kelso, Secretary

Board Members: Wolf Bielefeld; Dick Bottenberg; Kate Clover; Frank Janezich; Dave Kelso; Roxy Knuttila; Joe Newberg; Theresa Tweet, Dave Wilhelm

Editors: Theresa Tweet; Mark Ryan; Harvey Thorleifson; Rich Lively

Programs/Lectures/Labs: Steve Erickson

State Fair: Dan Japuntich

Newsletter: Theresa Tweet/Mark Ryan

Video Library: David Wilhelm

Webmaster: Alan Smith

Membership: Joanie Furlong

Field Trip Coordinator: David Wilhelm

GSM Outreach: Joel Renner and

Theresa Tweet

Geological Markers: Rebecca Galkiewicz

Lecture Recording: Joe Wright

Web Site: gsmn.org

The Geological Society of Minnesota is a 501(c)3 nonprofit organization. The purpose of this newsletter is to inform members and friends of activities of interest to the Geological Society of Minnesota.

Please note the GSM change of address: Send all GSM membership dues, change of address cards, and renewals to: Joanie Furlong, GSM Membership Chair, P.O. Box 141065, Minneapolis, MN 55414-6065; Membership dues are: \$10 Full-time students; \$20 Individuals; \$30 Families GSM News is published four times a Year during the months of February, May, August and November. Deadline for article submission is the first of the month, before the date of publication. Newsletter contributions welcomed.

Newsletter contributions welcomed

Of interest to our GSM enthusiasts: While out and about enjoying your vacation time – when you visit a site that you find interesting, please consider sharing your experiences with us by writing up a few words and sending it to Theresa Tweet at phoenix8185@gmail.com. Thank you in advance!

New GSM Members!

- Wendy Nemitz, St. Paul
- Michele Schermann, Minneapolis
- Angela & Peter Delong, Anoka
- James Brass, Wayzata
- Carol Nankivel, Inver Grove Heights
- Ann Brown, Bloomington

GSM Board Membership

The GSM Board consists of members who have a special interest in advancing the goals of our society, including lectures, field trips, and community outreach. The Board currently has nine members. Our bylaws limit the terms of Board members to four years, to encourage a turnover of perspectives and ideas. The Board typically meets quarterly, on the second Thursdays of February, May, August, and November, or a different date if conflicts arise. We typically meet from 7 to 9 PM at the Minnesota Geological Survey at 2609 W Territorial Rd, St. Paul MN 55114.

Board meetings are open to all members of GSM. So, whether you are a new member of GSM or have been a member for many years, if Board membership is something that might interest you, or you are just curious to see what our Board does and how it works, we encourage you to attend a meeting. And, if you have a topic you would like the Board to consider, please contact Theresa Tweet at phoenix8185@gmail.com.

Spring Banquet & Lecture

Mark your calendars for the Spring Banquet & Lecture on **May 6th, 2019**.

Location: **U Garden Restaurant**, 2725 University Ave. SE, Minneapolis.

Dinner **5:00-7:00 PM**; with the lecture to follow

Our guest speaker will be **John Westgaard**, B.A., Hill Annex Paleontology Project, **Science Museum of Minnesota**, and he will be speaking on

Fossils on the Iron Range (RESCHEDULED).

This Lecture as well as our other upcoming lecture information is available on our web page:

<http://gsmmn.mngeology.net/content/2018-2019-seminars-and-labs>

Member Spotlight; Alan Smith



Alan, his wife Kay, and Oliver Noland, a great-nephew (and great kid!)

1. How long have you been a GSM member? I've been a GSM member since around 1987.

2. How did you get interested in geology? I've always been interested in earth sciences and was drawn in by

the booth at the State Fair. I started attending the lectures and the rest is history.

3. What do you dig about the GSM? I always learn something at the lectures and it's a great group of members and lecture attendees!

Notes from the Past

The following appeared in the Summer 2010 edition of GSM News

Geology Vacation Ideas

Geocaching is an adventure game for Global Positioning System (GPS) users. It involves the creation and placement by players of caches containing a logbook and often other items and the subsequent searching for and locating of these caches by other players.

Hunting for a geocache can be an individual pursuit or, more commonly, a group or family affair. Some players use the game as a way to travel to unusual places in the country or to see features that are not marked on tourist maps.

Earthcaches are a type of "virtual" geocache – that is, they do not involve the creation of physical containers hidden at sites, but rather, Earthcache visitors learn about Earth through the cache notes when they visit the site. Unlike "traditional" caches, the visitors do not leave or remove items from a cache. Some Earthcaches may be established at places where geocachers can log their visits in a book at a visitors' center. Earthcaches provide not only location but also a lesson about what the geocacher is seeing.

Before you head out on vacation this year, check out the website www.earthcache.org. All you'll need is a GPS unit and lots of curiosity to turn your vacation into a geological adventure.

Institute on Lake Superior Geology



The 2019 meeting will be chaired by Mark Smyk (Ontario Geological Survey) and Pete Hollings (Lakehead University) in Terrace Bay, Ontario. The 65th Institute on Lake Superior Geology will be held in Terrace Bay on May 8 and 9. The committee is working hard to pull together a great meeting. As they get their plans in place they will share information through the web site, so check back regularly. For more information about Terrace Bay please visit their [web site](http://www.earthcache.org).

The First Circular for the planned ILSG trip to Hawaii can be downloaded [here](#)

The Wisconsin Geological and Natural History Survey has completed a data preservation and presentation project on their Lake Superior Legacy Collection. This collection contains the raw materials (notebooks, maps, samples, thin sections) of the Lake Superior Division of the USGS and is available [here](#).

[ILSG Field Guides win award!](#)

Also new a new page has been added to the ILSG web site to [honour the pioneers](#) that have studied Lake Superior geology.

2019 MESTA Conference

On February 1st, 2019, the 33rd Annual Minnesota Earth Science Teachers Association (MESTA) Conference was held at the District 287 Conference Center in Plymouth, Minnesota. Science teachers from around the greater Twin Cities area came together to network and hear earth science professionals talk about their field of study.

The events began Thursday evening with the chance to view the cosmos at the newly updated Como Planetarium. This year's keynote speaker was Annette S. Lee, the Director of Native Skywatchers (NSW). Lee is also a professional visual artist with three decades of experience in education as a teacher and educational leader and program administrator, and researcher.

The breakout sessions were:

“Skywarn Storm Spotting and Severe Weather”, presented by Jarrod Schoenecker, President of the Twin Cities Meteorological Society;

“Bedrock Geology and Hydrological Challenges of Southeast Minnesota”, presented by Julia Steenberg of the Minnesota Geological Survey;

“Authentic Learning and Assessment”, presented by Haley Kalina from the Alexandria Public Schools and Dana Smith of the Nicollet Public Schools; and

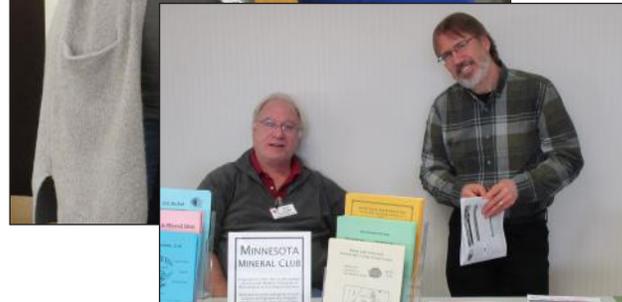
“Story Maps” by Jacqueline Hamilton of the Minnesota Geological Survey and Matt Winbigler, Cloquet Public Schools.

The Geological Society of Minnesota has been privileged to be a part of this event for many years, providing; information on the organization, pamphlets, and rock boxes as donations for the drawing that is held at the end of the conference.

Those of you who are in the field of education can check out the MESTA web-page containing the above listed information and event, as well as past MESTA Conferences, at: <https://mnearthscience.weebly.com/2019-mesta-conference.html>. Then, mark your calendars for the first Friday in February for the 2020 MESTA Conference and sign up!



Haley Kalina
and Kate
Rosok



Steve
Erickson and
Keith
Zilinski



Dan Gruhlke
and others



Present at this year's Conference were event organizers Haley Kalina and Kate Rosok. Some of the vendors in

attendance were Steve Erickson of the GSM (thank you for your help Steve!); Keith Zilinski of the Minnesota Mineral Club, and Dan Gruhlke represented the MN DNR, Project Learning Tree. Also in attendance, but not pictured, were many teachers, vendors, and other interesting people!

Theresa Tweet

From GSA

On 13 December 2018 and 19 December 2018 the Senate and House, respectively, passed the National Quantum Initiative Act with the aim of advancing quantum research and technology. Quantum research is the use of the laws of quantum physics for the storage, transmission, manipulation, computing, or measurement of information. This bill will establish a National Quantum Initiative (NQI), a 10-year, \$1.2 billion plan to further U.S. quantum research. Through this bill, quantum research will be advanced by the promotion of quantum research opportunities at the undergraduate, graduate, and postdoctoral level; the development of quantum

research facilities; and the promotion collaboration across universities, industry, government agencies, and government labs. This bill was signed into law on 21 December 2018.

Laura Szymanski, GSA Science Policy Fellow

GSM Holiday Celebration, 2018

When writing about GSM’s Annual Holiday Celebration, the exact guest count doesn’t really matter because there are always a lot of people (members and non-members alike) who make themselves at home at Ed and Sandy Steffner’s house one night a year for a good, old-fashioned Holiday gathering. To many of us, being able to relax and enjoy the company of other group members in such an inviting atmosphere is a real kindness during such a busy season – thank you Ed and Sandy! Please enjoy these pictures taken at the December 8, 2018, Holiday Celebration.



Thunder Bay Trip—July 2018

Thunder Bay boasts much mineralogical wealth and on this field trip, members of GSM came to explore its amethyst deposits at the Diamond Willow and Panorama Amethyst mines, as well as engaging in a tour of Thunder Bay and environs guided by Ontario Geological Survey geologists. The full field trip had been planned for Thursday thru Saturday, July 19-21, but as there are other wonderful attractions in Thunder Bay, many of the participants drove up a day earlier to visit Fort William Historical Park, a Canadian historical site. Fort William is an 18th century reconstructed military post which was once dedicated to the fur trade. Now there are reenactments in period dress, a museum and many other fantastic displays.

Thursday morning dawned bright and sunny as 24 GSM members caravanned to the family-owned Diamond Willow Amethyst Mine. The family members were welcoming and we were each given buckets to collect our amethyst samples. As we explored our surroundings, the son-in-law explained the early days of the mine. It seems that the original owner was an old grizzled guy who would wander the woods with dynamite in one pocket and blasting caps in the other. When he would find a likely site, he would blast and see



Large amethyst for sale at Diamond Willow

what turned up. The son-in-law said they have actually found dynamite at the base of some of the trees around the property. This was disposed of properly. Today the family owns about 600 acres and they work it using sustainable practices. The amethyst found there comes in a variety of sizes and they use fewer explosives, instead prying the material out with crowbars, which saves the larger crystals. They are located adjacent to the Blue Point Mine and the two mines cooperatively excavate in some areas. The Diamond Willow Amethyst Mines’ main pit is pretty large and there are also subsidiary pits in the locale. The mine also contains druze stuff and the color is very nice. Additionally, they do have specimens for sale in their Rock Shop. Diamond Willow has no admission fee; instead, you pay by the bucket or specimen. These

specimens have little to no associated hematite in the crystal that you find elsewhere, which is a unique characteristic of Thunder Bay Amethyst.



Deb & Ly proudly display their large haul

Next we caravanned to the big mine in the area, the Panorama Amethyst Mine. This mine was discovered in 1950 when they were cutting a road to a fire tower. They cut across the vein, and later people claimed those acres and the mining began in the 1960's. The present owners bought it in 1980. One of the owners is Steve Luckinuk; he is 91 and helps with the family business. Tim Luckinuk (Steve's son) was our guide and site manager here. We also had Dr. Jim Miller, who retired from UMD and was with Minnesota Geological Survey for many years, as another guide and knowledgeable resource, and Simon Dolega, who has his masters in geology and had been doing research.

We ate our bag lunches and then accompanied Tim and Jim into the mine itself. The actual mine is an open trench, with most of the amethyst around the sides of the trench. This mine is along a strike-slip fault; the main fault is EW with 4-6 smaller cross faults. The present quarry is 50 feet deep, and the vein goes down another 100 feet. Their mining practices are made sustainable by taking off only 3-4 feet at a time. One scraping pass can last 20 years before they have to scrape again. They



We explore the main Panorama trench

estimate they have another 30-40 years of sustainable amethyst mining left.

The geological events were described to us as two billion years ago there was a massive continental rifting that resulted in the creation of the Great Lakes Tectonic Zone (GLTZ). All this time there was a hydrothermal intrusion along preexisting faults and subsequent faults. The first quartz specimens to be discovered were about 1/4 inch and clear containing no amethyst. Then the water leached iron out of the sediments and this iron made the quartz purple. The amethyst was deposited, but the process was not continuous. There are phantoms, a crystal inside a crystal. There was also lots of zoning, areas of more and less purple, ranging from clear to almost black. The black amethyst was probably generated from aluminum in the hydrothermal mix. Nearing the end of the mine's growth, hematite was included in the mix, which gives some amethyst its distinctive red outer coating. In the newer emplacements, green quartz grows interchangeably with purple. There is no way to tell how long it took for the individual amethyst crystals to grow; estimates are 1 inch per

100,000 years, maybe some faster, maybe some slower. In the end, this faulting, rifting and hydrothermal emplacement and re-emplacment of crystals must have



Amethyst crystal in ambient light



Same crystal lit by flashlight from beneath

continued in phases for over a billion years. This makes for a very complicated record for the mine.

Our mine tour lasted about 90 minutes, and we all learned a lot. It was fascinating to see the various veins of amethyst, and the granite and sandstone that were in the mix. Once we emerged, we collected amethyst from the field of rock they had bulldozed out of the mine.

Friday's and Saturday's excursions were planned by Mary Kay Arthur. She hired a bus and we travelled in comfort together which was a wonderful solution to the herding of cats that GSM field trips can be. Our drivers were Connie on Friday and Peter on Saturday, and both were pleasant and accommodating. The Ontario Geological Survey geologists were Mark Puumala and Dorothy Campbell, assisted by grad students Marcus and Madison.

We all met at the Terry Fox monument outside Thunder Bay, heard a brief lecture about the general geology of the area, and then climbed aboard for our excursion.

The first stop was at a road cut at the bottom of the hill, leftover from the making of a new road to the monument. At the site of the Sudbury impact, we saw a whole panorama of layers of various breccias dating back 1,850 million-years-ago when a 10-15 km meteorite hit Sudbury 650 km to the east. The effects of that massive impact extended far past Thunder Bay; however, that was not discovered until recently when Greg Brumpton and Bill Addison, two local college science teachers, explored the area and found the evidence. There were faults evident, and the outcrop was a very good overview of what we were to learn about over the next two days.



Madison & Mark point out the Sudbury impact layer

The second stop was at Hillcrest Park where we saw the effects of the impact in more detail. It is in the middle of the Gunflint Iron Formation, an iron rich flint and mudstone layer. There was folding, disturbance and subsequently the Rove formation sandstone formed in a shallow sea.



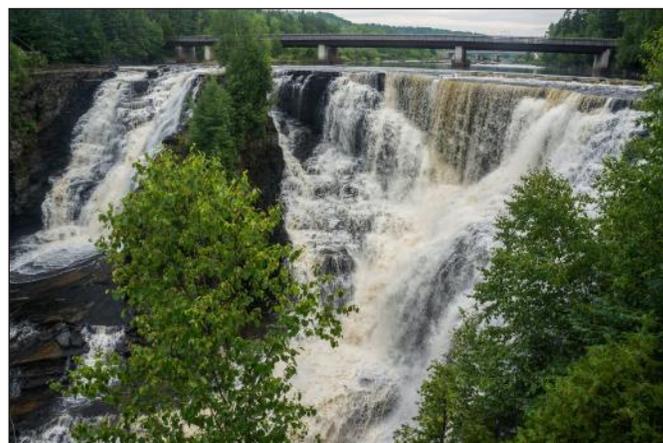
Exploring breccias and stromatolites on the outcrop

We next stopped at a yard by a house on a residential street. There was an outcrop of beautiful rock with breccias and stromatolites, polished by the glaciers with a nice garden planted around it. It was not a large garden, but since we had permission to stop there, our field trip group swarmed all over it to look at the

beautiful rocks.

Our fourth stop was something completely different, a Paleo-Indian archaeological site. Thunder Bay has the highest collection of Paleo-Indian sites, so it would have been a very nice place to live 8,500-9,500 years ago if you were a First Nations Person. There was glacial Lake Minong, which was considerably higher than Superior is now, and people would camp along its shores, especially at the outwash of rivers. We stopped at a grassy plain below electrical towers, and underneath were the sand and remnants of ancient travelers. The Neebing River met the lake at this site, and the shoreline was still somewhat evident. We dug around, but didn't find any artifacts, although we did find chert. Local resident Barry Wolframe spied our bus and came down to investigate. He owns some of the property and he kindly explained about the encampments and the site in general. The land is leased by the power company.

Our lunch stop was Kakabeka Falls, in a provincial park on the Kaministiquia River. The river and falls were the main outflow from the glaciers which helped carve out the gorge. The falls are on several layers in the Gunflint Formation, which is the thickest shale formation known. The cap rock is a chert formation which is more resistant to the flow of water than the underlying shales. There is a



Kakabeka Falls

tuff layer at the bottom and below that, chert carbonate. In 1906 a hydroelectric power station was built and it currently produces about 25Kw of power. Since the water running over the falls is now regulated, the movement of the river is not what it would have been naturally. The river was probably there before the glaciation. Next we went to



Boulder with pyrite, magnetite and sphalerite

the Conmee Township gravel pit. It is not being worked at present, and we swarmed around collecting banded chert and metallic rocks. It is the site of another fault and was interesting. (Yes, it was getting crowded in the bus with all our collected rocks!)

Our last stop of the day was at a site of Archaean pillow lavas. This is the basement rock for the area, it formed underwater and cooled slowly.

Saturday we met again at Terry Fox Monument, boarded the bus and headed north to the Sleeping Giant Provincial Park on the Sibley Peninsula in Lake Superior. At the bottom was the 2.7 billion-year-old Shebandowan greenstone belt. It formed at a continental margin and consists of coarse-grained pillow basalts which cooled below the waters. That basement was then eroded and there is an 800 million year gap between emplacements. Above that are the 1.9-1.7 billion-year-old Animike Basin sediments which consist of the massive Gunflint deposits, and the smaller Kakabeka conglomerate which consists of quartz plus local material. It is a thin layer with fairly flat topography consisting of beach deposits about 1 1/2 feet thick. The Gunflint deposits formed from chemical deposition, chert and associated materials. The sea repeatedly came in, then retreated out and stromatolites grew there. There was also phyllite there which formed under pressure. Calcite formed in the fault zone and there is rotten rock along the fault.

While the geologists pointed out various features we walked along the highway and collected rocks. The bus drove ahead and we met up with it.

The second stop moved us forward in time and we saw fine shale and the Rove formation of sandstones. After much tromping through the woods, we arrived at a cliff in the woods and observed the Devil's Flowerpot. This type of concretion is formed from fluids moving through the host rock and cementing minerals where they aggregate and make a type of 'flowerpot'. These are calcite and pyrite concretions.

The lunch stop was the most scenic of the entire tour. It was Tim Watson's property which started at a road in



Mark by Devil's Flowerpot

the forest and after a long steep climb, ended at with a wonderful view atop a sandstone cliff. Tim was very kind to share his property with us and we looked to the SW down the Sibley Peninsula at Lake Superior. Here the Sibley Formation lies unconformably on top of the Archaean basement. There are amethyst veins between the Archaean granite and Sibley group rocks. Amethyst needs radiation to get its purple color, plus iron so the Archaean granite rock provided the radioactivity, and the Sibley rocks provided the iron. The Sibley Peninsula is 1.5-1.3 billion-years-old. It was an arid environment on a playa lake alluvial fan, an inland lake. The Rove shales are at the bottom with green at the top. The next layer is the Pass Lake Conglomerate which consists of weathered Gunflint materials. To top the formation off, a layer of uniform sandstone sits at the summit. Above



View from Watson Lookout

Sibley lies the Rossport formation which has more siltstone, mudstone and dolomites, plus sandstone. Nearby are the Broom and Kettle sites of the Aqua-Plano Indians. There is a paleo-shoreline of Lake Minong, when the Sibley Peninsula was an island. It was an old hunting site for migrating caribou. At that time Sibley 'Island' consisted of sandstone pavement barrens, and all that grew there were lichens. There were no trees or bushes, so caribou fed on the lichens. After lunch we drove to the park's visitor center. We saw a diorama of Silver Islet Mine, or what was left of it.



Model of Silver Islet in its heyday



GSM– All of us at Watson Lookout

It was originally called Skull Rock, but renamed Silver Islet, and was the richest silver mine in the world at the time. The mine was on an island off the shore of the peninsula. When it was a mine, there was no foliage, which was removed to accommodate the mine and buildings. A northwest fault cut the diabase and the ore was deposited there. It was a deep and narrow lode. This silver mine boasted an ore of 2-3% concentration, which is extremely high for a silver mine. They mined 3 million ounces of silver from Silver Islet from 1868-1884. Mining ended in February 1884, after the coal shipment of fall 1883 was sunk in a storm, preventing the pumps from operating. Silver Islet now has trees; they brought in soil and planted them after the buildings were removed.

Our last stop was a look at Sleeping Giant across Lake Marie Louise. This is a formation of hills that resembles a sleeping giant, and is a sacred site for indigenous peoples.



Sleeping Giant

We drove back to the Terry Fox monument and later had dinner at Red Lion Smokehouse in downtown Thunder Bay. This marked the end of the trip. Some people stayed an extra day and toured Thunder Bay. It was a wonderful field trip with nice weather. Everyone who participated had a good time and made their way home with terrific rocks and wonderful memories.

For more photos of this trip, see <http://gsmmn.mngeology.net/content/2018-field-trips>.

Deborah Naffziger

Minnesota at a Glance Fossil Collecting in the Twin Cities Area

The Minnesota Geological Survey (MGS) has been made aware that fossil collecting activities have created hardship for property owners. In response, an MGS publication that listed sites where fossils could be collected has been removed and replaced with a revised version that no longer provides collecting locations. We are notifying groups that may have an interest in fossils that visiting and collecting, even in the road right-of-way, can cause problems and **we do not recommend visiting without prior consent of the property owner.**

The revised version of this publication can be accessed at: <https://conservancy.umn.edu/handle/11299/59440>

MEMBERSHIP RENEWAL REMINDER

Our fall membership renewal is on the horizon. Everybody will be up for renewal this fall when the new lecture series starts. Renew by mail or wait until the lecture series starts and renew in person. The membership year begins September 1. For those newly joining after April 1 and before September 1, membership will be good through September 2019. (New members joining between April 1 and August 31 get those months free!) If you wish to mail in your dues please include the information below. Membership renewal September 1, 2018 to September 1, 2019

Name(s): ---- _____

Address: ----- _____

Phone: ----- _____ E-mail(s): _____

Please make check payable to: GSM

Please mail to:

Membership Levels

Geological Society of Minnesota

() Student -----\$10

P.O. Box 141065,

() Individual----\$20

Minneapolis, MN 55414-6065

() Family -----\$30

() Sustaining----\$50

() Supporting---\$100

_____ Membership fee

_____ Tax-deductible contribution (GSM is a 501(c) 3 nonprofit educational organization)

_____ Total included



P.O. Box 141065, Minneapolis, MN
55414-6065

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