

Geologically Speaking

A Michigan Section AIPG Publication

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Student Chapter News—CMU & WMU

Andrew Mozola Scholarship Information

Field Trip Guide: The Eben Ice Caves

2022 Golf Outing Summary and 2023 Registration

Section Officers

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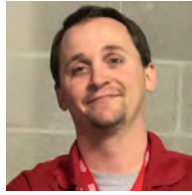
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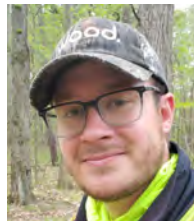
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Front Cover: The Eben Ice Caves near Munising, Michigan. The rock is the Cambrian age Munising Sandstone. See the Geology in Michigan article in this edition for more information.

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Geology Crossword #11 Solution

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C	O	M	P	A	C	T	I	O	N											

Across

1. Common in eolian deposits
6. Used for abandoning or sealing borings
10. Massive CaCO₃
14. Many spherical particles
15. Massive deposit in Dover
16. Not Flint, but close
17. c.f. Munising or Marshall
18. More or _____
19. Submarine debris flow
20. Five intervals of a turbidite
22. Applied to trash

Down

1. Similar to breccia, but smooth
2. e.g. Bell or Ellsworth
3. Twilight color craziness
4. Common clay mineral
5. Not a farmer's job
7. As with dune deposits
8. Rock with evidence of life
9. Court case activity
11. Non-fissile shale
12. Deposition of particles
13. Deposits from supersaturation
16. Not plastic or elastic
20. One's significant other
21. Sporadically

From the President's Desk

Happy New Year AIPG Michigan Section! The time is nigh that we begin looking for positive change in our lives during this annual celestial celebration. I hope you all find something in your life that is achievable and impactful to pursue for your 2023 resolution. Change is something we consistently seek and embrace throughout our lives. It is often disrupting, intimidating, annoying, and often necessary, but intended to be everlasting for a brighter tomorrow. In my experience as a professional, change is usually met in many ways based on the individuals in the room. For some, it is just not desirable. Maintaining the status quo is easy, regardless of any potential of becoming easier by embracing the change being offered. But for others, change is always welcomed and considered. New ideas are always permitted and evaluated, and with effective leadership, if warranted, can be implemented seamlessly for short- or long-term impact.

As an environmental geologist, I find myself in an industry that requires a constant need to embrace change. The science of my industry is constantly evolving, and I'm confident that all professional geologists find themselves in industries that are also ever evolving. These evolutions require industry-wide foundations that collectively are willing to seek better solutions for the problems involved.

Every project we work on should require someone challenging the approach that has been decided, to determine if there is a better path forward that would better serve our public health and environment. In fact, leadership should require someone be in the room with that intended purpose as standard operating procedure. As scientists we should only be accepting data that was driven by data quality objectives, is reproducible, and has an acceptable level of tolerance (or error) per the risk we are weighing it against. We are trained in our education to invalidate data that is not reproducible or representative of the intended hypothesis. We experiment to determine if there are better ways to answer the questions related to our study and we attempt to keep up with others that have proven better methodologies. So why should we not continue this experience into our professional behavior?

As a mid-level professional at the age of 35, I hope one day to be near retirement and able to look back to see an industry that has exponentially changed for the greater good. That contaminated sites have an expedited process of achieving closure with no unacceptable risk to the public or environment. I hope to look back and see how far we have come from that state we find ourselves in today, that decisions we continue to make are pragmatic, evolving, and continue to have a higher degree of confidence than the ones before. For any of these hopes to come any percentage point closer to becoming true in the future, I believe change needs to be embraced and sought after.

I relate directly to the environmental industry, but these thoughts absolutely don't apply to only my world. I believe all industries could benefit from embracing and

Check Out the AIPG Mentoring Program

Mentoring is an experience that promotes personal growth, creates meaningful connections, and sparks creative innovations. AIPG offers an opportunity to connect mentees with mentors. To sign up for the program is easy and can be done when paying your annual dues or updating your online profile. You may check the box on your paper dues renewal form that you send in via mail or log into your account at www.aipg.org and update your member profile. Be sure to check whether you would like to be a mentor or mentee and the fields of expertise. The system allows individuals to search for people with similar interests and connect via email. Check it out today!

seeking what could be better.

As we enter 2023 looking for personal resolutions, and preparing for our own individual change, I don't think we should stop there. I challenge everyone to take the momentum of the new year into their workplace and ask the challenging questions. Is the way we are doing things the best way to do them? Is there a way to collect better data that we would have a higher degree of confidence with. Data that we could report to our clients, stakeholders, regulators, and public with a face that beams confidence in the strategy we deployed.

I look forward to the privilege of serving the AIPG Michigan Chapter as president this year. I wish you all an effective, progressive, and impactful 2023.

Kalan

Errata

The October 2022 edition of Geologically Speaking had a photo caption on page 19 incorrectly labeled Ben Gaskevicius in Alaska. The correct location of the photo was the Westfjords of Iceland.

Member's Corner

The Member's Corner includes information about the Section's membership. This is your chance to provide information on where you are and what you are doing. Simply send the information to the Editor for inclusion in this section.

As your new Section Secretary for 2023, I was asked to provide an overview of myself as a way to introduce myself to the Section members who may not know me, so here we go. I have been a member of AIPG for approximately 15 years and this is my second round of supporting the Section as a member of the Executive Committee, so many of the more mature members (nice way of saying old 😊) should have some familiarity with me. I was fortunate to have the opportunity to work abroad (Sydney Australia) from 2015 to 2021 and was away from Section activities for those years, so many of the newer members don't know me. Consequently, this is a great way for the entire membership to get to know a little about who is supporting the Section and the rest of the Executive Committee as we move forward in 2023 and beyond. I was recently at the annual Section meeting in Ann Arbor and was pleased to see the number of rising professionals and students engaged with the organization, as well as celebrating a few members with 40 years of membership. There were also some amazing student posters presented during the meeting from multiple universities. In my opinion, all of this supports my view that the section has a growing and engaged membership and a bright future that I am proud to be part of. Separately, I am a current member of the AIPG's national Diversity, Equity and Inclusion (DEI) committee.

Introductions aside, I thought I would share a bit of my personal and professional journey with you. Firstly, I have been married for more than 36 years with four adult children and seven grandchildren. I grew up in Berkley,

MI and I am a proud Husky with an undergraduate degree in Geology and graduate work in mineral economics from MTU. I have had the opportunity to work in the resources/mining sector (gold exploration), but have spent more than 32 years in the environmental engineering industry focusing on site investigation/remediation and environmental due diligence. I enjoy the outdoors which was the main reason I choose geology as a career field. I currently live near Howell after buying a house from Sydney, Australia without ever actually seeing it aside from the listing pictures a facetime tour via my daughters (I don't recommend this approach, but the housing market was crazy at the time). Michigan has always been home and it's good to be back!

I currently work at Brown and Caldwell as a Senior Client Services Manager which is a fancy way of saying I support various client accounts with technical sales and delivery of services. As mentioned, I have been fortunate to work overseas on two occasions (both in Australia) and supported one of my former employers with their Canadian operations (I am a P.Geo in Ontario, Manitoba and Alberta). I have spent most of the past decade learning about PFAS assessment and remediation. I am currently a member of the Interstate Technology Regulatory Council (ITRC) Contaminants of Emerging Concern (CEC) national team and support Michigan's PFAS Action Response Team (MPART) as a member of the Citizen's Advisory Workgroup (CAWG) and a few of the related subgroups. In short, I have been lucky to have a diverse and exciting career full of learning opportunities and challenges. I look forward to using my personal and professional experiences in support of the section as we move into a new year.

Jason Lagowski

I Want To Publish Your Articles!



Hey everyone, I would like to encourage you to submit your articles for publication! As the Michigan Section Editor, and also the 2021-24 National Editor, I am working to put together two top-quality publications for our members. This is not a one person job. This is where you come in. I welcome your technical articles, case

studies, opinion pieces, mini field guides, and letters to the Editor.

The guidelines are pretty simple for articles for *Geologically Speaking*. All submissions must be professional and may not violate the AIPG code of ethics. They also may not have been submitted for publication elsewhere.

While most submissions will be accepted, we do not accept articles that are a sales pitch for a product or company.

The deadline for submitting articles for *TPG* is two months before the start of the quarter for which the *TPG* edition is published. Thus, February 1 is the deadline for the Apr/May/June edition.

Please submit your articles of no more than 3,200 words in MS Word format directly to me or to Dorothy Combs at National Headquarters at aipg@aipg.org. All graphics (photos, figures, or tables) should be submitted in .jpg, .tiff or other standard format at 300 dpi. Please ensure your graphics are clean and easy to read to make things easier for the editorial staff. Complete information on submitting an article may be found on National's website at: <https://aipg.org/page/TPGInformation>.

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Secretary's Report

The Michigan section AIPG Executive Committee meets about every month on the first Friday with a few deviations due to schedules. During the monthly one-hour meetings, Executive Committee board members have discussed and planned various topics, highlighted by month below:

September- Golf Outing, National, and Delegation of Authority

Vice President Kalan Briggs reported that 72 golfers attended the Golf Outing. He was awaiting the overall cost balance. It was reported that signage that can be reused next year for the golf outing was acquired from a different vendor. Feedback from the National Conference was received and that financials for the meeting were forthcoming. The Executive Committee continued discussing delegation of authority for committee chairs, but tabled the conversation.

October– Fall Hiatus

The Executive Committee did not meet

November- Student Chapter and Elections


The Executive Committee discussed Student Chapters being responsible for their own financials and a modification to the process for issuing checks to Student Chapters as a result of satisfying all article and election requirements. A motion shall be proposed in the future to document and approve student chapter checks prior to issuing the checks. The election for the position of 2023 Secretary and Early Career Professional (ECP) was opened. The Executive Committee searched for an ECP write-in candidate.

December- 2023 Dates

The Executive Committee set tentative dates for Newsletter publications, Quarterly meetings, and outlined dates already set for the RAM Center Workshop, the National Annual Meeting. The Golf Outing and Joint Meet-

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ings with MAEP are to-be-determined. Board member transitions are upcoming and the budget for 2023 will be discussed in early January.

Did You Know?

This article is intended to remind members of various aspects of AIPG and benefits of membership. If there is something you would like to see featured in this column, please contact the Editor...

AIPG believes mentoring is integral to encouraging geoscientists throughout their careers. This can include discussions on many different topics, including but not limited to:

- specific geoscience topics or questions
- education and experience required for specific career tracks
- any geoscience topic of interest
- geoscience employment search
- selecting the best suited geoscience career track
- work abroad experiences in geosciences

AIPG is setting up this mentor site to encourage one-on-one AIPG-member discussions. We encourage the mentor and mentee to include others in their discussions and research as needed. A mentor may or may not have applicable experience or knowledge related to a mentee's area of interest, but the mentor will help find information and/or an alternate mentor.

LOOKING FOR A MENTOR?

AIPG has members across all geoscience specialties who are willing to share their geoscience experiences, expertise and career choices and paths.

Any member looking for a Mentor is encouraged to contact a listed mentor by email to arrange a call, meeting, or virtual meeting. Talking with a professional that has “been there, done that” can be immensely beneficial. Furthermore, the networking will undoubtedly benefit both the mentee and mentor.

Search the list to find the geoscientist that works in your field of interest. Click on their name to see information about their geoscience expertise, experience, and interests. You will also find a link to their email. Go Explore! Find a mentor!

AIPG hopes that this new mentoring program will be beneficial. If you have questions or comments please contact the AIPG National Office at aipg@aipg.org or call 303-412-6205. All members are expected to adhere to the AIPG's Code of Ethics while using the Mentoring Program. AIPG Members (CPGs and Professional Members) interested in becoming a Mentor can submit the online Mentor form.

Students - Reminder

Don't Forget: Each Student Chapter must submit two articles for publication in *Geologically Speaking* each year to qualify for Section funding.

Send the articles to Adam Heft at adam.heft@wsp.com.

WANTED!

Your Articles for *The Professional Geologist*

- Technical
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- Letters to the Editor

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Coming Events

February 1, 2023: Deadline for National AIPG Student Scholarship Applications.

February 4, 2023: National Executive Committee Meeting, Tucson AZ.

February 9-12, 2023: The 68th Annual Tucson Gem & Mineral Show: Silica, Agates, & Opals, Oh My! Tucson Convention Center.

February 16, 2023: EGLE Remediation and Risk Management Webinar: Petroleum Vapor Intrusion – Updates to the Lateral Inclusion Zone Checklist and Vertical Separation Distance Checklist. <https://us06web.zoom.us/join/zoom-join-url>

April 27, 2023: EGLE Remediation and Risk Management Webinar: Topic — PFAS. Watch for upcoming announcement and registration link.

May 4-5, 2023: North-Central GSA 57th Annual Meeting, Grand Rapids. https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/nc/2023mtg/home.aspx.

June 1, 2023: Deadline for submittals for the Michigan Section Andrew Mozola Memorial Scholarship.

June 13-14, 2023: Michigan Section AIPG Environmental Risk Management Workshop at the Ralph A. MacMillan Conference Center in Roscommon.

July 6-18, 2023: Adventure Iceland Tour #1 with Dr. Tamie Jovanelly. www.icelandgeologytours.com.

July 25 to August 6, 2023: Adventure Iceland Tour #2 with Dr. Tamie Jovanelly. www.icelandgeologytours.com.

August 8-11, 2023: Brownfields 2023. To be held at the Huntington Place Convention Center in Detroit. Additional information can be found at <https://brownfields2023.org/2022/08/brownfields-2023-detroit-michigan/>.

September 12, 2023: 19th Annual Michigan Section AIPG Golf Outing. Fox Hills Golf Course in Canton. Registration will open on January 25, 2023. See flyer in this edition of *Geologically Speaking* for additional details and registration information.

September 16-19, 2023: AIPG 60th Anniversary Conference. Covington, KY. Details forthcoming in Apr/May/ Jun edition of *TPG*.

Minerals for Sale!

Long-time Michigan mineral collector and dealer, Bill Micolis, is selling his lifetime collection of material. Bill is in Milford. For additional details, please see the full-page flyer on the following page.

Welcome New Members!

The Michigan Section is continuing to grow. Please welcome the following new CPGs, Professional Members, Early Career Professionals, Associate Members, and Students:

Katrina Barauskas, SA-11680; Jesse Bishop, SA-11668; Brett Bogedain, SA-11612; Carrie Butske, SA-11670; Julia Daniel, SA-11684; Ariel Dorogi, SA-11674; Eleanor Durkee, SA-11681; Rebecca Florida, SA-11638; Andrew Gelderloos, ECP-0986; Leah Gies, MEM-3450; Amartya Kattamalavadi, SA-11679; Julia Koza, SA-11666; Sabrina Lanker, SA-11667; Kum Lor, SA-11677; Tanner McDonald, SA-11636; Madeline Mennenga, ECP-0991;

Olivia Mitchell, SA-11618; Julie Nitz, SA-11683; Nathaniel Okkonen, ECP-0984; Chanh Park, SA-11665; Sauradeep Purkayastha, SA-11640; Jasmine Ross, SA-11622; Julia Rudlaff, SA-11675; Anna Sauger, SA-11633; Ashley Scott, SA-11678; Luke Singer, SA-11610; Taylor Slyker, SA-11682; Heather Smith, AS-0203; Emily Stonge, SA-11676; Evan Sutherland, SA-11669; and Ryan Vannier, MEM-3448.

To each of our new members, welcome to our Section! We encourage you to attend Section meetings and other events. You are also invited to provide information for the Member's Corner articles.

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2022 Golf Outing

September 13th, 2022 ended up being the best way to celebrate the approaching end to the summer season with a round of golf with friends and colleagues. The 18th annual AIPG Michigan Chapter Golf Outing included 18 teams made up of a total of 72 players. Although the green and course conditions proved to be a bit more challenging than us amateurs are used to for this event, golfers still swung their A-game (if that's what you want to call it) to make new connections, support a great cause, and earn some potential bragging rights. The event took place at the beautiful Fox Hills Golf Course and specifically on their prestigious champion course – The Golden Fox in Canton, Michigan with perfect Michigan weather. As always, the net proceeds from this year's event, with a grand total almost \$7,000, supports many AIPG-sponsored awards and our affiliated student chapters.

All players were greeted with an enthusiastic registration table comprised of excited volunteers and given a goodie bag that included golf balls, tee's, socks, and much more! And of course many joined the excitement of the 50-50/prize raffle contest, mulligan purchases, putt-for-dough contest, skins, longest drive, closest-to-pin, and the ever-exciting Vegas hole.



Volunteer Gail Carr of Eurofins looking over our closest-to-the-pin contest.



Volunteers Duane Hattem of Pace and Keri Ryan of Hamp Matthews and Associates posing at the putt-for-dough contest.

The skill prize winners for the longest drive were Korey Mazur and Kim Ethridge, while the closest-to-pin sole winner was Jeremy Rasmussen. Contest and prize winners were lucky to receive golf bags, putters, speaker/GPS device, golf gloves, gift cards and many more! The 50-50 and prizes raffle raised a total of \$755, a total due in part to 50-50 winner James Colmer who graciously returned his winnings to AIPG (THANK YOU JAMES!). The Vegas hole hustled...err...managed by volunteer Andy Foerg raised \$595! And the raffle baskets raised \$280. Thank you to all who contributed to these exciting prizes, congrats to the winners, and to the losers...better luck next year!

The winning golf team included Bob Reichenbach, Craig Marlow, Kim Ethridge, and Chris Moffatt. They won a variety of local sport team club cover sets and ball markers.

2nd place was won by Tim Hebert, Shane Applebee, Jeff Gusman, and Jaime Wright. Their prizes included a case of different color Volvik® golf balls.




3rd place was won by Celeste Holtz, Doug Barber, James Colmer, and Tom Kaugher. Their prizes included sets of local team putter grips.

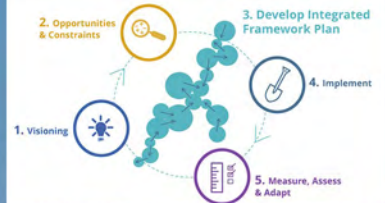


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The winning golf team included Bob Reichenbach, Craig Marlow, Kim Ethridge, and Chris Moffatt.



3rd place was won by Celeste Holtz, Doug Barber, James Colmer, and Tom Kaugher. Their prizes included sets of local team putter grips.



Rounding last, but certainly not least, was Sam Kitchin, Craig Regoni, Rachele Grefke, and Dan Nida. Who were honored with various obnoxious golf club covers, including a wonder woman, a rose, a kitty cat, and

very cute dog with a bow!

This event would not be possible without all of our perennial and new sponsors. A very big thank you to the following:

- **Job Site Services (JSS)** (Dinner Sponsor)



- **Fibertec Environmental Services** (Photo Sponsor)



- **Atlas ATC (Beverage Sponsor)**



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An especially big thank you to Fibertec, Atlas ATC, and PM Environmental, who also provided raffle gift baskets with exciting and valuable contents that were raffled off. The gift baskets included themes such as a beer and chocolate arrangement, fishing gear, and copper craft whiskey.

And of course, we took a moment to honor Bob Reichenbach for his years supporting the AIPG with the golf outing who stepped down as chair in 2021. Thank you again for the years of support, we couldn't have done it

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without you!

This event also would not be successful without the support and participation of all the volunteers as well; Lori Near and Heather Smith (Fibertec) for assisting with putt 4 dough and photos, Duane Hattem (Pace Analytical) for administering the putting contest, Melissa Craddock and Gail Carr (Eurofins US) for helping with the hole-in-one grand prize hole and hustling raffle tickets, Andy Foerg (ECS) for the Las Vegas hole, Keri Ryan (Hamp Matthews & Associates) with the registration table and con-

tests, and of course the energy behind (and in front) of the event, Laura Lambert (ERG), who assisted with everything including the initial set-up and coordination, raffles, and entertained us with her excellent MC skills!

We'd also like to thank the staff at Fox Hills Golf Course for the service and hospitality (and patience) provided for our event.

The Michigan AIPG Executive Committee would finally like to thank our golf chairperson and AIPG Michigan Chapter President, Kalan Briggs for organizing the event. The proceeds will be spent wisely and with due care.

Please join us next year for our 19th annual outing scheduled for September 12th once again at the beautiful Fox Hills club and will feature their championship Golden Fox course in Canton, Michigan! Please spread the word to your suppliers and fellow colleagues, and plan to bring your A-game (or just show up).

Also consider a sponsorship as we really could not have this event without our new and perineal sponsors. There are several different levels of sponsorship listed on the event page and event flier. Sponsors are also requested to include with their sponsorship a gift basket of at least \$30 in value that will be raffled off with the rest of the prizes.

Volunteers are also highly encouraged and very welcome!

This event is a great opportunity to spend time with colleagues and celebrate the closing end of a busy "summer field work" season. It is open to everybody, so please come and take advantage of the opportunity that so many others have done in the past. You need not be an avid golfer to participate, all are welcome!

The registration will be open on **Wednesday, January 25th, 2023** and can be completed at the event website here: <https://www.eventregisterpro.com/event/americaninstituteofprofessionalgeologists-1>.

If necessary, a hard copy registration form, along with a check covering the registration costs, can also be submitted to Kalan Briggs @ briggsk2@michigan.gov or mailed to 630 Piper Road, Haslett, MI 48840. Feel encouraged to take advantage of the "Early Bird" discount if you register/pay for golf by August 1, 2023.

We hope to see everyone next year and look forward to another successful event!

Editor's Note: Registration and information flyer for the 2023 Michigan Section AIPG Golf Outing can be found at the end of this edition of *Geologically Speaking*...



Glorious Hollywood shot of MC Laura Lambert.



Golf carts at Fox Hills; photo from Fox Hills Golf Course photo gallery.

Where in Michigan?

The October 2022 edition of *Geologically Speaking* featured a photograph that was not identified. The photograph at right features another view of the same area that may provide another clue as to location and formation.

This edition of *Geologically Speaking* features a new photograph **at right** - not the photo on the cover page. The first person to correctly identify what the photograph depicts (feature name, location, formation, and age) will win AIPG swag! Submit your entry via email to the editor; only one per person per issue please.

Don't forget to check out the feature article "Geology in Michigan" in this issue (as well as the last several editions) that presents a geologic feature of interest as a mini field guide. One of the best parts about being a geologist is field trips, and we are hoping that in your travels around the state or country you include these featured spots as a stop. Why not incorporate them into a family vacation or bring friends who may not be geologists and share these locations that make Michigan unique? We hope you enjoy reading about it, and more importantly, go see it in person! We invite you to share unique geologic features that you know about and submit a "mini field



guide" to share with our members in future editions.

Invitation to Our Members!

Do you have a case study to share?

The Michigan Section AIPG promotes knowledge sharing and would like to feature case studies from projects where others may benefit from successes as well as lessons learned. We feel as professionals that learning from each other is a great opportunity that AIPG offers our members. AIPG offers connection with other professionals and their experiences in the work we do every day. This case study represents what we would like to offer more to our members, not only as a way to solve problems, but unify us as professional geologists. Additionally, do you have a suggestion for other types of information to share that would be of interest to our membership?

Please send your case studies and suggestions for future publication in upcoming editions of *Geologically Speaking* to the Editor.

Update Your Information!

Please be sure that you continue to receive the Section's *Geologically Speaking* publication and other announcements. Submit an updated e-mail address to Adam Heft at adam.heft@wsp.com. If you move or change places of employment, don't forget to send your new contact information to both the Section and to National. If you are not receiving announcements directly from the Editor, it is because your email address is not up to date with the Michigan Section.

Please help the Editor by making sure that your email address doesn't bounce when the next announcement is sent. And be sure to cc Dorothy Combs, National AIPG Membership Director at aipg@aipg.org when you update your contact information. Thank you!

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Geology Before, During, and After a Pandemic



By Katharine Laage...

My geological journey started during my senior year of high school in 2019. My high school offered an advanced geology class, and I decided to put it on my schedule. We started the year learning the basics of geology.

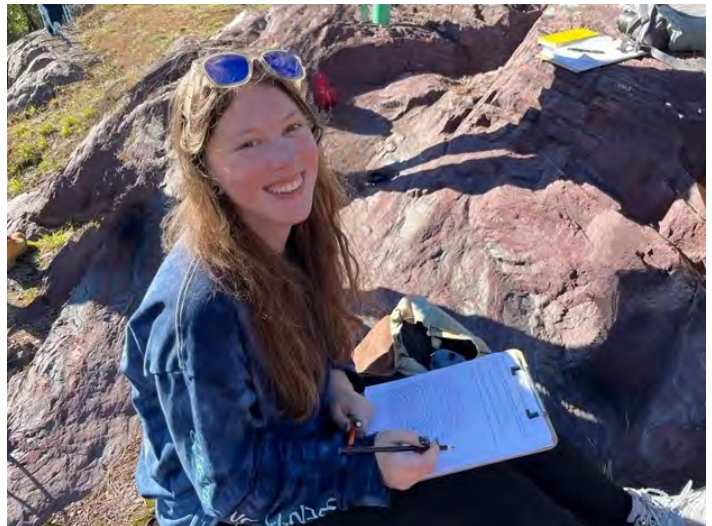
Maps, rock classification, rock identification, and laws of relative dating were all things we were taught. We were given rock kits, passed around examples, and joined groups to practice concepts. It was a typical classroom with plenty of hands-on learning. This kind of teaching was what roped me into geology. I loved the collaboration, real-life examples, and applying concepts to real rocks or minerals in front of us. We planned field trips for the early spring when the snow would melt, and we could visit geological sites around Michigan. As the second semester started, we moved to more advanced concepts and began studying for the finals.

News slowly broke of a new virus that could begin to spread from nation to nation. Spring break was approaching, and all of us seniors hoped this little virus wouldn't cause too much of a stir and we would still be able to finish our last year of high school as we all dreamed. Then, our school closed down. It was too dangerous to meet in person. Our school allowed all seniors to take their current grade and be done with the class or continue it for the rest of the year online and get a better grade. The only class I wanted to continue was my geology class. I got assignments through emails and Google Classroom, and we met virtually once a week to ask questions. All field trips were canceled, and all material was digital. It was now up to me to learn geology alone, in my room, on my laptop. I ended with a worse grade than I started with and a longing for the hands-on learning that we once had.

Summer came and went due to being locked up inside worrying about the future. I was gearing up for my first year of college and had no idea what to expect. I started as an anthropology major, hoping to advance my way to archeology. I knew some geology classes would be helpful, and I wanted to continue learning about the earth. All of my classes were online, with the option to

come to class on certain days with masks on. We met through a virtual meeting platform, and most students simply stayed muted and silent throughout the class. I would be on my laptop in my dorm, trying to pay attention to these professors talking on a screen. It was lonely and sad. I barely remember things I was taught in those classes, and that first year really turned me away from the idea of college learning altogether. I wasn't enjoying what I was learning through my major, and when my freshman year came to an end, I decided to switch to a geology major. It was the only class I still enjoyed, and the professors made such an effort to keep students engaged and continue with hands-on concepts.

By the time my sophomore year started, Covid-19 was a part of our daily lives. The vaccines were beginning to be announced, and our college was now ready for in-person classes again. I took as many geology classes as possible and ensured they were all labeled "In Person." I knew I could not handle another lonely semester trying to stay engaged with a screen. I took classes like Field Methods and Prehistoric Life. Both courses were small, with very few students, but each person there looked ready to learn. In field methods, we were able to go outside and work on labs with groups. We would collaborate on taking strike and dip or creating maps. In prehistoric life, we could pass around fossils while study-



Photograph by Katharine Laage.

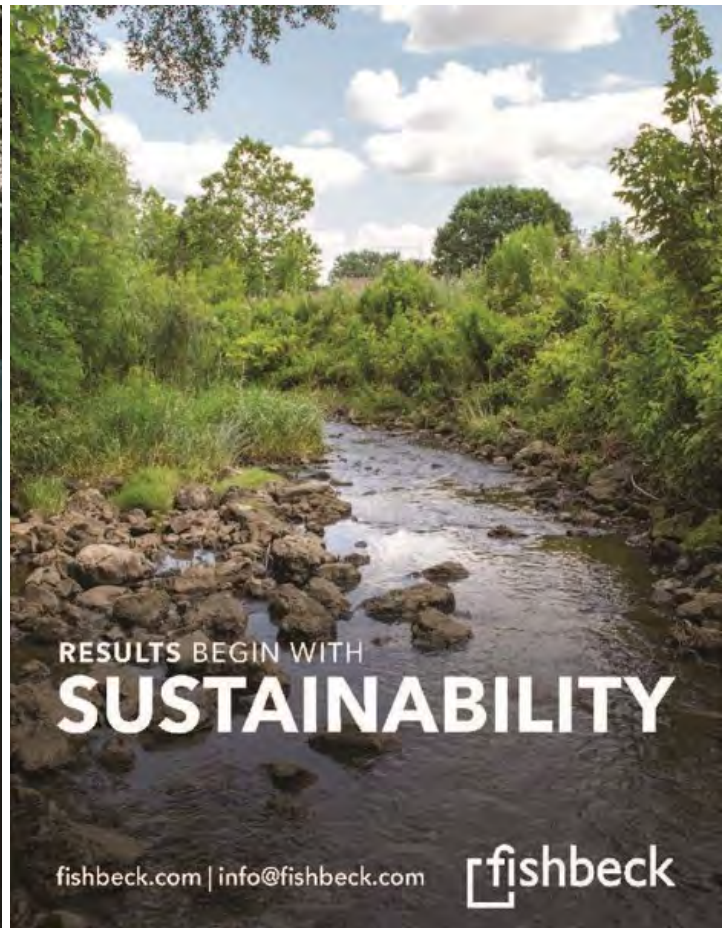


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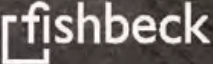
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Photograph by Katharine Laage.

ing the creature it once was. Being in a classroom once again was a great feeling. It sparked a passion for the science of geology and made me understand that it was something special, and I was finally excited to keep learning. During the last week of our classes in the Spring semester, it was announced that we were no longer required to wear masks. I could finally see the smiles of my classmates who I have bonded with over the semester. These people were some of my closest friends, and I finally got to see their faces and the professors who have mentored me; I could finally see them smile. I applied for geology internships and never wanted to stop learning.

Currently, during my Junior year of college, the threat of a global pandemic still looms around us but does not stop us from learning. My classes, like Mineralogy and Petrology, are back to operating as usual. We use microscopes to look at thin sections, and we can pass around specimens of different habits and shapes. This year, after four years of studying geology, we could finally go on a field trip. It was my first time truly being in the field, and it was a fantastic experience. We studied Michigan's geology and structures in the Upper Peninsula. Our class bonded and became great friends while we spent a week in cabins together and went to old mines or quarries.



Photograph by Katharine Laage.

This year we celebrated the 50th year of our geology department. Not only was it a huge milestone, but it also was a chance for generations of geologists to come together and celebrate the amazing science that we all are so passionate about. We talked over coffee and donuts, discussed the future of the department and what it's like currently, and finished the day with a huge BBQ dinner. It was a great time and something I would never imagine myself being a part of four years ago when covid first started. My journey of studying geology is nowhere close to being over, but I can open a new chapter of learning and grow my passion for the science.

Section Website Reminders

The Michigan Section has created a database of geologic photographs on our website. Please submit photographs that you are willing to share to Adam Heft at adam.heft@wsp.com. Don't forget to include your name and a short explanation of what the photograph depicts. The photographs will be uploaded to the website periodically.

If you have suggestions on other items that should be included on the History page, please let a member of the Section Executive Committee know.

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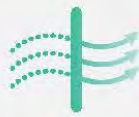
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Student Chapter News

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Greetings fellow Geologists and friends at AIPG!

The AIPG Student Chapter at Western Michigan University (dba Geology Club at WMU) has been thrilled to be back fully in person after a few difficult years of remote learning and not being able to meet in person often enough and we're very honored and humbled to have been selected as the AIPG National Outstanding Chapter of 2022! Our very first meeting back in September was full of a diverse and excited group of new members and familiar faces, eager to be a part of a great organization, learn more about the big world of geosciences and to make new, in-real-life friends with common shared interests and the common goal of raising awareness and fostering unique experiences related to geology and the geosciences. One of the first orders of business for the WMU AIPG Student Chapter was the election of the executive board members for the 2022-23 year. After the dust settled and each of the prospective board members had a fair chance to campaign, the following members were elected to the Executive Board for this year:

- President – Avianna Jackson: 4th year, Environmental Geology major (Avianna.m.jackson@wmich.edu)
- Vice President – Moira Burns: 3rd year; Hydrogeology major (moira.a.burns@wmich.edu)
- Secretary – Mary Howe: 3rd year; Public Non-Profit Administration major (mary.e.howe@wmich.edu)
- Treasurer – Garrett Link: 2nd year; Hydrogeology Graduate Student (garret.w.link@wmich.edu)
- WSA Representatives – Will Roosien and Donovan Vitale; 4th year Geophysics Major

Since September, our Chapter has been having our regular weekly meetings, Monday's at noon, that have been very well attended. We have established several standing committees: Fundraising (Chair – Jack Misner), Education and Outreach (Chair – Donovan Vitale), Field Trip (Chair – Ariel Martin), Museum (Lauren Jaskot), and Program (Chair - Ashley Patti) committees. Each of these committees has worked very hard and logged countless volunteer hours so far! The group has been hosting and participating in a lot of events. One of our first and biggest events of the year was the WMU Bronco



2022-22 AIPG Student Chapter Officers (L to R): Moira Burns, Avianna Jackson, Mary Howe, Will Roosein, Garrett Link. Photograph by Tom Howe.

Bash. The Student Chapter met with hundreds of WMU students and talked to them about AIPG and what it is that geologists do. We gave away rock candy, quartz crystals, fossils, broke open geodes and challenged them to a game of Whack-a-Dino! It was a HUGE success, and we had a line of people that wrapped around the block waiting to come spin to win and talk with us!



Bronco Bash 2022 was such a huge success! We couldn't believe how many people would wait in line for a free rock! . Photograph by Tom Howe.

A week later we helped host the WMU Geological and Environmental Science Alumni, Friends, and Family



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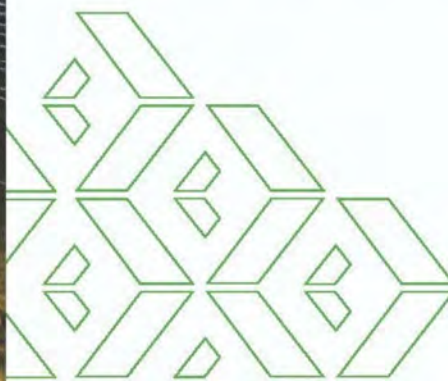
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“Back to the Field” Homecoming gathering at Revel and Roll in Kalamazoo where we honored our friend, alumna and AIPG superstar, Sara Pearson, with a well-deserved achievement award! Our volunteer student members got the chance to network with alumni and ask questions about careers and advice about the world of geosciences. They helped with the event activities and got the chance to raise funds by selling rock and mineral samples and merchandise. To help identify where we will be going for our annual spring geology field trip, we did a “Donate to Decide” fundraiser at the event, giving those who attended the option to help pick the location of the AIPG student chapter annual spring trip. The friends and alumni voted and this spring the Chapter will be going to Ireland to visit Giant’s Causeway among other excellent field stops and camp sites planned along the way. We are very excited to make this once in a lifetime journey and create some unforgettable memories! To this end, we have been busy fundraising and planning the trip.



Back to the Field event at Revel and Roll. Adam Heft and Sara Pearson are at the right side of the photo. Photograph by Tom Howe.

In October, the group hosted a gold panning workshop, a Halloween party and a haunted house. We have held fundraisers on Western Michigan University campus. We sold rocks, minerals, t-shirts, doughnuts, and coffee and passed out free rocks and geological insight to those passing by. To top it off, we were able to gain more interest our programs and our club amongst the general student population and added several new members to the student chapter. Our education and outreach committee are getting prepared to welcome 180 middle school students to WMU on November 21st where we will try to inspire them to consider what a degree in geosciences can offer them as well as how geosciences play a critical role in their everyday lives. One of the exciting displays we will show them is the newly donated Augmented Reality Sandbox (thanks, AIPG!). The committee also has a trip to a local elementary school scheduled the following week

where they will share ideas about geology with the students, let them dig for fossils and give them all hand lenses (Student Chapter provided) to take home with them!

The Museum Committee has been meeting every other week to come into the Lloyd Schmalz Geology and Mineral Museum on campus to clean, archive and catalog specimens, as well as spruce up some of our static displays!

Just this past week, the Program committee welcomed a guest speaker, David Stegink, from Envirollogic Technologies, Inc. to Rood Hall to talk to our student members about careers, opportunities and ways to connect with other professional organizations. Would you be interested in talking with our student chapter? Please let us know! The WMU AIPG student chapter formal meetings are held every week and to engage members to get to know others in the club, but there are also lots of other formal and informal events scheduled such as an upcoming Friends-giving ping pong potluck scheduled for Thanksgiving break.

The Chapter has been super busy and super involved this year! We are looking forward to connecting soon with the members of AIPG-Michigan Section and the other AIPG Michigan student chapters at the annual meeting in a few short weeks. To reach even more people about the amazing aspects of geology and AIPG, the members have taken to social media via Facebook and Instagram. Look out for regular postings about geology, and unique geological locations. Please like and follow us on social media on Instagram: @wmugeologyclub or on Facebook @Geology Club at WMU, or you can reach out to us directly at wmugeologyclub@gmail.com



The first meeting of the Student Chapter. Photograph by Tom Howe.

We also want to take this opportunity to send a special thanks to our student liaison, Joe Swarz, who recently

made a very generous donation to our club in support of our spring trip to Ireland... thanks Joe!

Would you also be willing to help support us by donating to our Ireland geology trip? We are well on our way to our goal of \$15,000!! Let us know if you would be willing to assist us!

Donations to the WMU AIPG Student Chapter can be sent directly (without fees) to our Treasurer, Garrett Link on Venmo @garrett_link (last four digits of phone is 3717). We would be so grateful if you wanted to!

As the fall semester starts to wind down, we are excited to continue full force in planning the spring trip, fundraising, and make memories and lasting connections! permanent seismic monitoring network in Alaska, there has been an increase in both the quality and the quantity of seismic data available on Alaska. I am relatively in the early stages of this research and am focused now on gathering a better understanding of what we know today about Alaska's mantle tomography. With time, we hope to use new visualization methods to go through an in-depth analysis of our new model out there and see how it compares to earlier research on the far-reaching depths of the subducting slab beneath the state. Alaska is home to the



Our AIPG student chapter members sweating it out for the cause in a T. Rex suit at Bronco Bash 2022. Photograph by Tom Howe.

most seismically active region in our country, and it is capable of producing some of the most powerful earthquakes in the world; this would make any seismologist excited to be there and gives this budding researcher good vibrations on what can be discovered about the assembly of the 49th state.

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Interesting Geology Links

The Editor has received links to various interesting geology-related sites. Some of the more interesting links are included here. If you have any links to geology-related sites that you would like to share, please forward them (with a citation, if applicable) to the Editor.

Thanks to Mark Francek of Central Michigan University for sharing via the "Earth Science Site of the Week" emails. This edition features a few "fun" links.

This is a glacial lake outburst flood: <https://atlas.eia.gov/apps/5039a1a01ec34b6bbf0ab4fd57da5eb4/explore>.

Tornado at the base of La Palma Volcano: <https://www.youtube.com/watch?v=7OJi7HE7TSI>.

Japan's Okinawa Coastlines Struggling With Pumice Stones From Volcanic Eruption: <https://www.usgs.gov/media/images/overview-water-quality-principal-aquifers-0>.

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Regulatory Roundup

Happy New Year! We are starting a new legislative session and all bills that were not passed into law have lapsed. New bills must be introduced for any initiatives the legislature chooses to continue from the 2021-2022 session and we can also expect many new initiatives to be introduced.

The amendments proposed through Senate Bill 1169 to the Underground Storage Tanks (USTs) regulations under Part 211 of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended are an example of a bill that has now lapsed and a new bill will need to be introduced if the legislature chooses to continue with the amendments.

Additionally, the five bills we have been watching related to mining and sustainability were introduced earlier last year were not passed in 2022 and will need to be reintroduced. They were developed by Michigan's Mining Future committee. They include the following:

[House Bill 6254](#): Ferrous Mining Research and Development Grants

[House Bill 6218](#): Non-Ferrous Research and Development Grants

[House Bill 6219](#): Unemployment Extension for Ferrous Mine Idle or Closure

[House Bill 6220](#): Advisory Committee on Michigan Hard-Rock Mining

[House Bill 6255](#): Mining Reclamation Fund

Rule promulgation is different from the legislative efforts and EGLE's Air Quality Division is continuing through the rule making process for pending rule set #2022-18 EQ on the Part 6. Emission Limitations and Prohibitions – Existing Sources of VIC Emissions. If you are interested in this rule set, be sure to subscribe to the [EGLE calendar](#) for dates on upcoming public hearing and comment opportunities.

Additional news from EGLE is the announcement of new acting director [Dan Eichinger](#) assuming the leadership role from Liesl Eichler-Clark. Acting Director Eichinger joins EGLE from the Department of Natural Resources where he served as director since 2018.

While it is unknown yet as to the initiatives that will become the focus of this legislative session, there are topics that will be at the top of the agenda for many like per- and poly-fluoroalkyl substances.

The following is an article from Gongwer News Service regarding the PFAS contamination at Camp Grayling

that was published January 3, 2023.

EGLE Official: Update On PFAS Impact Necessary For Expansion

An official with the Department of Environment, Great Lakes and Energy recommended the Army National Guard's proposed Camp Grayling expansion not move forward until it gives an update on PFAS contamination.

The project seeks to expand Camp Grayling by an additional 162,000 acres of state land for military training. It has proven controversial and yard signs opposing the expansion can be seen throughout the northern Lower Peninsula.

"The (EGLE) Remediation and Redevelopment Division Gaylord District Office believes an update is necessary on the status of Camp Grayling Investigations for PFAS under Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)," Randall Rothe, district supervisor of the Remediation and Redevelopment Division, said in the letter, first reported by Bridge Michigan. "The investigation needs to be assessed as part of any Camp Grayling expansion proposal."

In the December 22 letter to Bonnie Packer, acting PFAS program manager for cleanup and restoration branch for the Army National Guard, Mr. Rothe said EGLE had been waiting on "significant remedial progress for five years."

"EGLE Gaylord RRD does not support the expansion of Camp Grayling based upon the inability to take timely action to investigate, mitigate, and remediate significant areas of contamination at Camp Grayling," Mr. Rothe said. "It is EGLE Gaylord RRD's recommendation to the Michigan DNR not to accept an expansion of Camp Grayling until significant progress and timely action is taken."

In the week prior to the letter, the National Guard told EGLE it did not intend to extend drinking water from Beaver Creek Township to Grayling Township, a move which Mr. Rothe said was unacceptable because of PFAS impacts to private wells stemming from Cantonment on Lake Margrethe and Grayling Army Airfield.

The National Guard also told EGLE it would pause its remedial investigation at MATES – Maneuver Area Training Equipment Site – at the camp until 2024 or 2025. EGLE outlined in the letter the impacts at MATES have been known since 2018 and the current investigation does not include the MATES buildings where PFAS im-



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pacts most likely originated. EGLE also said the National Guard must sample all drinking water wells in a one-mile radius in the area surrounding MATES, saying "ecological risk assessment is necessary."

EGLE also had to open investigations in the past into several areas around Camp Grayling, including a fish sampling in the Au Sable and Lake Margrethe, saying PFAS impacts would only be partially known if the offsite investigation was done by the National Guard alone.

The insufficient mitigation and remediation during the past five years also encouraged EGLE to recommend the halt of the expansion, saying only 17 drinking water wells have been given access to less impacted water thanks to the extension of Grayling's water supply and the installation of whole home filters.

EGLE spokesperson Scott Dean said in an email to Gongwer that the department has "significant concerns about the Army National Guard's response to PFAS contamination at Camp Grayling.

"While the compliance letter references the district office's opposition to the proposed Camp Grayling expansion, Michigan EGLE has no regulatory authority over the proposed expansion and will not make a formal agency recommendation on that matter," Mr. Dean said in a statement. "EGLE will continue to pursue PFAS cleanup that protects the environment and public health at the Grayling site."

Additionally, EGLE's Air Quality Division announced the retirement of Director Mary Ann Dolahanty and the new Director Annette Switzer,

Reminder: We always encourage our members to support and participate in the legislative and rulemaking processes and lend our knowledge and experience as experts in the environmental field. We also wish everyone the best for 2023!

Proposed Rules

Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, [bill search](#)

Safe Drinking Water Act, PA 399 of 1976, as amended, [bill search](#)

Gas Safety Standards, PA 165 of 1969, as amended, [bill search](#)

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Complete information on the scholarship is included in the flyer in this edition of *Geologically Speaking*.

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Geology in Michigan – The Eben Ice Caves

By David Adler, CPG-11377

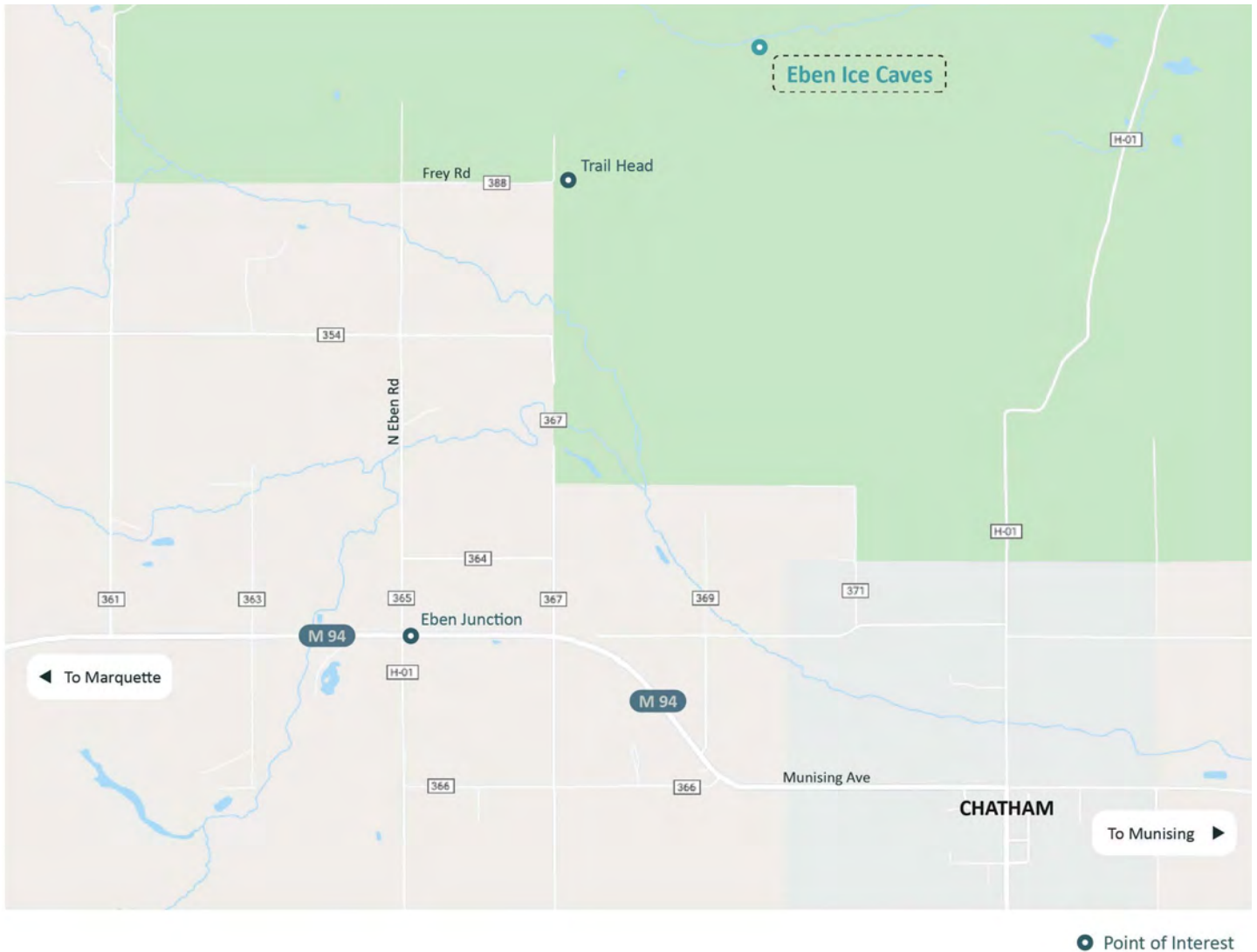


Figure 1: Ice Caves Location. Source: <https://snazzymaps.com/style/104137/default-w-out-labels>.

Latitude 46°22'55.76"N; **Longitude** 86°57'01.88"W.

Section 16, T46N, R21W, Alger County

Directions: The Eben Ice Caves are located in Alger County approximately 25 miles southwest of Munising and approximately 40 miles southeast of Marquette (see Figure 1). From Munising, take State Highway M-94 west to N Eben Road. Turn right (north) onto N Eben Road and proceed to Frey Road. Turn right (east) onto Frey Road and proceed to the end of Frey Road or park on Frey Road where space is available. On weekends, you may have to park on N Eben Road. The trail begins at the end of Frey Road and continues approximately 0.75

miles to the ice caves.

From Marquette, take US 41 south to M-94 and turn left (east) onto M-94. Take M-94 east and turn left (north) onto N Eben Road and proceed to Frey Road. Turn right (east) onto Frey Road and park as close to the end of Frey Road as possible.

Most of the 0.75-mile trail from the end of Frey Road to the ice caves is well packed with snow during the winter and relatively easy to navigate. However, the trail becomes steeper and can be icy in places as you approach the main ice cave area. Ice cleats (also known as crampons, yaks, yaktrax, etc.) for boots are highly recom-



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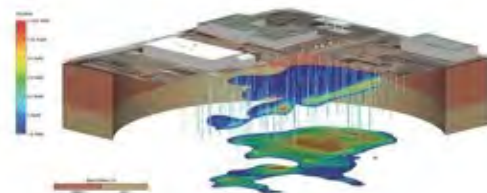
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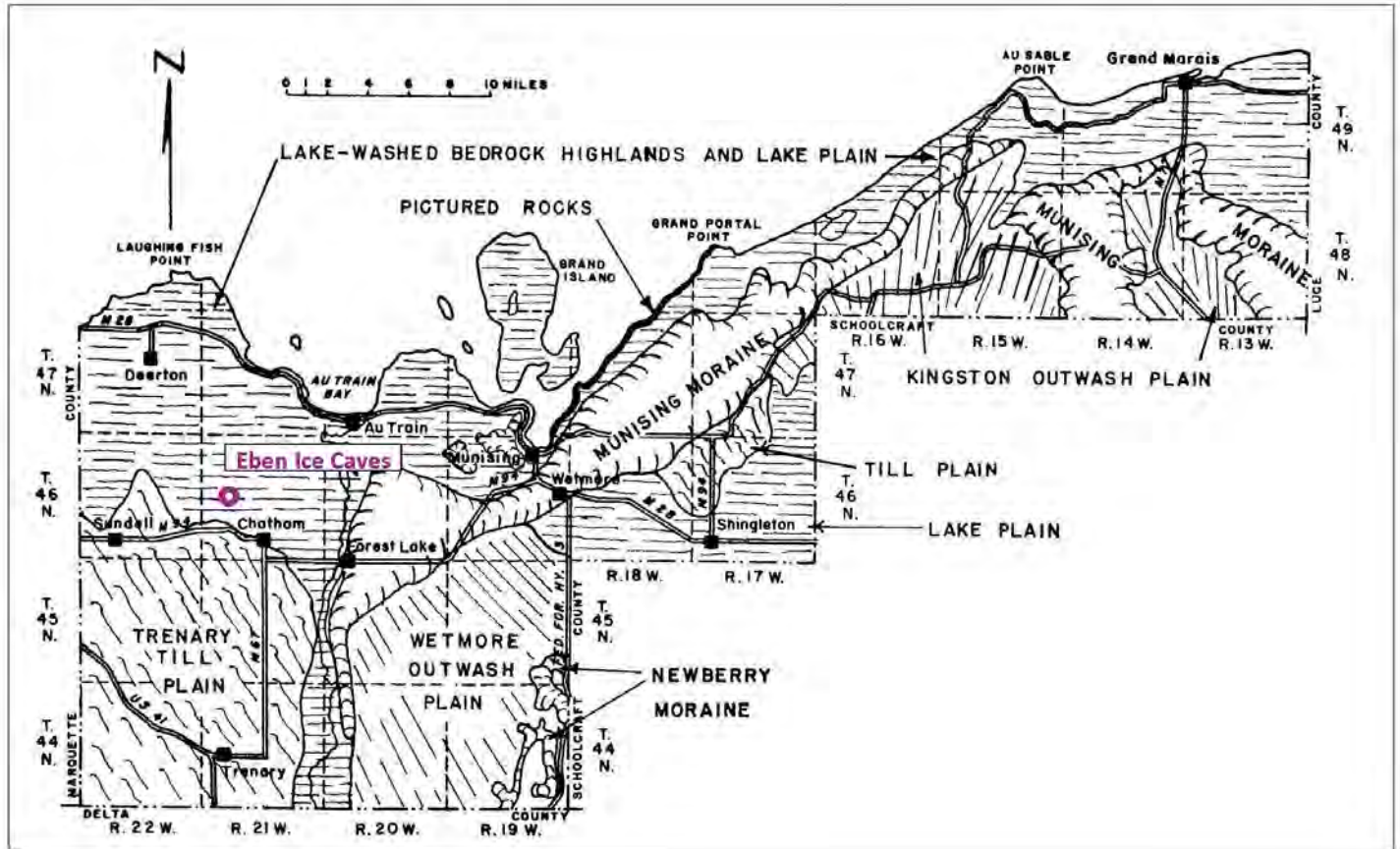


Figure 2: Geologic Setting. Source: Modified from Vanlier, 1963.

mended for visiting the ice caves. Some people also use ski poles. The ice caves are not handicap accessible.

Introduction

The Michigan Tech AIPG Student Chapter had the good fortune to take a winter field trip to the Eben Ice Caves on Saturday February 27, 2021. The Eben Ice Caves, located in the Rock River Wilderness Area of the Hiawatha National Forest in western Alger County, are a popular Upper Peninsula winter attraction. Many visitors flock to the ice caves on winter weekends to see the unusual ice formations that form against the backdrop of the south rim of the canyon of Silver Creek. Although there are other ice caves in the Upper Peninsula, most are along the Lake Superior coastline and are difficult to access during the winter months.

A winter visit to the Eben Ice Caves is an exhilarating and unique experience. The woods in Silver Creek Canyon are blanketed in pure white, undisturbed snow that imparts a subtle but special background sound effect along the trail. The winter air is clean and crisp. Dress appropriately and be ready to enjoy the great outdoors in the Upper Peninsula during the winter season. It's a fun and rewarding adventure.

Geologic Setting

The major physiographic features of Alger County are depicted on Figure 2. These physiographic features are the result of Pleistocene age glacial processes imposed on a bedrock surface consisting primarily of Paleozoic sandstone, limestone, and dolomite. Prominent regional

glacial features include moraines, till plains, outwash plains, and an extensive area described by Vanlier (1963) as lake-washed bedrock highlands and lake plain, which is where the ice caves are located.

The surface geology and bedrock geology of Alger County are shown on Figures 3 and 4 (on page 35), respectively. The Eben Ice Caves are located in an area characterized by only a very thin mantle of glacial/postglacial soils overlying bedrock. This can be seen along the south rim of Silver Creek Canyon on the trail to the caves where sandstone bedrock is well exposed in the canyon wall. The bedrock is the Upper Cambrian Munising Formation. The Munising Formation, also referred to as the Munising Sandstone, is generally light colored (white to light tan to light grey) fine to medium grained marine sandstone with beds of coarse grained to conglomeratic sandstone. According to Vanlier (1963), the Munising Sandstone is underlain unconformably by the eroded surface of the Lower to Middle Cambrian Jacobsville Sandstone, and is overlain by undifferentiated Ordovician and Cambrian rocks consisting of sandstone, sandy dolomite and dolomite.

Ice Formation

Figures 5 through 11 (beginning on page 36) are various photographs of the main ice cave area taken during the February 27, 2021 Michigan Tech Student Chapter field trip. The main ice caves have formed along a stretch of the south rim of Silver Creek Canyon. A laterally extensive recess cave has formed and is continuing to form in the south wall of the canyon as a result of weathering of

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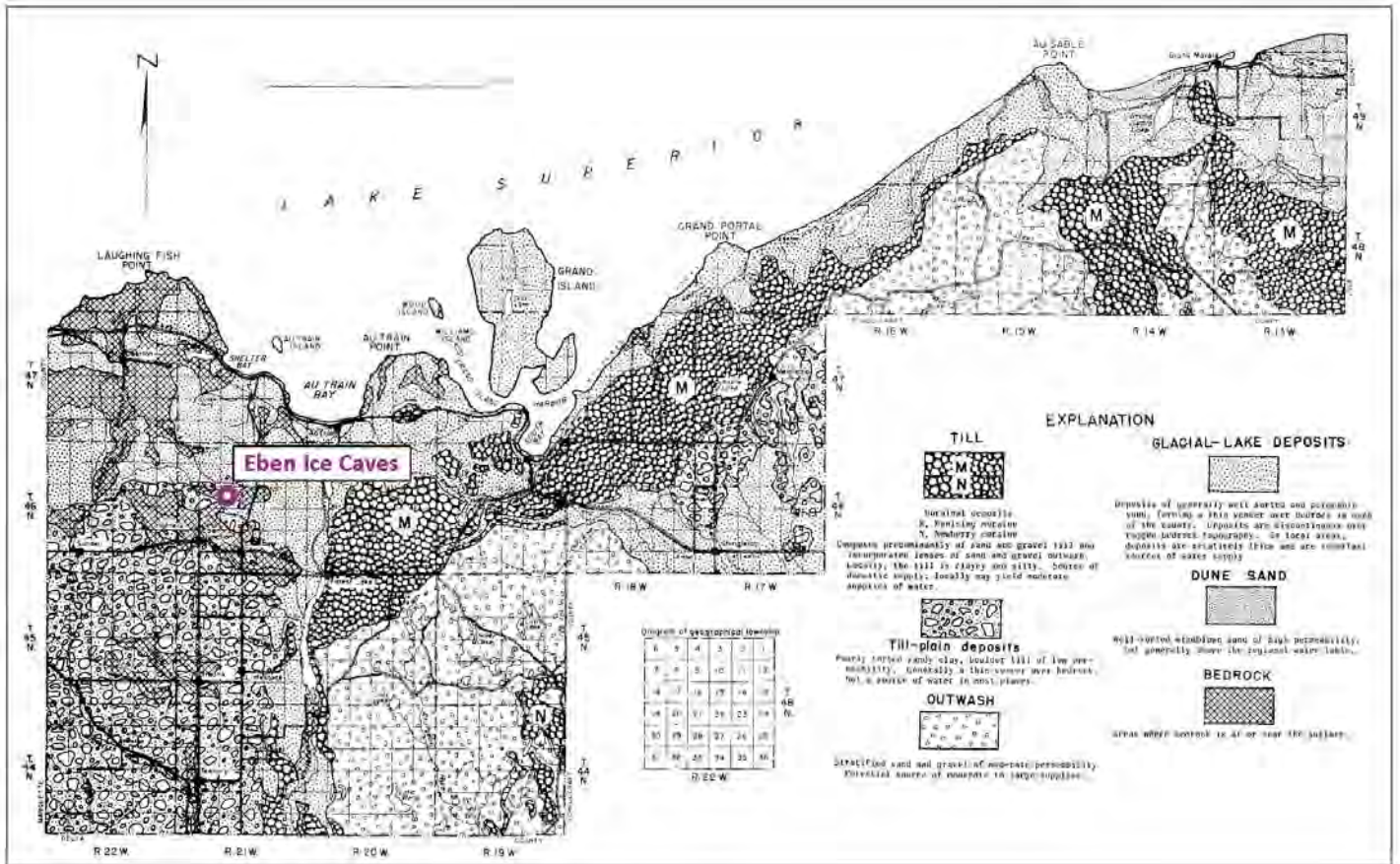


Figure 3: Surficial Geology. Source: Modified from Vanlier, 1963.

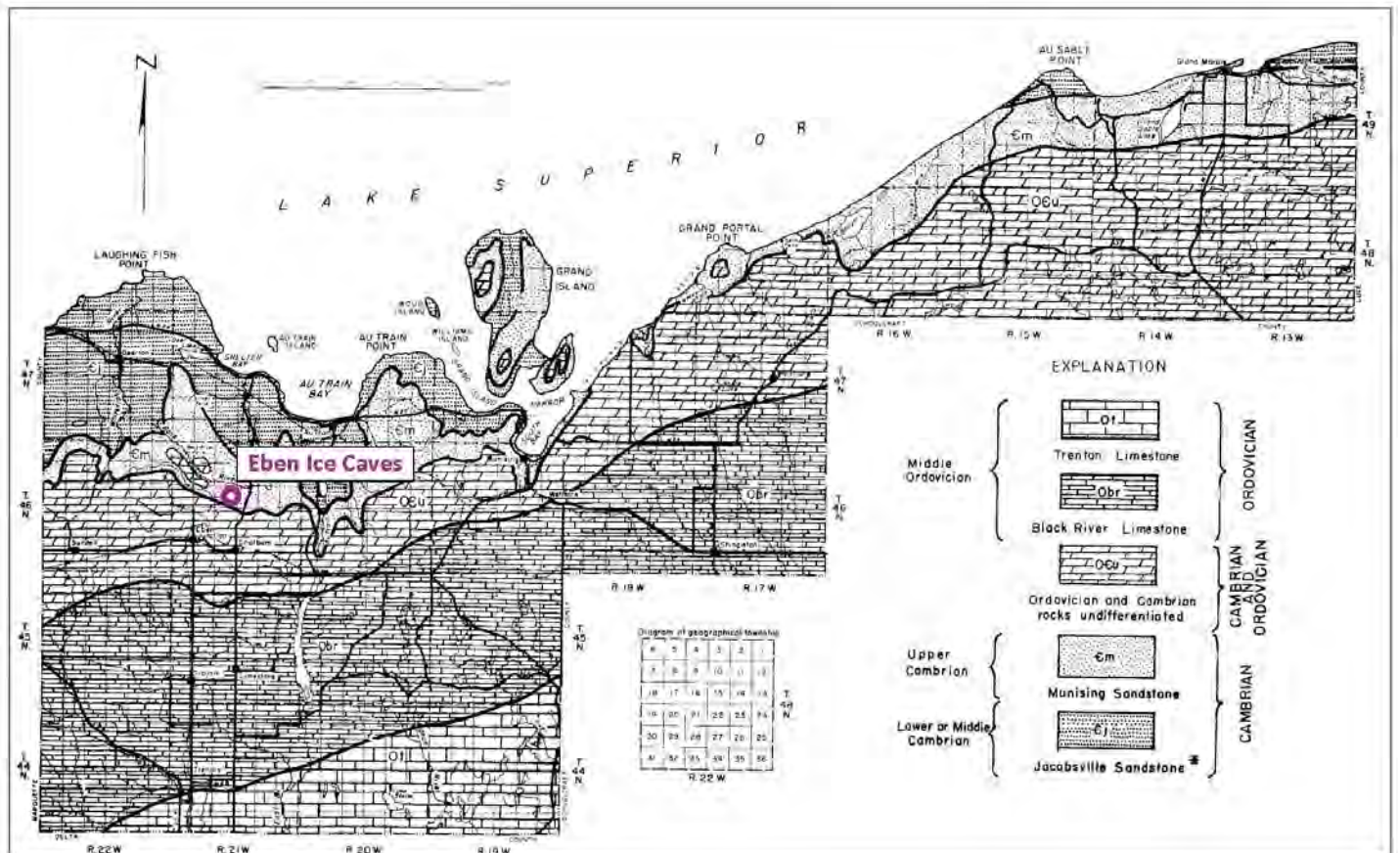


Figure 4: Bedrock Geology. Source: Modified from Vanlier, 1963.

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Figure 5: Panorama View of the East Side of the Ice Caves. Photo by Dave Adler (Feb, 27, 2021).



Figure 8: Ice Formations in the Roof the Munising Sandstone Recess Cave. Photo by Dave Adler (Feb, 27, 2021).

the Munising Sandstone bedrock. Based on observations made during the field trip, it appears that the ice for-

mations develop primarily by infiltration of water into and through the Munising Formation sandstone.



Figure 6: Panorama View of the West Side of the Ice Caves. Photo by Dave Adler (Feb, 27, 2021).



Figure 7: Frozen Waterfall. Photo by Dave Adler (Feb, 27, 2021).



Figure 9: Green Tinted Ice Stalactite. Photo by Dave Adler (Feb, 27, 2021).

It is presumed that the water infiltrates via the inherent primary porosity of the bedrock and along secondary porosity discontinuities in the rock mass, namely high angle fractures and the near horizontal sedimentary bedding planes. The ice formations observed in the photos of Figures 10 and 11 show ice that has infiltrated laterally via bedding plane discontinuities in the sandstone along the

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Figure 10: Ice Emanating from Sandstone Bedding Planes on the Back Wall of the Recess Cave. Photo by Dave Adler (Feb, 27, 2021).

back (south) wall of the recess cave. Figure 8 is a good illustration of ice formed by vertical infiltration of water through the sandstone that forms the roof of the recess cave.

Other possible mechanisms for ice formation include: 1) runoff of surface water over the rim of the canyon wall; and 2) infiltration of shallow groundwater from the soil/bedrock interface of the overlying canyon rim. Although there are no named waterfalls at the location of the Eben Ice Caves, at least not according to published waterfall guidebooks (Penrose, 1993; Stagg, 2016), the feature in the center of the photo in Figure 7 has the unmistakable look of a frozen waterfall.



Figure 11: Ice Emanating from Sandstone Bedding Planes on the Back Wall of the Recess Cave. Photo by Dave Adler (Feb, 27, 2021).

There are other recess caves in various stages of development that can be observed in the sandstone bedrock of the south wall of Silver Creek Canyon. Approximately $\frac{1}{4}$ mile to the east of the main ice cave is a less well-formed recess cave developing in the south wall of Silver Creek Canyon. This feature can be seen in the photo in Figure 13. Here the recess cave and associated ice formations have not reached the development stage of the main ice cave area. It's interesting to observe the



Figure 12: Michigan Tech Student Chapter Members Enjoying the Outdoors in Winter at the Eben Ice Caves. Photo by Dave Adler (Feb, 27, 2021).

different stages of recess cave development and the contrasting development of the associated ice formations.



Figure 13: Recess/Ice Cave Forming in the Munising Sandstone along the South Rim of Silver Creek Canyon. Photo by Dave Adler (Feb, 27, 2021).

References

- Penrose, L.T., B.T., and R., 1988, A Guide to 199 Waterfalls in Michigan, Friede Publications, Davison, Michigan, Fifth Printing, September 1993.
- Stagg, P., 2016, Waterfalls of Michigan, Book 1 East, MI Falls Publishing, Cadillac, Michigan.
- Vanlier, K.E., 1963, Reconnaissance of the Ground-Water Resources of Alger County, Michigan, Michigan Department of Conservation Geological Survey Division Water Investigation 1.

ASBOG Exam Update

ASBOG adopts Computer Based Testing for FG and PG Exams

Beginning in March 2023, the ASBOG Fundamentals of Geology (FG) and Practice of Geology (PG) Examinations will be given using Computer Based Testing (CBT). All examinees must take the examination at an approved testing facility. Prometric/Iso-Quality Testing (IQT) has multiple testing centers throughout the state, which should make taking ASBOG examinations more convenient.

Central Michigan University will continue to qualify candidates to take the FG examination, which will continue to be offered during the third Friday in March and the first Friday in October each year. The next scheduled examination date is Friday, March 17, 2023. CMU does

not qualify candidates for the PG examination. Anyone wishing to take the PG will need to register with one of the ASBOG member state boards.

There are three fees for taking the FG examination: \$50 CMU administration fee, \$200 ASBOG examination fee, and \$75 Prometric testing center seat fee. For March examinations, the deadline to apply through CMU is January 31st. For October, the deadline to apply through CMU is August 15th.

Complete information on applying to take the FG exam is available at se.cmich.edu/asbog. Useful information to help prepare for the FG Exam can be found in the ASBOG Candidate Handbook, which is accessible on the ASBOG website.

Member Input Sought

The Section Executive Committee is seeking input from members on a variety of topics. Do you have any suggestions regarding speakers/presentation topics that you would like to hear? What about field trips or other events? Some place you'd like to see us go, or something you think the membership would enjoy doing?

Then make your voice heard; please send your suggestions to one of the members of the Executive Committee; any of the seven members would be glad to hear from you. AIPG is your organization. Please help keep it relevant and interesting for all by participating.



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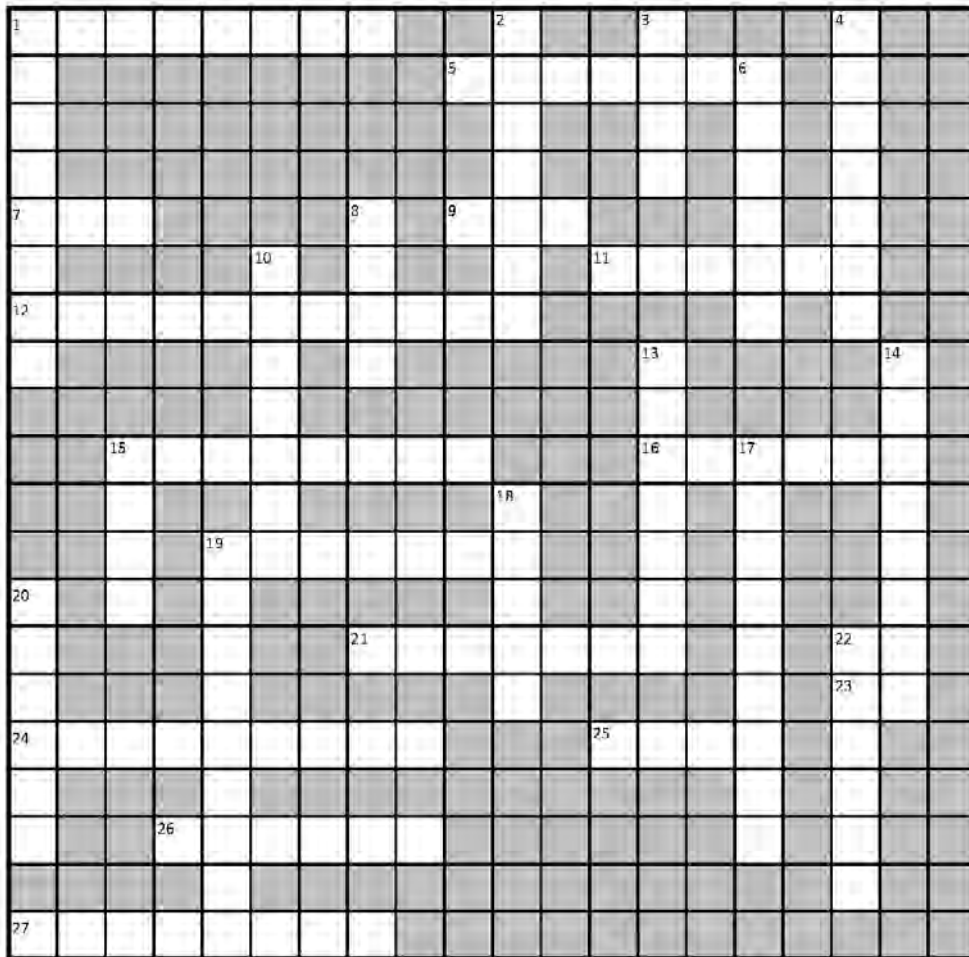
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Geology Crossword #12



Across

- 1. World's tallest mountain
- 5. Bedding component
- 7. Fertile volcanic soil
- 9. Hazy air pollution
- 11. Not sedentary
- 12. Largest known volcano
- 15. Destroyed Pompeii
- 16. Airfall material
- 19. Volcanic collapse crater
- 21. Sleeping
- 22. ___ Fish!
- 23. Blocky type lava
- 24. A combination like bourbon and beans
- 25. A brand of soap
- 26. A piece of partly burned wood or coal
- 27. Ropy type lava

Down

- 1. Largest Hawaiian volcano
- 2. Thick like honey
- 3. Not just for ice cream
- 4. Built of droplets
- 6. Reach the top
- 8. Long pass in football
- 10. Active Hawaiian vent
- 13. Dead, like the mastodon
- 14. Famous 1883 eruption
- 15. Surficial opening for lava
- 17. Fine glass-like strands
- 18. Subsurface molten rock
- 19. Mixed type substance
- 20. Medieval protective gear
- 22. Usually sulfurous

*The solution to this geology crossword will be included in the next edition of *Geologically Speaking*.

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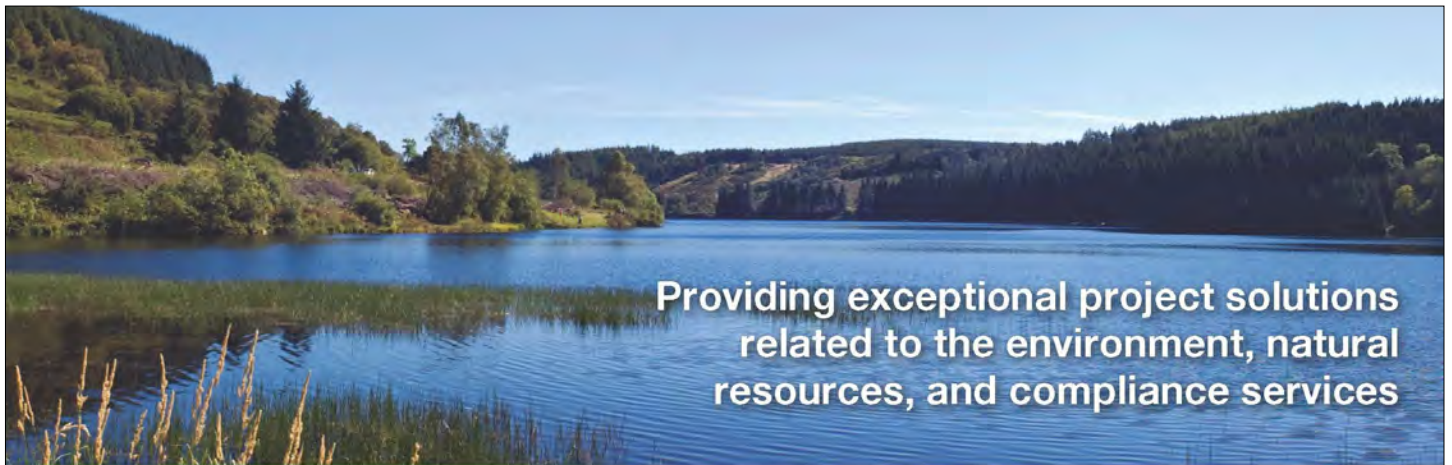
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The Michigan Section of the American Institute of Professional Geologists (AIPG) is committed to supporting undergraduate scholarships and has established the Andrew Mazola Memorial Scholarship to support undergraduate students majoring in geology with college education costs while encouraging student participation in AIPG.

Application Deadline and Award Date

Completed applications must be received by June 1, 2023. The scholarship awardee will be notified no later than June 30, 2023. The presentation of the scholarship shall be made to the student at the next scheduled Michigan Section meeting; the student awarded the scholarship is expected to attend the meeting.

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Application Process

1. Submit a cover letter introducing yourself and tell us why you want to be a geologist.
2. Submit a copy of your transcript (unofficial is acceptable) as documentation that you are a current student, and documentation indicating you have declared a major in geology/geoscience.
3. Submit a letter of recommendation from a geology/geoscience professor that provides an emphasis on your performance and activities in the classroom, in the department, and your character in how you work and help other students.

The application packet should be submitted to:

Attn: MI-AIPG Scholarship Committee Chair
Mr. Timothy B. Woodburne, CPG
Prein & Newhof
3355 Evergreen Drive, NE
Grand Rapids, MI 49525
e-mail: twoodburne@preinnewhof.com

Questions? Please contact Tim Woodburne at (616) 364-8491 or via e-mail.

19th Annual AIPG Michigan Section Golf Outing Tuesday September 12, 2023

The 19th Annual AIPG Michigan Section Golf Outing promises to be another successful event. Proceeds generated from the outing benefit the AIPG K-12 Education Grant fund, which provides thousands of dollars to a variety of worthy projects every year. Your generosity has been and will continue to be the key to enabling organizations and schools to provide meaningful educational programs and activities in the Geosciences.

This event also offers our sponsors exposure to many of the most influential professionals in our industry. **Registration will be open on January 25, 2023.**

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Registration Includes: Continental Breakfast, green fees, range balls, lunch at turn, networking opportunities, and dinner. Also includes: 50-50 drawing, raffle prize baskets, and Grand Prize raffles along with other prizes including, Putt-4 Dough for \$2,500, men's and women's Longest Drive and Closest-to-Pin contests, and goodie bags for all participants!

19th Annual AIPG Michigan Section Golf Outing

Tuesday September 12, 2023

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Goodie Bag Sponsor - Give-away items for 100 or more golfers (open and encouraged for all sponsors!)