

Geologically Speaking

Michigan Section AIPG Publication

Inside This Issue:

**Using Satellite Nighttime Imagery to Measure Hurricane
Katrina's Impact on New Orleans**

MSU's Earth and Environmental Science Symposium

EMU Activities

Regulatory Roundup



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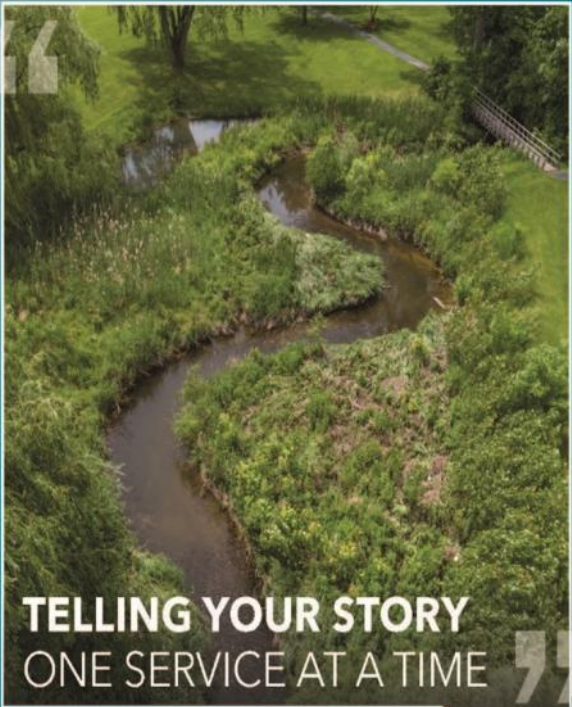


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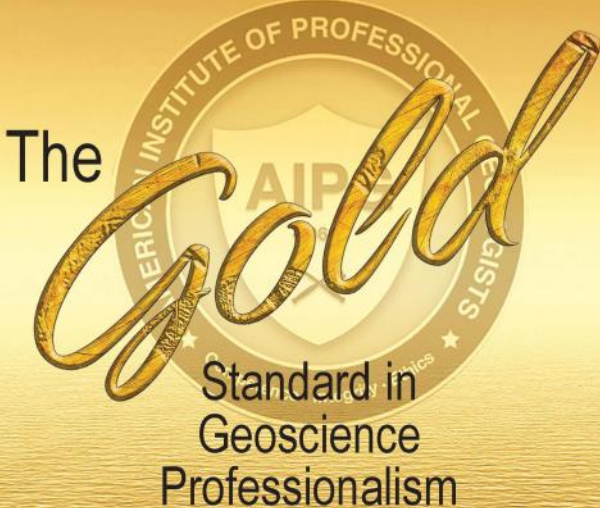
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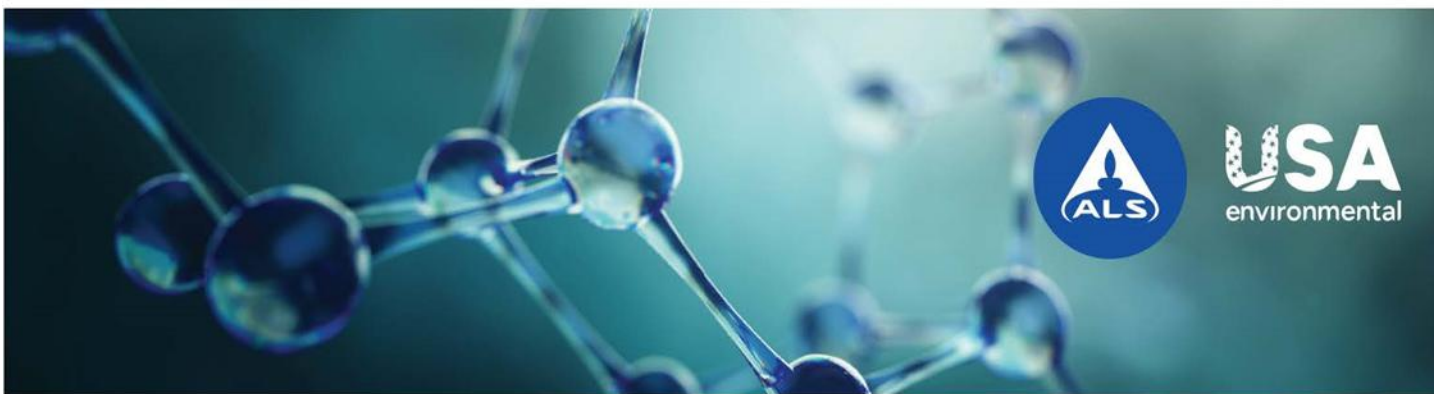
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Front Cover: Laughing Whitefish Falls in Alger County. The falls have numerous cairns on them from individuals who jumped the fence on the viewing platform. The rock consists of limey sandstone and dolomite of the Munising Formation. Photograph credit: Sara Pearson, August 2020.



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Geology Crossword #24 Solution

A	L	U	M	I	N	U	M		C							U			
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U		A					T	U	N	G	S	T	E	N					U
M		D					M							T	A	N	T	A	L

Across

1. Lightweight, metallic element
5. Policeman, slang
9. Used in flat panels and touchscreens
10. Component of a lead pencil
11. Corrosion protectant coating
12. Five cents
14. Used in electronics, antibacterial tools
17. Aerospace, auto, electronics alloy
20. Not a moron or a bosun
21. Not a famous German battleship
25. A famous valley in California
27. Used in semiconductors
28. Not something you lick with
31. Used in electrical parts of high temps

Down

1. Not a payment to a divorced spouse
2. Not a male laxative
3. Used in extreme temp. alloys
4. A nuclear fuel
6. Used in most fertilizers
7. Used in nuclear and aerospace applications
8. Old cans
13. Needed for stainless steel
15. Long dash
16. Egyptian sun god
18. Used in fiber optics, night vision
19. Not the good samaritan
22. Used in high-temp materials
23. Not one that repairs flutes
24. Used in atomic clocks for GPS
26. A fatal weight
29. ____, go home!
30. Positive ion of halite



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From the President's Desk

The Importance of Geology in Michigan

Geology is the story of Earth written in rock, soil, and water—and in Michigan, that story shapes everyday life in ways many people don't notice. From the Great Lakes shorelines and sandy dunes to copper country bedrock and fertile glacial soils, Michigan's landscapes and resources reflect a long history of ancient seas, tectonic change, and repeated ice ages. Understanding that history is more than academic: geology influences Michigan's economy, water supply, infrastructure, and environmental choices. Paying attention to what lies beneath our feet helps communities plan wisely, protect natural resources, and appreciate the distinctive places that make the state unique.

Michigan's geology also underpins key industries by concentrating valuable resources. The state is famous for native copper and iron mining in the Upper Peninsula, where ore deposits are linked to ancient volcanic rocks and long geologic processes of heat, pressure, and fluid movement. In the Lower Peninsula, sedimentary rocks provide resources such as limestone for cement and aggregate, gypsum for wallboard and plaster, and salt extracted from evaporite layers. Beyond solid minerals, the same sedimentary basin setting has supported oil and natural gas production, as porous rock layers can trap hydrocarbons beneath impermeable seals. Today, resource extraction is closely regulated, but the principle remains: geology determines where resources exist, how they can be accessed, and what environmental safeguards are needed to reduce impacts on land and water.

Water is Michigan's defining resource, and geology plays a central role in how water moves, is stored, and can become contaminated. Many communities rely on groundwater from wells, which draw water from aquifers made of sand and gravel or permeable bedrock. Mapping local geology helps identify wellhead protection areas, guides safe placement of septic systems, and supports decisions about stormwater management. It also informs efforts to restore and protect streams, wetlands, and nearshore environments that depend on groundwater inputs.

Geology is equally important for public safety and infrastructure. Michigan is not known for major earthquakes or volcanoes, but it does face geologic and geomorphic hazards. Along the Great Lakes, waves, currents, and changing lake levels can drive shoreline erosion and bluff instability, threatening homes, roads, and utilities. In parts of the state where limestone and other soluble rocks occur, groundwater can dissolve bedrock and create sinkholes or subsidence features. Steep dunes and bluffs can slump when saturated, and poorly compacted or organic-rich soils can cause uneven settling beneath buildings. Engineers and planners use geologic and soil information to design foundations, choose road base materials, manage erosion, and reduce landslide and sinkhole risks. In short, geology supports smarter construction and lowers

long-term maintenance costs.

Michigan's geologic features are also a major part of its identity and tourism economy. The state's dunes, cliffs, waterfalls, agate beaches, and rocky Lake Superior shorelines attract visitors and support outdoor recreation businesses. Places such as Pictured Rocks, Sleeping Bear Dunes, Tahquamenon Falls, and the Keweenaw Peninsula are popular not only because they are beautiful, but because their landscapes reveal clear geologic processes—layered sedimentary rocks, glacial shaping, and the ongoing work of wind and water. Geology education strengthens this connection by helping students and residents interpret the landscape and understand why certain regions look the way they do. That awareness can encourage stewardship, whether it involves protecting sensitive dune systems, limiting shoreline armoring in high-erosion areas, or supporting responsible mining and reclamation practices.

Ultimately, geology matters in Michigan because it connects the past to the choices we make today. The state's rocks and sediments control the distribution of natural resources, the reliability of groundwater, the stability of shorelines, and the character of landscapes that support recreation and local economies. When citizens, educators, and decision-makers understand Michigan's geologic foundation, they are better equipped to plan land use, protect water quality, and balance development with conservation. In a state defined by water and shaped by ice, geology is not just a background science—it is a practical tool for building resilient communities and preserving Michigan's natural heritage for future generations.

As the current President of the Michigan Section of AIPG, I am proud to be supporting the geosciences in Michigan at a time when the importance of geology in Michigan is not valued as much as it has been in the past. As professional geologists, we all need to be engaged and encourage the next generation of geoscientists and push for increased funding by both state and federal governments.

Jason Lagowski

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Secretary's Report

The AIPG Michigan Section Executive Committee has met three times, in March, April, and May, since the last issue of *Geologically Speaking*.

In March, the Executive Committee discussed AIPG student chapter requirements for spring articles and annual reports, which are necessary for Chapter of the Year eligibility. Updates were provided on Michigan State University's chapter status and ongoing coordination for the Early Career Professional (ECP) transition of Karlee Foster. The Treasurer reported progress on transferring the RBC investment account to Mercer and noted that accounts were up to date. The committee also discussed development of a Treasury/Finance Committee to provide long-term oversight of the investment account. Additional discussions included planning for upcoming professional development meetings, scholarship application promotion for the Andrew Mozola Scholarship, and website updates including student chapter registration policies and scholarship information.

In April, the Executive Committee reviewed student chapter funding eligibility and requirements, confirming that several student chapters met submission criteria for funding distribution by the Section. The committee discussed timing for disbursement of funds and coordination of communication with student chapters. Updates were also pro-

vided on the upcoming Environmental Risk Management Workshop for June 2026 and planning efforts for future field trips were mentioned. The Treasurer reported that accounts were in good standing. Additional discussion included formation of the Investment Account Committee, planning for upcoming events, and consideration of future engagement opportunities such as networking events and joint meetings.

In May, the Executive Committee continued coordination with student chapters regarding article submissions, annual reports, and election results, as well as finalizing updates to student chapter guidance documents. Funding distributions to eligible student chapters were confirmed, and recognition of Student Chapter of the Year was noted for Eastern Michigan University and Western Michigan University. The Treasurer reported that student chapter funding checks had cleared up and that the investment account balance had increased. The committee also reviewed recent participation at AIPG professional development events, noted the success of the Michigan Earth Science Teachers Association (MESTA) workshop in Alpena on Saturday, May 2, and discussed future meeting locations and field trip opportunities. Additional actions included approval to waive section dues for honorary members and continued work on the Investment Account Committee.

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Coming Events

August 1, 2026: Ishpeming Gem & Mineral Show. Ishpeming Elks Club, 597 Lake Shore Dr., Ishpeming.

August 5, 2026: Quincy Mine Hoist Rock Swap. Held at the Quincy Mine Hoist at 49750 US Hwy 41 in Hancock from 10 am to 6 pm. Additional details at: <https://quincymine.com/>.

August 7-9, 2026: Copper Country Rock and Mineral Show. Held at the Hancock Middle School at 501 Campus Drive off Highway 41 in Hancock.

August 29-September 2, 2026: AIPG Annual Meeting, Duluth, Minnesota. Details and registration information are on the AIPG national website.

October 9-11: Greater Detroit Gem, Mineral & Fossil Show. Held at the Macomb Community College Sports & Expo Center in Warren. The 80th anniversary theme is "Quest for Quartz" and features dozens of dealers, panning for gold, and geode cracking.

October 16-18, 2026: Central Michgian Lapidary & Mineral Society Show. Held at the Ingham County Fair Grounds (Main Arena, 700 E. Ash St., Mason, MI). This event offers wall-to-wall vendors, silent auctions, kids' crafts, and a rock shop.

December 3, 2026: Michigan Section AIPG Annual Meet-

ing, to be held at Weber's Inn, Ann Arbor. Details forthcoming.

September 25-28, 2027: AIPG Annual Meeting, Salt Lake City, Utah. Details and registration information forthcoming. This meeting will be co-chaired by Michigan's own Sara Pearson! Look for additional updates on this event!



Using Satellite Nighttime Imagery to Measure Hurricane Katrina's Impact on New Orleans

By Sarah Woodworth, SA-12942

Hurricane Katrina made landfall on August 29, 2005. It didn't just flood a city; it almost instantly turned off the lights in one of America's most culturally important cities. My final project for a Computational Geoscience course was to use satellite-derived Nighttime Light (NTL) data to figure out how dark it was. I asked a deceptively simple question: what can radiance measured from orbit tell us about a community's collapse and, later, its recovery?

The project was inspired by a growing body of research that uses remote sensing to connect artificial light at night to human activity. Light spills up from where people live, work, and have access to power, and sensors in orbit catch it. On the other hand, when a disaster happens, that signal gets weaker or goes away. After reading a paper on NTL Analysis after the 2010 Haiti Earthquake, I wanted to try to do a similar comparison after Katrina. I was able to map the disaster's spatial footprint and get a rough idea of where recovery was and wasn't happening by comparing Louisiana's annual composite NTL images from 2004 (before Katrina), 2005 (the year of Katrina), and 2006 (one year after the storm).

Data and Methods

The study used the CCNL (Consistent Calibration Nighttime Light) annual composite GeoTIFF rasters that were clipped to the state of Louisiana. In $\text{nW cm}^{-2} \text{sr}^{-1}$ units, these products show the average radiance that satellite sensors picked up over the course of each calendar year. All processing was performed in Python using the rasterio, geopandas, NumPy, and matplotlib libraries inside a Google Colab environment, making the workflow reproducible and shareable without specialized desktop GIS software. However, the clipping was very necessary since the files would not run in Google Colab due to the size if they were not.

The analysis proceeded in four steps. First, the full Louisiana extent of all three years was visualized side by side to capture the statewide pattern of light change. Second, the study area was zoomed into the Lower Ninth Ward and New Orleans East corridor, the neighborhoods most severely flooded and historically the slowest to recover, using a defined bounding box. Third, difference rasters were computed by subtracting the 2004 baseline from both the 2005 and 2006 layers, producing change maps that highlight areas of light loss (shown in red on a diverging color scale) versus light gain (shown in blue). Lastly, summary statistics including mean radiance, median radiance, and the percentage of "dark" pixels below a

threshold of $0.5 \text{ nW cm}^{-2} \text{sr}^{-1}$ were calculated for each time period and plotted as a bar chart.

One important caveat shapes interpretation of the 2005 layer: the CCNL products are annual composites. Due to hurricane Katrina striking in late August, the 2005 composite blends eight months of pre-storm radiance (January through August) with the catastrophic post-storm period (September through December). The 2005 image therefore underestimates the immediate magnitude of darkness following the storm. Despite this limitation, the results are still rather staggering, and the 2006 layer provides a cleaner window into the state of recovery roughly one year after the event.

Results

At the statewide scale, the comparison of 2004, 2005, and 2006 composite images makes the geography of the disaster immediately legible. The greater New Orleans metro, which appears as a bright cluster of radiance in 2004, dims noticeably in the Katrina-year composite and remains suppressed, though less severely, in 2006. Across other parts of Louisiana, NTL values remain relatively stable across all three years, confirming that the observed changes are spatially concentrated in the areas most affected by the storm and its aftermath rather than reflecting statewide trends or instrument artifacts.

The summary statistics reinforce this narrative quantitatively. Mean radiance in the zoom area drops measurably from the 2004 baseline to the 2005 Katrina-year composite, and while the 2006 mean shows partial recovery, it does not return to pre-storm levels within this one-year window. The percentage of dark pixels increased substantially in 2005 and remained elevated in 2006, providing a direct measure of the spatial extent of depopulation and power loss in the affected area.

Conclusions and Broader Significance

This project shows that satellite nighttime light data is a strong method to track the effects of a natural disaster on people at different levels of detail. By combining open remote sensing products with Python-based geospatial tools, it is possible to reconstruct the geography of catastrophe and recovery without relying on ground surveys or proprietary datasets.

The emphasis on the Lower Ninth Ward underscores an aspect of the analysis that transcends the technical. NTL data can help people understand how disaster re-

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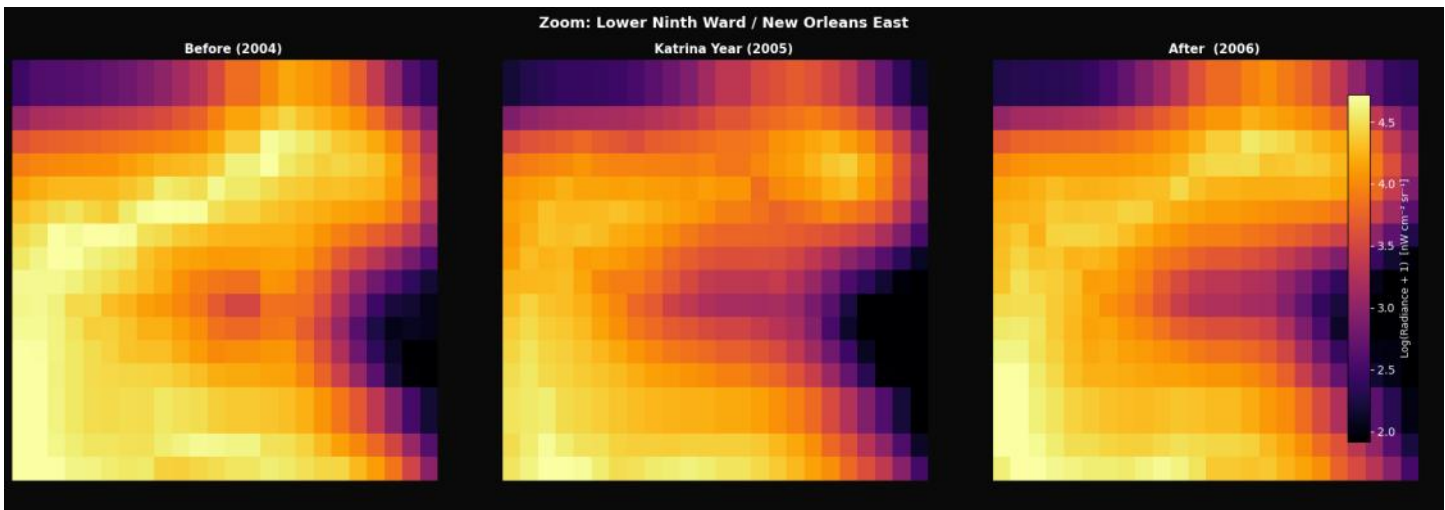


Photo 1: Nighttime light comparison map of the Lower Ninth Ward / New Orleans East: Before (2004), Katrina Year (2005), and After (2006). Generated from CCNL satellite raster data. Image credit: Sarah Woodworth, Michigan Tech University Computational Geoscience course project, 2026.

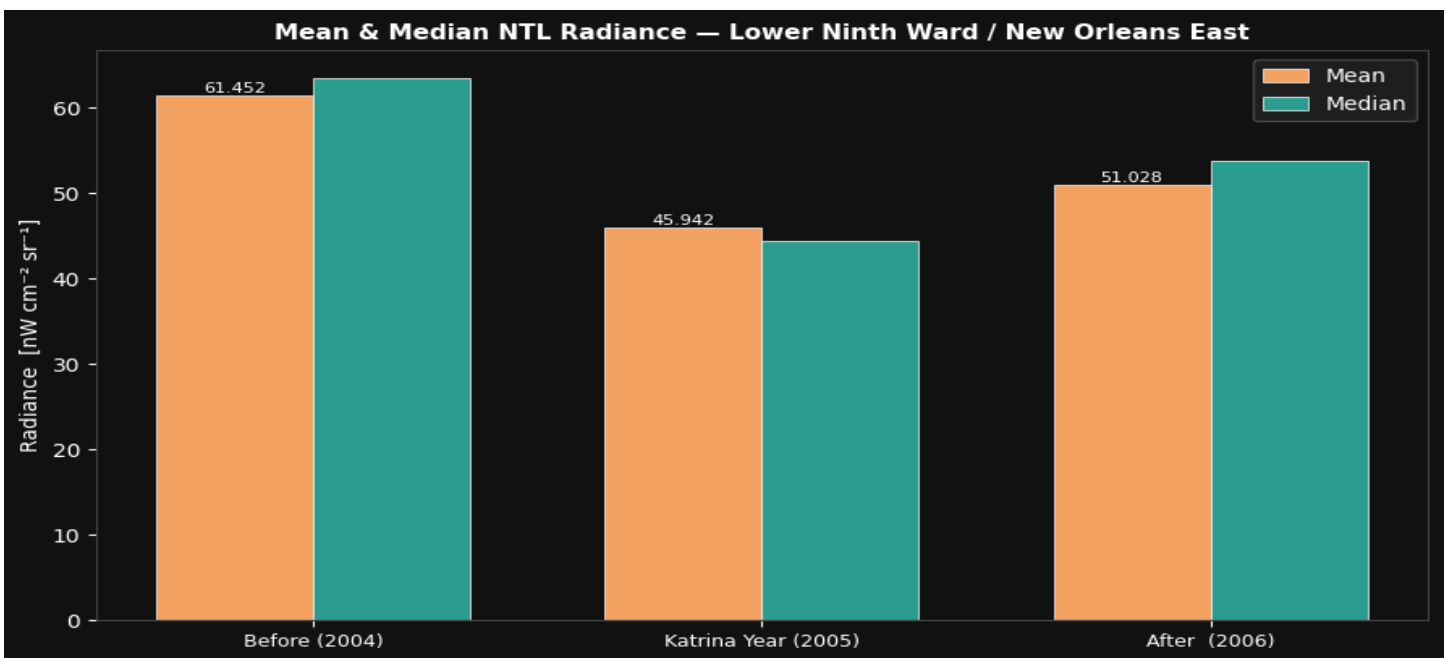


Photo 2: Nighttime light comparison statistics. Generated from CCNL satellite raster data. Image credit: Sarah Woodworth, Michigan Tech University Computational Geoscience course project, 2026.

sponse can be unfair in terms of space. The areas that stay dark the longest are not randomly spread out; they are in communities that have fewer resources to rebuild, less political visibility, and longer histories of disinvestment. Remote sensing cannot elucidate those patterns independently; however, it can delineate them with precision and impartiality, facilitating further inquiry.

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5. Python Geospatial Tools

rasterio: <https://rasterio.readthedocs.io> | GeoPandas: <https://geopandas.org> | NumPy: <https://numpy.org> | matplotlib: <https://matplotlib.org>.



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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...

Each year, AIPG holds an Annual National Meeting. This meeting is held each year in different locations around the country, and is typically hosted by the local AIPG section within whose jurisdiction the meeting is being held in the fall, usually in September or October.

This year's meeting, the 63rd in AIPG's history, will be held in Duluth, Minnesota. This will be the first time since 2006 that the Annual Meeting has been held in Minnesota.

The annual meetings are when the National Executive Committee conducts institute business, and all members are welcome and encouraged to participate or at least attend. Members can bring information and request that certain items can be considered by the Executive Committee and be included as new business in the agenda. And recent technological improvements have made it possible for the business meetings to be held as hybrid events so that those who are unable to attend in person can still attend virtually.

In addition to the current Executive Committee meeting, a second, much shorter Executive Committee meeting for the incoming committee is held, and meetings are also held for the Advisory Board—both current and incoming. It is during the incoming Advisory Board meeting

that an election is held by the Advisory Board delegates to elect the four individuals who will represent the Sections as Advisory Board representatives on the National Executive Committee.

Besides the business meetings, which are held on Saturday, an event is held concurrently for students, and includes topics such as resume building, career planning, and hearing from both Early Career Professionals and long time members to provide information to the students.

One of the other events include a silent auction, which is generally held during the Icebreaker event on Sunday evening following field trips. The silent auction is held on behalf of the Foundation of AIPG and raises funds it uses for grants for a variety of programs. Items auctioned in the past have included everything from small minerals, books, to museum quality specimens to a week long stay at one of our members' ranch!

One or two days of technical presentations are offered on a variety of subjects. This is an opportunity to hear what is new in the field and also to obtain continuing education units. This may be an opportunity to obtain all of your required CEUs all at once!

And of course, there are several field trips to local areas of interest, which often include mines or quarries. Samples are often to be had from some of these trips—the only caveat being you have to carry them back to the bus!

If you haven't attended an annual meeting, I hope you will consider doing so. There are many benefits to be had!

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 2026-27 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 Kayla Casey 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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Where in Michigan?

The October 2025 edition of *Geologically Speaking* featured a photograph of Munising Falls. The rock at the falls is the Cambrian aged Miner's Castle Member of the Munising Formation and the Au Train Formation, which is the cap rock at the falls. **Mark Petrie** correctly identified the photograph and gets his choice of swag for the correct answer.

This edition of *Geologically Speaking* features a new image at right - not the photo on the cover page. The first person to correctly identify the location, formation, and formation 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 the various 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.



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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 or because your IT group may classify it as junk or a bulk sending.

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 National Headquarters at aipg@aipg.org when you update your contact information. Thank you!



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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.

Support our Sponsors!

The Section Executive Committee would like to remind its members to support the companies advertising in this publication. Consider working with these companies, and when you speak with their representatives, let them know that you saw their ad in the Michigan Section AIPG publication *Geologically Speaking*.

AIPG Headquarters has a New Address!

On May 10, 2025, AIPG headquarters moved to a new location. The new address is:

10701 Melody Drive, Suite 630
Northglenn, Colorado 80234

The phone numbers and email addresses for all office staff remain the same.

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.

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. Let me know what you think of the selection below.

AIPG Lunch and Earn webinars: <https://aipg.org/page/Lunch-n-Earn>.

Geology Professor Shawn Willsey YouTube Channel: <https://www.youtube.com/@shawnwillsey>.

The AIPG YouTube Channel: <https://www.youtube.com/channel/UCZJVHi1yAPLJe1AksLOV3pA>.

Michigan Geological Survey (MGS) and resources from the Michigan Geological Repository for Research and Education (MGRRE) YouTube Channel. <https://www.youtube.com/@michigangeologicalsurvey/videos>.

Asteroid Apocalypse Devastates Earth: <https://www.youtube.com/watch?v=c1tvS0fRnvM>.

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.

No entries for the Member's Corner were received for this edition of *Geologically Speaking*.

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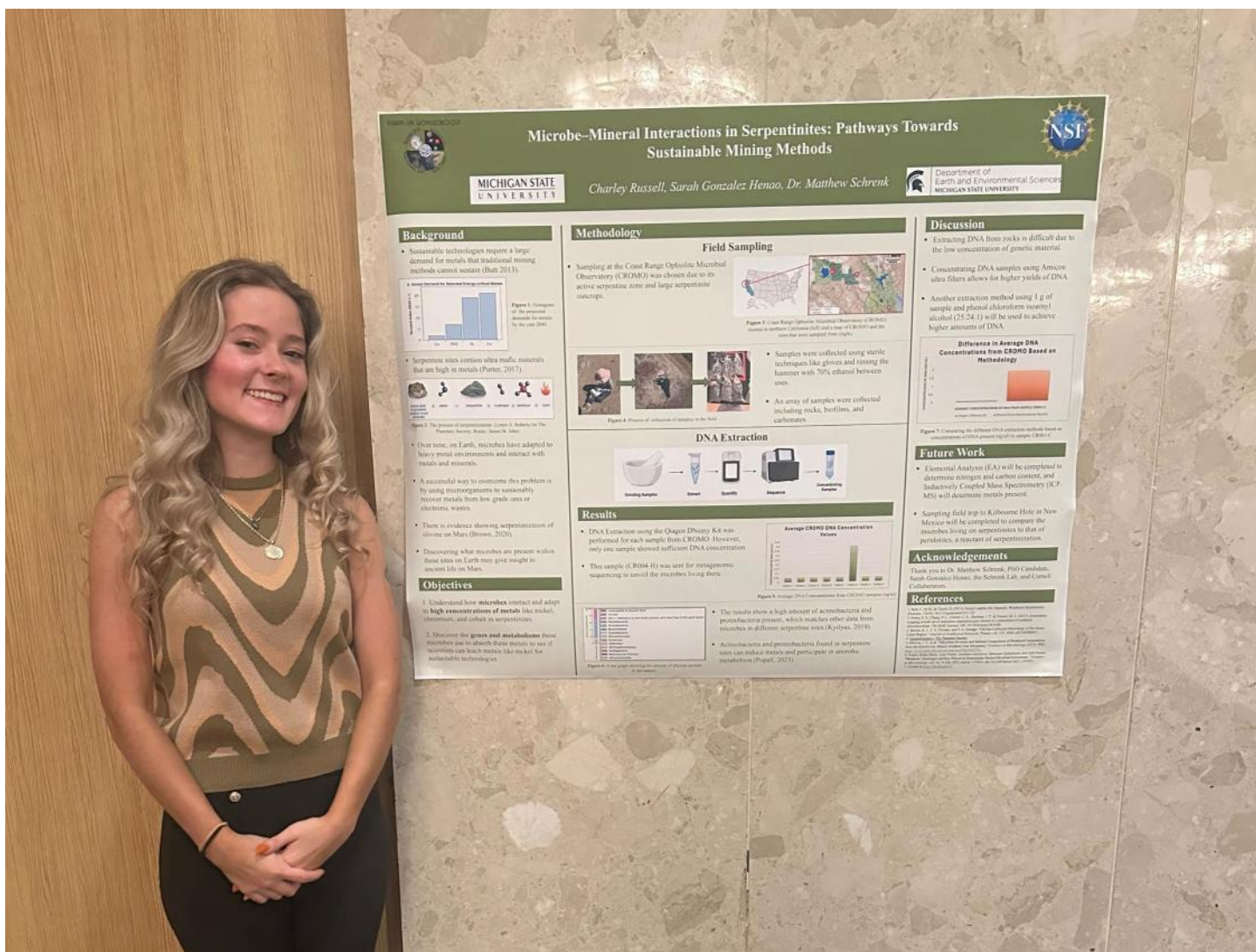
MSU's Earth and Environmental Science Symposium

Charles Bonten, MSU Student Chapter 2027 President

Michigan State University's (MSU) Earth and Environmental Science (EES) department hosts a yearly symposium, the EES symposium, to provide a platform for undergraduate and graduate student researchers to move their work from the lab to a research forum. This event serves as a bridge between academic study and professional application, allowing students to present their findings to faculty and peers in a setting that is professional yet supportive. Because the audience is mainly the EES department, including faculty and fellow students, this event can be less daunting than larger conferences. For many participants, this serves as a critical first step in developing science communication skills, as they must learn to explain complex data to those outside their immediate research groups.

The symposium can be an especially valuable experience for undergraduate students and AIPG student chapter members because it gives students a way to develop presentation skills before attending a larger regional or national conference. Standing next to a poster to defend one's findings to faculty and peers provides a unique challenge that goes beyond standard coursework, allowing students to practice articulating their work. Science communication is difficult, and oftentimes explaining complex research is difficult for people who don't study the material directly. The EES symposium provides students with a chance to practice some of these science communication skills.

The 2026 EES Symposium highlighted how members



Charley Russell presenting her research presentation at the EES Symposium. Photograph courtesy of Charles Bonten.

of our MSU American Institute of Professional Geologists (AIPG) chapter are moving their work from the lab to a public stage. The student member involvement highlights how AIPG members are active in undergraduate research and involved in department activities. Our chapter prioritizes this involvement because working under faculty guidance helps students build a professional foundation that goes beyond standard coursework. The wide variety of research presented by our members shows the real-world scope of the geosciences, with projects focusing on everything from renewable energy footprints to silicate weathering. Some of the AIPG members research projects that were presented at the symposium will be highlighted below.

Charles Bonten, our current AIPG president presented his research at this symposium, discussing the possible acoustic footprints of solar photovoltaic facilities across Michigan. This project examines the sounds that are produced by solar infrastructure, specifically focusing on what sound inverters generate. His research discussed how Solar photovoltaics are critical for reducing our dependency on finite energy resources. However, solar installations transform the land in ways that can affect local communities, causing pushback to solar PV deployment. For example, noise pollution is often cited as a source for local opposition in Michigan. Despite this concern, the acoustic signatures of solar PV facilities have not been widely studied or reported. His project aims to measure and provide some of the first acoustic data describing solar PV "soundscapes". His project incorporates a mix of data collection methods, including aerial imagery digitization, as well as on site field data collection at a local solar park. These data could help inform future studies and ultimately the design of solar facilities to minimize acoustic effects.

Mo Shuman, our outgoing AIPG Vice President, investigated extreme pyroxene enrichment in rift-related rocks by tracing the stability field of pyroxene crystals that occur abundantly within his study area. His research focused on the Kalakol flood basalts of southern Kenya, part of the East African Rift System. Using a suite of Python-based tools called PetThermoTools coupled with the MELTS thermodynamic engine. Mo generated phase diagrams and fractionation models to constrain the origin of the abundant clinopyroxene crystals observed in specific stratigraphic intervals. This project integrates whole-rock geochemical data obtained from XRF analyses with petrographic observations to determine the origin of large abundant clinopyroxene crystals within the Kalakol flood basalts.

Charley Russell, our current social media manager also presented her research at the EES symposium. She discussed microbe-mineral interactions in serpentinites for sustainable mining methods. More specifically, her project discusses the challenge of growing eco-conscious technologies that still use unsustainable mining methods. The goal of her project is to explore microbe-mineral interactions and their metabolic processes that they use to cope with high metal concentrations. To achieve her goal, she uses serpentinites from the Coast Range Ophiolite Microbial Observatory (CROMO), which are known for their high metal concentrations. She has extracted DNA from the microbial and mineral samples, completed ele-

mental analysis (EA) to determine nitrogen and carbon content, and plans to send the quantified DNA for metagenomic sequencing. So far, she has identified metal resistant bacteria in her samples as well as high concentrations of chromium and nickel. Her project is relevant because the knowledge obtained from this research will increase the knowledge about microbe-mineral interactions so that biomining can expand and hopefully replace unsustainable metallurgical methods.

Linus Resek, an AIPG student member who presented at the symposium, is investigating atmospheric carbon sequestration through the lens of silicate weathering, a process where carbon dioxide dissolves into rain and reacts with minerals to form stable carbonates. While this chemical reaction is often studied in the controlled environment of a laboratory, Linus is exploring its potential in the natural world. His research takes him to the Keweenaw Peninsula, where he collects sediment from decommissioned copper mines. These sites are filled with basaltic and conglomeratic material that may serve as a reactive source for sequestering carbon. By analyzing the mineral composition of these mine tailings, Linus aims to evaluate whether this "enhanced weathering" can be scaled into an effective method for reducing atmospheric carbon dioxide, potentially turning industrial legacies into environmental solutions.

The EES Symposium serves as a professional venue for students to move their research from lab-based data and research projects into public presentations. Defending a poster to faculty and peers requires an understanding and engagement with the purpose of the work, helping participants develop the science communication skills necessary for graduate studies and professional careers. This event acts as a training ground for larger national conferences, allowing MSU AIPG members to strengthen their geological knowledge while building networks outside of a standard classroom. By showcasing the diverse range of projects led by our members, the symposium highlights the chapter's commitment to professional growth and active involvement in the geoscience community.

Workshop Reminder to all Presenters

For all those who presented technical talks at the 2026 Environmental Risk Management Workshop in Roscommon, Michigan on June 16 & 17, a big thank you!

The Editor would like to encourage you to please consider converting your presentation to a technical article that can be included in an upcoming edition of either *The Professional Geologist* or *Geologically Speaking*. Contact Adam Heft at adam.heft@wsp.com for information or to submit your article. It may be submitted as a standard article or as an article for peer review at the author's discretion.

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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:

Bryce Baar, SA-13292; Alexander Bashaw, SA-12542; Maureen Bellaire, ECP-1200; Carli Best, SA-13291; Emmalynn Boulton, SA-12502; Shannon Brink, ECP-1209; Tori Brown, SA-12774; Hannah Brunton, SA-12531; Abbie Burkman, SA-13375; Gianna Busala, SA-13192; Cal Butts, SA-12546; Rhys Campbell, SA-12693; Gabriel Carcereri, SA-13269; Lucas Carlock, SA-13265; Sienna Cartwright, CPG-12396; Scott Cathey, MEM-3763; Maxwell Copus, SA-12585; John Corkery, MEM-3945; Brett Coulter, CPG-10125; Coreena Crummel, SA-12823; Christopher Cunningham, SA-12766; Matthew D'Adona, CPG-12326; Catherine Densham, SA-13361; Priyanka Dhamala, SA-12815; Erin Dhondt, MEM-3912; Kathleen Dragos, ECP-1276; Nora Duffy, SA-13165; Susannah Duly, CPG-11401; Grace Dykema, SA-13176; Casey Ehlert, MEM-2230; Neve Ellis, SA-13306; Brian Eustice, MEM-3898; Sarah Faldetta, CPG-10647; Helen Foldenauer, SA-12818; Karlee Foster, ECP-1177; Ryan Galdikas, SA-12882; Ethan Gardner, ECP-1204; Molly Gardner, CPG-12105; Matthew Garnett, MEM-3911; Jack Garrison, SA-13379; Hayden Gough, SA-12825; Alexandra Grabowski, SA-12761; Zachary Guikema, ECP-1314; Caleb Gullick, ECP-1333; Jeffrey Guzik, MEM-3878; Ava Haithcock, SA-13177; Ian Halbeisen, MEM-3899; William Hanson, SA-13277; Iain Harrelson, SA-12816; Leslie Hartig, CPG-12275; McKenzie Hatfield, SA-12721; Poppy Hobbs, SA-12760; Eric Hojnacki, MEM-3775; Ian Howe, SA-13211; Spencer Hower, ECP-1194; Cory Hughey, MEM-3887; Linsey Hula, SA-12798; Erin Hunter, SA-13207; Ashley Jones, SA-12819; Samantha Keilman, SA-13288; Zach Kitchens, SA-12554; Audrey Kneal, SA-13378; Grace Lahti, SA-12600; Matt Laird, MEM-3710; Zach Loffer, ECP-1311; Emily Lynch, ECP-1031; Bailey MacGregor, SA-13268; Marlayna MacKay, SA-12824; Madison Magiera, SA-13289; Lillian Majeske, SA-12737; Peter Mastriano, SA-13273; Sara McNett, SA-12635; Ihaja Metz, SA-13153; Nyasha Mhindu, SA-12662; Evan Mikkelsen, ECP-1319; Hannah Monear, MEM-3894; Ben Mperekwa,

SA-12707; Alora Mullins, SA-12758; Evangelia Murgia, Kudakwashe Mutanga, SA-12690; Delaney Novach, SA-12821; Vanessa O'Brien, SA-12375; Mike Osier, MEM-3901; Rebecca Powell, CPG-12400; Patrick Quigley, CPG-12116; Lesa Richardson, CPG-11300; Devon Risacher, SA-12756; Christopher Robinson, SA-12868; Nicole Rockentine, MEM-3877; Claire Rose, MEM-3956; Peter Rose, CPG-12349; Brendan Ryan, ECP-1299; Michael Sandusky, ECP-0783; Devin Sawyer, SA-12616; Ava Schneider, SA-13312; Brett Shoaff, MEM-3719; Trenton Singer, MEM-3413; Erika Sinn, SA-12500; Alexander Smith, SA-12632; Clyde Smith, MEM-3948; Geoffrey Smith, SA-13331; Olivia Smith, ECP-1310; Celia Stevens, SA-13287; Parker Sutton, MEM-3888; Jakob Szilagyi, MEM-3796; Megan Watikunas, MEM-3896; Abby Whitmore, ECP-1286; Kiara Williams, SA-12508; and Coty Withorn, CPG-12341.

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 so that our members can get to know you.



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EMU Activities

EMU's AIPG Student Chapter has had a semester full of events with many great activities for chapter members and other students to engage in. Below are highlights of the semester.



From left to right (standing) Emmalynn Boulton, Josh Dominick, McKenzie Hatfield, Tomas Ridley, Celia Stevens, Madison Magiera, Laila Panzenhagen (back), Brett Bogedain, Samantha Keilman, Alora Mullins, Alex Smith, Alexander Bashaw, Cassidy Douglas, Bee Gryko, Lindsay Timbs, Christopher Gellash, Lily Majeske, Vanessa O'Brien (March 26th, 2026).

WinterFest:

On January 15th, the EMU AIPG Student Chapter participated in an on-campus community event called WinterFest. This event, held in our student center ballroom,



From left to right: Alexander Bashaw, Joshua Dominick, Vanessa O'Brien, Alexander Smith, and McKenzie Hatfield.

gave students the opportunity to interact with Eastern Michigan University's many different clubs and organizations. We had a table with fossils, rock and mineral samples, department information, and club information. We had many people come up and learn more about our chapter, as well as how amazing the earth is!

1st Fish Lake Field Trip:

The EMU AIPG Student Chapter had an awesome weekend trip (Feb 6-8) to the EMU Fish Lake Environmental Education Center in Lapeer, Michigan. We kicked things off Friday night with a group sleepover in the dorms, which was a fun way to hang out and get everyone excited for the weekend. On Saturday, the group spent the day out in the field monitoring well sampling, and exploring the glacial geology of Fish Lake. It was a great chance to get hands-on experience and work together outside the classroom. After a long day, we relaxed with pizza and card games, which made for a fun and laid-back night. Sunday morning, we packed up, cleaned the dorms, and headed out. Overall, it was a great mix of fieldwork and bonding time, and everyone had a really good weekend.



From left to right: Vanessa O'Brien, Lindsay Timbs, Keilee Anderson, Brett Bogedain, Maddie Mageira, Cassidy Douglas, Erin Zakraysek, Celia Stevens, Bee Gryko, Laila Panzenhagen, Alora Mullins, Alex Smith, and Grace Trombley (Feb 7th, 2026).

Ypsi Earth:

On February 22nd, the EMU AIPG Student Chapter hosted our second annual Community Rock ID Event (Ypsi Earth), where we hosted an event that had us educating the Ypsilanti community about geology, spreading aware-

ness about the university geology department and the AIPG student chapter, and identifying rocks. Special guests John Hoskin (Michigan Gem and Mineral Society (MGMS) President) and Sally Hoskin (MGMS Show Chair) set up a display showcasing mineral fluorescence to allow event attendees the opportunity to view minerals in a way many may have not seen before, and to examine their own collections to see if their samples had this property.



From Left to right: Bailey MacGregor, Celia Stevens, Vanessa O'Brien, Josh Dominick, Alex Smith, Alexander Bashaw, Hannah Brunton, Brett Bogedain, Faculty Advisor Dr. Christopher Gellasch, Talla Barker, Dr. Hannah Blatchford. (February 22nd, 2026). Photo taken by Sally Hoskin.

2nd Fish Lake Field Trip:

The group had another great weekend trip (March 13-15) out at the Fish Lake Environmental Education Center. Other AIPG Student Chapters were invited, so we started Friday with another sleepover in the dorms, which was a fun way to catch up, get to know each other, and settle in for the weekend. On Saturday, instead of well sampling, we spent the day exploring the local landscape and playing a bunch of geology themed games, which kept the energy going into the night. On Sunday, we packed up and headed out after a fun and memorable weekend

Jackson Rock Show:

EMU's AIPG Student Chapter attended the Annual Gem and Mineral Show (March 20-22) hosted by the Michigan Gem and Mineral Society. Over the course of the weekend, members were able to connect with show attendees over their shared interests in geology, help identify minerals that attendees brought from home, and answer questions regarding the field of geology, EMU's geology program, and what the Student Chapter does over the course of the year. Club members had a great time hearing stories from alumni, identifying attendee's rocks, and raising money for the club. Student Chapter members

Hannah Brunton and Emmalyn Boulton received the MGMS field experience scholarship, which will help them cover the expenses of field camp.



Chapter members from left to right: Celia Stevens, Alora Mullins, Vanessa O'Brien, Alexander Bashaw (March 20th, 2026).

Undergraduate Symposium:

On March 27th, several chapter officers and student members attended EMU's 46th Annual Undergraduate Symposium to present their various research projects. This event allowed chapter members to showcase the research they have been working on and share their research with fellow students, family, and the community.

- President Alexander Bashaw presented "Using a Cell Phone to Create Rotatable 3D Images of Fossils with Photogrammetry".
- Student Chapter members Brett Bogedain and Gouro Koita presented their research, "Analysis of Dutchess County, New York's Classic Metamorphic Barrovian Sequence".
- Student Chapter member Emmalynn Boulton gave an oral presentation titled "Investigating the Impact of Climate Change on Physical and Chemical Hydrology at Fish Lake".
- Member-at-Large McKenzie Hatfield presented "Identifying the Top of a Moved Glacial Erratic with Schmidt Hammer Rock Hardness Data".
- Vice President Vanessa O'Brien presented "Determining Groundwater Flow Patterns In Glacially-Influenced Wetlands At Fish Lake".
- Student Chapter member Tomas Ridley presented "Erratic Circumference Ratio: A New Metric for Differentiating Moved v. Unmoved Glacial Boulders".

Michigan Geological Survey Core Repository Field Trip:

The EMU AIPG Student Chapter made a trip (April 4th) to The Michigan Geological Repository for Research and Education at Western Michigan University's campus. There, the EMU and WMU AIPG Student Chapter members met at the Rockhound Rock Shop in Galesburg, Michigan. This massive rock shop held many gorgeous pieces and wonderful antiques. From there, the two Student Chapters travelled to the Core Repository, and met



From left to right: Alexander Bashaw (EMU AIPG Student Chapter president), Clara Cronin (EMU AIPG Student Chapter member), Erin Hunter (WMU AIPG Student Chapter president), Grace Dykema (WMU AIPG Student Chapter member). Photo taken by Linda Harrison .

with Linda Harrison (Data Specialist) and Dr. Bill Harrison (Emeritus Researcher), who gave an amazing tour of the facility. In this tour, students were shown spectacular cores, antique oil samples, and thought-provoking posters on the geology of Michigan. Students learned about the phenomenal geological history of Michigan, and gained an appreciation for the wealth of knowledge held in cores and their archives, like The Michigan Geological Repository for Research and Education.

Washtenaw Elementary Science Olympiad (WESO):

EMU AIPG Student members assisted geology and geography department head Dr. Clark and assistant professor Dr. Blatchford in teaching 4th and 5th graders rock identification for the Washtenaw Elementary Science Olympiad (May 9th). At this event, Student Members, alongside professors, taught students from over 30 different elementary schools the basics of rock and mineral identification, what tools are used in identifying rocks and minerals, and the origins for the three rock types. We were glad to give these young students the opportunity to understand and appreciate geology, as well as a chance to practice the hand sample portion of their WESO workshop. Additionally, some of our Student Members will be volunteering for the workshop event, helping faculty members hold the test on May 10th.

Fundraising and General Events:

As the academic year comes to a close, we can look back at our success. This has been a spectacular year for the EMU AIPG Student Chapter. We had multiple merchandising campaigns; through which we have sold club hoodies, t-shirts, and now even stickers. We have also participated in 5 rock shows. Of the 5 total rock shows we will participate in this year, two will have taken place on Eastern Michigan's Campus. This fundraising has been used to let our student members experience wonderful trips, eat good food, and learn more about the world around them. This momentum will not only continue to build, but continue to be used to better our student member's experience.



New EMU AIPG Student Chapter merchandise: Stickers created by Samantha Keilman.



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Regulatory Roundup:

Land, Water, Air & Natural Resources

Legislative, Regulatory, and Policy Updates

Prepared by Sara Pearson, CPG
Director, Michigan Geological Survey

The first half of 2026 has been active for legislative, regulatory, and policy developments that intersect with the geosciences. While not every action will result in immediate changes to professional practice, several have the potential to influence future work involving groundwater, environmental remediation, natural resources, energy, infrastructure, and geologic investigations. Rather than summarize every legislative proposal or regulatory action, this update highlights several developments that are shaping the conversation and are worth following in the months ahead.

What Do This Year's Budget Discussions Mean for Geoscience?

The Legislature has passed Michigan's Fiscal Year 2027 budget, setting funding priorities for state programs in the year ahead. The EGLE budget reflects a mix of continued investments, reductions, and one-time appropriations across programs responsible for environmental protection, water resources, remediation, geologic resources, energy, and infrastructure.

Several areas of the EGLE budget intersect directly with the work of geoscience professionals, including water infrastructure, contaminated site cleanup and redevelopment, water quality and groundwater protection, geologic resource management, oil and gas programs, mining programs, and data systems that support environmental and resource decisions. These programs affect the work of state agencies, local governments, consultants, researchers, utilities, and industry across Michigan.

Funding for the Michigan Geological Survey was included as one-time funding rather than ongoing operational support. This distinction matters because statewide geologic mapping, groundwater characterization, subsurface data preservation, federal grant matching, and multi-year research partnerships are continuing responsibilities that require long-term capacity.

The final budget is a reminder that funding decisions

affect more than individual programs. They influence Michigan's ability to maintain the technical expertise, data, and scientific information needed to address environmental challenges, manage natural resources, support infrastructure and economic development, and respond to emerging issues. For the geoscience community, understanding where the state is investing—and where long-term capacity remains uncertain—is an important part of understanding the policy landscape.

Why Is Michigan Evaluating Geologic Hydrogen?

Naturally occurring geologic hydrogen has emerged as an area of growing national interest as researchers, industry, and governments evaluate its potential as a future energy resource. Michigan joined that discussion in January when Governor Whitmer issued Executive Directive 2026-1.

The directive asked the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Michigan Public Service Commission (MPSC), Michigan Infrastructure Office (MIO), and Michigan Department of Natural Resources (DNR) to evaluate geologic hydrogen within their respective areas of responsibility and provide recommendations to support future policy decisions.

As part of EGLE's response, the Michigan Geological Survey prepared the section describing the technical resource needs and research necessary to begin evaluating Michigan's geologic hydrogen potential. The report identified the need for additional geologic mapping, subsurface characterization, data compilation, and research to better understand whether naturally occurring hydrogen resources exist in Michigan and how they could be evaluated in the future.

Although geologic hydrogen remains an emerging area of study, Michigan has taken an important first step in identifying the scientific information needed to evaluate its potential.

What's Next for PFAS?



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PFAS remains one of the most active areas of environmental policy at both the state and federal levels. Federal litigation involving drinking water standards and hazardous substance designations continues, while implementation of recently adopted requirements is moving forward.

Although regulatory requirements may continue to evolve, the need for sound site characterization, representative sampling, and quality technical data remains unchanged. These developments have the potential to influence investigation strategies, remediation decisions, due diligence, and future regulatory requirements.

How Is Renewable Energy Changing the Role of Geoscience?

Implementation of Public Act 233 continues as Michigan transitions to a new renewable energy siting process. As utility-scale renewable energy projects move forward, geoscience will continue to play an important role in evaluating site conditions, foundation design, groundwater resources, aggregate availability, and potential geologic hazards.

These projects demonstrate that geologic information contributes well beyond environmental compliance. It supports informed decisions related to land use, infrastructure, resource management, and long-term project planning.

Why Do Critical Minerals Continue to Receive Attention?

Federal and state interest in domestic critical mineral resources continues to grow as policymakers work to strengthen domestic supply chains and reduce reliance on foreign sources. Michigan continues to participate in national efforts through geologic mapping, resource assessments, and research supported by programs such as Earth MRI. These efforts are improving our understanding of Michigan's mineral potential while providing information needed to evaluate future resource development.

As demand for critical minerals continues to increase, geoscientists will play an important role in identifying resources, evaluating environmental considerations, and providing the scientific information needed to support balanced resource management decisions.

On the Horizon

- **FY 2027 Budget:** Conference committee negotiations continue on Michigan's Fiscal Year 2027 budget, including funding decisions affecting EGLE programs and the Michigan Geological Survey.
- **Geologic Hydrogen:** State agency recommendations have been submitted in response to Executive Directive 2026-1. Future discussions are expected to

focus on technical data needs, research priorities, and policy considerations.

- **PFAS:** Federal litigation and implementation of drinking water standards continue. Additional court decisions and agency guidance are anticipated.
- **Renewable Energy:** Implementation of Public Act 233 continues as state agencies and local governments work through Michigan's renewable energy siting process.
- **Critical Minerals:** State and federal initiatives continue to emphasize domestic mineral resources, creating new opportunities for geologic mapping, research, and resource assessment.

The information presented is intended to provide general awareness of emerging legislative, regulatory, and policy developments affecting the geoscience profession. It is provided for informational purposes only and should not be interpreted as legal advice or as representing the official positions of AIPG, the Michigan Geological Survey, Western Michigan University, or any other organization with which the author is affiliated.



Michigan legislative bill [search](#)

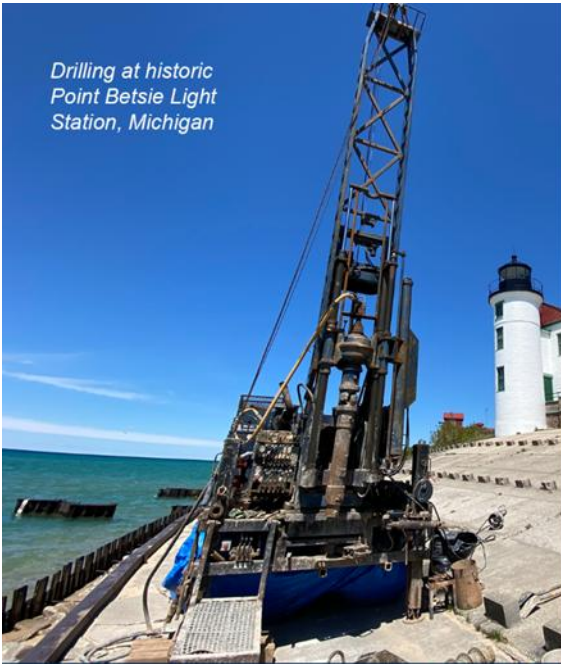


Michigan Administrative Code Rulemaking System [search](#).

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!

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ASBOG Exams

The ASBOG Fundamentals of Geology (FG) and Practice of Geology (PG) Examinations are administered using Computer Based Testing (CBT). All examinees must be certified to take the examination at an approved Prometric/Iso-Quality Testing (IQT) facility. Multiple testing centers are located throughout Michigan. Central Michigan University (CMU) qualifies candidates to take the FG examination in Michigan and surrounding states.

The FG and PG exams are given in March and October each year. **The next scheduled examination dates are Thursday and Friday, October 1 & 2, 2026.** Two days will be available to accommodate the anticipated demand.

There are three fees for taking the FG examination: \$50 CMU administration fee, \$200 ASBOG examination fee, and \$75 Prometric testing center seat fee. **The deadline to apply for the exam through CMU is August 15, 2026.**

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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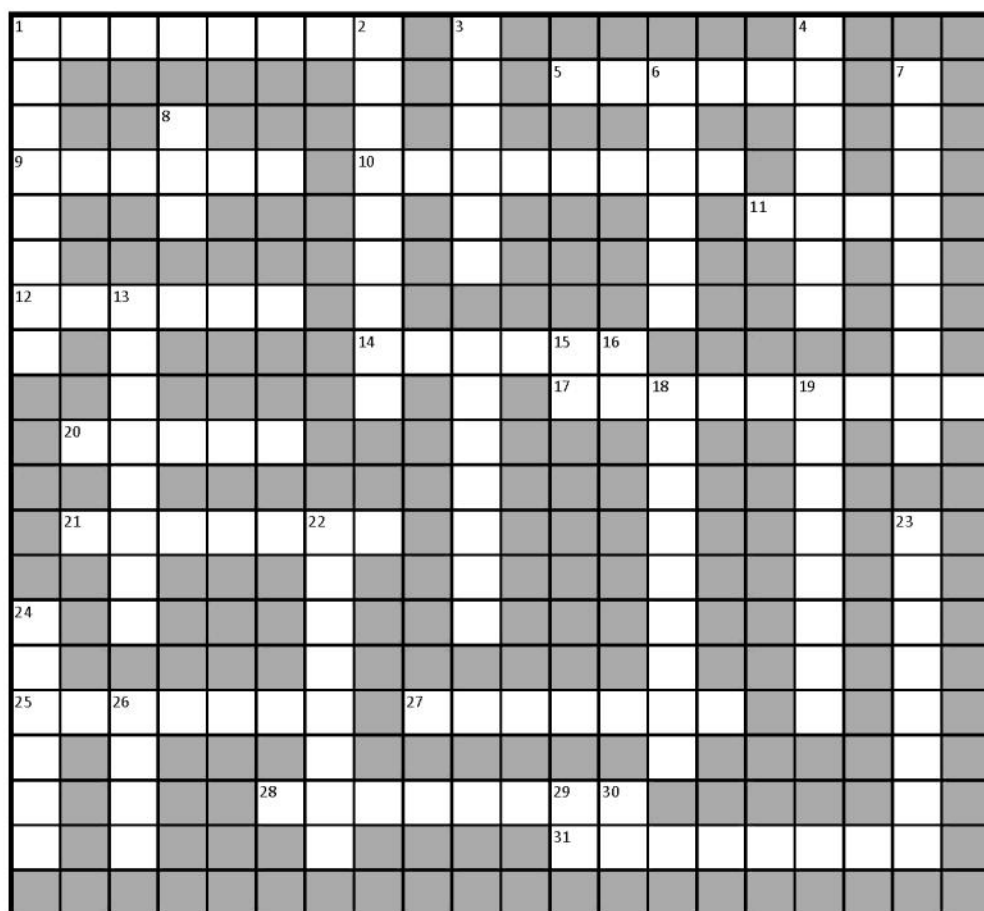
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Geology Crossword #24



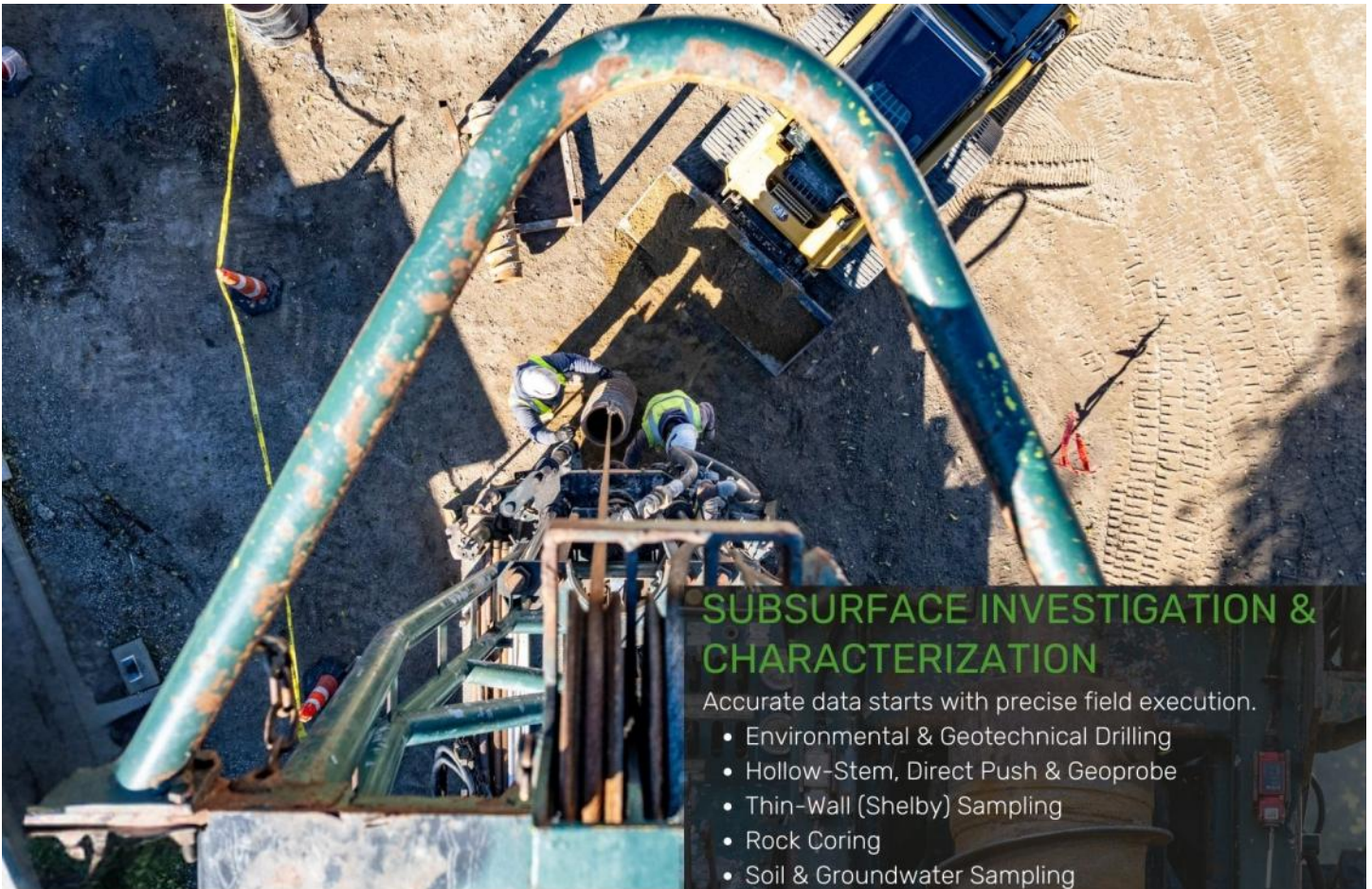
Across

1. Lightweight, metallic element
5. Policeman, slang
9. Used in flat panels and touchscreens
10. Component of a lead pencil
11. Corrosion protectant coating
12. Five cents
14. Used in electronics, antibacterial tools
17. Aerospace, auto, electronics alloy
20. Not a moron or a bosun
21. Not a famous German battleship
25. A famous valley in California
27. Used in semiconductors
28. Not something you lick with
31. Used in electrical parts of high temps

Down

1. Not a payment to a divorced spouse
2. Not a male laxative
3. Used in extreme temp. alloys
4. A nuclear fuel
6. Used in most fertilizers
7. Used in nuclear and aerospace applications
8. Old cans
13. Needed for stainless steel
15. Long dash
16. Egyptian sun god
18. Used in fiberoptics, night vision
19. Not the good samaritan
22. Used in high-temp materials
23. Not one that repairs flutes
24. Used in atomic clocks for GPS
26. A fatal weight
29. ____, go home!
30. Positive ion of halite

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



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