

# Core Quarterly

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## Capital Investment Requires Operational Commitment

by Sara Pearson, CPG

The Michigan Geological Survey (MGS) exists for a simple reason: Michigan needs to understand the ground beneath our feet.

Every decision about water, infrastructure, natural resources, land use, and environmental stewardship depends in some way on knowing what is below the surface. That knowledge does not appear on its own. It must be collected, organized, interpreted, preserved, and made accessible so it can inform the work of researchers, communities, industry, and policymakers across the state. That is the role of the MGS.

Since 2019, through a targeted state investment supported by temporary project staff, MGS corrected and modernized approximately 1.3 million well records, including the manual entry of more than 500,000 historic paper records. This major undertaking concluded at the end of 2025, on schedule and within budget, delivering measurable improvements to Michigan's groundwater data infrastructure and public access to critical subsurface information. It stands as a clear example of what disciplined public investment can achieve: defined objectives, accountable management, and a lasting statewide benefit.

That same model applies to long-term operational support. Sustained funding allows MGS to build on successful projects and maintain the continuity required for science programs that serve Michigan year after year. Temporary funding can accomplish

targeted tasks. Long-term science, however, depends on stable capacity.

Beginning in 2023, stable annual base funding of \$3 million allowed MGS to sustain statewide geologic mapping, laboratory services, federal grant match, data stewardship, and student

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**Michigan  
Geological  
Survey** EST. 1837

training. From 2023 through 2025, MGS secured \$12 million in federal funding, multiplying Michigan’s investment and bringing additional resources into the state. At the same time, the Survey continued to invest in the next generation of geoscientists by supporting five student interns last year and has plans for another five to six this year, along with additional student workers. MGS has also provided more than 50,000 hours for student research from federal projects utilizing 20-50 percent matching state funds. These opportunities are not incidental; they are part of building Michigan’s future workforce and expanding practical training in applied geoscience.

MGS is also entering an important new chapter in its physical infrastructure. On March 20, 2026, we will host a groundbreaking ceremony for the new Michigan Geological Repository for Research and Education (MGRRE) facility. This event marks a major milestone not only for the Survey, but for the long-term stewardship of Michigan’s geologic materials and data resources. The new facility is scheduled to be completed in December 2026 and represents a significant investment in preserving and expanding access to the subsurface records that support scientific research, education, and informed decision-making.

Phase One of the facility is supported by \$3 million from the Michigan Department of Education, nearly \$3 million from the Michigan Department of Environment, Great Lakes, and Energy (EGLE), and up to \$2 million in financing from Western Michigan University. Together, these investments will modernize core preservation, improve access to geologic materials, and create a stronger foundation for research and collaboration. The facility will help ensure that irreplaceable materials collected over decades from water wells, oil and gas drilling, geotechnical borings, mineral exploration, and other subsurface investigations are preserved and available to answer both current and future questions about Michigan’s geology.

Importantly, the facility is designed for expansion. An estimated additional \$8 million investment would add dedicated scientific workspace and training facilities capable of hosting larger groups of students, researchers, and industry partners. Completing that vision would create a fully integrated research and workforce hub, one that strengthens Michigan’s capacity to study its subsurface, prepare future professionals, and support innovation tied to the state’s economic development that depends on geologic resources.

Yet even as this progress continues, the current budget proposal would reduce MGS annual base funding from \$3 million to \$400,000. That reduction would significantly affect the continuity of programs that depend on stable operational support. Mapping programs, federal grant match, laboratory services, data stewardship, and workforce development are not one-time activities. They require people, expertise, planning, and consistency. A building alone cannot deliver impact without the

## Director’s Note

The Michigan Geological Survey was created on the very day Michigan became a state in 1837. From the beginning, leaders understood something fundamental: if you want to build a future, you must understand your resources.

For 189 years — across three iterations and periods of inconsistent funding — the Survey has carried that responsibility forward.

Geology is long-term work. It requires sustained expertise and commitment beyond a single budget cycle. When we invest in understanding Michigan’s water, minerals, and land, we invest in the safety, resilience, and economic strength of this state.

We provide the science beneath Michigan’s surface.

As we prepare to open a new repository facility and look toward future expansion, we are ready to continue this work with the sustained commitment it requires.

— Sara Pearson, CPG

staff and programs that activate it.

This is the central issue: how do you manage resources if you do not know what you have?

## Location, quantity, and quality matter.

That is where MGS serves Michigan. We provide the science, the data, and the expertise needed to understand the state’s geologic resources and to ensure that knowledge informs research, policy, industry, infrastructure planning, and public awareness. From groundwater to aggregates, from geologic hazards to land-use planning, sound decisions begin with sound subsurface information.

Michigan is investing in infrastructure and in the future of its economy and communities. Restoring stable operational funding for MGS helps ensure those investments deliver their full return. It protects the continuity of programs that generate practical value, leverage outside funding, train students, and provide the geologic information needed to support responsible development and long-term stewardship.

The strength of MGS also depends on engagement from the communities, educators, industry partners, and decision-makers who use and value this work. If our data, mapping, or expertise have informed your research, supported your work, or strengthened your community, we encourage you to share that impact with your policy leaders. Understanding Michigan’s geologic resources—their location, quantity, and quality—is not a narrow technical exercise. It is a shared investment in the state’s future.

# WHY STABLE GEOLOGIC FUNDING MATTERS FOR MICHIGAN

## Stable funding for the Michigan Geological Survey is foundational infrastructure.

Michigan's decisions on drinking water, infrastructure, energy, mineral, and land use rely on geologic expertise and data that cannot be rapidly rebuilt once lost; keeping and growing access to that information requires \$3M in ongoing state support.

This funding is at risk, limiting the Survey's ability to deliver statewide geologic data and expertise at a time when demand for this information is increasing and Michigan's ability to compete, contribute, and lead nationally is at stake.

At the national level, U.S. resilience and national security priorities are increasingly focused on understanding critical minerals, domestic energy resources, groundwater, and other geologic information essential to food and national security, infrastructure, and economic stability.

### WHAT'S AT RISK

*Without Stable Funding*



**Loss of federal and partner funding opportunities when state matching funds are unavailable.**  
From 2023-2025, MGS was awarded \$12M in federal dollars.



**Increased risk to drinking water and public health from incomplete groundwater data.**



**Outdated geologic information guiding infrastructure, housing, and land-use decisions.**



**Disruption of long-term projects due to stop-and-start funding cycles.**



**Loss of public, precompetitive geologic data needed to reduce risk and attract private investment.**



**Limited scientific support for energy development and climate resilience, including critical minerals and hydrogen.**



**Permanent loss of geologic samples and data, scientific capacity and institutional knowledge.**

### WHAT STABLE FUNDING ENABLES



**Leverage of federal and partner investments through reliable state matching funds.**  
Federal agencies have issued more than \$50 million in geologic resource related funding opportunities in 2026.



**Protection of drinking water supplies through improved groundwater understanding supports public health and Michigan's multi-billion-dollar economy.**



**Production of current, statewide geologic maps that support infrastructure and land use decisions and delivers an estimated \$7-\$10 return for every \$1 invested.**



**Certainty allowing sustained commitment to and uninterrupted completion of large, multi-year projects that reduce risk and protect long-term economic value.**



**Provision of public, precompetitive geologic data that lowers risk, attracts private-sector and federal investment, and supports billions of dollars in long-term economic value.**



**Support for safe energy development & climate resilience, including critical minerals and hydrogen, to build new sectors in Michigan's multi-billion-dollar economy.**



**Trusted, unbiased science that preserves geologic data/samples, capacity, and institutional knowledge essential to public safety and an economy fundamentally dependent on Michigan's geologic resources.**

# Michigan's Hydrogen Opportunity: MGS Leads the Way

by Autumn Haagsma, PhD

Michigan is rapidly emerging as one of the most promising regions in the United States for natural and stimulated geologic hydrogen, thanks to its unique subsurface geology and strong research ecosystem. Recent U.S. Geological Survey work identifies the Lower Peninsula as highly prospective for natural hydrogen generation, driven by iron rich Precambrian basement rocks and the influence of the Midcontinent Rift.

*“Michigan sits atop one of the most geologically promising hydrogen systems in the nation.”*

With statewide interest accelerating—supported by Michigan’s 2026 **Geologic Hydrogen Exploration and Preparedness Initiative**—the Michigan Geological Survey (MGS) is taking a central role in developing the science needed to evaluate and manage this emerging energy resource.

MGS is advancing a coordinated research program focused on four major areas essential for hydrogen exploration and storage to build the scientific foundation needed to support a growing hydrogen ecosystem:

**Precambrian Core Analysis:** MGS houses **135 feet of Precambrian core** and cuttings from ~50 wells, which are now being analyzed through CT scanning, mineralogical studies, fluid inclusion analysis, and FTIR spectroscopy in collaboration with MSU and NETL. These studies help identify hydrogen generating minerals and evidence of trapped or migrated hydrogen.

*“These cores hold the clues to Michigan’s hydrogen story.”*

**Statewide Precambrian Mapping:** Through STATEMAP proposals and integrated geophysics, MGS is updating Michigan’s Precambrian framework—mapping lithology, structural controls, and depth to basement—to pinpoint areas favorable for hydrogen generation and trapping.

**Regional Seismic Interpretation:** MGS is exploring acquisition and compilation of existing seismic data to refine structural understanding of the Midcontinent Rift and basement

architecture—key components in evaluating hydrogen occurrence and stimulation potential.

**Laboratory Hydrogen Experiments:** In partnership with WMU Engineering, MGS is developing thermal shock experiments to test whether Michigan rock samples release hydrogen under controlled stimulation—advancing research into “orange hydrogen” potential.

## Why This Matters for Michigan

Hydrogen could become a cornerstone of Michigan’s energy transition. The state’s geology also ranks highly for geologic hydrogen storage, including salt formations, depleted reservoirs, and porous basin units. Combined with the state’s automotive and manufacturing sectors, hydrogen offers pathways for decarbonizing heavy industry and transportation.

MGS’s work directly supports statewide research needs, including feasibility mapping, geochemical analysis, reservoir modeling, and coordinated sampling programs—all essential for informed exploration and responsible development.

*“MGS is laying the groundwork for a safe, science driven hydrogen future.”*

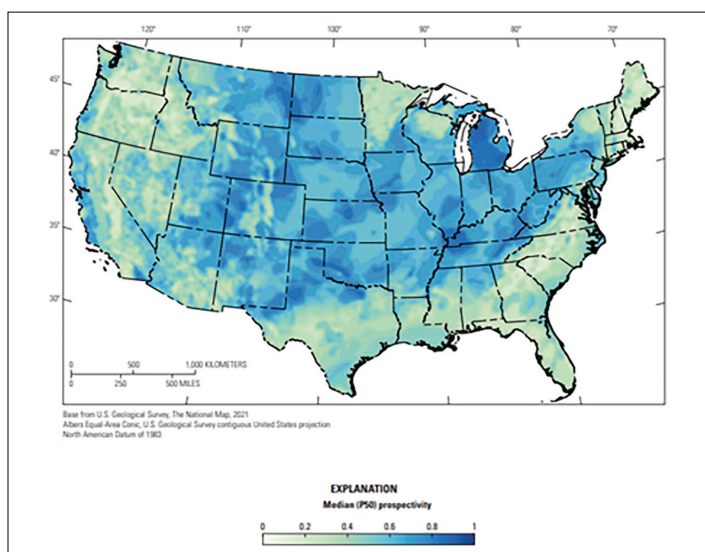


Figure 1: Median hydrogen prospectivity map of the United States, where darker blue indicates higher potential. From Gelman et al., 2025.



## MICHIGAN HYDROGEN INNOVATION COALITION

### Join Us!

We are building a future where hydrogen powers Michigan's economy and decarbonizes its industries. Whether you are an investor, manufacturer, utility, or research institution, there is a place for you at MHIC! We are currently seeking funding from private investors and industry partners to supplement additional support from public grants and research contracts.

# From Fossils to Weird Rocks: MGS Brings Summer Discovery to Michigan Libraries

By Sara Pearson and Lisa Winger

This summer, MGS is teaming up with libraries across the state to turn curiosity into discovery through fossils, geology, and some wonderfully weird rocks.

“Unearth a Story,” the 2026 public library summer reading theme connects children and families with paleontology, geology, fossils, and the stories held in the Earth beneath their feet.

MGS invited libraries across Michigan to participate in special geology-focused programming, and the response has been enthusiastic. Libraries will host in-person events with MGS that introduce audiences to Michigan's geology and fossils through presentations and hands-on samples and activities. These programs make geology approachable, memorable, and fun, giving participants the chance to interact with real materials while learning more about the natural history of our state.

These library events reflect the continued growth of the Survey's education and outreach efforts and the expanding reach of the CoreKids program. MGS builds resources that connect young learners and families with geoscience in ways that are engaging, accessible, and enjoyable. By pairing educational materials with community-based programming, the Survey creates more opportunities for people to experience geology not as an abstract subject, but as something tangible, local, and full of discovery.

One especially fun option being featured this year is Weird Rocks, a program that highlights some of the unusual and surprising properties of rocks and minerals. Participants can explore rocks that ring, rocks that conduct electricity, rocks

that burn, and even rocks that stink. It is the kind of program that captures curiosity immediately while opening the door to deeper conversations about mineral properties, Earth materials, and how geologists observe and interpret the world around them.

Together, these offerings show how MGS is broadening the way it connects with the public. Whether through fossils, hands-on specimens, or unusual rocks that challenge expectations, the goal is the same: to spark curiosity and help people of all ages see that geology is full of stories waiting to be uncovered.

As summer approaches, these outreach efforts offer libraries and communities a chance to connect reading, science, and discovery in a way that feels fresh and memorable. Through CoreKids and its broader education mission, MGS is helping more Michiganders explore the geology of their state and discover that even an ordinary-looking rock can tell an extraordinary story.



MGS's new fossils learning module is available online on the MGS website.

# What Lies Beneath: MGS Unveils Interactive Borehole Inventory

by Matt Bell and Tom Valachovics

Collecting geologic information is a long-term mission of the Michigan Geological Survey, and how we share that data continues to evolve. If you have ever questioned what is beneath your feet or been asked why there are pumping jacks in the middle of a field, subsurface information provided by MGS is critical to understanding these questions. The Survey's data inventory has previously been shared using static Microsoft Excel sheets available on web pages. These Excel sheets required manual updating and reuploading when new samples or cores were added to the collection, often causing them to be out of date. To fulfill a growing need for access to our data, we have upgraded our system to improve the user experience and provide the most current data possible. We have compiled all the collection records into a single database hosted on GIS-centric web viewer so that the information is not only accessible, but the location is immediately identifiable and current, greatly improving the efficiency, time savings and overall experience in one application.

Garrett Ringle, Matthew Bell, and Thomas Valachovics created an interactive platform on ArcGIS Online that displays and serves geologic datasets housed at the Survey's Michigan Geological Repository for Research and Education (MGRRE) from locations across the State of Michigan as a "one-stop shop". Both cores and cuttings (rock and sediment) that are archived at the MGRRE are provided for the public to interact with and download any related information at their leisure. This data is easily searchable by formation, location, and borehole type, among others and

has helpful links directly to the borehole record if it is recorded in Dataminer. Basic borehole information such as name, API number, formation, depth, and cored interval is available right in the app. Furthermore, working in the ArcGIS Online environment allows users to add and edit their own data simultaneously.



MGS geologist Matt Bell reviews the data in the Interactive Borehole Inventory while examining the cores at MGRRE.  
(photo credit: Linda Harrison)

On the backend, the internal core inventory systems are now integrated with the online viewer, meaning that users will always see the most up-to-date inventory and information. Gone are the days of wondering if you have the most recent inventory list or need to call to learn what interval of core is stored at MGRRE. Although we are still always happy to chat about our core, our goal is to improve accessibility of the data to industry and researchers alike at the click of a button. We are also more than happy to welcome you to the repository to view the core and see it firsthand.

Recent updates have allowed the integration of our core photos collection, historic scout ticket

scans, thin section scans, and many other datasets archived at ScholarWorks into our spatial inventory. We will also be enriching the borehole data to fill in some of the blanks still in the dataset through paper records or other digital databases.

Explore the application using the link below. The application works best on a desktop computer or laptop.

Link for Michigan Borehole Inventory: <https://experience.arcgis.com/experience/542473a7826f4cc6a09644d752b29498>

# MGS on the Road: Highlights from a Full Season of Conferences and Outreach

by Autumn Haagsma, PhD

The fall and winter seasons were packed with outreach, education, and scientific collaboration as the Michigan Geological Survey participated in a wide range of events across the state and nation. From celebrating department history to presenting cutting-edge subsurface research, MGS strengthened partnerships, showcased our expertise, and advanced critical conversations about Michigan's energy and mineral future.

The season began on September 24th with leadership hosting a booth at the State Capitol to showcase MGS' great work. It was followed by an event on September 28 with the Department of Geological and Environmental Sciences' 60th Anniversary Celebration, honoring six decades of scholarship, student success, and collaborative research. The event brought together alumni, industry partners, and university leadership to reflect on the department's growing role in Michigan's scientific community.

On October 23, MGS hosted the Michigan Public Service Commission and the National Association of Pipeline Safety Representatives for an overview on MGS's aggregate and surficial mapping projects and carbon capture, utilization, and

storage (CCUS) including . That same day, MGS presenters traveled to Marquette to participate in the Society for Mining, Metallurgy & Exploration meeting, contributing updates on energy and mineral resource programs.

Later in October, MGS researchers presented their work at the at GSA Connects in San Antonio (October 17–22), highlighting ongoing work in statewide subsurface datasets.

On November 5, MGS staff presented their projects at the annual Core Workshop in Traverse City, engaging industry, regulators, and students in hands-on core examination and energy-related discussions. The season concluded with MGS presentations at the State of Michigan's Geologist Biennial Training (November 11–12), supporting statewide professional development in Michigan geology.

From local partnerships to national conferences, these events underscore MGS's leadership in advancing geoscience research, outreach, and energy transition readiness across Michigan.



Autumn Haagsma (left), Lisa Winger (middle), and Sara Pearson (right) representing MGS at the Capitol.



MGS hosted the National Association of Pipeline Safety Representatives as part of their National Meeting in October.

# Where Geoscientists Learn by Doing

by Sara Pearson, Ashley Quigley, and Libby Ives, PhD

For a geoscientist, Michigan's Upper Peninsula is one of the best places for field work in the summer.

At MGS, we place a strong emphasis on hands-on learning, and the Upper Peninsula provides an ideal setting for that work. One of the key opportunities the Survey provides is workforce development. We do that by giving students and recent graduates meaningful experience through real-world applications of applied science. Our interns work alongside Survey staff on projects that are important to the state's understanding of geologic resources, geologic hazards, and subsurface conditions. In the process, they gain practical skills and experience that will help them as they begin their career paths as geoscientists.

This year, our internship opportunities in the UP will support active work in surficial geology, karst mapping, and critical minerals. Interns will assist with field surveys, mapping, sample collection, field notes, and digital data entry while learning how geologic information is collected, documented, and used in

ongoing Survey work. This is not artificial or theoretical work. Interns are contributing to active projects with clear public value while building experience in field methods, observation, and data collection.

The work also supports broader outcomes for the state. Our projects help improve understanding of Michigan's geology and provide information that can be used in resource assessment, land management, and hazard awareness. For example, the karst mapping project will provide information that the U.S. Forest Service can use to improve forest management through a better understanding of subsurface conditions and geologic features that influence the landscape.

Providing these opportunities is an important part of the Survey's work. We are not only producing geologic information for the state, but also helping train the next generation of geoscientists through direct involvement in applied, field-based projects.



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