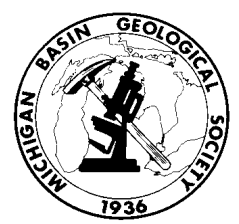


ON THE ROCKS

A Newsletter of the Michigan Basin Geological Society



2022-2023 Edition 8

www.mbgs.org

May 2023

ANNOUNCEMENTS

MBGS Membership Meeting, May 9th, 2023, 7:00PM - RESCHEDULED

Dr. Jeffrey Freymueller and Dr. Anthony Kendall, Michigan State University will present “Developing a Groundwater Model for the Great Lakes Basin Using Multi-Disciplinary Observations”.

Join Zoom Meeting

<https://us06web.zoom.us/j/84372592765?pwd=OTdNbGgvUzIQcVFyZllsSUUxU05LZz09>

Meeting ID:

843 7259 2765

Passcode

624643

Core Display Educational Tool Available to Members

MBGS has a core display available for use that visually demonstrates permeability/porosity. There are educational posters available for use with the core display. Contact any of the officers to reserve this great educational tool.



LED Field Lens and MBGS Lanyard – Limited Supply

The Michigan Basin Geological Society has a limited supply of geological field hand lens and lanyard (photo attached) for purchase. The field hand lens is a large 21mm lens with a 20X magnification. A pair of white LEDs provides illumination for all those darkened close-up viewing of rocks, minerals and fossils. A case is provided for the field lens with a key to remove the batteries. Batteries are included. The green lanyard has MICHIGAN BASIN GEOLOGICAL SOCIETY printed on one side of the unfussy 1" wide webbing. This lanyard is designed with a breakaway buckle clip and detachable keychain for versatile use and comfortable wearing. MBGS is offering the Lanyard/LED Hand Lens and Case combo



for \$15 each. If you request to have your purchase mailed, standard costs for mailing container and postage will apply. Please contact John Yellich at john.a.yellich@wmich.edu to place an order.

MBGS Summer Break

No summer meeting will be held, or newsletters sent for the months of June, July and August. We look forward to reconvening in the fall. If you are interested in running for an MBGS officer position for the 2023-2024 year, please reach out to any of the current Executive Committee members.



May 2023 MBGS Virtual Membership Meeting

Presentation: Developing a Groundwater Model for the Great Lakes Basin Using Multi-disciplinary Observations

Presenters: Dr. Jeffrey Freymueller and Dr. Anthony Kendall, Michigan State University

When: May 9th, 2023, 7:00 PM

Join Zoom Meeting:

<https://us06web.zoom.us/j/89053576903?pwd=T1NtM2tSaGxTN3pWdER1QitEbXpsUT09>

Meeting ID: 890 5357 6903

Passcode: 100966

Mobile +16469313860

Abstract: Developing a Groundwater Model for the Great Lakes Basin Using Multi-disciplinary Observations

The Great Lakes are perhaps the world's single most evident store of freshwater, including five of its largest lakes and over 20% of total surface freshwater. Yet, below the land surface of the Great Lakes Basin lies a sixth, mostly unknown store of water. Hidden from view, groundwater flows through a complex collection of groundwater aquifers containing more water than Lake Huron. Scientists and engineers struggle to understand the dynamic nature of Great Lakes groundwater due to factors including complex glacial terrain and a lack of long-term monitoring data across the Basin. Yet this vast flow and store of water is not completely invisible; scientists from MSU's Earth and Environmental Sciences, in partnership with five universities across the US, are bringing together traditionally isolated practices, tools, and data, to form a new understanding of Great Lakes groundwater. The tremendous mass of all of the Great Lakes Basin flowing waters deforms the land's surface, which geodesists can measure using millimeter-accurate measurements of hundreds of points across the basin from GPS, similarly-precise maps of surface deflections from satellite radar, and orbital instruments that map Earth's gravity field. Water, seeping up from below, saturates hundreds of thousands of wetlands across the Basin—a seasonal transformation visible to remote sensing scientists using both optical and radar satellites. Hydrologic modelers can then build synthetic versions of the Great Lakes aquifer systems, simulating how weather, climate, and human land and water use control the movement of groundwater. Through this interdisciplinary effort, we will develop a deeper understanding of this critical groundwater resource, and create for the first time complete, dynamic maps of groundwater levels and movement across the Basin. Researchers, policymakers, engineers, and the general public across the US and Canada will directly benefit from this new view of one of the Earth's most important—yet invisible—water resources.

Biographical Sketch

Dr. Jeffrey Freymueller – Dr. Freymueller is a geodesist who works to understand the structure and movements of Earth's crust, either through the deep forces that drive plate tectonics, or the near-surface movements of water. He employs an ever-expanding network of global positioning satellites to measure the vertical and horizontal movements of the surface over years to decades. These often slow, but sometimes startlingly abrupt, motions reveal the processes otherwise hidden underneath. Dr. Freymueller holds an endowed Chair for Geology of the Solid Earth in MSU's Earth and Environmental Sciences, and also serves at that department's chair.

Dr. Anthony Kendall – Dr. Kendall is a hydrogeologist who studies human and climate interactions with the terrestrial water cycle, focusing on water resource quantity and quality. He uses computational models of groundwater and surface water systems, along with machine learning and remote sensing, to answer questions that data and experiments alone cannot. He is an Assistant Professor in MSU's Earth and Environmental Sciences, but is a long-time Spartan, holding three degrees from MSU and working there as a full-time researcher for over a decade.

REFERENCES

We are providing links for your reference. Please visit these sites to learn more about specific events and happenings. If you have an event to share, let us know!



American Institute of Professional Geologist – Michigan Section – <http://mi.aipg.org/newsletters.htm>

Central Michigan Lapidary and Mineral Society - <http://www.michrocks.org/>

Eastern Section AAPG - <https://www.esaapg.org/>

EGLÉ Calendar of Events - [Calendar \(michigan.gov\)](http://calendar.michigan.gov)

Flint Rock and Gem - <https://flintrockandgem.org/events>

Michigan Association of Environmental Professionals - <https://www.maep.org/>

Michigan Basin Geological Society – www.mbg.org

Michigan Clean Water Corps - <https://micorps.net/about/>

Michigan Mineralogical Society - <https://www.michmin.org/>

Midwest Mineralogical and Lapidary Society - <http://www.mmls.us/>

Rock Clubs in USA - [All Mineral, Rock, Gem Shows, GeoSites, Rock Clubs in USA \(rockandmineralshows.com\)](http://AllMineralRockGemShowsGeoSitesRockClubsinUSA(rockandmineralshows.com))

Society of Petroleum Engineers - <https://www.spe.org/events/calendar/>

EVENTS

May 5 – 6, 2023: Michigan Lakes and Streams, Protecting and Restoring Michigan’s Lakes and Streams, 62nd Annual Conference, Crystal Mountain Resort, MI. <https://mymlsa.org/mlsa-events/annual-conference-2023/>

June 4-6, 2023: [Improving Michigan's Access to Geographic Information Networks \(IMAGIN\)'s 30th Annual Conference](http://ImprovingMichigan'sAccesstoGeographicInformationNetworks(IMAGIN)'s30thAnnualConference), Crystal Mountain Resort, MI.

June 13-14, 2023: [AIPG Environmental Risk Management Workshop, Roscommon, Mi](http://AIPGEnvironmentalRiskManagementWorkshop,Roscommon,Mi)

June 21-22, 2023: Michigan Environmental Justice Conference [Michigan Environmental Justice Conference - Michigan Department of Environment, Great Lakes, and Energy \(idloom.events\)](http://MichiganEnvironmentalJusticeConference-MichiganDepartmentofEnvironment,GreatLakes,andEnergy(idloom.events))

October 25-27, 2023: [Michigan Communities Association of Mapping Professionals \(MICAMP\)'s Annual Conference](http://MichiganCommunitiesAssociationofMappingProfessionals(MICAMP)'sAnnualConference) October 25-27, 2023, Boyne Mountain Resort, MI.

ONLINE RESOURCES

- **American Geoscience Institute – Interactive Michigan Geology Maps:** [Interactive map of the geology of Michigan | American Geosciences Institute](http://InteractivemapofthegeologyofMichigan|AmericanGeosciencesInstitute)
- **Digital Geology Library Overview:** https://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-01-20_307979_7.pdf
- **GeoWebFace:** [GeoWebFace \(michigan.gov\)](http://GeoWebFace(michigan.gov))
- **Digital Geology Library Mining Overview:** https://www.michigan.gov/documents/deq/GIMDL-Catalog-2013_06_22_mining_425595_7.pdf
- **Michigan Geological Survey:** [Michigan Geological Survey | Western Michigan University \(wmich.edu\)](http://MichiganGeologicalSurvey|WesternMichiganUniversity(wmich.edu))
- **USGS Michigan Geological Map Data:** [Michigan geologic map data \(usgs.gov\)](http://Michigangeologicmapdata(usgs.gov))
- **CMU, Clarke Historical Library, Michigan Geology:** https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oil_and_Gas_Industry/History_of_Michigan_Oil_and_Gas/Pages/Michigan-Geology.aspx

MICHIGAN BASIN GEOLOGICAL SOCIETY OFFICERS
2022-2023

PRESIDENT: JENNIFER TROUT, Research Associate
Michigan Geological Survey, Michigan Geological Repository for Research and Education
1903 W. Michigan Ave., Kalamazoo, MI 49008-5241
W (269) 387-8633 C (269) 290-4048, jennifer.l.trout@wmich.edu

VICE PRESIDENT: ANDREA MUNOZ-HERNANDEZ, Ph.D., District Supervisor
Michigan Department of Environment, Great Lakes, and Energy
Remediation and Redevelopment Division / Jackson District Office
W (517) 599-7525, munozhernandeza@michigan.gov

SECRETARY: JOHN A. YELlich, Director
Michigan Geological Survey, Western Michigan University
1903 West Michigan Ave, Kalamazoo, MI 49008-5241
W (269) 387-8649 C (303) 901-2886; john.a.yellich@wmich.edu

TREASURER: PETE ROSE, Geologist
Minerals Management, Michigan Department of Natural Resources
W (517) 284-5901, RoseP1@michigan.gov

BUSINESS MANAGER: PETER ROSE, Geologist
Minerals Management, Michigan Department of Natural Resources
W (517) 284-5901, RoseP1@michigan.gov

PAST – PRESIDENT: CHRIS CHRISTENSEN, Geologist
Michigan Department of Environment, Great Lakes and Energy Remediation and Redevelopment
Division
350 Ottawa NW, Grand Rapids, MI 49503
(616) 446-7582 christensenc@michigan.gov

NEWSLETTER EDITOR: ARLENE ANDERSON-VINCENT, Natural Resource Manager
BlueTriton Brands
19275 Eight Mile Road, Stanwood MI 49346
W (231) 823-8451 arlene.anderson-vincent@bluetriton.com

PUBLICATIONS: [Open](#)

ELECTRONIC PUBLICATIONS: Please contact an officer for information

WEBMASTER: JOHN ESCH, eschj@michigan.gov

MBGS PUBLICATIONS

<http://www.mbgs.org/publications.html>

Historical publications now available on USB Flash Drives". Each USB Flash Drive is 8GB

Prices include postage, handling and any applicable sales tax.
Orders for publications should be prepaid in U.S. Funds and addressed to:
MBGS — Publications
P.O. Box 14044
Lansing, MI 48901-4044

Historical CD #1: Nine out-of-print publications from 1949 through 1965 and 1998, 2000, \$15

- The Stratigraphy of Manitoulin Island, Ontario, Canada, June 19-20, 1954
- The Devonian and Silurian Rocks of Parts of Ontario, Canada and Western New York, June 22-23, 1951
- The Traverse Group of the Northern Part of the Southern Peninsula of Michigan, June 16-17, 1949
- The Devonian Strata of the London-Sarnia Area, Southwestern Ontario, Compiled by Erwin C. Stumm, Lewis B. Kellum and Jean Davies Wright, June 9-10, 1956
- The Ordovician Rocks of the Escanaba-Stonington Area, Led by R. C. Hussey, June 2-3, 1950
- The Niagara Escarpment of Peninsular Ontario, Canada, June 18-19, 1955
- Lower Paleozoic and Pleistocene Stratigraphy Across Central Wisconsin, Compiled by C. E. Prouty, Led by L. M. Cline, J. L. Hough and R. F. Black, 1960
- Classic Silurian Reefs of the Chicago Area, by Donald G. Mikulic and Joanne Kluessendorf, June 27, 1998
- Geology of Central Ontario, Canada, 1965

Historical CD #2: Four out-of-print publications from 1947, 1959, 1983 and 1991, 2001, \$15

- Copper Country Field Trip, Michigan, June 20-22, 1947
- Geology of Mackinac Island and Lower and Middle Devonian, South of the Straits of Mackinac, June 12-14, 1959
- Tectonics, Structure and Karst in Northern Lower Michigan, August 1983
- Geology of the Pictured Rocks, Upper Peninsula, Michigan, July 11-13, 1991

Historical CD #3: Six out-of-print publications from 1948, 1952, 1990 - 1995, 2001, \$15

- Pleistocene and Early Paleozoic of the Eastern Part of the Northern Peninsula of Michigan, June 18-21, 1948
- Stratigraphy and Structure of the Devonian Rocks in Southeastern MI and Northwestern OH, June 20-21, 1952
- Lower Ordovician and Upper Cambrian of Wisconsin, May 10-12, 1990
- Guidebook to the Precambrian Geology and Metallogeny of the Central Upper Peninsula of Michigan September 12-13, 1991

Historical CD #4: Six out-of-print publications from 1957, 1958, 1961, 1967, 1968 and 1970, 2004, \$15

- Silurian Rocks of the Northern Peninsula of Michigan, 1957
- Cambrian Geology of Parts of Dickinson and Iron Counties, Michigan, June 1958
- Geologic Features of Parts of Houghton, Keweenaw, Baraga and Ontonagon Counties, Michigan, May 19-21, 1961
- Correlation Problems of the Cambrian and Ordovician Outcrops Areas, Northern Peninsula of Michigan 1967
- The Geology of Manitoulin Island, June 1968
- Devonian Strata of Alpena and Presque Isle Counties, Michigan 1970

Historical CD #5: Five out-of-print publications from 1971, 1989, 2001, and Oil & Gas Fields Vol. 1 & 2, 1969 & 1992, 2006, \$50

- Oil & Gas Fields Symposium, Volume 1, April 1969, 200 pp., maps, illus., second printing with updates
- Oil & Gas Fields Manual of the Michigan Basin, Volume 2, 1992, 520 pp., maps, illus.
- Glacial Geology of Southwestern Michigan, 1989, 53 pp. by A. Kehew, L. J. Schmaltz, and W. T. Straw
- Geology of the Lake Erie Islands and Adjacent Shores, 1971, 65pp., maps, illus. by Jane L. Forsyth

- Glacial Geology of Southwestern Michigan, Landforms of the Lake Michigan Lobe, Southwestern Michigan, 2001, AAPG Eastern Section Meeting Field Trip, 32 pp., maps, illus. by A Kehew and A. Kozlowski

Historical CD #6: Six out-of-print publications from 1946, 1953, 1963, 1966, 1978 & 1987 plus the Richfield Challenge, 1952 & Tom Knapp's MS Thesis, 2007 \$15.

- Guidebook for Ordovician Stratigraphy of the Cincinnati, Ohio and Richmond, Indiana Areas, June 12, 13, 1953 by W. H. Shideler and B. T. Sandefur
- Guidebook for Ontario Geological Excursion to Kettle Point – Owen Sound- Waubauskene, June 21, 22, 23 1946 by W. A. Roliff, C.S. Evans and J.F. Caley
- Guidebook for the Stratigraphy of the Silurian Rocks in Western Ohio, May 31- June 2, 1963 by C. H. Summerson, Jane L. Forsyth, Karl V. Hoover and J. R. Ulteig
- Guidebook for Cambrian Stratigraphy in Western Wisconsin, May 21, 22, 1966 by Merideth E. Ostrom
- Geology of the Manitoulin Area, Special Papers #3, September 29, 30 and October 1, 1978 by J. T. Sanford
- and R. E. Mosher
- Middle Devonian Cratonic Carbonates and Shales in Southwestern Ontario, November 14, 1987 by Bruce Wilkinson
- The Richfield Challenge, A Review of the Richfield Developments in Michigan, 1952 by Gordon H. Hautan
- A Theory of Rogers City and Dundee Relationships in Central Michigan, Masters Thesis, 1947 by Tom Knapp

Historical CD #7: Field Guidebooks from 1962, 1969, 1977, 1980, 1985 & 1988, \$15

- Silurian Rocks of the Southern Lake Michigan Area, 1962, James H. Fisher, Chairman, MBGS Annual Field Conference
- Studies of the Precambrian of the Michigan Basin, by Harold B. Stonehouse, 1969
- The Geology of the Marquette District: a Field Guide By F. W. Cambay, 1977
- Ordovician and Silurian Geology of the N. Peninsula of Michigan, 1980, R.B. Votaw, 40 pp., illus., maps
- Special Paper #4: Ordovician and Silurian Rocks of the Michigan Basin and its Margins, 1985 K.R. Cercone and J.M. Budai (eds.), 96 pp., illus.
- Upper Keweenaw Rift-Fill Sequence, Mid-Continent Rift System, Michigan, 1988, P.A. Daniels and R.D. Elmore, M.S. Wollensak, ed., 150 pp., illus., maps

OTHER SPECIAL OFFERS

- **Historical CD Set - # 1 – 7 (detailed above) for a special purchase price of \$95**
- **NE Lower Peninsula Geological Field Conf., 2004, T. Black, M. Wollensak, On CD \$10**
- **Stratigraphic Lexicon for Michigan, 2001, prepared by MBGS and published by DEQ, \$4**
- **Robert E. Mosher Geological Studies** A lifetime of geological research on Silurian Rocks with John T. Sanford. The disks are organized chronologically and include field work in North America and Europe. 2007, 2 CDs \$35.

State of Michigan Employment Opportunities

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for an Environmental Quality Analyst 9-P11 position within the Air Quality Division (AQD). This position is located at 7953 Adobe Road, Kalamazoo, MI 49009. [Posting](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for five Environmental Quality Analyst 9-P11 positions within the Remediation & Redevelopment Division. This position is located in Warren, MI. [Posting](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for a Geologist for the Hazardous Waste (HW) Program. This position is located in Lansing, MI. [Geologist 12 | Job Details tab | Career Pages \(governmentjobs.com\)](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for an Environmental Technician 8-E10 within the Air Quality Division (AQD). This position is located in Lansing, MI. [Environmental Technician 8-E10 | Job Details tab | Career Pages \(governmentjobs.com\)](#)

The Michigan Department of Natural Resources is currently recruiting for a Natural Resources Manager 13 - Unit Manager – Atlanta. [Natural Resources Manager 13 - Unit Manager - Atlanta | Job Details tab | Career Pages \(governmentjobs.com\)](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for an Environmental Technician 8-E10 within the Air Quality Division (AQD). This position is located in Detroit, MI. [Environmental Technician 8-E10 | Job Details tab | Career Pages \(governmentjobs.com\)](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for an Environmental Manager 14 (Gaylord District Supervisor). The position is responsible for administering the operations of the OGMD Gaylord District. [Environmental Manager 14 \(Gaylord District Supervisor\) | Job Details tab | Career Pages \(governmentjobs.com\)](#)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is currently recruiting for an Environmental Engineer Licensed 12 - Warren District Office. This position serves as the senior licensed district engineer for the Drinking Water and Environmental Health Division (DWEHD). [Environmental Engineer Licensed 12 - Warren District Office | Job Details tab | Career Pages \(governmentjobs.com\)](#)