

North-Central Section Meeting Program

Vol. 55, No. 3



L.V. Eberhard Center at GVSU. Photo credit: Amanda Pitts, University Communications, Grand Valley State University.

4–5 May
Grand Rapids, Michigan, USA

www.geosociety.org/nc-mtg

2023

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**FINAL PROGRAM FOR
ABSTRACTS WITH PROGRAMS**

**57th Annual Meeting
NORTH-CENTRAL SECTION, GEOLOGICAL SOCIETY OF AMERICA
4–5 May 2023
The L.V. Eberhard Center
Grand Valley State University
Grand Rapids Michigan**

A Meeting in the Mitten

**Hosted By
Grand Valley State University**



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NOTICE

By registering for this meeting, you have acknowledged that you have read and will comply with the GSA Code of Conduct for Events (full code of conduct listed on inside back cover). If you have any concerns about behavior that may violate the Code, please contact:

GSA Executive Director and CEO, Melanie Brandt, mbrandt@geosociety.org

GSA Ethics and Compliance Officer, Nan Stout, ethics@geosociety.org

You may also stop by the registration desk or the GSA Bookstore to have the named individuals directly contacted via phone. Registration for the meeting requires full vaccination status, and booster shots are strongly advised. Masks are encouraged for all indoor events associated with this meeting. Please refrain from attending if you have any viral symptoms.

General Information



Welcome

The Local Organizing Committee warmly welcomes you to Grand Rapids, Michigan for the 57th meeting of GSA's North-Central Section, a Meeting in the Mitten. Once known as America's "Furniture City", Grand Rapids lies along the Grand River less than an hour from the shore of Lake Michigan. The largest city on the west side of the state, it provides a geographic and cultural intersection that creates a rich backdrop for a diverse meeting program.

We are excited to host the meeting at the L.V. Eberhard Center at Grand Valley State University, where a glance outside the window of the East Lobby reveals a USGS gaging station with a record going back to 1901. You will also see "The Blue Bridge" that crosses the river and gives us easy access to the vibrant City Center district that is home to a mix of arts and culture, breweries, restaurants, shopping, and outdoor activities. Or you can walk along the Mount Vernon pedestrian pathway, explore the GVSU Pew Campus, and find the 20-foot limestone sculpture "Akii Ndodem" (Earth Totem) by local Anishinaabe artist Jason Quigno.

At this year's meeting, we have a broad offering of technical sessions as well as field trips, short courses, student activities, and special events. Our keynote speaker, Adam Wygant, is Michigan's State Geologist and Director of the Oil, Gas, and Minerals Division (OGMD) in the Michigan Department of Environment, Great Lakes, and Energy (EGLE). We look forward as well to the opportunities for conversations and connections that occur when we gather together. With an outstanding scientific program on tap, and the backdrop of Grand Rapids and beautiful west Michigan, we hope that you find this year's North-Central section meeting enjoyable and invigorating.

Geology of the Grand Rapids Area

The geology of the Grand Rapids area presents an interesting geological story of the Mississippian (lower Carboniferous) and the Quaternary Periods with a large gap between the two (major unconformity). Bedrock underlying the city is of the Mississippian Bayport and Michigan Formations (Osagian and Meramecian in age) and consists of shale, limestone, dolostone, and gypsum. The Michigan Formation unconformably overlies the Marshall Sandstone (age is Osagian), which serves as an important regional aquifer, west and south of Grand Rapids. Overlying the Michigan Formation is the Bayport Limestone. To the north and north-east of the city younger Pennsylvanian (upper Carboniferous) clastics and the enigmatic "red beds" unconformably overlie the Mississippian strata. These sedimentary rocks were deposited in shallow marine and delta environments of the Michigan Basin, which formed during tectonic events in the Paleozoic assembly of Pangea and closure of the Iapetus Ocean.

The original "rapids" of the city were located downtown between 6th Street and Fulton Street where the river drops ~15 feet over about a mile. The rapids are now gone and replaced by the 6th Street Dam and smaller dams and flood control structures. The Bayport and Michigan Formations are close to the surface in Grand Rapids and have likely produced a knickpoint in the river's erosion between the upper and lower reaches of the Grand River. Most of the boulders in the original rapids were likely erratics derived from glacial sediments, as well as local dolostone of the Michigan Formation. Boulders were removed from the rapids in the 19th and 20th century and used in some of the earliest buildings in the city, especially in church foundations that can still be seen throughout the city. The original river channel has also been greatly reduced in width (by up to 50%) by filling of the channel and building of flood walls in the downtown area in the 19th and 20th century. Gypsum from the Michigan Formation was mined in the past and now the mines are used for cool storage in the southwestern part of the city just south of the Grand River.

Overlying and completely covering the Mississippian bedrock is a thick sequence of Quaternary glacial and non-glacial sediments (from ~50 to 400+ feet thick). At least four named glacial till units are found in the subsurface to the west of the city. Two of these tills were deposited during Illinoian or Pre-Illinoian glaciations (at least ~320,000 to ~125,000 years ago) because they underlie organic bearing sediments that are likely from the last interglacial (~125,000 to ~80,000). Two other units overlying interglacial sediments were deposited during the late Wisconsin Episode of glaciation (~30,000 to ~11,700 years ago).

The landscape of Grand Rapids was primarily shaped by both the Saginaw and Lake Michigan lobes of the Laurentide ice sheet during the Wisconsin glaciation. The site of the city is nearly exactly at the interlobate boundary of the two lobes. As ice retreated after ~18,500 years ago end moraines, streamlined uplands, till plains, eskers, pitted outwash and kettled terrains were formed. At least two glacial lakes formed to the west and south of the city during deglaciation (the older Glacial Lake Milwaukee and the younger Glacial Lake Chicago). Large erratics, some up to 3 meters in length, are common in the city and some very impressive examples are found in both East Grand Rapids and in West Side neighborhoods near John Ball Park and Zoo. The most common erratics are granite, gneiss, and mafic igneous rocks.

The Grand River Valley itself was cut across the deglaciated landscape as glacial lake outburst floods (GLOFs) flowed from Glacial Lake Saginaw into Glacial Lake Chicago between ~18,000 to 13,600 years ago. The valley itself is an excellent example of an underfit stream as the valley is much wider than needed for the current Holocene

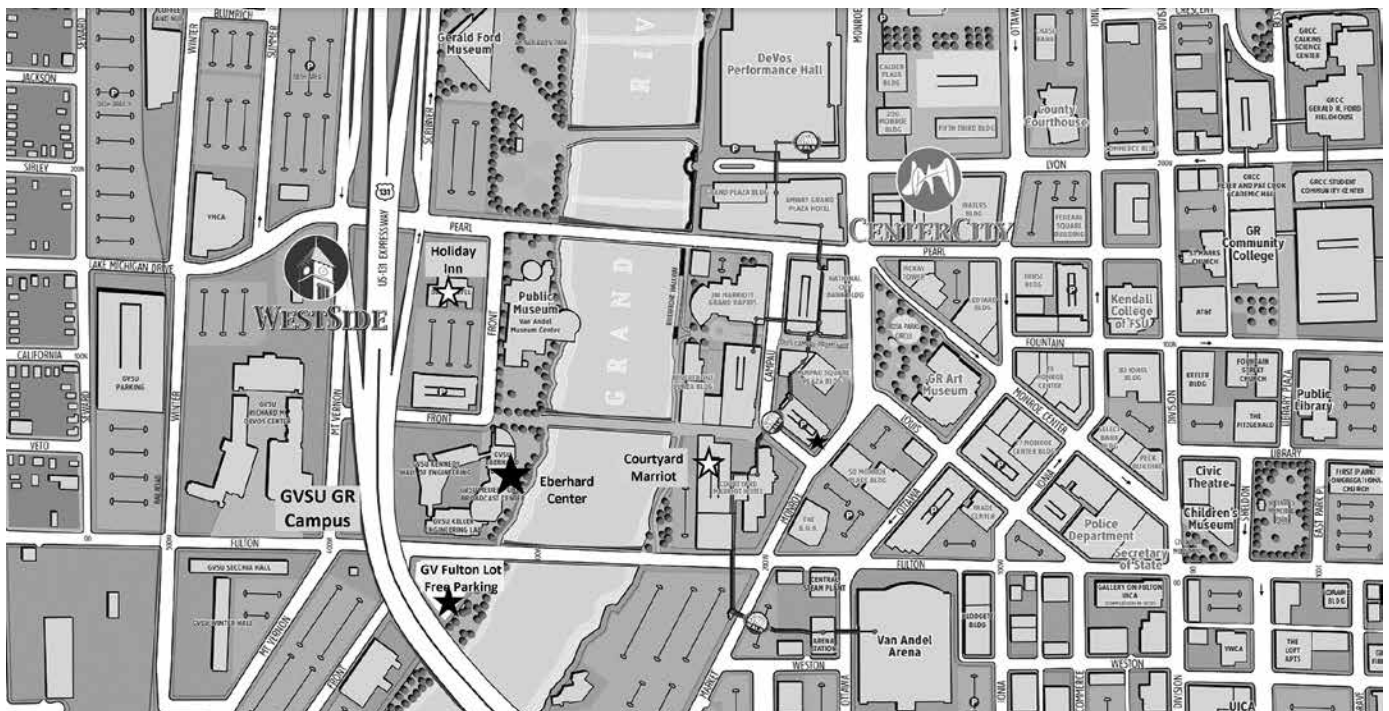
flow of the river. Numerous large gravel bars and terraces in and alongside the valley demonstrate that during deglaciation the river was braided and experienced high discharge events like GLOFs. After drainage of Glacial Lake Chicago ~13,600 years ago inland parabolic dunes formed to the west of Grand Rapids on the abandoned lakebed, with some dune fields even climbing up the glaciated uplands above the lake plain or forming in former outwash valleys. As forest developed following deglaciation and covered the landscape during the early Holocene, dunes were stabilized and preserved as relict landforms. During most of the Holocene weathering has produced soils, and mass wasting and fluvial processes have eroded the glacial landscape. During the late Holocene, Lake Michigan reached its modern level about 4,500 years ago and since then large coastal dunes have been building higher along the lakeshore.

This history and even some of the end Pleistocene events were witnessed by the first peoples of North America. Native Americans of the Hopewell Culture built mounds along the Grand River to the southwest of Grand Rapids (Norton Mounds) about 2,000 years ago. A reconstruction of the mounds can be seen in Ah Nab Awen Park west of the river

and just north of Fulton Street and the Eberhard campus. The area along the banks of the Grand River near downtown, and the Grand Rapids region is both an important historic (~1700 CE) and current home for tribal members of the Odawa (Ottawa), Ojibwa (Chippewa), and Potawatomi (people of the Three Fires, Anishinabek or the “original people”). European settlement began in the late 18th and early 19th century and large-scale logging and agriculture followed quickly after. This major land use change resulted in massive filling of wetlands and river valleys with silt and sand as legacy sediment. Today much of the landscape is being rapidly modified and sometimes altered beyond recognition by sand and gravel mining, road construction, and by urban and suburban developments. Currently, humans are by far the most active geomorphic agents in the Grand Rapids area. (Contributed by Prof. Patrick M. Colgan, GVSU).

Maps and Directions

The L.V. Eberhard Center is located at 301 Fulton St W in downtown Grand Rapids, just a block away from the Center City district attractions.



Map of downtown Grand Rapids, showing location of L.V. Eberhard Center on the GVSU campus, Fulton Parking lot, the Courtyard by Marriott, downtown Grand Rapids and the Holiday Inn Grand Rapids Downtown.

Parking

Free Parking is available on the Robert C. Pew downtown campus and is one block south of the L.V. Eberhard Center in the Fulton Street Parking Lot (312 West Fulton Street, Grand Rapids, MI 49504) across Fulton Street from the L.V. Eberhard Center. Please tell the parking attendant

you are attending the North-Central Geological Society of America Conference. If you are staying at the Holiday Inn, you may park there. The walk is one block to L.V. Eberhard Center.

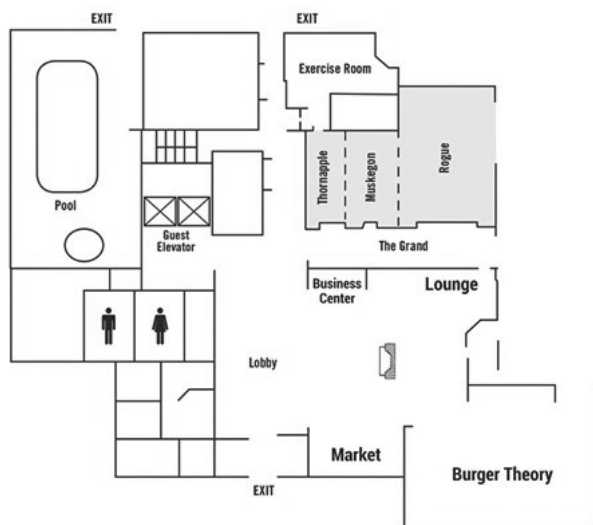
A map of the conference center area and parking lots is available at <https://www.gvsu.edu/homepage/files/pdf/maps/robertc.pewgrandrapidsdowntowncampus.pdf>.

Convention Center

The convention is on the 2nd-5th floors of L.V. Eberhard Center.

Holiday Inn Meeting Spaces

Short courses, some meetings and GSA Mentor Program and Career Workshop activities will take place at the Holiday Inn Grand Rapids Downtown in the Thornapple, Muskegon and Rogue rooms.



Map showing the location of the Thornapple, Muskegon, and Rogue meeting spaces on the main floor of the Holiday Inn Grand Rapids Downtown

Travel Directions

The L.V. Eberhard Center is located on the west bank of the Grand River, north of Fulton Street W and east of I-131. Address: 310 Fulton St. W., Grand Rapids, MI 49501.

Fulton Lot Driving Directions: MapQuest/Google Maps
Address 312 W. Fulton, Grand Rapids, MI 49504

From Chicago: I-94 East to I-196/US-31 (Exit 34) at Benton Harbor. Take I-196 toward Grand Rapids to US-131 South. Take US-131 South to Pearl Street exit (keep to the right of the on-ramp to US-131 as this becomes the off-ramp for Pearl Street). You will then merge onto Mt. Vernon Ave. Continue on Mt. Vernon until you come to a light at Fulton St, turn left here. Under the US-131 Overpass, the Fulton Lot will be on your right. Approximately 200 miles from Chicago. PLEASE NOTE: Michigan is one hour ahead of Illinois (EST).

From Detroit/Lansing: I-96 West to I-196 West (Gerald R. Ford Freeway) to US-131 South. Take US-131 South to the Market Street exit (keep to the right of the on-ramp to US-131). Turn left onto Market from the exit. Turn left on

Fulton. Under the US-131 Overpass, the Fulton Lot will be on your left. Approximately 2 hours from Detroit, and 60 minutes from Lansing.

From Holland: I-196 East to US-131 South. Take US-131 South to the Pearl Street exit (keep to the right of the on-ramp to US-131 as this becomes the off-ramp for Pearl Street). You will then merge onto Mt. Vernon Ave. Continue on Mt. Vernon until you come to a light at Fulton St, turn left here. Under the US-131 Overpass, the Fulton Lot will be on your right. Approximately 30 miles from Holland.

From Kalamazoo: US-131 North to the Pearl Street Exit, #85B. Turn left onto Pearl Street and proceed one block beyond the US-131 overpass to Mt Vernon Ave and turn left, in two blocks turn left on Fulton St. The Fulton Lot will be on your right. Approximately 50 miles from Kalamazoo.

From Muskegon: I-96 East to US-131 South. US-131 South to the Market Ave Exit. Turn Left on to Market, and then Left on Fulton St. The Fulton Lot will be on your left. Approximately 45 miles from Muskegon.

From Northern Michigan: US-131 South to the Market Ave Exit. Turn Left on to Market, and then Left on Fulton St. The Fulton Lot will be on your left. Approximately 150 miles from Traverse City.

DASH Around Downtown Grand Rapids

Grand Rapids is equipped with a downtown area shuttle called DASH. It is a system of small buses that link downtown neighborhoods and destinations. This service is free to ride and provides convenient connections to all parts of the urban core. For details and routes, go to <https://downtowngr.org/get/dash>.

Climate

Early May can be pleasant in Grand Rapids. We have made it past the winter and spring is here with flowers in full bloom. Temperatures typically range from the ~50° F to 70° F. It is also a month of relatively high precipitation. Pack with layers in mind, as there can be a significant temperature variation from morning to night.

Registration

Registration is required to participate in all events associated with the meeting, including technical sessions, field trips, short courses, exhibits, special meetings, and planned social events. Registration badges must be worn for access to all activities, and guest registration is required for attendance at the welcoming reception, scheduled lunches, breakfasts, dinners, and field trips. A current student ID is required to obtain student registration rates. K-12 professionals are invited to attend at reduced rates.

Registration Schedule

On-site registration and badge pick-up is on Level 2 of the L.V. Eberhard Center at the top of the main stairs.

Wednesday, 3 May 2:30–8 p.m.

Thursday, 4 May 7 a.m.–5 p.m.

Friday, 5 May 7 a.m.–2 p.m.

Fees

On-site registration fees are presented below, and shown in US dollars.

	Full Meeting	Single Day
Professional Member	\$310	\$185
Professional Member 70+	\$180	\$110
Professional Nonmember	\$360	\$220
Early Career Prof Member	\$225	\$135
Student Member	\$90	\$55
Student Nonmember	\$135	\$80
High School Student	\$40	\$25
K–12 Professional	\$95	\$55
Guest	\$75	N/A
Field Trip/Workshop only	\$50	N/A

Guest registration is intended for non-geoscientist spouses or friends and does not include attendance at technical sessions, field trips, or short courses. A registered professional, a student, or a K–12 professional must accompany guest registrants. Students and K–12 teachers must show a current ID at check-in to obtain special rates.

Cancellations, Changes, and Refunds

All requests for additions, changes, and cancellations must have been made in writing to GSA Headquarters and received by 3 April 2023. There will be no refunds for cancellations received after this date and no refunds for on-site registrations. Preregistration refunds will be mailed from GSA Headquarters after the meeting.

Meeting App and Abstracts

A web-based app is available for this meeting. This app allows you to view and search the meeting program and create your own schedule of events to attend. You can also view the full abstracts text from this app. Please access the app at <https://gsa.confex.com/gsa/2023NC/meetingapp.cgi>.

If you would prefer a paper version of the program book, please print the pdf version of the program book available on the meeting website. Some printed copies of the pdf will be available onsite.

Accessibility

GSA is committed to ensuring full participation for all conference attendees. You may indicate special requirements on your registration form; please inform the local organizing committee of these requirements at least one month prior to

the meeting. Accessible rooms at the hotel are available and can be reserved.

Continuing Education Credits

CEU's can be earned for attendance at technical sessions, workshops, and field trips. Please check the meeting website after the meeting to download your CEU certificate.

Accommodations

We strongly encourage meeting participants to reserve rooms at either the Courtyard by Marriott, Downtown Grand Rapids or the Holiday Inn Grand Rapids Downtown. These are both within a short walk from the meeting venue.

Cultural and Recreational Amenities

Within walking distance from L.V. Eberhard Center and the local hotels you will find a wide variety of dining, shopping, culture and entertainment options. The Grand Rapids Public Museum (including the Roger B. Chaffee Planetarium) is next door, the Gerald R. Ford Presidential Museum is a short walk north along the river. Across the river a short distance you will find the Grand Rapids Art Museum and the Grand Rapids Children's Museum. Also, on the East bank of the River are the DeVos Performance Hall, which hosts the Grand Rapids Symphony, the Van Andel Arena, and the Devos Place Convention Center.

For those looking for recreation, the David D. Hunting YMCA is a short walk northwest, just north of the GVSU campus. Several parks along the river, including Ah-Nab-Awen Park and the Fish Ladder Park, provide space for walking and exploring the river.

A 20-minute walk east will take you to the Heritage Hill neighborhood, a large urban historic district with 1300 homes that date back to 1843. The Meyer May House within Heritage Hill is a Frank Lloyd Wright design.

John Ball Zoo is ~1.3 miles west of L.V. Eberhard Center along Fulton Street and the zoo area links to an extensive natural area and parks along the west bank of the Grand River with excellent hiking and running trails.

The Frederic Meijer Gardens and Sculpture Park is a 15-minute drive to the east and well worth a visit. It features a comprehensive outdoor sculpture collection, indoor art exhibits, both indoor and outdoor gardens, a large tropical conservatory, nature trails, a Japanese Garden, and a Children's Garden.

If you have time while here, be sure to explore the beautiful beaches and dunes along Lake Michigan, less than an hour west of Grand Rapids. Several State and County parks provide access to the beaches and hiking trails.

Experience Grand Rapids

Looking for fun and easy things to do outside meeting hours? Check out some of Grand Rapids' most popular recreation and entertainment options at <https://www.experiencegr.com>. Everything is close and convenient to your hotel and meeting site, so you can experience it all while you're here.

Be sure to sign up for GR Attendee Exclusives before you visit. You'll enjoy special attendee-only discounts at local restaurants and attractions, just by showing your smartphone! To sign-up go to <https://www.experiencegr.com/gr-attendee/>.

Special Events & Activities

Wednesday, 3 May

Welcoming Reception. 5–7 p.m., East Lobby, 2nd floor, L.V. Eberhard Center.

Thursday, 4 May

GSA North-Central Section Management Board Meeting. 6:30–8 a.m., EC 310.

Session Chairs/Student Volunteer Orientation. 7–7:30 a.m., EC 514. This meeting includes a review of session time management, AV procedures, and other information affecting the conduct of the day's sessions.

GeoCareers Workshop Part 1. Career Planning and Informational Interviewing. 9–10 a.m.; Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). This workshop will help you begin the job-hunting process and will introduce you to informational interviewing. No registration is necessary, everyone is welcome to attend.

GeoCareers Workshop Part 2. Geoscience Career Exploration. 10–11 a.m., Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). What do geologists in various sectors earn? What do they do? What are the pros and cons to working in academia, government, and industry? Workshop presenters and professionals in the field will address these issues. No registration is necessary, everyone is welcome to attend.

Town Hall: What's Happening at GSA. Noon–1 p.m., EC 201. Join us to meet the new GSA Executive Director and CEO Melanie Brandt for greetings and updates on happenings at GSA and a townhall discussion.

Roy J. Shlemon Mentors Program in Applied Geoscience. Noon–1:30 p.m., Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). GSA student members will have the opportunity to discuss career prospects and challenges with applied geoscientists from various sectors over a FREE lunch. Space is limited; first come, first served.

Geology Club Meet-Up. 2–3 p.m., north end of the West Lobby on the second floor of the L.V. Eberhard Center. Chat with other representatives about their activities, goals, and accomplishments.

Evening Social. 4–5:30 p.m., East Lobby, 2nd floor, L.V. Eberhard Center.

Great Lakes Section–SEPM Business Meeting. 5 p.m., GLS–SEPM Exhibit Hall booth in the Paul A Johnson Conference Center (EC 215). Members and non-members alike are welcome.

GSA North-Central Section Open Meeting. 5–5:30 p.m., West Gallery, 2nd floor L.V. Eberhard Center.

Keynote Address. 5:45 p.m., Room 201, 2nd floor, L.V. Eberhard Center. Adam Wygant, Director of the Oil, Gas, and Minerals Division (OGMD) in the Michigan Department of Environment, Great Lakes, and Energy (EGLE), *Mitten*

State Geology, how it shaped our past and will impact our future.

Abstract: Michigan's varied geologic history provides for its signature shape which allows Michiganders the ability to show you points of interest on their hands - a left mitten forms the Upper Peninsula, and a right mitten forms the lower peninsula. This unique shape is even reflected in the State motto, "If you seek a pleasant peninsula, look about you." The geologic history of Michigan also greatly influences the state's anthropogenic development. Michigan's combination of tectonic rifting, development of a marine sedimentary basin, and subsequent glaciation provided abundant natural resources in the form of metallic minerals, oil and natural gas, valuable mineral brines, other evaporite minerals, and aggregate resources. Even after 186 years of Michigan Geological Survey history and investigation, geologists are seeking to improve the geological understanding of the state to provide greater mineral and energy security, sequester carbon, manage dynamic changes related to climate with our shorelines and streams, and secure a future with safe drinking water resources and improved water quality.

Bruce Dice Mineralogical Museum. The Dice Museum will also be open for conference visitors all day Thursday and Friday (transportation not provided).

Description: The Dice Mineralogical Museum in Grand Rapids has a world-class collection of more than 300 minerals and some rare fossils. For more information and directions go here: <https://calvin.edu/academics/departments-programs/geo/bruce-dice-mineralogical-museum/NC-GSA-2023>.

Informal Gatherings. The West Gallery on the 2nd Floor of the Eberhard Center is a designated zone for informal student and career networking from 7:30 a.m. to 6 p.m.

Informal Alumni. 7–9 p.m. The Grand Valley State University Geology Department is hosting an informal alumni gathering at the downtown University Club room in the Richard M. DeVos Center/ All GVSU geology alumni groups, faculty and current students are welcome. For more information, contact Mizi Loving at lovingm@gvsu.edu.

Informal Alumni. 7:30–9:30 p.m. Calvin University alumni and friends are invited to an informal alumni gathering at the Dice Mineralogical Museum (at Calvin University). For more information, contact Deanna van Dijk (dvandijk@calvin.edu).

Friday, 5 May

Session Chairs/Student Volunteers Orientation. 7–7:30 a.m., EC 514. This meeting will include a review of session time management, AV procedures, and other information affecting the conduct of the day's sessions.

GSA Campus Representative Appreciation Breakfast. 7–8 a.m., Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). This complimentary light breakfast for Campus Reps is held to say Thank You. If you are a campus representative or are interested in becoming one, please plan to attend this celebratory event.

GeoCareers Workshop Part 3. Cover Letters, Résumés, and CV's. 9–10 a.m., Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). Whether you are currently on the job market or not, learn how to prepare the best résumé possible. You will review numerous examples to help you learn important résumé do's and don'ts. No registration is necessary, everyone is welcome to attend.

John Mann Mentors Program in Applied Hydrogeology. Noon–1:30 p.m., Holiday Inn Grand Room (Thornapple, Muskegon, and Rogue Rooms). GSA student members interested in applied hydrogeology or hydrology as a career will have the opportunity to network with professionals in these fields over a FREE lunch. Space is limited; first come, first served.

Ethnicity and Identity Group Meetup. Noon–1 p.m., EC 201. Host is Elizabeth Long, Associate Director for Diversity, Equity and Inclusion at GSA.

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Informal Gatherings. The West Gallery on the 2nd Floor of the Eberhard Center is a designated zone for informal student and career networking from 7:30 a.m. to 6 p.m. on both Thursday and Friday.

In Remembrance of Al Kehew. Western Michigan University will be hosting a gathering in remembrance of Al Kehew following session T36 (Remembering Our Colleague, Al Kehew: His Contributions to Glacial Geomorphology, Midwestern Glacial Geology, and Geologic Mapping). All friends of Al are welcome to join us. For details and to RSVP, please contact Cristine Thomas at WMU (cristine.thomas@wmich.edu).

Field Trips

GSA's Commitment to Care prioritizes your safety. For additional information, please contact the field trip co-chairs: Peter Wampler, wamplerp@gvsu.edu, or Ed Hansen, hansen@hope.edu. All field trip participants should check-in and meet field trip leaders outside the main entrance of the L.V. Eberhard Center. All field trips depart from Front Street just to the north of the L.V. Eberhard Center main entrance.

Pre-Meeting:

FT1. Michigan Geological Repository for Research and Education (MGRRE) Tour—Michigan Subsurface Geology Using Borehole Core Samples. Wed., 3 May. Cost: US\$110. Check in 8:30 a.m., departs 9 a.m., returns 4 p.m. Leaders: Peter Voice, Western Michigan University, peter.voice@wmich.edu; William B. Harrison III, Western Michigan University, william.harrison_iii@wmich.edu; Jennifer Trout, Western Michigan University, jennifer.l.trout@wmich.edu; Robb Gillespie, Western Michigan University, robb.gillespie@wmich.edu.

Description: Tour of the MGRRE facility—WMU's premiere subsurface geology facility. Selection of Michigan Basin cores, including salt, on display. Finish with a tour of WMU's Schmaltz Geology Museum and Dinosaur Park. **FT2. Tour of PFAS Disposal and Treatment Sites in Northern Kent County.** Wed., 3 May. Cost US\$60. Check in 12:30 p.m., departs at 1 p.m., returns 5 p.m. Leaders: Richard Rediske, Grand Valley State University, rediske@gvsu.edu; Karen Vorce, Michigan Department of the Environment, Great Lakes, and Energy, vorcek@michigan.gov.

Description: The disposal of PFAS wastes from a Tannery in Rockford, Michigan, has contaminated 40 km² and impacted +800 residential wells. We will learn about problems associated with PFAS contamination and visit the Tannery, the House Street Disposal Site, and the area where the plume vents into the Rogue River. Wear appropriate clothing for outdoor walking. We will be on pedestrian friendly walkways with limited off path travel. Public restrooms are available at the Tannery site and Versluis Lake.

During the meeting:

FT3. Riverwalk Tour—Restoring the Rapids in Grand Rapids. Thur., 4 May. Cost US \$30. Check in 10:30 a.m., departs at 11 a.m., returns 1 p.m. Leaders: Wendy Ogilvie, Grand Valley Metro Council/Lower Grand River Organization of Watersheds, wendy.ogilvie@gvmc.org; Matt Chapman, Grand Rapids Whitewater, matt@grandrapidswhitewater.org; Michael Staal, City of Grand Rapids, mstaal@grand-rapids.mi.us.

Description: Historic dredging, channelization, and dams have degraded the Grand River. The purpose of the Grand River restoration project is to replace the four low-head dams in downtown Grand Rapids with boulders and natural materials that will restore aquatic habitat diversity, improve suitability for native fishes and mussels, and enhance public safety. This will be a walking tour of about 3 miles. Please wear good walking shoes and be prepared for all types of weather. Please bring your own refillable water bottle. We will be able to stop about halfway through for a bio-break.

FT4. Collections Tour of the Grand Rapids Public Museum. Fri., 5 May. Cost US\$35. Check in 10:30 a.m., departs 11 a.m., returns 1:30 p.m. Leader: Cory Redman, Grand Rapids Public Museum, credman@grpm.org.

Description: A behind-the-scenes tour of the Grand Rapids Public Museum's (GRPM) collection facility. The GRPM is Michigan's oldest museum (est. 1854) and holds more than 0.25 million objects related to history, culture, and science. This tour will visit all the collection spaces but focus on objects related to Earth's systems. Water in a closed container can be allowed in the collections, but not food or other liquids. Photos of the collection and the objects within are welcome. Field trip participants will have the opportunity to handle a series of artifacts presented on the tour.

FT5. Mississippian Gypsum Mine Geology and Paleontology Field Trip. Fri., 5 May. Cost US\$50. Check in 5:30 p.m., departs 6 p.m., returns 9 p.m. Leaders:

John VanRegenmorter, Grand Rapids Community College, johnvanregenmorter1@grcc.edu; Peter Wampler, Grand Valley State University, wamplerp@gvsu.edu.

Description: The Mississippian Michigan Formation contains thick beds of gypsum, an important mineral to the early economy of west Michigan. Fossils of fish, coprolites, and plants are also found in this formation. Participants will discuss the geology and paleontology in an underground mine and will have the opportunity to collect samples. The mine tour will consist of entry through the storage facility and a roughly 60-foot vertical trip on a large freight elevator then a walking tour over uneven and potentially slippery ground. There are parts of the mine that are paved and would be accessible to someone with limited mobility, however, to access all the locations we will be visiting on the field tour there would be some uneven and muddy ground. Flashlights are required.

Post-Meeting:

FT6. Coastal Dunes of Southern Lake Michigan. Sat., 6 May. Cost US\$120. Check in 7:30 a.m., departs 8 a.m., returns 7 p.m. Leaders: Suzanne DeVries-Zimmerman, Hope College, zimmerman@hope.edu; Erin Argyilan, Indiana University Northwest, eargyila@iun.edu; Todd Thompson, Indiana Geological and Water Survey, Indiana University, tthomps@indiana.edu.

Description: Lake Michigan coastal dunes, the world's largest freshwater dune complexes, are important for understanding coastal development in response to lake-level dynamics and the evolution of coastal dunes and their ecosystems. This trip emphasizes current research on dune dynamics at research sites near Holland, Michigan, and in Indiana Dunes National Park. The trip involves moderately strenuous hiking through loose sand on dunes.

FT7. Mid-Michigan's Outdoor Classroom: Pennsylvanian Marginal-Marine Strata at Grand Ledge, Michigan. Sat., 6 May. Cost US\$160. Check in 7:30 a.m., departs 8 a.m., returns 5 p.m. Leaders: Danita Brandt, Michigan State University, brandt@msu.edu; Melinda Higley, Calvin University, mchigley@calvin.edu; Madeline Marshall, Albion College, mmarshall@albion.edu; Heather L. Petcovic, Western Michigan University, heather.petcovic@wmich.edu; Michael Velbel, Michigan State University, velbel@msu.edu; Peter J. Voice, Western Michigan University, peter.voice@wmich.edu; Ian Winkelstern, Grand Valley State University, winkelsi@gvsu.edu.

Description: This trip examines classic Pennsylvanian exposures at Grand Ledge, Michigan, where complex stratigraphy continues to foster discussion and debate. Field stops highlight the bedrock exposures of channelized sandstones, fossil-bearing shales and sandstones, coals, and limestone. A trip to the Pennsylvanian strata exposed at Grand Ledge, Michigan, is often the first geology field experience for many Michigan geology students, making it a vital field-trip resource. This trip will thus also highlight teaching resources, including a tour of the fossils and strata of Michigan's Coal Measures from the perspective of the educational and cultural importance of these outcrops. We

will be hiking on and off park trails. The ground is uneven and may be muddy. Participants should wear sturdy footwear. The park trails are not wheelchair accessible. A bag lunch (sandwich, chips, cookie, fruit) is included; a vegetarian sandwich option is available. Participants with special dietary needs are welcome to bring their own. Participants are encouraged to bring their own water bottles. Water fountain and restrooms are available at Fitzgerald Park.

FT8. Geology, Age, and Shock Metamorphism of The Kentland, Indiana, Impact Structure. Sun. May 7. Cost US\$200. Check in 7:00 a.m. Departs 7:30 a.m. Returns 5:00 p.m. Leader: John Weber, Grand Valley State University, weberj@gvsu.edu.

Description: This trip will cover the geology, age, and shock metamorphism of the Kentland impact structure through examination of spectacular 3D outcrops in the central uplift exposed in the Newton County Stone (Kentland) Quarry, including seminal geologic mapping work of Ray Gutschick, and recent research on radial faulting, paleomagnetism, thermochronology, and shock metamorphism. *All participants must attend a safety briefing conducted by quarry staff and must wear appropriate safety gear (hard hats, steel-toed shoes, safety glasses) at all times at all stops. In addition, please use extreme caution when walking and when making observations, particularly near quarry walls.*

SHORT COURSES

For additional information, please contact the short course organizer, Tara Kneeshaw, kneeshta@gvsu.edu, or the short course leaders listed below.

SC1. Practical High-Energy Injection in Overburden and Bedrock: Preparation, Tools, Design, Distribution, and Evaluation Illustrated by Case Studies. Wed., 3 May, 8 a.m.–noon, Holiday Inn Thornapple Room. Cost: US\$25 students/US\$80 professionals. Leader: Edward Winner, RPI Group, ed@trapandtreat.com.

Description: The course provides an in-depth understanding of high-energy injection in the overburden and bedrock. It will present advancements in technology, techniques, and equipment. It will address misconceptions regarding pumps, injection tooling, flow rate, injection point grid spacing, injection pressure, and how injectate distributes. Actual field data will be presented.

SC2. Near Subsurface Microbiology: It's the Little Things That Count. Wed., 3 May, 1–5 p.m., Holiday Inn Thornapple Room. Cost: US\$25 students/US\$80 professionals. Leader: Edward Winner, RIP Group, ed@trapandtreat.com; Aaron Peacock, Microbac Laboratories, aaron.peacock@microbac.com.

Description: Subsurface microbes drive biogeochemical processes impacting groundwater, mineral deposits, soils, and sediments. This course aims to orient the participant to microbes, processes, and effects that illustrate the importance of microbial life in the subsurface. For example, subsurface microbes live a starvation lifestyle. How do microbes address limitations in electron acceptors or donors and degradable organic carbon? Microbes can be both planktonic (free-swimming), and they can build biofilm communities.

What's the trigger for each mode of life? Microbes build complex communities. Why and how do such communities function? Microbes are known to degrade complex chemicals, from hydrocarbons to chlorinated solvents. How does this occur? Microbes leave metabolic material in the environment; what do these materials become? Understanding microbial life is essential to understanding geology. The course will build your knowledge.

SC3. Stratigraphic Imaging of Geomorphic, Geologic, and Geoarchaeological Landscapes. Wed., 3 May, 1–5 p.m., Holiday Inn Muskegon Room. Cost: US\$25 students/US\$80 professionals. Leader: Harry Jol, University of Wisconsin Eau Claire, jolhm@uwec.edu.

Description: Our goal in the workshop is to demonstrate how ground penetrating radar (GPR) can aid in better understanding various geomorphic, geologic, and geoarchaeological environments. This interactive and hands-on workshop will have attendees move through an understanding of the GPR research workflow, including in-class interpretation exercises collated from a variety of field settings.

Students and First-time Attendees

The Local Organizing Committee extends a special welcome to students and first-time attendees of this conference. In particular, we want to draw your attention to a series of special events in the program, such as the **GeoCareers Workshops**, the **Roy J. Shlemon Mentors Program in Applied Geoscience**, the **Geology Club Meet-Up**, and the **Evening Social** (these are on Thursday, 4 May; see the program schedule for more details). We also hope that you attend the keynote address by Adam Wygant, Director of the Oil, Gas, and Minerals Division (OGMD) in the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Please note, throughout the conference there will be an informal student gathering space set aside in the north end of the West Lobby on the second floor of the L.V. Eberhard Center.

Have questions about what it is like to attend a section meeting of GSA? We encourage you to check out a fantastic resource created by GSA for first-time conference attendees: <https://speakingofgeoscience.org/2022/09/27/tips-for-first-time-attendees-of-gsa-connects/>. Their suggestions cover a range of topics such as preparing your presentation, networking, following-up with contacts after the conference, and more!

Student Volunteers

Students accepted as meeting volunteers must check in at the Student Volunteer Desk located near the registration area on the 2nd floor of the L.V. Eberhard Center.

Exhibits

Exhibits are located in the Paul A Johnson Conference Center (EC 215) on the 2nd floor of the Eberhard Center.

Hours for Exhibits are:

Setup: Wednesday, 3 May: 10 a.m.–4 p.m.

Open: Thursday, 4 May: 9 a.m.–6 p.m.

Open: Friday, 5 May: 9 a.m.–4 p.m.

Tear down: Friday, 5 May: 4 p.m.–6 p.m.

Exhibitors (as of press time)

2024 Joint North-Central/South-Central Section Meeting
AECOM
AIPG
ASBOG
Barr Engineering Co.
Calvin University
CPS US, Inc
Geotech Environmental Equipment, Inc.
Grand Rapids Community College—School of STEM
GSA Bookstore
GSA Foundation
Grand Valley State University Geology Club
Michigan Basin Geological Society
Michigan Department of Environment Great Lakes and Energy
Michigan Tech Geological and Mining Engineering Sciences
Smart Gas Sciences
University of Missouri Geological Sciences
University of Toledo Department of Environmental Sciences
University of Wisconsin—Madison
Western Michigan University Department of Geology and Environmental Sciences

Information for Presenters

Unless otherwise noted, each speaker will be allotted a time of 20 minutes for oral presentations (17 minutes for presentation; 3 minutes for questions, discussion, and transition). Presentations must be prepared using PowerPoint or PDF formats. One laptop with Windows PowerPoint, one LCD projector, and one screen will be provided for all oral sessions. In addition, each room is equipped with a lectern microphone, wireless microphone, wireless computer mouse and PowerPoint advancer, and a speaker timer. **Speakers may not use their own laptops for presentations.**

All poster sessions are in the Paul A Johnson Conference Center (EC 215). Authors in the morning sessions are asked to have their posters in place by 7:45 a.m. and taken down at noon. Afternoon posters may be put up at 12:45 p.m. and taken down at 5:30 p.m. Authors of posters should be present at their posters for 2 hours during their allotted sessions: 9–11 a.m. for morning sessions, and 2:30–4:30 p.m. for afternoon sessions. Poster presenters have one 4' x 8' (1219 mm x 2438 mm) horizontal "landscape" poster display surface, and numbers on the poster boards correspond to the poster booth numbers listed in the Program. Pushpins and/or Velcro will be provided. For student presenters, please discuss the fonts and layout of your poster with your mentor(s) so you can have the highest impact for your visitors.

The Speaker Ready Room

The Speaker Ready Room is located in EC 411, and open for program checking and speaker assistance as follows:

Wednesday, 3 May: 3–7 p.m.

Thursday, 4 May: 7 a.m.–7 p.m.

Friday, 5 May: 7 a.m.–2 p.m.

Each speaker must bring their PowerPoint or PDF presentation on a USB compatible flash drive (a.k.a. thumb drive or memory stick) to the Speaker Ready Room for checking and uploading to their session's folder according to the deadlines below. Failure to do so may result in presentations being omitted from session sequences. Morning presentations must be uploaded by the end of the day prior to the presentation, and afternoon presentations must be uploaded by noon on the day of the presentation.

If Presentation is:

Thursday, 4 May, AM

Thursday, 4 May, PM

Friday, 4 May, AM

Friday, 4 May, AM

Upload Not Later Than:

7 p.m., Wednesday, 3 May
noon., Thursday, 4 May

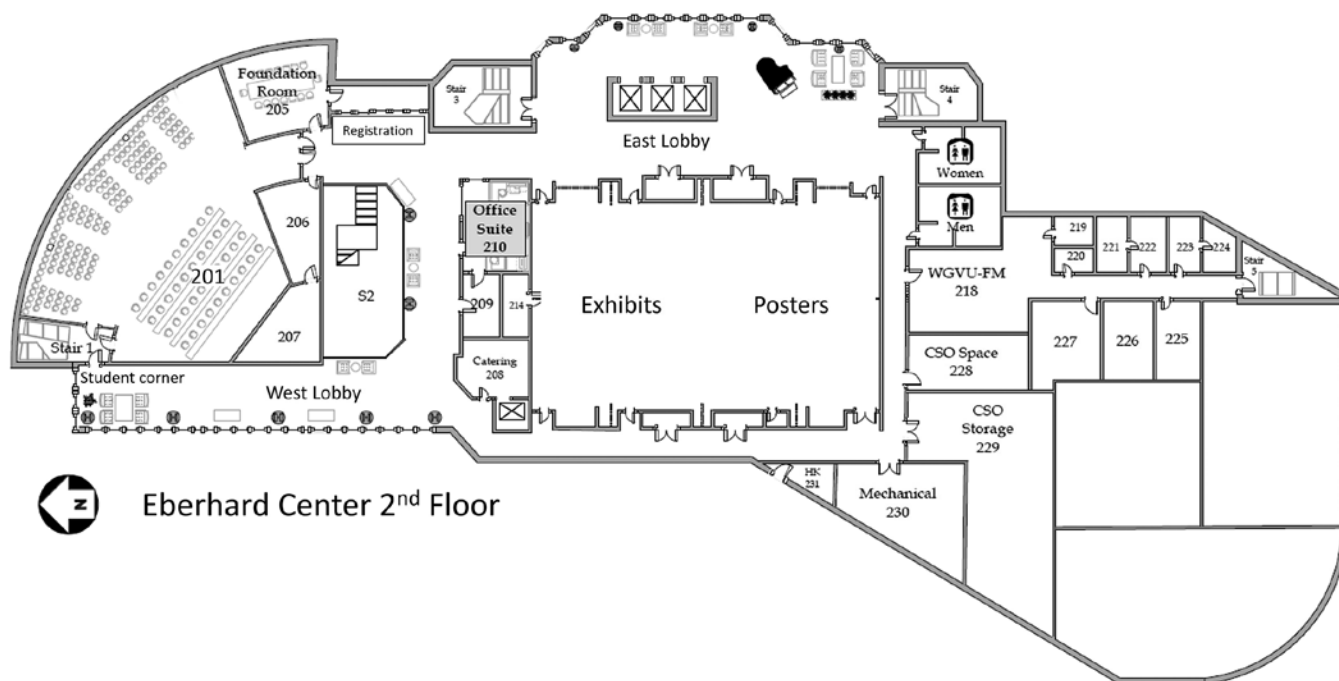
7 p.m., Thursday, 4 May
noon., Friday, 4 May

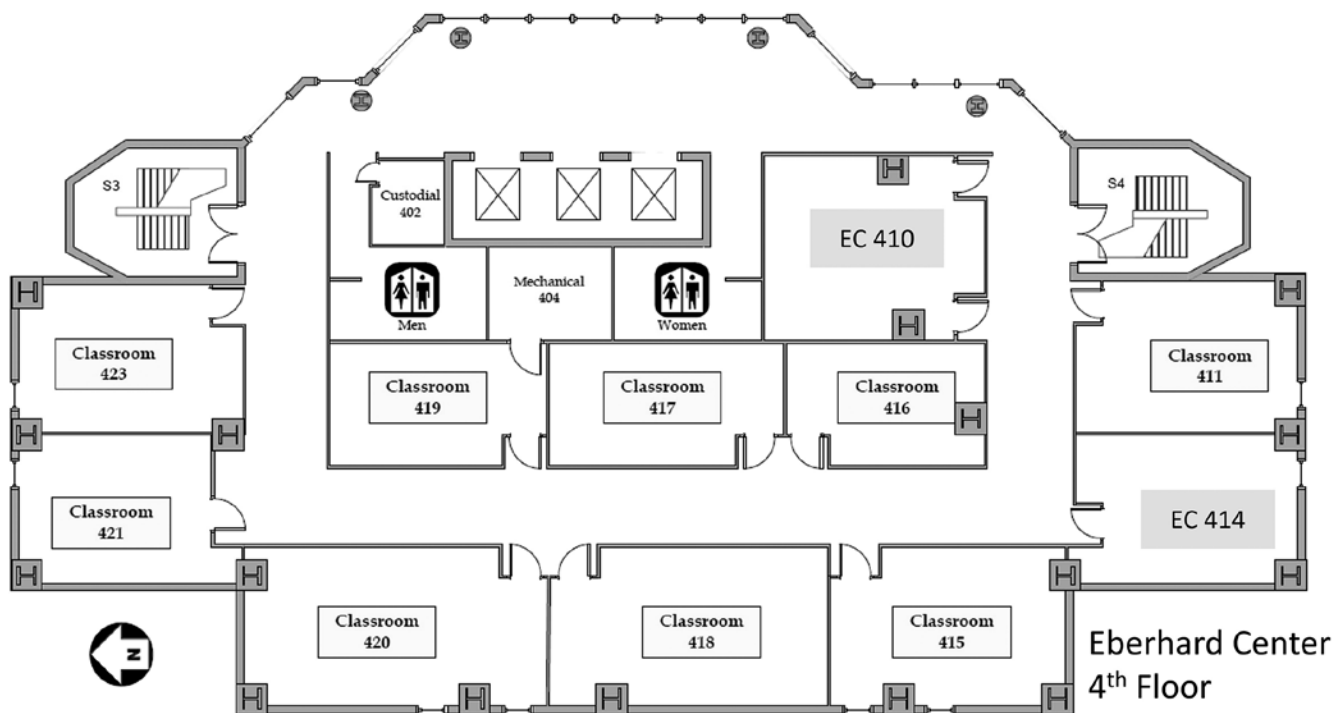
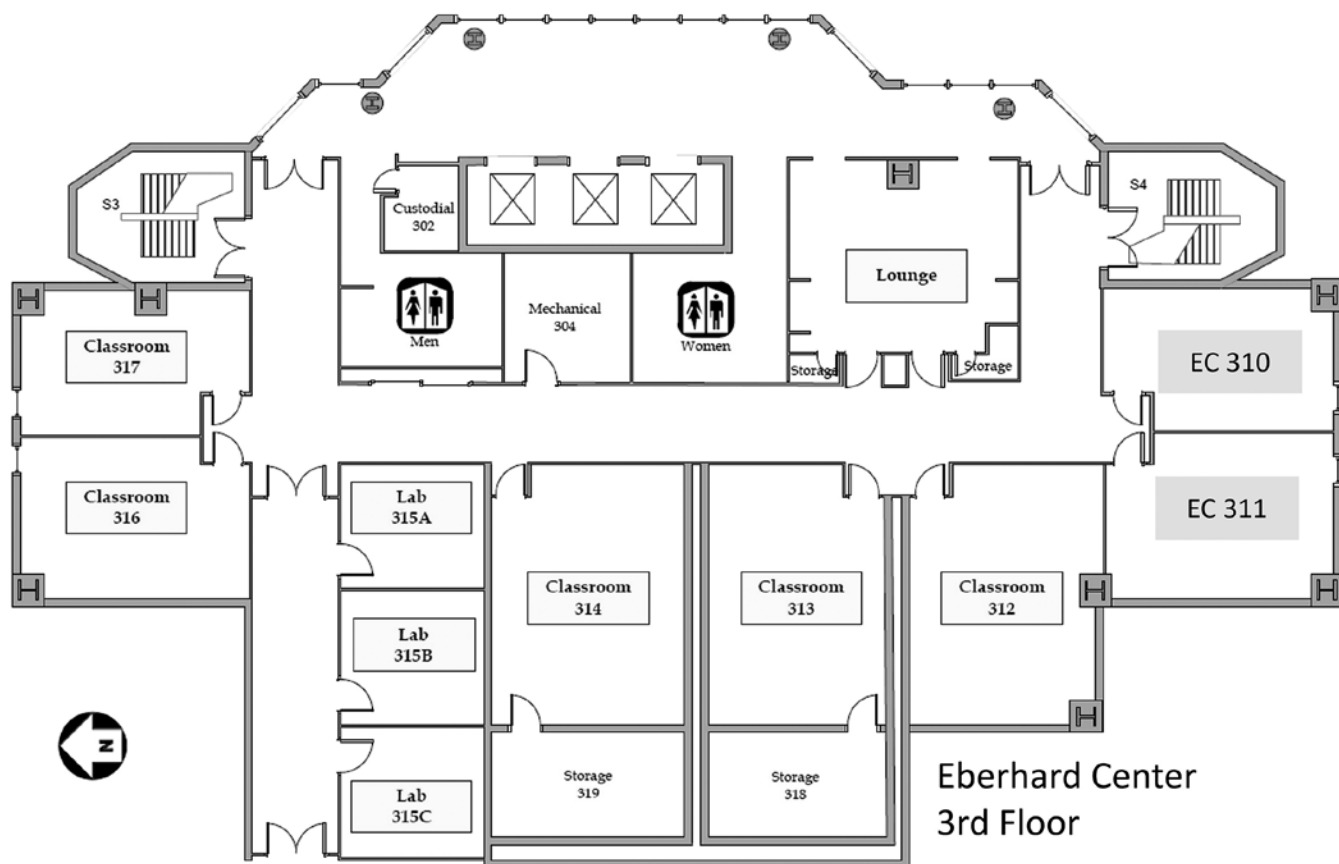
Information for Session Chairs

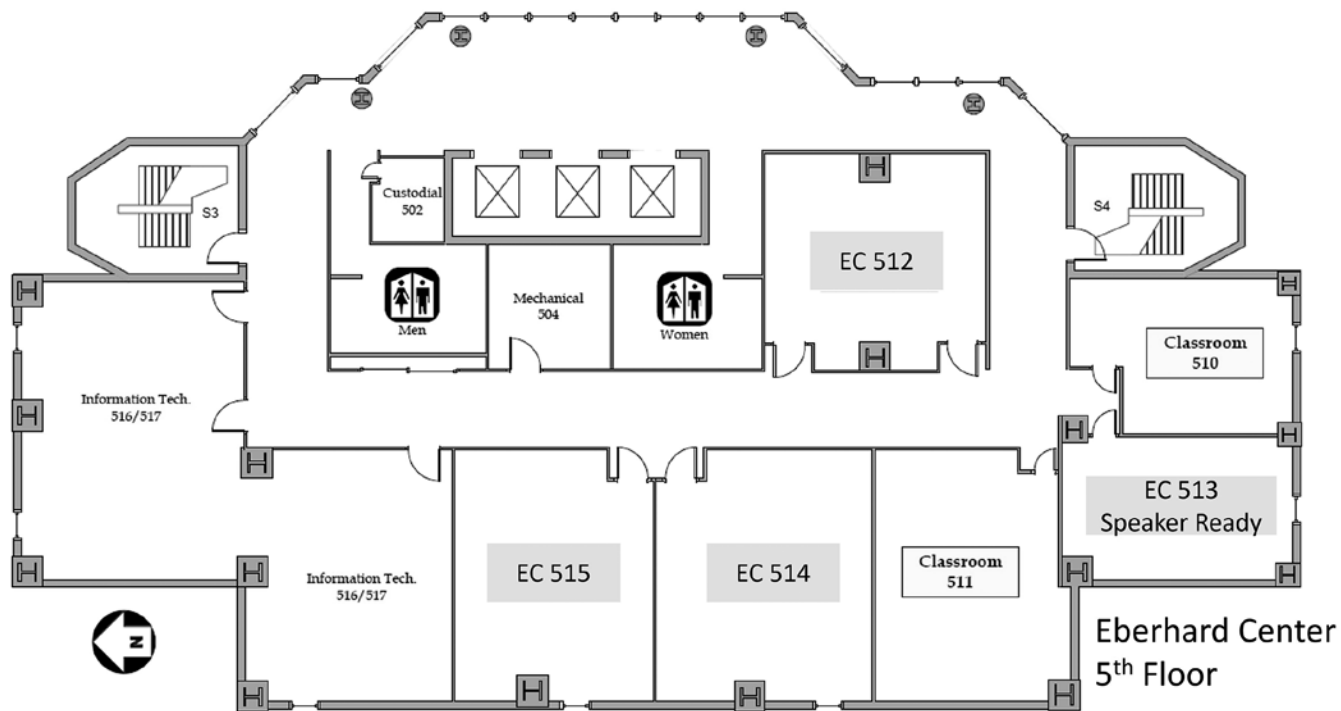
Session chairs are required to attend a Session Chairs Orientation, being held in EC 514 from 7 a.m.-7:30 a.m. Thursday and Friday. Session chairs are requested to adhere to the schedule and to encourage the strict time limits provided to speakers.

Session chairs are asked to strictly adhere to the technical program schedule and to limit speakers to their allotted time. If a speaker does not appear for an assigned time slot, session chairs should call for a break or discussion period and begin the following presentation at its scheduled time.

Center Convention Maps







Schedule of Events

EVENT	TIME	LOCATION
WEDNESDAY, 3 MAY		
FT1. Michigan Geological Repository for Research and Education (MGRRE) Tour—Michigan Subsurface Geology Using Borehole Core Samples Check-In (Field Trip)	8:30–9 a.m.	L.V. Eberhard Center
SC1. Practical High-Energy Injection in Overburden and Bedrock: Preparation, Tools, Design, Distribution, and Evaluation Illustrated by Case Studies (Short Course)	8 a.m.–noon	Thornapple Room, Holiday Inn
Exhibitor Set Up	10 a.m.–4 p.m.	EC 215
FT2. Tour of PFAS Disposal and Treatment Sites in Northern Kent County Check-In (Field Trip)	12:30–1 p.m.	L.V. Eberhard Center
SC2. Near Subsurface Microbiology: It's the Little Things That Count (Short Course)	1–5 p.m.	Thornapple Room, Holiday Inn
SC3. Stratigraphic Imaging of Geomorphic, Geologic, and Geoarchaeological Landscapes (Short Course)	1–5 p.m.	Muskegon Room, Holiday Inn
Registration Open	2:30–8 p.m.	Level 2, top of main stairs
Speaker Ready Room	3–7 p.m.	EC 411
Welcoming Reception	5–7 p.m.	EC Foundation Room
THURSDAY, 4 MAY		
GSA North-Central Section Management Board Meeting	6:30–8 a.m.	EC 310
Session Chairs/Student Volunteer Orientation	7–7:30 a.m.	EC 514
Registration Open	7 a.m.–5 p.m.	Level 2, top of main stairs
Speaker Ready Room	7 a.m.–7 p.m.	EC 411
Informal Gatherings (designated zone for informal student and career networking)	7:30 a.m.–6 p.m.	EC West Gallery
GeoCareers Workshop Part 1	9–10:00 am	Grand Room, Holiday Inn
Exhibits Open	9 a.m.–6 p.m.	EC 215
GeoCareers Workshop Part 2	10–11 a.m.	Grand Room, Holiday Inn
FT3. Riverwalk Tour—Restoring the Rapids in Grand Rapids Check-In (Field Trip)	10:30–11 a.m.	L.V. Eberhard Center
Morning Oral Technical Sessions		
T1. Teaching Geoscience at 2YC: Working to Engage Students and Broaden Participation	8 a.m.–noon	EC 515
T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology I	8 a.m.–noon	EC 311
T19. Aqueous and Environmental Geochemistry	8 a.m.–noon	EC 414
T23. Undergraduate and Graduate Geoscience Student Showcase	8 a.m.–noon	EC 514
T31. The Origin of Compositional and Thermal Heterogeneity within Earth's Interior	8 a.m.–noon	EC 512
Poster Sessions: authors present 9 to 11 AM		
T2. Recent Advances in K–16 Geoscience Education (Posters)	8 a.m.–noon	EC 215
T15. Recent Advances in Hydrogeology (Posters)	8 a.m.–noon	EC 215
T24. Undergraduate Research Poster Session I (Posters)	8 a.m.–noon	EC 215
T27. Carbonate Formation and Diagenesis (Posters)	8 a.m.–noon	EC 215
Town Hall: What's Happening at GSA	noon–1 p.m.	EC 201-203

EVENT	TIME	LOCATION
Afternoon Oral Technical Sessions		
T8. Fostering a Diverse, Equal, Inclusive, and Anti-Racist Geoscience Community	1:30–5:30 p.m.	EC 514
T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology II	1:30–5:30 p.m.	EC 311
T15. Recent Advances in Hydrogeology	1:30–5:30 p.m.	EC 512
T26. The Stratigraphic Record of Syntectonic Sedimentation and Synsedimentary Deformation: Frameworks for Avoiding the Logical Fallacy of Begging the Question	1:30–5:30 p.m.	EC 515
T28. Critical Minerals in North-Central United States: Exploration, Mining, and Processing	1:30–5:30 p.m.	EC 414
Afternoon Poster Sessions: authors present 2:30 to 4:30 PM		
T19. Aqueous and Environmental Geochemistry (Posters)	1:30–5:30 p.m.	EC 215
T22. If You Could Turn Back Time: An Open Session on Paleoclimatology of Any Sort (Posters)	1:30–5:30 p.m.	EC 215
T23. Undergraduate and Graduate Geoscience Student Showcase (Posters)	1:30–5:30 p.m.	EC 215
T29. Reading the Record of Tectonic Processes through Diverse Investigations of Igneous and Metamorphic Rocks (Posters)	1:30–5:30 p.m.	EC 215
Roy J. Shlemon Mentors Program in Applied Geoscience	noon–1:30 p.m.	Grand Room, Holiday Inn
Geology Club Meetup	2–3 p.m.	Level 2, north end of West Lobby
Evening Social	4–5:30 p.m.	EC East Lobby
GSA North-Central Section Open Meeting	5–5:30 p.m.	EC West Gallery
Great Lakes Section–SEPM Business Meeting	5–6 p.m.	GLS-SEPM Exhibit Hall booth, EC 215
Keynote Address: Adam Wygant, Director of the Oil, Gas, and Minerals Division (OGMD) in the Michigan Department of Environment, Great Lakes, and Energy (EGLE)	5:45–6:45 p.m.	EC 201-203
Informal Alumni (All Grand Valley State University Geology Department alumni groups, faculty and current students are welcome)	7–9 p.m.	University Club Room, Richard M. DeVos Center
Informal Alumni (Calvin University alumni and friends are invited)	7:30–9:30 p.m.	Dice Mineralogical Museum, Calvin University
FRIDAY, 5 MAY		
Session Chairs/Student Volunteer Orientation	7–7:30 a.m.	EC 514
GSA Campus Representative Appreciation Breakfast	7–8 a.m.	Grand Room, Holiday Inn
Registration Open	7 a.m.–2 p.m.	Level 2, top of main stairs
Speaker Ready Room	7 a.m.–2 p.m.	EC 411
Informal Gatherings (designated zone for informal student and career networking)	7:30 a.m.–6 p.m.	EC West Gallery
Morning Oral Technical Sessions		
T2. Recent Advances in K–16 Geoscience Education	8 a.m.–noon	EC 515
T13. Processes and Landforms of Great Lakes Coasts	8 a.m.–noon	EC 311
T18. Fate and Transport of PFAS in the Engineered and Natural Environment	8 a.m.–noon	EC 414
T25. Future Directions in Mineralogy and Petrology: A Session for Undergraduate and Graduate Researchers	8 a.m.–noon	EC 410
T27. Carbonate Formation and Diagenesis	8 a.m.–noon	EC 514
T33. Advances in Geophysics for Shallow Subsurface Investigations	8 a.m.–noon	EC 512

EVENT	TIME	LOCATION
Morning Poster Sessions: authors present 9 to 11 AM		
T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology (Posters)	8 a.m.–noon	EC 215
T24. Undergraduate Research Poster Session II (Posters)	8 a.m.–noon	EC 215
T31. The Origin of Compositional and Thermal Heterogeneity within Earth's Interior (Posters)	8 a.m.–noon	EC 215
GeoCareers Workshop Part 3	9–10 a.m.	Grand Room, Holiday Inn
Exhibits Open	9 a.m.–4 p.m.	EC 215
FT4. Collections Tour of the Grand Rapids Public Museum (Field Trip)	10:30–11 a.m.	L.V. Eberhard Center
Ethnicity and Identity Group Meetup	noon–1 p.m.	EC 201-203
John Mann Mentors Program in Applied Hydrogeology	noon–1:30 p.m.	Grand Room, Holiday Inn
Afternoon Oral Technical Sessions		
T3. Building the High School to College Pipeline: Honoring the Career of Chris Bolhuis	1:30–5:30 p.m.	EC 515
T12. The Grand River Past, Present, and Future	1:30–5:30 p.m.	EC 512
T20. Climate Change Impacts on Carbon and Nutrient Cycling in Wetland Soils	1:30–5:30 p.m.	EC 311
T29. Reading the Record of Tectonic Processes through Diverse Investigations of Igneous and Metamorphic Rocks	1:30–5:30 p.m.	EC 410
T36. Remembering Our Colleague, Al Kehew: His Contributions to Glacial Geomorphology, Midwestern Glacial Geology, and Geologic Mapping	1:30–5:50 p.m.	EC 201-203
Afternoon Poster Sessions: authors present 2:30 to 4:30 PM		
D1. Paleontology (Posters)	1:30–5:50 p.m.	EC 215
T13. Processes and Landforms of Great Lakes Coasts (Posters)	1:30–5:30 p.m.	EC 215
T25. Future Directions in Mineralogy and Petrology: A Session for Undergraduate and Graduate Researchers (Posters)	1:30–5:30 p.m.	EC 215
T33. Advances in Geophysics for Shallow Subsurface Investigations (Posters)	1:30–5:30 p.m.	EC 215
Exhibitor Tear Down	4–6 p.m.	EC 215
FT5. Mississippian Gypsum Mine Geology and Paleontology Field Trip Check-In (Field Trip)	5:30–6 p.m.	L.V. Eberhard Center
In Remembrance of Al Kehew (For correct time/location, RSVP to Cristine Thomas, cristine.thomas@wmich.edu)	6–8:30 p.m.	Location Provided after RSVP
SATURDAY, 6 MAY		
FT6. Coastal Dunes of Southern Lake Michigan Check-In (Field Trip)	7:30–8 a.m.	L.V. Eberhard Center
FT7. Mid-Michigan's Outdoor Classroom: Pennsylvanian Marginal-Marine Strata at Grand Ledge, Michigan Check-In (Field Trip)	7:30–8 a.m.	L.V. Eberhard Center

Technical Sessions

Meeting policy prohibits the use of cameras or sound-recording equipment at technical sessions and poster sessions.



A no-smoking policy has been established by the Program Committee and will be followed in all meeting rooms for technical sessions.

NOTICE

In the interest of public information, the Geological Society of America provides a forum for the presentation of diverse opinions and positions. The opinions (views) expressed by speakers and exhibitors at these sessions are their own and do not necessarily represent the views or policies of the Geological Society of America.



NOTE INDEX SYSTEM

Numbers (3-4, 15-4) indicate session and order of presentation within that session.

* denotes speaker

THURSDAY, 4 MAY 2023

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 1

T1. Teaching Geoscience at 2YC: Working to Engage Students and Broaden Participation (GSA Energy Geology Division; GSA Geoscience Education Division; National Association of Geoscience Teachers (NAGT); National Association of Geoscience Teachers (NAGT) Geo2YC Division)

8:00 AM, L.V. Eberhard Center, EC 515

Tari Mattox and Andrea Bair, Presiding

- | | | |
|-----|----------|---|
| | 8:00 AM | Introductory Remarks |
| 1-1 | 8:05 AM | Mattox, Tari*: BUILDING VIRTUAL FIELD TRIPS FOR 2YC STUDENTS |
| 1-2 | 8:25 AM | Turner, Sheldon*: CLOSING THE SUCCESS GAP THROUGH UNDERGRADUATE RESEARCH AT A COMMUNITY COLLEGE |
| 1-3 | 8:45 AM | Bair, Andrea*: BUILDING A HANDS-ON, INTERACTIVE, ASYNCHRONOUS, FULLY ONLINE PHYSICAL GEOLOGY LECTURE + LAB COURSE AT A 2YC: FROM EMERGENCY REMOTE LEARNING ONWARD |
| 1-4 | 9:05 AM | Voorhees, David*: WHAT IS THE ROLE OF MODALITY TO LEARNING DURING THE PANDEMIC? |
| | 9:25 AM | Break |
| 1-5 | 9:40 AM | Resnick, Cheryl*: USING PODCASTS TO CONNECT SCIENTISTS WITH STUDENTS |
| 1-6 | 10:00 AM | VanRegenmorter, John*: ENGAGING NON-MAJORS WITH A STUDENT-DRIVEN APPROACH TO CLASS PROJECTS |
| 1-7 | 10:20 AM | Johnson, Beth A.*: SOTL INQUIRY INTO STUDENTS MAKING MEANINGFUL CONNECTIONS TO THE GEOSCIENCES |
| | 10:40 AM | Concluding Remarks |

SESSION NO. 2

T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology I (GSA Marine and Coastal Geoscience Division; GSA Quaternary and Geomorphology Division)

8:00 AM, L.V. Eberhard Center, EC 311

Randall Schaetzl, Timothy Fisher and Patrick Colgan, Presiding

- | | | |
|-----|----------|--|
| 2-1 | 8:00 AM | Kozlowski, Andrew*; Mahan, Shannon A.; Graham, Brandon; Huot, Sebastien; Backhaus, Karl: STRATIGRAPHIC AND CHRONOLOGIC CONSTRAINTS FOR THE MAXIMUM AGE OF MIS 2 GLACIAL ONSET IN UPSTATE NEW YORK STATE, USA |
| 2-2 | 8:20 AM | Backhaus, Karl*; Frieman, Richard A.; Kozlowski, Andrew: UNDERSTANDING NEW YORK STATES BEDROCK TOPOGRAPHY AND DRIFT THICKNESS THROUGH FIELD AND DIGITAL TECHNIQUES |
| 2-3 | 8:40 AM | Casaus, Maureen*; Fisher, Timothy; Jol, Harry M.: GEOMORPHIC ASSESSMENT OF GLACIAL LAKE AGASSIZ STRANGLINES IN NORTHWEST MINNESOTA |
| 2-4 | 9:00 AM | Colgan, Patrick*: A COMPARISON OF MODERN AND ANCIENT GLACIAL LANDFORMS, SEDIMENTS, AND PROCESSES OF BREIDAMERKURJÖKULL, ICELAND AND THE LAKE MICHIGAN LOBE IN SOUTHWESTERN MICHIGAN, USA |
| | 9:20 AM | Break |
| 2-5 | 9:35 AM | Curry, Ben*; Bruegger, Alison: CHRONOLOGICAL EMBELLISHMENTS TO THE CALUMET AND NIPISSING PHASES: SOUTHWESTERN LAKE MICHIGAN REGION |
| 2-6 | 9:55 AM | Velbel, Michael*; Eriksen, Zachary: A PLEISTOCENE PRO-GLACIAL LACUSTRINE DELTA DEPOSIT IN MICHIGAN, USA – A TERRESTRIAL ANALOG OF THE ANCIENT DELTA-LAKE SYSTEM AND FLOOD DEPOSITS AT JEZERO CRATER, MARS |
| 2-7 | 10:15 AM | Schaetzl, Randall*; Lepper, Kenneth: THE MACKINAC LOBE OF THE LAURENTIDE ICE SHEET – A CONSPICUOUS PLAYER IN THE GLACIATION OF NORTHERN LOWER MICHIGAN |

- 2-8 10:35 AM Curry, Ben*; Schaetzl, Randall; Lowell, Thomas; Fulton, Albert: DEGLACIAL HISTORY OF REMNANT LAKES OF GLACIAL LAKE ROSCOMMON

SESSION NO. 3

T19. Aqueous and Environmental Geochemistry (GSA Marine and Coastal Geoscience Division; International Association of Geochemistry)

8:00 AM, L.V. Eberhard Center, EC 414

David Long and W. Lyons, Presiding

- 8:00 AM Introductory Remarks
- 3-1 8:05 AM Kolak, Jonathan*; Long, David: EVIDENCE OF DISSOLVED SOLIDS FLUX UPWARD FROM THE MICHIGAN BASIN INTO LAKE MICHIGAN BENTHIC SEDIMENTS – A NEW LOOK AT OLD DATA
- 3-2 8:25 AM Finegan-Dronchi, Carly*; Hasenmueller, Elizabeth: WATERSHED LITHOLOGY INFLUENCES RETENTION TIMES FOR POLLUTANTS ASSOCIATED WITH ROAD DEICING EVENTS
- 3-3 8:45 AM Hernandez, Natalie*; Hasenmueller, Elizabeth: SOURCING, TIMING, AND EXTENT OF MICROPLASTIC MOBILIZATION BY URBAN FLOODING
- 3-4 9:05 AM McLean, Colleen E.*; Armstrong, Felicia P.; Zaitzew, Casey M.; Fuese, Nicholas R.: EVALUATION OF MICROPLASTICS IN BEACH SANDS ON ISLE OF MAN
- 3-5 9:25 AM Khodadadi, Maral*; Widom, Elisabeth; Krekeler, Mark: AMOUNT AND SIZE DISTRIBUTION OF LEAF-LEVEL PARTICULATE MATTER FROM AN EMITTER IN SW OHIO USING SEM/EDS: IMPLICATIONS FOR THE SPATIAL FOOTPRINT OF A POLLUTION POINT SOURCE
- 9:45 AM Break
- 3-6 10:00 AM Costa, Ozeas*; Welch, Susan; Lyons, W.: SOURCES, SINKS, AND TRANSPORT OF NUTRIENTS ACROSS A MIXED-USE WATERSHED IN NORTH-CENTRAL OHIO
- 3-7 10:20 AM Velazquez, Diana*; Kharbush, Jenan J.; Sheldon, Nathan; Hren, Michael T.; Junium, Christopher; Howard, Cecilia; McKay, Camelin: INVESTIGATING CONTROLS ON CARBON AND NITROGEN CYCLING IN A MODERN ANOXIC LAKE ENVIRONMENT
- 3-8 10:40 AM Schrenk, Matthew*; Sabuda, Mary; Melville, Olivia: THE FORM AND OXIDATION STATE OF IRON AND SULFUR COMPOUNDS INFLUENCES THE COMPOSITION OF GROUNDWATER MICROBIAL COMMUNITIES
- 3-9 11:00 AM Stoltzfus, Abbey*; Bank, Justin; Jenkins, Nick; Wudke, Hannah; McLeod, Claire; Krekeler, Mark P.S.: A MINERALOGICAL INVESTIGATION OF A HISTORICAL SILICARE CONSUMER TALC PRODUCT: INITIAL ELECTRON MICROSCOPY REVEALS PARTICLES OF CONCERN

SESSION NO. 4

T23. Undergraduate and Graduate Geoscience Student Showcase (GSA Energy Geology Division; GSA Marine and Coastal Geoscience Division; Council on Undergraduate Research Geosciences Division)

8:00 AM, L.V. Eberhard Center, EC 514

Ken Brown, Claire McLeod and Robert Shuster, Presiding

- 8:00 AM Introductory Remarks
- 8:05 AM Lightning talk: KLEINER, Cheyenne, EARTH AND ENVIRONMENTAL SCIENCE STUDENT LEVELS OF COMMUNITY ENGAGEMENT IN PLACE-BASED EDUCATION CLASSES AND PROGRAMS
- 8:10 AM Lightning talk: BARNES, Eugene, CHRONOQUEST: CHANGING UNDERGRADUATE PERCEPTIONS OF EARTH SCIENCE RESEARCH THROUGH PARTICIPATION

- 8:15 AM Lightning talk: BAKER-STAHN, Lucille, THE HIDDEN FALLS MEMBER: LITHOSTRATIGRAPHY AND DEPOSITIONAL INSIGHTS INTO THE PLATTEVILLE FORMATION, SOUTHEASTERN MINNESOTA
- 8:20 AM Lightning talk: NWEKE, Oluchi, SEQUIOTA SPRING AND POND WATER QUALITY MONITORING STUDY IN SPRINGFIELD, MISSOURI
- 8:25 AM Lightning talk: BOBER, Katherine, CHEMICAL VARIATIONS IN AMBER EXAMINED WITH TWO-PHOTON EXCITATION FLUORESCENCE MICRO-SPECTROSCOPY
- 8:30 AM Lightning talk: O'QUIN, Megan, UTILIZING CORAL REEF SUB-FOSSIL ASSEMBLAGES TO ASSESS STABILITY AND CHANGE IN BELIZEAN REEF COMMUNITIES OVER THE PAST 800 YEARS PART A
- 8:35 AM Lightning talk: JUSTICE, Ian, UTILIZING CORAL REEF SUB-FOSSIL ASSEMBLAGES TO ASSESS STABILITY AND CHANGE IN BELIZEAN REEF COMMUNITIES OVER THE PAST 800 YEARS PART B
- 8:40 AM Lightning talk: SCHIRRIK, Benjamin, INTRODUCING THE FERTILE DUNE FIELD, MINNESOTA, USA: CONTEXT, GEOMORPHOLOGY AND CHRONOLOGIC CONSTRAINTS
- 8:45 AM Lightning talk: FARMER, Grace, INTRODUCING THE FERTILE DUNE FIELD, MINNESOTA, USA: DUNE TYPES, WIND DIRECTIONS AND SAND CHARACTERISTICS AT AGASSIZ ENVIRONMENTAL LEARNING CENTER
- 8:50 AM Lightning talk: RECHTYGIEL, Nyla, GRAVITY STUDY OF A GRANITE-GREENSTONE BELT IN THE EASTERN PILBARA CRATON, WESTERN AUSTRALIA
- 8:55 AM Lightning talk: MORAN, Trevor, MODELING GRAVITY DATA IN THE EASTERN PILBARA CRATON, AUSTRALIA
- 9:00 AM Lightning talk: BROWN, Ken, CHARACTERIZING AIRBORNE PARTICULATE MATTER RELEASED FROM A RURAL LIMESTONE QUARRY AND CEMENT MANUFACTURING FACILITY IN GREENCASTLE, IN

SESSION NO. 5

T31. The Origin of Compositional and Thermal Heterogeneity within Earth's Interior

8:00 AM, L.V. Eberhard Center, EC 512

Allison Pease, Jiaxin Zhang, Meichen Liu and Yurong Zhang, Presiding

- 8:00 AM Introductory Remarks
- 5-1 8:05 AM Tan, Madeleine*; Ritsema, Jeroen: RECEIVER FUNCTION ANALYSIS OF THE MICHIGAN BASIN
- 5-2 8:25 AM Lane, Joseph*; Mickus, Kevin; McKay, Matthew: GEOPHYSICAL MODELING OF CRUSTAL STRUCTURES AND THEIR IMPACT ON THE FORMATION OF THE MIDDLE AND LOWER TENNESSEE RIVER VALLEY
- 5-3 8:45 AM Jacobson, Seth*: ESTABLISHING PRIMORDIAL CHEMICAL STRATIFICATION IN PLANETARY MANTLES DUE TO ACCRETION
- 5-4 9:05 AM Golos, Eva*; Fischer, Karen: INTERPRETATION OF THERMAL HETEROGENEITY FROM SEISMIC WAVESPEED IN THE CONTINENTAL LITHOSPHERE: TOOLS AND LIMITATIONS
- 9:25 AM Break
- 5-5 9:40 AM Zhang, Jiaxin*; McNamara, Allen K.: INFLUENCE OF COMPOSITION-DEPENDENT VISCOSITY ON THE LATERAL SPATIAL AND MORPHOLOGIC STABILITY OF PRIMORDIAL THERMOCHEMICAL PILES IN THE EARTH'S LOWER MANTLE
- 5-6 10:00 AM Krauss, Heidi*; McNamara, Allen K.: THE ROLE OF INITIAL CONDITION IN CONTROLLING THE VERTICAL STABILITY OF DEEP MANTLE COMPOSITIONAL RESERVOIRS

AM

THURSDAY

5-7 10:20 AM Nathan, Gabriel*; Jacobson, Seth: ISOTOPIC FRACTIONATION DUE TO MULTI-STAGE PLANETARY CORE FORMATION
10:40 AM Concluding Remarks

8-4

INTERPRETER AT THE CUSTER-GALLATIN NATIONAL FOREST

- 11 Underhill, Abe J.; Ayer, Hannah M.; Brenton, Mikayla A.; Davis, Justin L.; Gammon, Angel M.; St.Pierre, Jade G.A.; Bird, Broxton W.; Wilson, Jeremy J.; Nealy, Cameron A.*: PRE-COLUMBIAN POPULATION DYNAMICS AT CAHOKIA, IL (USA) AND THE ROLE OF LATE HOLOCENE FLOODING
- 12 Litwiler, Morgan*; Arkle, Kelsey: ANALYZING CHANGE IN PINE ABUNDANCE IN A SEDIMENT CORE FROM GREMEL WILDLIFE SANCTUARY
- 13 Gerezhgher, Nahum*; Nyarko, Samuel; Varma-Nelson, Pratibha: QUALITATIVE ANALYSIS OF CYBER-PLTL SESSIONS: ASSESSING FREQUENT TEAMWORK SKILL USAGE IN STUDENT LEARNING
- 14 Klais, Danielle*; Duchesne, Rocio: EVALUATING METHODS FOR DETERMINING THERMOKARST LAKE EXTENT CHANGES OVER THE PERIOD 2001 - 2020
- 15 Garcia, Andres*; Kilibarda, Zoran: SINKHOLE MORPHOLOGY AND DENSITY ON MITCHELL KARST PLATEAU IN SOUTHERN INDIANA
- 16 Sadowski, Kyle*: BATHYMETRIC AND WATER QUALITY SURVEY OF THREE LAKES IN COOK COUNTY, ILLINOIS
- 17 Norman, Shelby*; Alcorn, Jessica; Goswami, Arghya: DETECTION OF GLYPHOSATE IN THE WATERS OF NORTHWESTERN MISSOURI
- 18 Pellman, Chantal*; Duchesne, Rocio: TRACKING PROGRESSION OF EUTROPHICATION IN TWO LAKES IN WI VIA SATELLITE IMAGERY
- 19 Liu, Katherine M.*; Doyle, Alexander M.; Hayes, Shannon; Huelskamp, Madison S.; Moore, Andrew L.: COARSE GRAIN SIZE AND MOBILE SEDIMENT RESULT IN MINIMAL CONTAMINANT STORAGE BEHIND A LOW-HEAD DAM IN RICHMOND, IN
- 20 Hudson, Taylor; Sparks, C.*: HYDRAULIC HEAD DIFFERENTIAL FOR FLUID FLOW VECTORS IN SUBAXIAL MAGMA SYSTEMS OF THE MID-ATLANTIC RIDGE (30°N TO 30°S) SUBJECT TO ROTATIONAL SHEARING
- 21 Sorsen, Jessica M.*; Soluri, Logan D.; Elkins, Lynne J.; Messa, Cole; Stark, Gregory; Sims, Kenneth; Langmuir, Charles: CHARACTERIZING THE INFLUENCE OF MANTLE HETEROGENEITY AND RESULTING MAGMA SUPPLY VARIATIONS ON DETACHMENT FAULTING AT SLOW-SPREADING MID-OCEAN RIDGES
- 22 Morrison, Cameron*; Kerswell, Buchanan: COMPARING PT PATHS OF METAMORPHIC ROCKS DETERMINED BY QUANTITATIVE AND SEMI-QUANTITATIVE APPROACHES: A CASE STUDY FROM THE MONVISO OPHIOLITE, ITALY
- 23 Sims, Dwight*; Kerswell, Buchanan: DEFORMATION OF DRY HIGH-PRESSURE ECLOGITES DURING TECTONIC SLICING OF SUBDUCTED OCEANIC LITHOSPHERE: A CASE STUDY FROM THE MONVISO OPHIOLITE, ITALY
- 24 Tuttle, Lydia*; Peterson, Ginny: CONSTRAINTS ON QUARTZ DEFORMATION CONDITIONS USING EBSD, PALEOPIEZOMETRY, AND THIN SECTION MICROSTRUCTURES IN THE CHUNKY GAL MOUNTAIN FAULT, SOUTHWESTERN NORTH CAROLINA
- 25 Swartz, Samantha*: GARNET-BIOTITE COMPOSITION AS A GEOTHERMOMETER OF SCHIST: BLACK HILLS, SOUTH DAKOTA

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MORNING POSTER TECHNICAL SESSIONS

SESSION NO. 6

T2. Recent Advances in K-16 Geoscience Education (Posters) (GSA Geoscience Education Division)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #

- 6-1 1 Reimink, Jesse*; Bolhuis, Christopher: UTILIZING THE POWER OF AUDIO FOR GEOSCIENCE OUTREACH AND EDUCATION - THE PLANETGEO PODCAST AND RELATED PROJECTS
- 6-2 2 Hayes, Shannon*; Barrett, Katherine L.: APPLICATIONS OF GOOGLE MY MAPS FOR SPATIAL LEARNING IN FIELD SCIENCE

SESSION NO. 7

T15. Recent Advances in Hydrogeology (Posters) (GSA Hydrogeology Division)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #

- 7-1 3 Efobo, Oghenevwe*; Seyoum, Wondwosen: SPATIOTEMPORAL VARIATION OF BASEFLOW AND SURFACE RUNOFF TO ASSESS GROUNDWATER VARIABILITY
- 7-2 4 Gentry, Ryan*; Kneeshaw, Tara; Winkelstern, Ian; Huth, Tyler; Konecky, Bronwen; Hutchings, Jack: OBSERVED SHIFTS IN δD , $\delta^{18}O$, AND $\Delta^{17}O$ IN PRECIPITATION AT ALLENDALE, MICHIGAN: 2021-2023
- 7-3 5 Carrick, Noah*; Kneeshaw, Tara: SPATIAL AND TEMPORAL EVALUATION OF STORMWATER POND PERFORMANCE IN DISTRIBUTION OF CONDUCTIVITY AND CHLORIDE CONCENTRATIONS
- 7-4 6 Larson, Erik*; Testa, Maurice P.: THE KARST OF MACKINAC COUNTY, MICHIGAN: WHERE WE'VE BEEN AND WHERE WE'RE GOING
- 7-5 7 Dooley, Andrew*; Seyoum, Wondwosen: WATER COLOR OF MINNESOTA'S SENTINEL LAKES (SLICE) BY SATELLITE REMOTE SENSING

SESSION NO. 8

T24. Undergraduate Research Poster Session I (Posters) (GSA Energy Geology Division; Council on Undergraduate Research Geosciences Division)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #

- 8-1 8 Perrow, Alexa*: ANALYSIS OF CAVE BEAR DIET AND LIFE MODE THROUGH EXAMINATION OF SKULL FEATURES
- 8-2 9 Johnson, Hannah*: PALEO-RECONSTRUCTION AND PALEO-ART OF THE CISTECPHALID DICYNODONT KEMBWACELA KITCHINGI
- 8-3 10 DeSantiago, Jonathan*; Callahan, Caitlin: IMPACTS OF A GEOCORPS INTERNSHIP AS A GEOLOGY

SESSION NO. 9**T27. Carbonate Formation and Diagenesis (Posters)
(GSA Energy Geology Division)**

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #		
9-1	26	Martin, Ariel*; Kaczmarek, Stephen: A VISUAL JOURNEY THROUGH DOLOMITIZATION: MINERALOGICAL AND TEXTURAL TRANSFORMATIONS OF CA-MG-CARBONATES DURING HIGH-TEMPERATURE EXPERIMENTS
9-2	27	Burns, Moira*; Al-Musawi, Mohammed; Kaczmarek, Stephen: PETROLOGICAL EVIDENCE OF EARLY DOLOMITIZATION FOLLOWED BY NODULAR GYPSUM-ANHYDRITE IN THE LUCAS FORMATION, MICHIGAN BASIN, USA
9-3	28	Salome, Brianna*; Al-Musawi, Mohammed; Kaczmarek, Stephen: ANHYDRITE DIAGENESIS IN THE RICHFIELD MEMBER OF THE LUCAS FORMATION, MICHIGAN BASIN, USA
9-4	29	Gianecchini, Maya*; Brown, Garrett; Winklestern, Ian; Riemersma, Peter; Wilmeth, Dylan: CARBON ISOTOPE VARIABILITY IN 2.2 GA KONA DOLOMITE STROMATOLITES DURING THE LOMAGUNDI-JATULI EVENT
9-5	30	Greve, ADAM*; Winkelstern, Ian Z.; Riemersma, Peter: MEASURING MICROBIALITE CONTRIBUTIONS TO LAKE BOTTOM SEDIMENTATION IN FISH LAKE, MICHIGAN WITH STABLE ISOTOPES
9-6	31	Kaczmarek, Stephen*; Al-Musawi, Mohammed; Martin, Ariel; Hellner, Evan; Maurisset, Jean; Redlon, Chris; Scott, Ashley: A DETAILED PETROLOGICAL INVESTIGATION OF THE BYRON FORMATION PERITIDAL MARINE LIMESTONES AND DOLOSTONES, MICHIGAN BASIN, USA

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 10**T8. Fostering a Diverse, Equal, Inclusive, and Anti-Racist
Geoscience Community (GSA Energy Geology Division)**

1:30 PM, L.V. Eberhard Center, EC 514

Ian Winkelstern, Caitlin Callahan, Amber Kumpf, Stephen Mattox, Tari Mattox and Virginia Peterson, Presiding

10-1	1:30 PM	Cameron, Barry I.*; Raicu, Valerica; Gronert, Scott; Saffarini, Daad: EMPOWERING DIVERSE STEM TRANSFER STUDENTS WITH SUMMER INSTITUTES, PEER MENTORING, AND RESEARCH EXPERIENCES
10-2	1:50 PM	McLeod, Claire*; Sipola, Maija; Brudzinski, Michael; Krekeler, Mark: SUPPORTING STUDENT SUCCESS IN GRADUATE GEOSCIENCE PROGRAMS THROUGH A FIRST SEMESTER ONBOARDING COURSE
10-3	2:10 PM	Morris, Nina*; Petcovic, Heather; Voice, Peter; Atchison, Christopher L.: EFFECTIVE INSTITUTIONAL AND TEACHING STRATEGIES FOR SUPPORTING GEOSCIENCE STUDENTS WITH LEARNING DISABILITIES
10-4	2:30 PM	Ringle, Garrett B.; Murgia, Evangelia*; Yellich, John: A SIMPLE AND EFFECTIVE METHOD FOR IMPROVING ACCESSIBILITY OF MICHIGAN PARKS
10-5	2:50 PM	Mattox, Tari*: INCORPORATING INDIGENOUS KNOWLEDGE INTO VIRTUAL FIELD TRIPS

10-6	3:10 PM	Callahan, Caitlin*: MY FIGHT WITH TIME IN THE STRUGGLE TO LEARN WITH A DISABILITY AS A STUDENT AND AS A PROFESSOR IN GEOLOGY
10-7	3:30 PM	Schumacher, Anne*: TAKING UP SPACE: A QUEER GEOLOGIST'S JOURNEY FROM COAL TO CONSULTING
10-8	3:50 PM	Lewandowski, Katherine*: AN INITIAL LOOK AT THE COMPOSITION OF GEOSCIENCE DEPARTMENTS BY GENDER AND RANK
10-9	4:10 PM	Johnson, Beth*: INTRINSIC AND EXTRINSIC FACTORS FOR GEOSCIENCE FACULTY GENDER BIAS AT TWO-YEAR COLLEGE CAMPUSES
10-10	4:30 PM	Petcovic, Heather*; Bertman, Steven; Koretsky, Carla: ADVOCATES AND ALLIES: MEN CHAMPIONS FOR GENDER EQUITY ADVANCE-ING THE INCLUSION OF WOMEN FACULTY IN STEM
10-11	4:50 PM	Sipola, Maija*; Ventura-Valentin, Wilnelly; O'Connor, Abigale; McLeod, Claire; Brudzinski, Michael: WORKING TOGETHER TOWARD EQUITY: GOALS, PROJECTS, AND NEXT STEPS OF THE MIAMI UNIVERSITY URGE POD AND DEPARTMENT DEI COMMITTEE
10-12	5:10 PM	Peterson, Ginny*; Callahan, Caitlin; Kumpf, Amber; Mattox, Stephen; Mattox, Tari; Winklestern, Ian: REFLECTING ON LESSONS LEARNED FROM PARTICIPATION IN THE UNLEARNING RACISM IN THE GEOSCIENCES (URGE) PROGRAM

SESSION NO. 11**T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology II (GSA Marine and Coastal
Geoscience Division; GSA Quaternary and
Geomorphology Division)**

1:30 PM, L.V. Eberhard Center, EC 311

Randall Schaetzl, Timothy Fisher and Patrick Colgan, Presiding

11-1	1:30 PM	Loope, Henry*; Hanson, Paul; Antinao, José Luis; Jacobs, Peter; Grimley, David: LAST GLACIAL MAXIMUM AND LATE GLACIAL EOLIAN SAND ACTIVITY, EAST FORK WHITE RIVER BASIN, INDIANA, USA
11-2	1:50 PM	Hansen, Dougal*; Zoet, Lucas; Morgan-Witts, Natasha; Menzies, John: AN EXPERIMENTAL BASELINE FOR ICE-TILL STRAIN INDICATORS
11-3	2:10 PM	Morgan-Witts, Natasha*; Hansen, Dougal; Zoet, Lucas: IMPACTS OF EFFECTIVE PRESSURE OSCILLATIONS ON TILL DEFORMATION
11-4	2:30 PM	Fisher, Timothy*; Sasowsky, Ira; Chartolani, Giorgi; Aden, Douglas; Parrick, Brittany: SUBGLACIAL MELT-WATER EROSION PRESAGES LANDSCAPE FOR RENEWED KARSTIFICATION
11-5	2:50 PM	Norris, Tyler*: CHARACTERIZING THE BURIED TEAYS VALLEY IN THE EASTERN MIDWEST, USA
11-6	3:10 PM	Valachovics, Thomas*; Nash, T. Andrew; Norris, Tyler: THE QUATERNARY GEOLOGY OF FAYETTE COUNTY, OHIO: PALIMPSEST MORAINES AND THE TIMING AND RETREAT OF THE SCIOTO SUBLOBE

SESSION NO. 12**T15. Recent Advances in Hydrogeology
(GSA Hydrogeology Division)**

1:30 PM, L.V. Eberhard Center, EC 512

Peter Riemersma and Chris Gellasch, Presiding

	1:30 PM	Introductory Remarks
12-1	1:35 PM	Nsude, Nnaemeka*; Seyoum, Wondwosen; Peterson, Eric: UNDERSTANDING GROUNDWATER FLOW IN A SATURATED BUFFER ZONE (SBZ) USING NUMERICAL MODELS: CASE STUDY OF THE T3 SITE, CENTRAL ILLINOIS

- 12-2 1:55 PM Baker, Emily A.*; Parsen, Michael; Hart, David: GROUNDWATER TRANSPORT IN THE WISCONSIN CENTRAL SANDS REGION
- 12-3 2:15 PM Li, Rui*; Filippelli, Gabriel M.; Wang, Lixin: THE IMPACTS OF ANTHROPOGENIC ACTIVITIES AND SEASONALITY ON URBAN STREAM WATER QUALITY
- 12-4 2:35 PM Li, Pei*; McGarr, Jeffery; Ford, Robert; Wallace, Corey; Kleman, Teagan; Fields, Colton; Trutschel, Leah; Ward, Dylan; Rowe, Annette; Fritz, Ken M.; Soltanian, Reza: CHARACTERIZING HYPORHEIC ZONE PROCESSES CONTROLLED BY SEDIMENTARY ARCHITECTURE WITHIN COMPOUND BAR DEPOSITS USING FIELD DATA AND NUMERICAL MODELING
- 2:55 PM Break
- 12-5 3:10 PM Saleh, Hassan*; Sultan, Mohamed; Abdelmohsen, Karem; Karimi, Hadi; Emil, Mustafa Kemal: GRACE AND GRACE-FO UNRAVEL THE IMPACTS OF TROPICAL CYCLONES ON ARABIA'S HYDROLOGY: NAJD WATERSHED AS A CASE STUDY
- 12-6 3:30 PM Honer, Justin*; Reeves, Donald M.; Akara, Mahawa-Essa Mabossani; Parashar, Rishi: FLUID FLOW AND SOLUTE TRANSPORT PROPERTIES OF WELL-CONNECTED FRACTURE NETWORKS IN COLUMNAR BASALT
- 12-7 3:50 PM Kutsienyo, Eusebius J.*; Appold, Martin; Cather, Martha: ASSESSMENT OF THE EFFECTS OF CO₂ INJECTION ON A QUARTZ-RICH SANDSTONE RESERVOIR THROUGH BATCH REACTION EXPERIMENTS: CASE STUDY OF THE FARNSWORTH, TEXAS CARBON SEQUESTRATION SITE
- 12-8 4:10 PM Mcdaniel, James*; Gouzie, Doug: ANALYZING POTENTIAL CHEMICAL VARIABILITY AND ITS RELATIONSHIP TO ENGINEERING PROPERTIES IN THE BURLINGTON-KEOKUK FORMATION, SPRINGFIELD, MISSOURI
- 4:30 PM Concluding Remarks

SESSION NO. 13

T26. The Stratigraphic Record of Syntectonic Sedimentation and Synsedimentary Deformation: Frameworks for Avoiding the Logical Fallacy of Begging the Question

1:30 PM, L.V. Eberhard Center, EC 515

Kevin Evans, Presiding

- 13-1 1:30 PM Thurston, Olivia*; Stevens Goddard, Andrea; Stewart, Jack: NEW LOW-TEMPERATURE THERMOCHRONOLOGY DATES FROM MICHIGAN BASIN CORE SAMPLES REVEAL EARLY REHEATING EVENTS IN BASIN HISTORY
- 13-2 1:50 PM Haagsma, Autumn*: A COMPARISON OF THE CAMBRIAN MT. SIMON SANDSTONE ACROSS THE MIDWESTERN UNITED STATES FOR CARBON DIOXIDE STORAGE
- 13-3 2:10 PM Zambito, James*: STRATIGRAPHY OF THE DEVONIAN ANTRIM SHALE ON THE SOUTHEASTERN MARGIN OF THE MICHIGAN BASIN
- 13-4 2:30 PM Evans, Kevin*; Bassett, Damon J.: SYNSEDIMENTARY DEFORMATION AND SYNTECTONIC SEDIMENTATION IN MISSISSIPPIAN CARBONATES OF MISSOURI
- 13-5 2:50 PM Ibrahim, Abdullah*; Sultan, Mohamed; Abotalib, Abotalib Z.; Emil, Mustafa Kemal: STRUCTURAL CONTROL ON THE INCEPTION AND EVOLUTION OF EAST SAHARAN MEGA-DEPRESSIONS
- 13-6 3:10 PM Velbel, Michael*; Losiak, Ania; Smrecak, Trisha; Whitford, Craig: THE CIRCULAR FEATURE IN OTTER LAKE (BENZIE COUNTY) MI IS NOT AN IMPACT CRATER: A GROUNDWATER SPRING VENT HYPOTHESIS

SESSION NO. 14

T28. Critical Minerals in North-Central United States: Exploration, Mining, and Processing

1:30 PM, L.V. Eberhard Center, EC 414

Snehamoy Chatterjee and Timothy Eisele, Presiding

- 14-1 1:30 PM Eisele, Timothy*: MANGANESE DEPOSITS OF THE LAKE SUPERIOR DISTRICT, AND POTENTIAL METHODS FOR EXTRACTING THEM
- 14-2 1:50 PM Woodruff, Laurel*; Drenth, Benjamin; Hammarstrom, Jane; Dicken, Connie: CRITICAL MINERAL POTENTIAL OF THE NORTH-CENTRAL UNITED STATES
- 14-3 2:10 PM Elhebiry, Mohamed*; Sultan, Mohamed; Yellich, John: CRITICAL MINERAL EXPLORATION IN UPPER PENINSULA OF MICHIGAN: CHALLENGES AND OPPORTUNITIES
- 14-4 2:30 PM Appold, Martin S.*; Sperry, Max: RARE EARTH ELEMENT ORE POTENTIAL OF APATITE MINERALIZATION IN THE BOURBON AND IRON MOUNTAIN DEPOSITS IN THE SOUTHEAST MISSOURI IRON METALLOGENIC PROVINCE
- 14-5 2:50 PM Cox, Teagan*; Pierangeli, Luiza Maria Pereira; Brennan, Clara; Konieczka, Victoria; Sirbescu, Mona-Liza C.: EXPLORING FOR LITHIUM-CESIUM-TANTALUM (LCT) PEGMATITES: WEATHERING AND DISPERSION AUREOLES ASSESSED THROUGH SOIL GEOCHEMISTRY
- 3:10 PM Break
- 14-6 3:25 PM Hunt, William*; Sahdarani, Dyah; Lamadrid, Hector; Locmelis, Marek: STUDY OF THE SHEPHERD MOUNTAIN AND PILOT KNOB IRON ORE DEPOSITS USING STRATIGRAPHIC RELATIONSHIPS, FIELD OBSERVATIONS, AND FLUID INCLUSION DATA
- 14-7 3:45 PM Lamadrid, Hector*; Sahdarani, Dyah; Hunt, William: A FLUID APPROACH TO UNDERSTANDING THE IOA MINERALIZATIONS IN SE MISSOURI
- 14-8 4:05 PM Paton, Timothy*; McLaughlin, Pat; Clark, Ryan; Bancroft, Alyssa M.; Emsbo, Poul: ADVANCING THE UNITED STATES' GEOLOGIC FRAMEWORK IN THE SEARCH FOR CRITICAL MINERALS: STUDY OF REE-ENRICHED PHOSPHORITES YIELDS NEW INSIGHTS INTO CHICAGO SUBSURFACE RESOURCES
- 14-9 4:25 PM Sahdarani, Dyah*; Hunt, William; Lamadrid, Hector: THERMAL RECONSTRUCTION USING FLUID INCLUSIONS OF PEA RIDGE IOA-REE DEPOSITS, SE MISSOURI

AFTERNOON POSTER TECHNICAL SESSIONS

SESSION NO. 15

T19. Aqueous and Environmental Geochemistry (Posters) (GSA Marine and Coastal Geoscience Division; International Association of Geochemistry)

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

Booth #

- 15-1 1 Thomas, Anthony*; Dirksen, Mahlan; Zuehsow, Caden; Conkle, Ryan; Brown, Connor: NITRATE DILUTION RATES WITHIN LITTLE CEDAR CREEK
- 15-2 2 McGinnis, Natalie*; Kneeshaw, Tara: LONG-TERM EVALUATION OF POLYAROMATIC HYDROCARBON RETENTION IN FIELD-CONTAMINATED SOIL

- 15-3 3 Rankin, Mia; Welch, Susan; Smith, Devin F.; Lyons, W.*: THE IMPACT OF IMPERMEABLE SURFACE RUNOFF ON THE GEOCHEMISTRY OF THE OLENTANGY RIVER
- 15-4 4 Vodopyanov, Amy*; Knorr, Leah; Berry, Maria; Schrenk, Matthew: MICROBIAL COMMUNITY COMPOSITION AND FUNCTION IN SHALLOW GROUNDWATER ON THE MICHIGAN STATE UNIVERSITY CAMPUS: PREDICTING BIOGEOCHEMICAL RESPONSES TO ENVIRONMENTAL CHANGE
- 15-5 5 Chen, Zhaozhe*; Costa, Ozeas; Lee, Jiyoung; Volk, Abigail: REMOVAL OF MICROCYSTIN USING ARTIFICIAL FLOATING ISLANDS IN RESIDENTIAL WASTEWATER

SESSION NO. 16**T22. If You Could Turn Back Time: An Open Session on Paleoclimatology of Any Sort (Posters)**

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

Booth

- 16-1 6 Oeste, Ryan*; Wanamaker, Alan D.; Thatcher, Diana; Denniston, Rhawn F.; Graham, Andrew; Polyak, Victor J.; Regala, Federico T.; Asmerom, Yemane: MARINE ISOTOPE STAGE 4 CHANGES IN HYDROCLIMATE OF SOUTHERN PORTUGAL
- 16-2 7 Minnebo, Lillian*; Winkelstern, Ian Z.; Zhang, Jade; Petersen, Sierra: CLUMPED ISOTOPE SCLEROCHRONOLOGY REVEALS COLDER, LOCALLY VARIABLE LAST INTERGLACIAL CONDITIONS IN BERMUDA
- 16-3 8 Lollos, Darya*; Curley, Allison; Petersen, Sierra: BIOLOGICALLY DRIVEN ISOTOPIC FRACTIONATIONS IN BIVALVE GENERA DOSINIA AND MACTRA BETWEEN 43°S AND 53°N
- 16-4 9 Davies, Samantha*; Petersen, Sierra; Myers, Corinne; Pietsch, Charlie; Witts, James; Lowery, Christopher M.; Hoffman, Jon J.: A REGIONAL RECONSTRUCTION OF LATEST CRETACEOUS (MAASTRICHTIAN) OCEAN TEMPERATURES IN THE GULF COASTAL PLAIN USING CLUMPED ISOTOPE THERMOMETRY IN BIVALVE MACROFOSSILS
- 16-5 10 Thomas, Anthony*; Carlson, Abigail; Isley, Raegan; Gael, Jaimelee; Boham, Kaylee: USING THE PHENOLOGICAL CYCLES OF HARDWOODS IN NORTHEAST INDIANA AS A PROXY TO MEASURE IMPACT OF CLIMATE CHANGE

SESSION NO. 17**T23. Undergraduate and Graduate Geoscience Student Showcase (Posters) (GSA Energy Geology Division; GSA Marine and Coastal Geoscience Division; Council on Undergraduate Research Geosciences Division)**

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

Booth

- 17-1 11 Kleiner, Cheyenne*; Libarkin, Julie C.: EARTH AND ENVIRONMENTAL SCIENCE STUDENT LEVELS OF COMMUNITY ENGAGEMENT IN PLACE-BASED EDUCATION CLASSES AND PROGRAMS
- 17-2 12 Barnes, Eugene*; Lepper, Kenneth: CHRONOQUEST: CHANGING UNDERGRADUATE PERCEPTIONS OF EARTH SCIENCE RESEARCH THROUGH PARTICIPATION
- 17-3 13 Baker-stahl, Lucille*: THE HIDDEN FALLS MEMBER: LITHOSTRATIGRAPHY AND DEPOSITIONAL INSIGHTS INTO THE PLATTEVILLE FORMATION, SOUTHEASTERN MINNESOTA
- 17-4 14 Nweke, Oluchi*; Alkier, Hannah; Pavlowsky, Robert; Owens, V.: SEQUIOTA SPRING AND POND WATER

QUALITY MONITORING STUDY IN SPRINGFIELD, MISSOURI

- 17-5 15 Bober, Katherine*; Stoneman, Michael R.; Raicu, Valerica; McCoy, Victoria E.: CHEMICAL VARIATIONS IN AMBER EXAMINED WITH TWO-PHOTON EXCITATION FLUORESCENCE MICRO-SPECTROSCOPY
- 17-6 16 O'Quin, Megan*; Justice, Ian; Cramer, Katie; O'Dea, Aaron; Norris, Richard D.; Leonard-Pingel, Jill: UTILIZING CORAL REEF SUB-FOSSIL ASSEMBLAGES TO ASSESS STABILITY AND CHANGE IN BELIZEAN REEF COMMUNITIES OVER THE PAST 800 YEARS PART A
- 17-7 17 Justice, Ian*; OQuin, Megan; Cramer, Katie; O'Dea, Aaron; Norris, Richard D.; Leonard-Pingel, Jill: UTILIZING CORAL REEF SUB-FOSSIL ASSEMBLAGES TO ASSESS STABILITY AND CHANGE IN BELIZEAN REEF COMMUNITIES OVER THE PAST 800 YEARS PART B
- 17-8 18 Schirrick, Benjamin*; Farmer, Grace; Barnes, Eugene; Waugh, Alexander; Lepper, Kenneth: INTRODUCING THE FERTILE DUNE FIELD, MINNESOTA, USA: CONTEXT, GEOMORPHOLOGY AND CHRONOLOGIC CONSTRAINTS
- 17-9 19 Farmer, Grace*; Barnes, Eugene; Schirrick, Benjamin; Waugh, Alexander; Lepper, Kenneth: INTRODUCING THE FERTILE DUNE FIELD, MINNESOTA, USA: DUNE TYPES, WIND DIRECTIONS AND SAND CHARACTERISTICS AT AGASSIZ ENVIRONMENTAL LEARNING CENTER
- 17-10 20 Rechtzygiel, Nyla*; Kelso, Paul; Tikoff, Basil; Moran, Trevor; Hazeltine, William; Everest, Ann: GRAVITY STUDY OF A GRANITE-GREENSTONE BELT IN THE EASTERN PILBARA CRATON, WESTERN AUSTRALIA
- 17-11 21 Moran, Trevor*; Kelso, Paul; Tikoff, Basil; Rechtzygiel, Nyla; Everest, Ann; Hazeltine, William: MODELING GRAVITY DATA IN THE EASTERN PILBARA CRATON, AUSTRALIA
- 17-12 22 Brown, Ken*; Kitchens, Zach; Emanuelson, Nicholas; Shrestha, Kelsang; Adams, Katelyn; Claar, Caleigh; Doyle, Colin; Keller, Margaret; Martin, Thomas; Oaks, Scarlett; Peats, Mary; Ruiz Amaya, Angela; Seitz, Frances; Sucher, Tyler; Tiggleman, Sarah; Wolfe, Claire: CHARACTERIZING AIRBORNE PARTICULATE MATTER RELEASED FROM A RURAL LIMESTONE QUARRY AND CEMENT MANUFACTURING FACILITY IN GREENCASTLE, IN

SESSION NO. 18**T29. Reading the Record of Tectonic Processes through Diverse Investigations of Igneous and Metamorphic Rocks (Posters)**

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

Booth

- 18-1 23 Lee, Raymond; Jakeway, Jackson; Morgan, Sven*; Student, James: TRANSITION IN MICROSTRUCTURE AND CRYSTALLOGRAPHIC PREFERRED ORIENTATION IN QUARTZITES WITH DISTANCE FROM THE EJB PLUTON, EASTERN CALIFORNIA
- 18-2 24 Schuermann, Eric*: STRAIN HETEROGENEITY WITHIN THE NEMO GROUP SHEAR ZONE IN SOUTH DAKOTA'S BLACK HILLS SUGGESTS OBLIQUE CONVERGENCE DURING THE PRECAMBRIAN ASSEMBLY OF THE SOUTHERN TRANS-HUDSON OROGENY
- 18-3 25 Schroeder, Hannah*; Holder, Robert; Roy, Supratik: ANALYSIS OF TECTONIC ACTIVITY DURING THE LATE ARCHEAN IN THE ENGLISH RIVER SUBPROVINCE, ONTARIO CANADA

FRIDAY, 5 MAY 2023

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 19

T2. Recent Advances in K-16 Geoscience Education (GSA Geoscience Education Division)

8:00 AM, L.V. Eberhard Center, EC 515

Stephen Mattox and Peter Voice, Presiding

- 19-1 8:00 AM Mattox, Stephen*: THE UNEQUAL DISTRIBUTION OF AMERICA'S GROUNDWATER RESOURCES VIEWED FROM NGSS MS-ESS3-1
- 19-2 8:20 AM Bowman, Luke*; Danhoff, Brian; Matthys, Anthony; Bluth, Gregg J.S.: CAREER CONNECTION EXPLORATIONS: ENRICHING MIDDLE SCHOOL SCIENCE USING NASA RESOURCES
- 19-3 8:40 AM Griffey, Denisha*; Wallace, Luchara: WIRED TO WIRELESS: NAVIGATING K-12 GEOSCIENCE EDUCATION DURING THE PANDEMIC TO FOSTER ENGAGEMENT
- 19-4 9:00 AM Gillespie, Robb; Sultan, Mohamed; Caruthers, Andrew H.; Voice, Peter*; Petcovic, Heather: WMU DINOSAUR PARK: AN UPDATE
- 19-5 9:20 AM Crabtree, Stephen*: ASSESSING STUDENT ENGAGEMENT AND PARTICIPATION POST-COVID: HOW IS ONLINE CONTENT AFFECTING THE RETURN TO "NORMAL"?
- 19-6 9:40 AM Foley, Kristen*; Petcovic, Heather: EXPLORING THE FEATURES THAT MAKE POPULAR VIRTUAL FIELD EXPERIENCES GREAT
- 19-7 10:00 AM Parrish, Ethan C.*; Meyers, Stephen: CURRICULUM-SPECIFIC FILM: ELEVATING ENGAGEMENT IN THE INTRODUCTORY GEOSCIENCE CLASSROOM
- 19-8 10:20 AM Curtis, Daniel*; Brown, Megan; LaDue, Nicole: DIAGRAM AFFORDANCES AND THEIR IMPACT ON STUDENTS' ANSWERS ABOUT RIVERS AND GROUNDWATER

SESSION NO. 20

T13. Processes and Landforms of Great Lakes Coasts (GSA Marine and Coastal Geoscience Division)

8:00 AM, L.V. Eberhard Center, EC 311

Suzanne J. DeVries-Zimmerman and Zoran Killibarda, Presiding

- 8:00 AM Introductory Remarks
- 20-1 8:05 AM Fisher, Timothy*; Wiles, Greg C.; Wiesenberger, Nick: AN EXCEPTIONALLY LOW WATER LEVEL IN LAKE HURON DURING THE 17TH CENTURY
- 20-2 8:25 AM Roland, Collin*: IMPACTS OF ELEVATED WATER LEVELS ON EROSION OF WISCONSIN'S LAKE MICHIGAN COASTAL BLUFFS
- 20-3 8:45 AM Becker, Richard*; Doro, Kennedy; Palaseanu, Monica; Yellich, John; Kincare, Kevin: INVESTIGATING A FAILING LAKE MICHIGAN BLUFF USING UAS IMAGERY AND GROUND BASED GEOPHYSICAL TECHNIQUES,
- 20-4 9:05 AM Volpano, Chelsea*; Zoet, Lucas; Rawling III, J. Elmo; Theuerkauf, Ethan: QUANTIFYING SEDIMENT TRANSPORT FROM COASTAL BLUFFS AND CORRESPONDING NEARSHORE CHANGES IN THE GREAT LAKES
- 9:25 AM Break
- 20-5 9:40 AM Zoet, Lucas*; Dodge, Stefanie E.; Volpano, Chelsea A.; Rawling III, J. Elmo; Theuerkauf, Ethan: CRYOGENIC

WAVE TANK EXPERIMENTS EXAMINING THE EFFECTS OF NEARSHORE ICE

- 20-6 10:00 AM Davis Todd, Carrie*; Kolke, Clay; Merwin, Andrew; Hoekje, Peter: RELATIONSHIP BETWEEN SEDIMENT SIZE AND MAGNETIC SUSCEPTIBILITY IN LAKE ERIE BEACH SANDS
- 20-7 10:20 AM van Dijk, Deanna*: A CASE STUDY OF LAKE MICHIGAN DUNE DYNAMICS AS LAKE LEVELS CHANGE
- 20-8 10:40 AM Mattheus, Christopher*; Huot, Sebastien; Barklage, Mitchell; Theuerkauf, Ethan; Braun, Katherine; Dwyer, Katherine; Phillips, Andrew; Spitzer, Liz; Pearce, Kristen: STRATIGRAPHIC RECONSTRUCTION OF THE LATE HOLOCENE ZION BEACH-RIDGE PLAIN, SW LAKE MICHIGAN: TARGETING OVERWASH SANDS FOR OSL DATING
- 20-9 11:00 AM Arbogast, Alan F.*; Lovis, William A.; McKeehan, Kevin G.: GEOGRAPHY AND PRELIMINARY AGES OF COASTAL SAND DUNES IN THE NORTHERN PART OF LAKE MICHIGAN
- 11:20 AM Concluding Remarks

SESSION NO. 21

T18. Fate and Transport of PFAS in the Engineered and Natural Environment

8:00 AM, L.V. Eberhard Center, EC 414

Donald "Matt" Reeves, Daniel P. Cassidy and Richard Rediske, Presiding

- 21-1 8:00 AM Eisen, Kevin*; Roy, Tiffany; Christianson, Evan: SIMULATION OF THE PFAS AIR DEPOSITION PATHWAY TO GROUNDWATER CONTAMINATION
- 21-2 8:20 AM McGarr, Jeffery*; Li, Pei; Meyal, Alireza; Rubinstein, Rebecca; Versteeg, Roelof; McAvoy, Drew; Soltanian, Reza: UNDERSTANDING FATE AND TRANSPORT OF PERFLUOROOCTANE SULFONIC ACID (PFOS) WITHIN RIPARIAN FLOODPLAINS
- 21-3 8:40 AM Rediske, Richard*: PFAS CONTAMINATION IN NORTHERN KENT COUNTY: HOW THE LEGACY USE OF SCOTCHGARD IMPACTED GROUNDWATER AND SURFACE WATER RESOURCES AND COMMUNITY HEALTH
- 21-4 9:00 AM Coffin, Ethan*; Reeves, Donald M.; Cassidy, Daniel: PFAS LEACHING AND TRANSFORMATIONS IN MUNICIPAL SOLID WASTE LANDFILLS: FROM CONSUMER PRODUCTS TO LEACHATE
- 9:20 AM Break
- 21-5 9:35 AM Link, Garrett*; Reeves, Donald M.; Cassidy, Daniel: CHARACTERIZING PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) IN FINAL TREATED SOLIDS (BIOSOLIDS) FROM MICHIGAN WASTEWATER TREATMENT PLANTS
- 21-6 9:55 AM Trobisch, Kai*; Reeves, Donald; Cassidy, Daniel P.: ASSESSING THE FATE AND TRANSPORT OF PFAS IN WASTEWATER TREATMENT PLANT EFFLUENT DISCHARGED TO RAPID INFILTRATION BASINS
- 21-7 10:15 AM Vitale, Donovan*; Reeves, Donald M.; Coffin, Ethan; Link, Garrett: HIGH RESOLUTION PER AND POLYFLUOROALKYL SUBSTANCE MASS BALANCE IN A WASTEWATER TREATMENT PLANT POST AQUEOUS FILM FORMING FOAM SPILL

SESSION NO. 22

T25. Future Directions in Mineralogy and Petrology: A Session for Undergraduate and Graduate Researchers

8:00 AM, L.V. Eberhard Center, EC 410

Gary Michelfelder, Sarah Brownlee, Guillaume Girard, Elizabeth Kenderes and Claire McLeod, Presiding

- 8:00 AM Introductory Remarks

- 22-1 8:05 AM Crabtree, Stephen*: MAPPING OF DISCONTINUOUS UNITS OF PYROCLASTIC PUMICE AND TUFF SOUTH OF MT. MAZAMA, OREGON
- 22-2 8:25 AM Sedaghat, Azadeh*; McLeod, Claire: INSIGHTS INTO THE SOURCE OF CONTINENTAL ARC MAGMATISM: A STUDY OF MAFIC MINERAL CLUSTERS FROM THE CENTRAL ANDES
- 22-3 8:45 AM Wudke, Hannah*; Bank, Justin; Gillis, Morgan; Curtis, Juliana; McLeod, Claire; Krekeler, Mark P.S.: ONGOING ELECTRON MICROSCOPY INVESTIGATIONS OF TALC AND ASSOCIATED MINERALS FROM THE YELLOWSTONE MINE, MONTANA
- 9:05 AM Break
- 22-4 9:20 AM Gillis, Morgan*; Gokey, Kailee; Stittle, Landon; Curtis, Juliana; Krekeler, Mark: PRELIMINARY SCANNING ELECTRON MICROSCOPE ANALYSIS OF HOUSE DUST AND PAINT FROM HAMILTON, OH
- 22-5 9:40 AM Roy, Supratik*; Holder, Robert; Viète, Daniel: HEAT SOURCES DURING PALEOPROTEROZOIC MOUNTAIN BUILDING, PENOKEAN OROGEN, MICHIGAN
- 22-6 10:00 AM Kattemalavadi, Amartya*; Kleinsasser, Jackie; Simon, Adam; Peterson, Dean; Hudak, George J.: SERPENTINE MINERALOGY FROM FE-TI OXIDE-BEARING ULTRAMAFIC INTRUSIONS IN THE DULUTH COMPLEX, MN
- 10:20 AM Concluding Remarks

SESSION NO. 23

T27. Carbonate Formation and Diagenesis (GSA Energy Geology Division)

8:00 AM, L.V. Eberhard Center, EC 514

Ian Winkelstern, Stephen Kaczmarek and Ariel Martin, Presiding

- 23-1 8:00 AM Kaczmarek, Stephen*: A DECADE OF LABORATORY AND FIELD STUDIES: LESSONS LEARNED FROM INVESTIGATING DOLOMITE MINERALOGY
- 23-2 8:20 AM Al-Musawi, Mohammed*; Scott, Ashley; Kaczmarek, Stephen: DOLOMITE STOICHIOMETRY AS A PROXY FOR TRACKING FLUID CHEMISTRY, TEMPERATURE, AND FLOW DIRECTION IN FAULT-RELATED HYDROTHERMAL DOLOMITES: FIELD OBSERVATIONS FROM THE EARLY SILURIAN SUCCESSION OF THE MICHIGAN BASIN
- 23-3 8:40 AM Scott, Ashley*; Al-Musawi, Mohammed; Kaczmarek, Stephen: PARAGENESIS OF THE UPPER ORDOVICIAN SALUDA FORMATION: INSIGHTS FROM PETROGRAPHIC ANALYSES
- 23-4 9:00 AM McLaughlin, Pat*; Bancroft, Alyssa M.; Rine, Matthew; Klock, Carolina; Emsbo, Paul: THE RISE OF PINNACLE REEFS DURING THE MID-TELYCHIAN MANITOWOC EVENT
- 23-5 9:20 AM Al-Musawi, Mohammed*; Harrison, William B.; Voice, Peter; Kaczmarek, Stephen: HIGH-RESOLUTION ELEMENTAL DATA IN CARBONATES, A TOOL FOR CONSTRUCTING SEQUENCE STRATIGRAPHIC FRAMEWORK, OR FANCY GAMMA-RAY WIRE-LINE LOG?
- 23-6 9:40 AM Lasemi, Yaghoob*; Askari Khorasgani, Zohreh: PALEOKARST EVENTS IN THE CAMBRO-ORDOVICIAN KNOX SUCCESSION, ILLINOIS BASIN

SESSION NO. 24

T33. Advances in Geophysics for Shallow Subsurface Investigations (GSA Geophysics and Geodynamics Division)

8:00 AM, L.V. Eberhard Center, EC 512

Kennedy Doro and Kevin Mickus, Presiding

- 24-1 8:00 AM Mickus, Kevin*: DETAILED GRAVITY STUDIES AT OLD FAITHFUL GEYSER, YELLOWSTONE NATIONAL PARK

- 24-2 8:20 AM Jol, Harry M.*; Loope, Walter; Loope, Henry; Fisher, Timothy; Breckenridge, Andy: SUBSURFACE IMAGING OF A HOLOCENE BARRIER, LONESOME POINT, MI
- 24-3 8:40 AM Mickus, Kevin*: MAGNETIC AND VLF-EM INVESTIGATIONS AT THE OLD FAITHFUL GEYSER, YELLOWSTONE NATIONAL PARK
- 24-4 9:00 AM Urom, Obinna*; Doro, Kennedy: TIME-LAPSE MONITORING OF VARYING SOIL WATER SATURATION AFTER PRECIPITATION USING ELECTROMAGNETIC IMAGING
- 9:20 AM Break
- 24-5 9:35 AM Otchere, Nana-Aboagye*; Doro, Kennedy: COMBINED GEOPHYSICS AND DOUBLE-RING INFILTRATION TESTS ESTIMATE SPATIAL DISTRIBUTION OF INFILTRATION RATES IN WETLAND SOILS
- 24-6 9:55 AM Doro, Kennedy*: ELECTRICAL SIGNALS AS PROXIES FOR WETLAND SOILS CHARACTERISTICS AND HYDRO-BIOGEOCHEMICAL PROCESSES
- 24-7 10:15 AM Solum, John*; Auchter, Neal; Falivene, Oriol; Cilona, Antonino; Kleipool, Luuk; Zarian, Pedram: IMPROVED MODELS OF THE SUBSURFACE USING DEEP LEARNING FOR GEOLOGICAL CORE CHARACTERIZATION

MORNING POSTER TECHNICAL SESSIONS

SESSION NO. 25

T11. Recent Advances in Glacial Geology, Geomorphology, Sedimentology, and Chronology (Posters) (GSA Marine and Coastal Geoscience Division; GSA Quaternary and Geomorphology Division)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #

- 25-1 1 Nunez Ferreira, Francisca*; Zoet, Lucas; Rawling III, J. Elmo: RELATION BETWEEN SEDIMENT TRANSPORT AND SUBGLACIAL HYDROLOGY DURING ESKER FORMATION
- 25-2 2 Shepherd, Brianna S.*; Portenga, Eric W.; Ceperley, Elizabeth G.; Ullman, David J.: LIMITED APPLICATION OF SCHMIDT HAMMER EXPOSURE-AGE DATING IN THE GREAT LAKES REGION
- 25-3 3 Curry, Ben*; Grimley, David; Phillips, Andrew; Mander, Katie M.; Stumpf, Andrew; Lund, Deette M.; Hamilton, McKenzie S.: QUATERNARY DEPOSITS OF ILLINOIS: MAP UPDATE
- 25-4 4 Brooks, Jeremy*; Smith, Lillian; Hansen, Dougal; Tovar, Alexander; Zoet, Lucas: THE MORPHOLOGY OF STRIATIONS PRODUCED DURING LABORATORY EXPERIMENTS OF SUBGLACIAL ABRASION

SESSION NO. 26

T24. Undergraduate Research Poster Session II (Posters) (GSA Energy Geology Division; Council on Undergraduate Research Geosciences Division)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #

- 26-1 5 Brunner, Eric*; Al-Musawi, Mohammed; Kaczmarek, Stephen: THE ROLE OF CLAY COATINGS ON QUARTZ CEMENTATION IN THE ST. PETER SANDSTONE, MI BASIN, USA

AM

FRIDAY

26-2	6	Silvey, William*; Al-Musawi, Mohammed; Kaczmarek, Stephen: THE EFFECTS OF LATE STAGE COMPACTION AND CEMENTATION ON RESERVOIR QUALITY: A CASE STUDY FROM THE DETROIT RIVER GROUP, MICHIGAN BASIN
26-3	7	Siurek, Alec*; Kilibarda, Zoran: PRELIMINARY XRF ANALYSIS OF IRONSTONE CONCRETIONS FROM THE MAZON CREEK LAGERSTÄTTE
26-4	8	Cruz, Elena*; Kilibarda, Zoran: XRF ANALYSES OF CHERT PEBBLES FROM BEACHES OF SOUTHERN LAKE MICHIGAN
26-5	9	Howe, Morgan*; Mumper, Eric: TRACKING OF IGNEOUS AND METAMORPHIC GLACIAL ERRATICS IN CENTRAL OHIO FROM THE CANADIAN SHIELD USING SEM-EDS ANALYSIS
26-6	10	Mocherman, Logan*; Castle, Angela; Neckerman, Andrew; Riemersma, Peter: COMPOSITION AND GRAIN SIZE ANALYSIS OF COASTAL SANDS ALONG FLORIDA'S ATLANTIC AND GULF COAST BEACHES, A GEOLOGICAL STORY BENEATH OUR FEET
26-7	11	Smalley, Blake*; Larson, Erik: DISSOLUTIONAL MICRO-TEXTURES ON CARBONATES: CURRENT WORK AND FUTURE OPPORTUNITIES
26-8	12	Kippe, Zachary D.*; Erdman, Gracie N.; Riemersma, Peter: INSIGHT INTO THE ORIGIN OF DENSE SHELL BEDS IN THE PLEISTOCENE CALOOSAHATCHEE FORMATION IN FLORIDA FROM GRAIN SIZE ANALYSIS OF SEDIMENT IN MATRIX AND WITHIN ARTICULATED MOLLUSKS
26-9	13	Cox, Nicholas*; Kandel, Hari: ANALYZING PROVENANCE OF JACOBVILLE SANDSTONE OF THE EASTERN UPPER PENINSULA OF MICHIGAN USING URANIUM-BEARING MINERALS
26-10	14	Willis, Bailey*; Arkle, Kelsey: ESTABLISHING CONSTRAINTS ON TAPHONOMIC INERTIA IN SHALLOW MARINE SEDIMENTS: ST. CROIX, USVI
26-11	15	St.Pierre, Jade G.A.; Brenton, Mikayla A.; Bird, Broxton W.; Wilson, Jeremy J.; Gibson, Derek K.; Nealy, Cameron*: AEOLIAN RECORD OF MEGADROUGHTS FROM A CONTINUOUS LAKE CORE RECORD IN THE GREAT PLAINS
26-12	16	Kelley, Mari*: COMPARING LAB AND NATURALLY GROWN GYPSUM GROWTH MORPHOLOGIES
26-13	17	Puetz, Emma*; Williams, Audrey Rose; Obob-Ikuenobe, Francisca; Giesler, Ron: COMPARISON OF THREE MICROVERTEBRATE ASSEMBLAGES IN THE UPPER HELL CREEK FORMATION IN EASTERN MONTANA
26-14	18	Weakley, Hunter*; Pope, John P.: STUDY OF RADIOLARIA CONTAINED WITHIN CALCIUM PHOSPHATE CONCRETIONS IN PENNSYLVANIAN AGE ANNA, EXCELLO, MUNCIE CREEK AND OAKLEY BLACK SHALES FROM MISSOURI, KANSAS AND OKLAHOMA
26-15	19	Evans, Madalin; Hughes-Phelan, Sara; Marron, John*; Lewandowski, Katherine: LOW-RESOLUTION STUDY OF BENTHIC FORAMINIFERA FROM PLEISTOCENE COOL-WATER CARBONATES FROM TASMANIA DURING THE PLEISTOCENE (ODP SITE 1168A)
26-16	20	Howard, Lydia*; Houser, Colin C.; Marron, John; Lewandowski, Katherine: COMMUNITY STRUCTURE AND POPULATION DYNAMICS OF PLEISTOCENE BENTHIC FORAMINIFERA FROM ODP SITE 1171C (SOUTH TASMAN RISE)
26-17	21	Stewart, Jack*; Stevens Goddard, Andrea; Thurston, Olivia: MICHIGAN BASIN ISOPACH MAPS REVEAL LOCAL VARIATIONS IN TOPOGRAPHY
26-18	22	Georgevich, Stephanie*; Kelso, Paul: USING GROUND PENETRATING RADAR TO INVESTIGATE THE

POSSIBILITY OF PROHIBITION ERA TUNNELS AT CLUB MANITOU

SESSION NO. 27

T31. The Origin of Compositional and Thermal Heterogeneity within Earth's Interior (Posters)

8:00 AM, L.V. Eberhard Center, EC 215

Authors will be present from 9 to 11 AM

Booth #	
27-1	23 Mickus, Kevin; Rogers, Logan*: GRAVITY AND MAGNETIC ANALYSIS OF THE AMU DARYA BASIN OF TURKMENISTAN AND UZBEKISTAN
27-2	24 Fujita, Kazuya*; Ruff, Larry J.; Brudzinski, Michael; Esch, John; Rappolee, Eleanor: THE SEISMICITY OF SOUTHWESTERN MICHIGAN
27-3	25 Pease, Allison*: COMPOSITIONAL VARIATION OF PEROVSKITES IN EARTH'S INTERIOR

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 28

T3. Building the High School to College Pipeline: Honoring the Career of Chris Bolhuis (GSA Geoscience Education Division)

1:30 PM, L.V. Eberhard Center, EC 515

Stephen Mattox and Jesse Reimink, Presiding

28-1	1:30 PM	Thomas, Anthony*: INCREASING ENGAGEMENT & INTEREST IN GEOSCIENCES AT GARRETT HIGH SCHOOL THROUGH MEANINGFUL CONNECTIONS, PARTNERSHIPS, & RELATIONSHIPS WITH ACADEMIA
28-2	1:50 PM	Mattox, Stephen*; St. John, Steven; Bolhuis, Christopher: BUILDING A PIPELINE FROM HIGH SCHOOLS TO COLLEGE GEOLOGY PROGRAMS: INSIGHTS FROM A 20-YEAR PROGRAM IN MICHIGAN
28-3	2:10 PM	DeWitt, Andrew*: ROCKS, RIVERS, CONSULTING, AND EDUCATION – CHRIS'S IMPACT ON ME AND A GENERATION OF STUDENTS
28-4	2:30 PM	Dalman, Erica*: FROM THE MITTEN TO THE OIL PATCH
28-5	2:50 PM	Reminga, Katy*: HISTORICAL LAND USE INFLUENCE ON FINE-GRAINED SEDIMENTATION IN CHANNEL AND FLOODPLAIN DEPOSITS IN A FORESTED MISSOURI OZARK WATERSHED
28-6	3:10 PM	DeYoung, Samuel*; McKay, Matthew; Cruzan, Jordan D.: GEOLOGIC MAPPING AND GEOCHRONOLOGY OF THE HEAVENS GATE 7.5-MINUTE QUADRANGLE: HOW LONG DOES IT TAKE TO ACCRETE AN ISLAND ARC TO A CONTINENT?
28-7	3:30 PM	Reimink, Jesse*: ON THE ORIGINS OF CONTINENTAL NUCLEI - A RESEARCH CAREER INSPIRED BY CHRIS BOLHUIS

SESSION NO. 29

T12. The Grand River Past, Present, and Future

1:30 PM, L.V. Eberhard Center, EC 512

Peter Wampler and Kory Konsoer, Presiding

29-1	1:30 PM	Wampler, Peter*: GRAND RIVER WATER QUALITY SAMPLING
29-2	1:50 PM	Wampler, Peter*; Lang, Madeleine; Romanski, Allison: EXPLORING A MORE ELEGANT WATER QUALITY INDEX - DO WE DARE?
29-3	2:10 PM	Konsoer, Kory*; Siddique, Sumaiya Tul; Wampler, Peter: LONG-TERM GEOMORPHIC IMPACTS OF

- 29-4 2:30 PM Konsoer, Kory*; Siddique, Sumaiya Tul; Langendoen, Eddy; Ursic, Mick; Wampler, Peter; Ferguson, Jacob: DEPOSITIONAL PATTERNS AND SEDIMENTATION RATES ASSOCIATED WITH LONGITUDINAL TRAINING WALLS (LTWS) IN THE GRAND RIVER, MICHIGAN (USA)
- 29-5 2:50 PM Siddique, Sumaiya Tul*; Konsoer, Kory: THE EFFECTS OF LONGITUDINAL TRAINING WALLS (LTWS) ON TWO-DIMENSIONAL FLOW STRUCTURE IN THE GRAND RIVER, MICHIGAN (USA)
- 3:10 PM Discussion

SESSION NO. 30

T20. Climate Change Impacts on Carbon and Nutrient Cycling in Wetland Soils

1:30 PM, L.V. Eberhard Center, EC 311

Ziming Yang and Michael Philben, Presiding

- 30-1 1:30 PM Smith, Devin*; Welch, Susan; Flynn, Raymond; Henry, Tiernan; Croot, Peter; Preece, Vicky; Lehnhart-Barnett, Hannah; Lyons, W.; Carey, Anne E.: THE BIOGEOCHEMISTRY OF INTACT, DEGRADED, AND DEFORESTED IRISH BLANKET BOG
- 30-2 1:50 PM Dietrich, Abigail*; Smith, Devin; Lyons, W.; Carey, Anne E.: HYDROGEOCHEMICAL RELATIONSHIPS IN RIVERS DRAINING PEATLANDS IN NORTHWEST IRELAND
- 30-3 2:10 PM Bryan, Lauren*; Philben, Michael; Schoonover, Erik; Hile, Trevor; Lundy, Christian; Shaw, Rachel; Dole, Mackenzie; Koehl, Alexis; Smith, Madison; O'Donnell, Madeleine; Behrens, Grace: SELECTIVE PRESERVATION OF STRUCTURAL CARBOHYDRATES DURING PEAT FORMATION
- 30-4 2:30 PM Shaw, Rachel*; Bryan, Lauren; Lundy, Christian; Koehl, Alexis; Smith, Madison; Dole, Mackenzie; Behrens, Grace; O'Donnell, Madeleine; Philben, Michael: DEVELOPMENT OF AN INDEX FOR ORGANIC MATTER QUALITY IN PEATLANDS SOILS
- 2:50 PM Break
- 30-5 3:05 PM Smith, Madison*; Philben, Michael; Bryan, Lauren; Shaw, Rachel: TEMPERATURE SENSITIVITY OF NITROGEN MINERALIZATION IN PEAT FROM A SOUTHWESTERN MICHIGAN BOG
- 30-6 3:25 PM Yang, Ziming*; Zaporski, Jared; Eisenman, Christina; Aspin, Alexandria: ORGANIC CARBON-MINERAL-NUTRIENT INTERACTIONS IN WETLAND SOILS NEAR LAKE MICHIGAN
- 30-7 3:45 PM Vander Pas, Brooke*; Smart, Matthew; Gilhooly, William; Filippelli, Gabriel M.; Marshall, John; Whiteside, Jessica: CHEMOSTRATIGRAPHIC APPROACH TO TRACKING HIGH-PALEOLATITUDE NUTRIENT INFLUX IN AN EARLY TO MIDDLE DEVONIAN COASTAL SEQUENCE, WESTERN FALKLAND ISLANDS, SOUTH AMERICA
- 30-8 4:05 PM Sun, Chijun*; Shanahan, Tim; DiNezio, Pedro: SPRING WARMING DRIVES PAST AND FUTURE SHIFTS IN GREAT PLAINS STORM INTENSITY

SESSION NO. 31

T29. Reading the Record of Tectonic Processes through Diverse Investigations of Igneous and Metamorphic Rocks

1:30 PM, L.V. Eberhard Center, EC 410

Robert Holder and Hannah Blatchford, Presiding

- 31-1 1:30 PM Michelfelder, Gary*; O'Dowd, Conor L.; Wagner, Ethan; Rentz, Shannon Porter: GEOCHEMICAL EVIDENCE OF MIOCENE LITHOSPHERIC THINNING IN SOUTHERN NEW MEXICO: IMPLICATIONS FOR THE INITIATION OF RIFTING OF THE RIO GRANDE RIFT

- 31-2 1:50 PM Allred, Isaac*: DID THE APPALACHIAN DETRITAL ZIRCON SIGNAL CHANGE THROUGH THE PHANEROZOIC EON?
- 31-3 2:10 PM Street, Julisan*; Holder, Robert: HIGH-TEMPERATURE GRANULITE METAMORPHISM IN THE IVANPAH AND SOUTHERN MCCULLOUGH MOUNTAIN RANGES
- 2:30 PM Break
- 31-4 2:45 PM Zakharov, David*: WHERE WATER MEETS MAGMA: A HIGH-TEMPERATURE RECORD OF SUBAERIAL EXPOSED CONTINENTAL CRUST THROUGH TIME
- 31-5 3:05 PM Xu, Yiruo*; Holder, Robert; Viete, Daniel: INTERROGATING THE RECORD OF ARCHEAN TECTONICS FROM METAMORPHISM IN THE MINNESOTA RIVER VALLEY, USA (SUPERIOR PROVINCE)
- 31-6 3:25 PM Holder, Robert*; Viete, Daniel: THE METAMORPHIC ROCK RECORD THROUGH EARTH'S HISTORY
- 3:45 PM Discussion

SESSION NO. 32

T36. Remembering Our Colleague, Al Kehew: His Contributions to Glacial Geomorphology, Midwestern Glacial Geology, and Geologic Mapping

1:30 PM, L.V. Eberhard Center, EC 201-03

Kevin Kincare, Andrew Kozlowski and John Yellich, Presiding

- 32-1 1:30 PM Kincare, Kevin*: A VIRTUAL FIELDTRIP OF LATE PLEISTOCENE AND HOLOCENE DEPOSITS OF LUDINGTON RIDGE, MASON COUNTY, MICHIGAN
- 32-2 1:50 PM Sultan, Mohamed*; Elhebiry, Mohamed: FROM LIMITED PLACER OUTCROPS TO MAPPING THE LARGEST TERRESTRIAL ICE STREAM: ALAN KEHEW'S CONTRIBUTIONS TO LATE ORDOVICIAN GLACIATION IN THE SAHARAN-ARABIAN DESERT
- 32-3 2:10 PM Sauck, William*: MEMORIES OF AL KEHEW AND SOME OF THE PROJECTS ON WHICH WE COLLABORATED
- 32-4 2:30 PM Colgan, Patrick*: A PERSONAL REFLECTION ON THE IMPORTANT CONTRIBUTIONS OF ALAN E. KEHEW TO OUR KNOWLEDGE OF THE GLACIAL GEOLOGY OF MICHIGAN
- 32-5 2:50 PM Esch, John*; Yellich, John: DR. ALAN KEHEW - WORLD CLASS GEOLOGIST AND THE SURFICIAL GEOLOGY OF CASS COUNTY, MICHIGAN
- 32-6 3:10 PM Erber, Nathan*: A FORMER STUDENT'S PERSPECTIVE ON DR. ALAN KEHEW'S CONTRIBUTIONS TO THE UNDERSTANDING OF GLACIAL LANDSCAPES IN SOUTHERN MICHIGAN, USA
- 32-7 3:30 PM Kozlowski, Andrew*: MELTWATER, MAPPING AND MORAINES: ADVENTURES IN THE SAGINAW LOBE TERRAIN OF SOUTHWEST MICHIGAN AND BEYOND
- 32-8 3:50 PM Backhaus, Karl*: SURFICIAL GEOLOGIC MAPPING OF THE BRONSON QUADRANGLES IN SOUTHWEST MICHIGAN AND THE LEGACY OF THE EDMAP PROGRAM UNDER DR. ALAN KEHEW
- 32-9 4:10 PM Norris, Tyler*: BURIED VALLEY MAPPING IN MICHIGAN: A VIEW FROM ONE OF DR. ALAN KEHEW'S LAST GRADUATE STUDENTS
- 32-10 4:30 PM Lingle, Derrick*: ORIGIN OF HIGH LEVELS OF AMMONIUM IN GROUNDWATER, OTTAWA COUNTY, MI
- 32-11 4:50 PM Gillespie, Robb*: INTERACTIONS OF THE SAGINAW AND LAKE MICHIGAN GLACIAL LOBES - THE KALAMAZOO COUNTY MAPPING PROJECT
- 32-12 5:10 PM Zoet, Lucas*; Barrette, Nolan; Muto, Atsu; Rawling III, J. Elmo: WATER SOURCE FOR TUNNEL CHANNEL FORMATION IN THE GREEN BAY LOBE, WI

32-13 5:30 PM Yellich, John*; Chase, Ronald: MICHIGAN BLUFF IMPACTS AND CHANGES, WHO LISTENED?

AFTERNOON POSTER TECHNICAL SESSIONS

SESSION NO. 33

D1. Paleontology (Posters)

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

Booth

- | | | |
|-------|----|--|
| 33-1 | 1 | Van Kanegan, Neil*; Lundstrom, Craig C.: STABLE STRONTIUM ISOTOPIC BEHAVIOR OF CALCIUM-ALUMINIUM RICH INCLUSIONS FROM ALLENDE |
| 33-2 | 2 | McLeod, Claire*; Schweitzer, Alex; Gawronska, Aleksandra; Brum, Jared; Loocke, Matthew; Shaulis, Barry J.: PETROLOGICAL CHARACTERIZATION OF DOMINION RANGE (DOM) LUNAR METEORITES 18666 AND 18543 |
| 33-3 | 3 | Stivers-Biscuso, Autumn*; Thole, Jeffrey T.; Westgaard, John: MICROBIAL ROLE IN THE PRESERVATION OF LATE CRETACEOUS FOSSILS OF THE COLERAIN FORMATION, MESABI IRON RANGE, MINNESOTA |
| 33-4 | 4 | Shaffer, Austin B.; Schweitzer, Carrie*; Feldmann, Rodney M.: BIOGEOGRAPHY, BIODIVERSITY, AND ENVIRONMENTAL PREFERENCE OF HOMOLOIDEA (BRACHYURA) FROM THE LATE JURASSIC TO THE PRESENT |
| 33-5 | 5 | Vohs, Athena J.; Cherubini, Ashley; Schweitzer, Carrie*; Feldmann, Rodney M.: DIFFERENTIAL PRESERVATION OF CRABS (BRACHYURA, RANINOIDA) IN ASH-RICH CONCRETIONS FROM THE EOCENE OF WEST COASTAL USA |
| 33-6 | 6 | Wicker, Jagger*; Redman, Cory: COMPARING COMMON SAMPLING METHODS FOR FOSSIL MARINE-INVERTEBRATES IN THE BELL SHALE FORMATION (MIDDLE DEVONIAN) OF MICHIGAN |
| 33-7 | 7 | Labonte, Caitlin*; Schweitzer, Carrie; Feldmann, Rodney M.: CHANGES IN MORPHOLOGY, DIVERSITY, AND ENVIRONMENT IN THE SPONGE CRABS (DECAPODA, BRACHYURA, DROMIOIDEA) FROM THE CRETACEOUS TO HOLOCENE |
| 33-8 | 8 | Lindgren, Blake*; Wagner, Peter J.: PALEOZOIC BRACHIOPOD DISTRIBUTIONS |
| 33-9 | 9 | Robitsch, Todd*: RUDOLF KAUFMANN: PIONEER EVOLUTIONARY PALEONTOLOGIST |
| 33-10 | 10 | Cline, Daniel*; Ciampaglio, Charles; Shell, Ryan; Fuelling, Lauren J.: MARINE VERTEBRATE FAUNA OF THE GLENROCK LIMESTONE AND BENNETT SHALE (COUNCIL GROVE GROUP) OF KANSAS |
| 33-11 | 11 | Grimmett, Holly E.; Schweitzer, Carrie*; Feldmann, Rodney M.; Farlow, James O.: CHANGES IN MORPHOLOGY AND ENVIRONMENT IN THE CRAB CHACEON (DECAPODA, BRACHYURA, GERYONIDAE) FROM THE OLIGOCENE TO HOLOCENE |
| 33-12 | 12 | Schweitzer, Carrie*; Feldmann, Rodney M.: ONTOGENETIC CHANGE IN THE CRAB ORBITOPLAX WEAVERI (DECAPODA, BRACHYURA, EURYPLACIDAE) FROM THE EOCENE LOOKINGGLASS FORMATION, OREGON, WASHINGTON |

SESSION NO. 34

T13. Processes and Landforms of Great Lakes Coasts (Posters) (GSA Marine and Coastal Geoscience Division)

1:30 PM, L.V. Eberhard Center, EC 215

Booth

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| 34-1 | 13 | Eising, Josiah*; Andringa, Daniel G.; Guikema, Zach E.; Holleman, Titus; VanHekken, Joel E.: WRACK AND ITS EFFECT ON LAKE MICHIGAN BEACH SURFACES |
| 34-2 | 14 | Kramp, Jessica*; Deeren, Asa; Diepstra, Ruth; Lindemulder, Zachary D.; Paintin, Amanda; Vredevoogd, Ashley: THE EFFECTIVENESS OF SAND FENCES ON WEST MICHIGAN BEACHES |
| 34-3 | 15 | Prom, Grace*; Anderson, David; Greene, Sam; Fridsma, Jordan; Hoeksema, Seth; Pickett, Cherith: EARLY FOREDUNE INDICATORS DURING FALLING LAKE MICHIGAN LEVELS |
| 34-4 | 16 | Atma, Luke*; McClure, Jake; McRae, Austin; Rohrer, RyAnn: INVESTIGATING SAND RAMPS IN A LAKE MICHIGAN BEACH-DUNE SYSTEM |
| 34-5 | 17 | Fisher, Timothy*; Loope, Henry; Loope, Walter; Jol, Harry M.; Breckenridge, Andy; Goble, Ronald: SEDIMENTARY AND GEOMORPHIC RECORDS OF LITTORAL TRANSPORT DURING THE NIPissing TRANSGRESSION-REGRESSION CYCLE, NORTHEAST COAST OF THE UPPER PENINSULA OF MICHIGAN |
| 34-6 | 18 | Diggins, Thomas*; Mattheus, Christopher; Spitzer, Liz; Pearce, Kristen; Rosario, Liane: GEOMORPHIC AND VEGETATION DYNAMICS ALONG A GREAT LAKES RIDGE PLAIN: ASSESSING THE UTILITY OF COASTAL JUNIPERS AS DENDROCHRONOLOGICAL PROXIES OF LAKE-LEVEL CHANGE |
| 34-7 | 19 | Gustafson, Abigail*; Dykstra, Abby; Price, Brandon; Yang, Candace; Zhang, Monica: THE OPTIMAL BIOGEOMORPHIC ENVIRONMENT FOR A RARE DUNE THISTLE |

SESSION NO. 35

T25. Future Directions in Mineralogy and Petrology: A Session for Undergraduate and Graduate Researchers (Posters)

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

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| 35-1 | 20 | Zimmerer, Madalyn*; Gillis, Morgan; Gokey, Kailee; Argyilan, Erin P.; McLeod, Claire; Krekeler, Mark: CHARACTERIZATION OF TECHNOGENIC MAGNETIC PARTICLES (TMPS) WITHIN THE CONTEXT OF URBAN POLLUTION IN GARY, INDIANA |
| 35-2 | 21 | Fierman, Amanda*; Gillis, Morgan; Gokey, Kailee; McLeod, Claire; Krekeler, Mark: INITIAL INVESTIGATION OF ROAD SEDIMENT AS A TRACER OF POLLUTION IN THE LOCAL ENVIRONMENT NEAR A VACANT PROPERTY IN HAMILTON, OHIO |
| 35-3 | 22 | Luker-Corrado, Shyanne; Gillis, Morgan; Jenkins, Nick; Bhowmick, Mithun; Krekeler, Mark; Fierman, Amanda*: THE FIRST SHOCK COMPRESSION EXPERIMENTS ON SEPIOLITE: IMPLICATIONS OF GEOTECHNICAL MATERIALS FOR BLAST MITIGATION |
| 35-4 | 23 | Harmon, Amelia*; Michelfelder, Gary: INSIGHTS INTO MAGMA STORAGE AND EVOLUTION AT LICANCABUR VOLCANO, CENTRAL ANDES, CHILE |
| 35-5 | 24 | Bilodeau, Remy*; Michelfelder, Gary; Laviada-Garmon, Drew; Lenhard, Nathaniel: SHORT ERUPTION WINDOWS FOR LARGE VOLUME DOMES IN THE ALTIPLANO PUNA VOLCANIC COMPLEX, CHILE |
| 35-6 | 25 | Wagner, Ethan*; Michelfelder, Gary; Rentz, Shannon Porter: MILLION-YEAR MELT-PRESENCE IN MOGOLLON DATIL VOLCANIC FIELD RHYOLITES: CONSTRAINING |

THE HISTORIES OF THE BURSUM CALDERA RESURGENT DOMES

- 35-7 26 Zhang, Hanlin*; Michelfelder, Gary; Wagner, Ethan: THE RELATIONSHIP OF EPITHERMAL AU-AG-CU BEARING FLUIDS TO MAGMATISM IN THE MOGOLLON DATIL VOLCANIC FIELD, NEW MEXICO
- 35-8 27 Essex, Cameron*; Cameron, Barry: PALEOENVIRONMENTAL RECONSTRUCTIONS OF THE PLEISTOCENE ICE SHEET INFORMED BY GLACIO-VOLCANIC DEPOSITS IN NORTHEAST ICELAND

SESSION NO. 36

T33. *Advances in Geophysics for Shallow Subsurface Investigations (Posters)* (GSA Geophysics and Geodynamics Division)

1:30 PM, L.V. Eberhard Center, EC 215

Authors will be present from 2:30 to 4:30 PM

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- 36-1 28 Sturmer, Daniel*; Kessler, Cody; Phipps, Emma; Fletcher, Aaron; Marsh, Thomas; Alabri, Azzan: INITIAL MASW ANALYSIS OF THE CINCINNATI METRO AREA AND IMPLICATIONS FOR SEISMIC HAZARD IN HAMILTON COUNTY, OHIO

- 36-2 29 Alabri, Azzan; Nieweiowski, Sam; Amole, Fili-Fenua; Janszen, Jacob; Kleman, Teagan; McCarthy, Nathan; Naake, Hans; Wagner, Aaron; Lowell, Thomas V.; Sturmer, Daniel*: POST-GLACIAL STRATIGRAPHY DERIVED FROM 2-D CHIRP DATA AT AMBAJEJUS LAKE, NORTH-CENTRAL MAINE
- 36-3 30 Lapoint, Hannah*; Doro, Kennedy: RAPID SITE CHARACTERIZATION OF OHIO RESTORED WETLANDS USING GEOPHYSICS
- 36-4 31 Higley, Melinda*; Iheme, Onyinyechi; Bott, Caitlyn: GROUND PENETRATING RADAR IMAGERY OF A PENNSYLVANIAN SANDSTONE AT GRAND LEDGE, MICHIGAN
- 36-5 32 Matheus, Christopher*; Barklage, Mitchell; Rosario, Liane; Spitzer, Liz; Pearce, Kristen; Theuerkauf, Ethan; Braun, Katherine: GPR INTEGRATION WITH TOPOGRAPHIC MONITORING DATA AS COASTAL RECONSTRUCTIVE TOOL: EXAMPLES FROM NATURAL AND URBAN SHORELINE REGIONS IN ILLINOIS

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The second number (following the dash) indicates the presentation order of the paper within its session.

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