2019
PROGRAM

South-Central/
North-Central/
Rocky Mountain Joint
Section Meeting

25–27 March
Manhattan, Kansas, USA

www.geosociety.org/sc-mtg

THE GEOLOGICAL SOCIETY OF AMERICA®
Museums at the Forefront of the History and Philosophy of Geology: History Made, History in the Making
Edited by Gary D. Rosenberg and Renee M. Clary

Natural history museums have evolved over the past 500 years to become vanguards of science literacy and thus institutions of democracy. Curiosity about nature and distant cultures has proven to be a powerful lure, and museums have progressively improved public engagement through increasingly immersive exhibits, participation in field expeditions, and research using museum holdings, all facilitated by new technology. Natural history museums have dispersed across the globe and demonstrated that public fascination with ancient life, vanished environments, exotic animals in remote habitats, cultural diversity, and our place in the cosmos is universal. This volume samples the story of museum development and illustrates that the historical successes of natural history museums have positioned them to be preeminent facilitators of science literacy well into the future.

SPE535, 348 p., ISBN 9780813725352
list price $89.00 | member price $62.00

Edited by Raymond V. Ingersoll, Timothy F. Lawton, and Stephan A. Graham

Through a remarkable combination of intellect, self-confidence, engaging humility, and prodigious output of published work, William R. Dickinson influenced and challenged three generations of sedimentary geologists, igneous petrologists, tectonicists, sandstone petrologists, archaeologists, and other geoscientists. A key figure in the plate-tectonic revolution of the 1960s and 1970s, he explained how the distribution of sediments on Earth’s surface could be traced to tectonic processes, and is widely recognized as a founder of modern sedimentary basin analysis. This volume consists of 31 chapters related to Dickinson’s research interests; many of the authors are his former students, their students, and their students’ students, demonstrating his continuing profound influence. The papers in this volume are an impressive tribute to the depth and breadth of Bill Dickinson’s contributions to the geosciences.

SPE540, 757 p., ISBN 9780813725406
$99.00, member price $70.00

Buy online at http://rock.geosociety.org/store/
Program
Joint section meeting of the Geological Society of America
53rd SOUTH-CENTRAL, 53rd NORTH-CENTRAL,
and 71st ROCKY MOUNTAIN
25–27 March 2019
Hilton Garden Inn Manhattan & Manhattan Conference Center
Manhattan, Kansas

Source to Sink across the Midcontinent: Geosciences from the Rockies to the Gulf

Local Program Committee

General Chairs ............................................... Matthew Kirk, Tina Niemi, Shannon Mahan
Technical Program Chairs ..................................... Joel Spencer, Alison Graettinger, Shari Kelley
Field Trip Chairs .................................................... Susan Stover, Rex Buchanan
Graphics Chair .................................................... Alexandria Richard
Student Volunteer Coordinator .................................... Aida Farough
Exhibits Coordinator ................................................ Matthew Brueseke
Sponsorship Coordinators ....................................... Saugata Datta, Jejung Lee

GSA Section Officers for 2018–2019

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We are grateful to the several entities and individuals who made substantial contributions to help underwrite the costs of the meeting. Their names will be prominently displayed at the meeting. Our sponsors as of press time are:

GSI Engineering
Kansas State University—College of Arts and Sciences

Kansas State University—Office of the Vice President for Research
University of Texas at Arlington—Department of Earth and Environmental Sciences

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 page 29). If you have any concerns about behavior that may violate the Code, please contact:

GSA Executive Director, Vicki McConnell, vmconnell@geosociety.org
GSA Ethics and Compliance Officer, Nan Stout, gsaeventscode@gmail.com

You may also stop by the registration desk or the GSA Bookstore to have the named individuals directly contacted via phone.
LOCATION
The 2019 joint meeting of the South-Central, North-Central, and Rocky Mountain GSA sections is hosted by Kansas State University in Manhattan, Kansas. Thriving as a lively, college environment in the Flint Hills, Manhattan is home to delectable dining destinations, a vibrant nightlife, and exciting outdoor adventures. Take a short walk from the conference venue to explore downtown shops and restaurants or learn about the local history and ecology at the Flint Hills Discovery Center. Borrow a bike from the local bike share program and cruise along the Kansas River on the Linear Park Trail. Whether you want to go for a hike on the native tallgrass prairie, poke around in the Permian bedrock, or soar through the trees on zipline, Manhattan is a great starting point for a wide-range of adventures.

FLINT HILLS GEOLOGY
[Source: Goldberg and Miller, Geology of the Flint Hills, Kansas: Sea level and climate changes in the Permian. Field-trip Guidebook, 2019 Joint Regional GSA]
Manhattan is located near the northern edge of the Flint Hills; a strip of rolling hills that extends south into Oklahoma and contains some of the last remnants of native tallgrass prairie (see figure below). The Flint Hills were carved by erosion of Permian bedrock, which mostly consist of limestones and mudstones. The occurrence of those rock types repeats itself several times in the Permian succession of Kansas, recording past cycles of sea level and climate changes. The limestones were deposited in marine environments and may contain abundant chert nodules. Flint is a common name for chert and thus, the nodules give the Flint Hills their name. Mudstones overlying the limestone layers are often gray and fossiliferous, consistent with shallow marine deposition. Above those marine facies, an interval of red and green mudstones with extensive paleosol (i.e., ancient soil) development is often present. Variation in sea level and climate occurred as southern hemisphere continents of Gondwana fluctuated between glacial and interglacial periods. Glacial advance and retreat would be associated with both global cyclical sea-level fluctuation and climate change. Arid to semi-arid conditions prevailed during sea-level rise and highstand, resulting in deposition of carbonate sediment. Falling sea-level was associated with a transition to seasonally wet climates that initiated the influx of siliciclastic muds. As sea-level fell, these siliciclastic muds became subaerially exposed, allowing soils to develop. More details about the geology of the Flint Hills as well as its history and ecology are on display across the street from the Conference Center in the Flint Hills Discovery Center.

VENUE
The meeting location is the Manhattan Conference Center, which is connected to the Hilton Garden Inn, downtown Manhattan. Field trips are departing from the main entrance of the Conference Center and workshops are being held in rooms inside the Conference Center. See Field Trip and Workshop section for details.

TRANSPORTATION
For those driving to the conference, Manhattan is located along interstate 70 and is 110 miles west of Kansas City, Missouri, 130 miles north of Wichita, Kansas, 175 miles south of Omaha, Nebraska, and 495 miles east of Denver, Colorado. Air transportation options include the Manhattan Regional Airport (MHK), located 5 miles west of the conference center. MHK offers direct service to Dallas-Fort Worth (3 flights/day) and Chicago O’Hare (2 flights/day). Alternatively, attendees may also choose to fly to alternative airports nearby and drive to Manhattan. Options include Kansas City (MCI), Salina, Kansas (SLN), Wichita (ICT), and Omaha (OMA). Once in town, many of the hotels offer a shuttle to and from the airport. Ride-hailing services (e.g., Uber and Lyft) are also available.

PARKING
Free parking is available in the parking garage connected to the Manhattan Conference Center.
EATING AND DRINKING
The restaurant within the Hilton Garden Inn offers breakfast and dinner weekdays, 6 a.m.–8 p.m. Additional restaurants and bars are located adjacent to the conference center, in downtown Manhattan (within 0.5 mi), in the Aggieville shopping district near the Kansas State University campus (1.5 mi), and various other locations around town. A complete list is available here: http://www.manhattancvb.org/19/Dining.

WEATHER
In March, average daily high and low temperatures in Manhattan are 57°F (14°C) and 30°F (-1°C). Most precipitation falls between May and August. However, precipitation rates begin to gradually increase in March. Thus, participants are encouraged to check the forecast prior to their travel and potentially come prepared for a broad range of conditions.

REGISTRATION
Registration is required for anyone attending technical sessions, field trips, short courses, or exhibits. Check-in and on-site registration is located in the Hilton Garden Inn Manhattan, Ballroom Prefunction and open the following times:

- **Sunday, 24 March** 3–6 p.m.
- **Monday, 25 March** 6:30 a.m.–4:30 p.m.
- **Tuesday, 26 March** 6:30 a.m.–4:30 p.m.
- **Wednesday, 27 March** 6:30–11 a.m.

**Registration Fees**
On-site registration fees are below and are shown in U.S. dollars. Professionals registering for the meeting are encouraged to add US$15 to their registration fee to help a student attend the meeting.

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<td>Professional Member</td>
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<td>Field Trip/Workshop Only</td>
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**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 download the app at https://gsa.confex.com/gsa/2019SC/meetingapp.cgi.

ACCOMMODATIONS
A block of rooms had been reserved at the Hilton Garden Inn (+1-785-532-9116), and the Fairfield Inn (+1-785-539-2400).

SPECIAL EVENTS
**Sunday, 24 March**
- **Town Hall Session: GSA Strategic Planning Initiative.** 4–5 p.m. Konza Prairie Room. Please join GSA Executive Director Vicki McConnell for an update on GSA’s Strategic Planning. This is an opportunity to interact with leadership and ask questions about the future plans for GSA.
- **Welcome Reception.** 5–7 p.m., Big Basin/Kaw Nation Room. Enjoy snacks and a complimentary beverage while connecting with your colleagues. Each participant receives a coupon for one free beer, wine, or non-alcoholic beverage in their registration packet.

**Monday, 25 March**
- **Geology Club Meet-Up.** 2–3 p.m., McDowell Room. Chat with other representatives about their activities, goals, and accomplishments.
- **Posters/Exhibits Reception.** 4–5:45 p.m. Big Basin/Kaw Nation Rooms. Enjoy light snacks and a complimentary beverage while visiting the poster / exhibit hall. Each participant receives a coupon for one free beer or wine in the registration packet.
- **Keynote Presentation by Allyson K. Anderson Book.** 6–7 p.m., Konza Prairie/Kings/Flint Hills Rooms. Please join us for this keynote presentation, to be given by Allyson K. Anderson Book, Executive Director of the American Geosciences Institute.

**Tuesday, 26 March**
- **Thank-you Breakfast for GSA Campus Reps.** 7–8 a.m., Big Blue River Office. This complimentary 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.
- **Posters/Exhibits Reception.** 4–5:45 p.m. Big Basin/Kaw Nation Rooms. Enjoy light snacks and a complimentary beverage while visiting the poster / exhibit hall. Each participant receives a coupon for one free beer or wine in the registration packet.
- **Keynote Presentation by Robbie R. Gries.** 6–7 p.m. Konza Prairie/Kings/Flint Hills Rooms. Please join us for this keynote presentation, to be given by Robbie R. Gries, President of GSA.

**Wednesday, 27 March**
- **Posters/Exhibits Coffee.** 10–11:45 a.m., Big Basin/Kaw Nation Rooms. Enjoy coffee and tea while connecting with your colleagues.
- **Outstanding Student Presentation Awards Ceremony.** 11:45 a.m.–12:15 p.m., Big Basin/Kaw Nation Rooms. Come
find out which undergraduate and graduate students won awards for their oral or poster presentations!

BUSINESS MEETINGS
GSANorth-CentralSectionManagementBoardMeeting. Monday, 25 March, 6:30–8 a.m., Big Blue River Office.

GSA South-Central Section Management Board Meeting. Monday, 25 March, 7–8 a.m., Little Apple Boardroom.

GSA Rocky Mountain Section Management Board Meeting. Monday, 25 March, 7–8 a.m., Fort Riley Room.

GSA North-Central Section All-Member Business Meeting. Monday, 25 March, 5:45–6 p.m., Konza Prairie/Kings/Flint Hills Rooms.

GSA South-Central, and Rocky Mountain Sections Open Meeting. Tuesday, 26 March, 5:45–6 p.m. Konza Prairie/Kings/Flint Hills Rooms.

TECHNICAL PROGRAM
Speaker Ready Room
The Speaker Ready Room is located in the Cottonwood Room in the Conference Center, and is available at the following times:

- Sunday, 24 March: 4:30–6:30 p.m.
- Monday, 25 March: 7:30 a.m.–5:30 p.m.
- Tuesday, 26 March: 7:30 a.m.–5:30 p.m.
- Wednesday, 27 March: 7:30 a.m.–11 a.m.

Computers and assistance is available to view presentations. All presentations are displayed as PowerPoint presentations in technical sessions, and presentations should be prepared using a 16:9 ratio. The Speaker Ready Room can also be used to check presentations prior to uploading files. We ask that oral presenters upload their presentations the night prior for morning sessions or at least 2 hours prior to the beginning of their session for afternoon sessions.

Posters
Each poster board is 4 feet × 8 feet (landscape), and posters can be hung with stickpins or Velcro. Pins and Velcro will be available in the exhibit hall. Posters will be located in the Big Basin/Kaw Nation Rooms adjacent to the exhibitors. Presenters are expected to have their posters up by 8:30 am, and they are expected to be present at their posters from 4 to 5:45 p.m. for posters in sessions that take place on Monday and Tuesday and from 10 to 11:45 a.m. for posters in the session on Wednesday. Presenters should take down their posters at the end of the session. Any posters not taken down will be discarded.

Technical Sessions
Please direct questions related to the following sessions to the Technical Program Chairs, Joel Spencer, joelspen@ksu.edu, Alison Graettinger, graettingera@umkc.edu, and Shari Kelley, shari.kelley@nmt.edu.

Theme Sessions
T3. Injection-Induced Seismicity in the U.S. Midcontinent: Where Are We after a Decade?
T5. Mantle Dynamics and Lithospheric Deformation.
T9. Mafic and Ultramafic Magmatism in the Midcontinent and Beyond.
T10. Rhyolite/Granite Magmatism.
T11 Microanalyses, Macro Implications: Using Microscale Analyses to Decipher System-to-Regional Scale Processes.
T18. Unconventional Aquifers and Aquifer Management.
T24. Karst Processes and Speleology.
T32. Geology of the Greater Kansas City Area (Posters).
T33. Undergraduate Student Research (Posters).
T34. Pleistocene Records of Climatic and Environmental Change in the Rocky Mountains, Great Plains, and Midwest.

Discipline Sessions
D1. Energy Geology
D2. Environmental Geology
D3. Quaternary Geology, Geomorphology, Paleoclimate, and Limnogeology
D4. Sedimentology and Stratigraphy
D5. Structural Geology
D6. Geochemistry (Posters)
D7. Hydrogeology (Posters)
D8. Paleontology (Posters)
D9. Planetary Geology (Posters)
D10. Science and Society (Posters)
D11. Volcanoes and Igneous Rocks (Posters)

FIELD TRIPS
All trips depart from the Hilton Garden Inn Manhattan & Manhattan Conference Center entrance. For additional information, please contact Field Trip Chairs, Susan Stover, susanstover@ku.edu, and Rex Buchanan, rex@kgs.ku.edu.

FT1. Looking Beneath the Plains: Geology of the Ogallala Formation and the Central High Plains of Kansas.
Jon Smith, Kansas Geological Survey; Tony Layzell, Kansas Geological Survey. Sat.–Sun, 23–24 March, 7 a.m.–5 p.m. (overnight in Scott City, Kansas). Cost: US$245.
This field trip will visit outcrops that are the focus of ongoing research efforts examining the stratigraphic architecture, chronostatigraphy, and ichnology of the Ogallala Formation in Kansas. Stops include an operating volcanic ash quarry and Ladder Creek Canyon in west-central Kansas containing paleosols, trace fossils, and historic ruins and battlefields. We will also discuss the hydrogeology of the Ogallala aquifer and some of the policy implications for management of this vital resource.


Visit two archaeological sites near Manhattan, Kansas: the Coffey site in the Big Blue River valley and the Claussen site on Mill Creek. Learn about Holocene and late Pleistocene alluvial and soil stratigraphy, landscape evolution in the stream valleys, and the context of deeply buried archaeological components dating back at least 12,000 years. Multi-proxy data provide a detailed history of environmental change at both sites. That history is crucial to understanding human adaptations in the Flint Hills during the Pleistocene-Holocene transition and the warm, dry Alithermal climatic episode.

**FT5. The Science and the Industry of the Permian Hutchinson Salt.** Marcia Schulmeister, Emporia State University; Kathleen Counter Bennison, West Virginia University; Anna Sofia Andeskie, West Virginia University. Sunday, 24 March, 6:30 a.m.–9 p.m. Cost: US$87.

The 120-meter-thick Permian Hutchinson Salt Member of the Wellington Formation of central Kansas supports multiple industries. Composed of bedded halite, gypsum/anhydrite, and minor siliciclastic mudstone, it was deposited by shallow saline waters in a warm, dry climate. Underground salt mines access the purest halite, producing salt that is distributed through the U.S. and Canada. The vast space left by mining supports a prosperous commercial storage enterprise and a popular underground tourist attraction. Additional vertical solution caverns host the nation’s primary midcontinent liquid petroleum gas (LPG) storage industry. This field trip explores the origin and use of Hutchinson Salt in core samples and subsurface outcrops while meeting in an underground salt cavern, and topside, at a solution storage cavern.

**FT6. Trails West, Kansas City Vicinity, Missouri and Kansas.** James S. Aber, Emporia State University; Susan W. Aber, Emporia State University. Sunday, 24 March, 7 a.m.–6 p.m. Cost: US$58.

This field trip includes several famous trails: Lewis and Clark, Santa Fe, Oregon, and California. The trip also features Civil War and Border War sites. Pennsylvanian cyclothem make up the bedrock geology. The drainage system was determined by glaciation, specifically ice-marginal meltwater that carved the modern Missouri and Kansas river valleys as well as several other lesser valleys. These valleys served as primary transportation corridors that led to human settlement and development of the Kansas City metropolitan region.

**FT7. Windows into the Cretaceous Mantle of the North American Mid-Continent—Kimberlites of Riley County.** Pamela Kempton, Kansas State University; Matt Brueske, Kansas State University; Kayleigh Rogers, Kansas State University. Sunday, 24 March, 12:30–5 p.m. Cost: US$40

Cretaceous-age kimberlites in Riley County, Kansas, are unusual in that they erupted through Proterozoic rather than Archaean crust. Their occurrence, along with other localities in Wyoming and North Canada, has been linked to a lithosphere-scale structure called the “kimberlite corridor.” The Riley County kimberlites represent the southernmost kimberlite locality along the corridor. Participants on this field trip will have the opportunity to visit three different localities and will be provided with the latest information on their structure, composition, and petrogenesis.


The alluvial aquifer in the Kansas River valley is an important aquifer for municipal, industrial, and agricultural uses. This field trip will provide participants with an overview of how the aquifer is being used and a new water-level monitoring program to enhance understanding of the impact of that use.

**FT11. Geology of the Flint Hills, Kansas: Sea-Level and Climate Changes in the Permian.** Karin Goldberg, Kansas State University; Keith Miller, Kansas State University (retired). Thursday, 28 March, 8 a.m.–5 p.m. Cost: US$56.

This field trip focuses on the lower Permian (Wolfcampian) succession exposed in the Manhattan area, Riley County, Kansas. Nearly continuous exposures display numerous cycles of sea-level change (“cyclothemes”). Stacked paleosol horizons that are part of the Wolfcampian cyclothemes also record climate changes, from arid/semi-arid to sub-humid/seasonal climates.

**SHORT COURSES**

**SC1. Making Geoscience Animations and Videos and Assessing them in the Classroom.** Sunday, 24 March, 10 a.m.–4 p.m. Alcove Room. Robert J. Stern, University of Texas at Dallas; Ning Wang, University of Texas at Dallas; Jeffrey Ryan, University of South Florida; Lochtah Vaughn, University of Texas at Dallas; Siloa Willis, University of Texas at Dallas. Cost: US$50.

Geoscientific information and processes are very amenable to treatment using videos and animations but not enough are being made or assessed in the classroom. This short course is designed to engage interested geoscientists to make and assess their own geoscience videos and animations. The short course will stress the importance of identifying target audiences, carrying out research, generating storyboards and narrations, making and editing videos and animations, the importance of sound, dissemination, and assessment.

**SC2. GSA On To the Future Professional Skills Short Course for Students.** Sunday, 24 March, 8 a.m.–5 p.m. Tuttle Room. Stephen K. Boss, University of Arkansas; Tahlia Bear,
Geological Society of America; Katherine Ellins, University of Texas at Austin.

This National Science Foundation–sponsored short course will focus on building the professional skills of undergraduate and graduate students with a focus on résumé and CV development, networking, and other written and oral communications. The course will be interactive and include individual and group exercises, discussion, and presentations. Limited to 20 students.

EXHIBITS
Exhibits are located in Big Basin/Kaw Nation Rooms. For additional information, please contact the Exhibits Coordinator, Matthew Brueseke, brueseke@ksu.edu.

Set-up: Sunday, 24 March, noon–5 p.m.
Open: Sunday, 24 March, 5–7 p.m.
Open: Monday, 25 March, 8 a.m.–6 p.m.
Open: Tuesday, 26 March, 8 a.m.–6 p.m.
Open: Wednesday, 27 March, 8 a.m.–noon
Tear down: Wednesday, 27 March, noon–9 p.m.

Exhibitor (as of early January)
2020 Rocky Mountain Section GSA Meeting
2020 South-Central Section GSA Meeting
2020 North-Central Section GSA Meeting
Geological Society of American Bookstore
Geological Society of America Foundation
Kansas Geological Survey
Kansas State University, Department of Geology
National Association of State Boards of Geology (ASBOG)
Oklahoma State University/Boone Pickens School of Geology

OPPORTUNITIES FOR STUDENTS
Outstanding Student Presentation Awards. Cosponsored by GSA South-Central Section, North-Central Section, Rocky Mountain Section. These sections of GSA will award cash prizes and plaques to the best graduate and undergraduate posters and oral presentations. Judging of student oral and poster presentations will take place throughout the meeting, and award winners will be announced at the awards reception on Wednesday, 11:45 a.m.–12:15 p.m. in Big Basin/Kaw Nation Rooms. To be eligible, students must be lead authors and presenters, and should be capable of answering detailed questions about their research.

Mentor Programs
For information about the Mentor Programs, please contact Jennifer Nocerino at jnocerino@geosociety.org.

Roy J. Shlemon Mentor Program in Applied Geoscience. Monday, 25 March, noon–1:30 p.m., McDowell Room. Students and early career professionals will have the opportunity to discuss career prospects and challenges with applied geoscientists from various sectors over a FREE lunch.

John Mann Mentors in Applied Hydrogeology Program. Tuesday, 26 March, noon–1:30 p.m., McDowell Room. Students and early career professionals interested in applied hydrogeology or hydrology as a career will have the opportunity to network with professionals over a FREE lunch.

Geoscience Career Workshops
For more information about the Geoscience Career Workshops, please contact Jennifer Nocerino at jnocerino@geosociety.org.

Geoscience Career Workshop Part 1. Career Planning and Informational Interviewing. Monday, 25 March, 9–10 a.m., McDowell Room. Your job-hunting process should begin with career planning, not when you apply for jobs. This workshop will help you begin this process and will introduce you to informational interviewing. This section is highly recommended for freshmen, sophomores and juniors. The earlier you start your career planning the better.

Geoscience Career Workshop Part 2. Geoscience Career Exploration. Monday, 25 March, 10–11 a.m., McDowell Room. What do geologists in various sectors earn? What do they do? What are the pros and cons to working in academia, government, and industry? Professionals in the field, will address these issues.

Geoscience Career Workshop Part 3. Cover Letters, Résumés, and CVs. Tuesday, 26 March, 9–10 a.m., McDowell Room. How do you prepare a cover letter? Does your résumé need a good edit? Whether you are currently in the job market or not, learn how to prepare the best résumé possible. You will review numerous examples to help you learn important résumé dos and don’ts.

STUDENT VOLUNTEERS
The South-Central, North-Central, and Rocky Mountain Sections offer free meeting registration to student volunteers in return for ~7 hours of work during the meeting. If you are a student interested in volunteering, please contact the Student Volunteer Coordinator, Aida Farough at afarough@ksu.edu.

Students will meet with the Student Volunteer Coordinator before the meeting begins at the Student Volunteer Table (located near Registration) for their assignments.
### Schedule of Events

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<th>EVENT</th>
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<td>FT1. Looking Beneath the Plains: Geology of the Ogallala Formation</td>
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<td>and the Central High Plains of Kansas (Field Trip)</td>
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<td>FT3. Late-Quaternary Landscape Evolution and Geoarchaeology in the</td>
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<td>Flint Hills of Northeastern Kansas: A Tale of Two Sites (Field Trip)</td>
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<td>Ballroom Prefunction</td>
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<td>4–5 p.m.</td>
<td>Konza Prairie Room</td>
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<td>Speaker Ready Room</td>
<td>4:30–6:30 p.m.</td>
<td>Cottonwood Room</td>
</tr>
<tr>
<td>Exhibits Open</td>
<td>5–7 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td><strong>Welcome Reception</strong></td>
<td>5–7 p.m.</td>
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<tr>
<td><strong>MONDAY, 25 MARCH</strong></td>
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<tr>
<td>Registration</td>
<td>6:30 a.m.–4:30 p.m.</td>
<td>Ballroom Prefunction</td>
</tr>
<tr>
<td>GSA North-Central Section Management Board Meeting</td>
<td>6:30–8 a.m.</td>
<td>Big Blue River Office</td>
</tr>
<tr>
<td>GSA South-Central Section Management Board Meeting</td>
<td>7–8 a.m.</td>
<td>Little Apple Boardroom</td>
</tr>
<tr>
<td>GSA Rocky Mountain Section Management Board Meeting</td>
<td>7–8 a.m.</td>
<td>Fort Riley Room</td>
</tr>
<tr>
<td>Speaker Ready Room</td>
<td>7:30 a.m.–5:30 p.m.</td>
<td>Cottonwood Room</td>
</tr>
<tr>
<td>Exhibits Open</td>
<td>8 a.m.–6 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
</tbody>
</table>

**Morning Oral Technical Sessions**

<p>| T1. Conventional and Unconventional Reservoir Rocks: Advances in    | 8 a.m.–noon       | Konza Prairie Room                            |
| Experiments, Modeling, and Simulations                              |                   |                                               |
| T8. Cenozoic Magmatic and Tectonic Processes of Colorado–New Mexico: | 8 a.m.–noon       | Tuttle Room                                   |
| Understanding Voluminous Volcanism during the Transition from       |                   |                                               |
| Laramide Contraction to Rio Grande Rift Extension                  |                   |                                               |
| T11. Microanalyses, Macro Implications: Using Microscale Analyses   | 8 a.m.–noon       | Kings Room                                    |
| to Decipher System-to-Regional Scale Processes                      |                   |                                               |</p>
<table>
<thead>
<tr>
<th>EVENT</th>
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<th>LOCATION</th>
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<tbody>
<tr>
<td>T18. Unconventional Aquifers and Aquifer Management</td>
<td>8 a.m.–noon</td>
<td>Flint Hills Room</td>
</tr>
<tr>
<td>T28. Exciting New Interdisciplinary Themes in Quaternary Geochronology</td>
<td>8 a.m.–noon</td>
<td>Alcove Room</td>
</tr>
</tbody>
</table>

**Poster Sessions: Authors will be present from 4 to 5:45 PM**

<table>
<thead>
<tr>
<th>T33. Undergraduate Student Research (Posters)</th>
<th>8:30 a.m.–5:45 p.m.</th>
<th>Big Basin/Kaw Nation Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geoscience Career Workshop Part 1. Career Planning and Informational Interviewing</td>
<td>9–10 a.m.</td>
<td>McDowell Room</td>
</tr>
<tr>
<td>Geoscience Career Workshop Part 2. Geoscience Career Exploration</td>
<td>10–11 a.m.</td>
<td>McDowell Room</td>
</tr>
<tr>
<td>Roy J. Shlemon Mentor Program in Applied Geoscience</td>
<td>noon–1:30 p.m.</td>
<td>McDowell Room</td>
</tr>
</tbody>
</table>

**Afternoon Oral Technical Sessions**

| T3. Injection-Induced Seismicity in the U.S. Midcontinent: Where Are We after a Decade? | 1:30–5:45 p.m.      | Konza Prairie Room           |
| T9. Mafic and Ultramafic Magmatism in the Mid-Continent and Beyond   | 1:30–5:45 p.m.      | Kings Room                   |
| T14. Geoscience Outreach and Engagement I                            | 1:30–5:45 p.m.      | Tuttle Room                  |
| T20. Advances in the Measurement and Modeling of Integrated Surface and Subsurface Hydrologic Systems | 1:30–5:45 p.m.      | Flint Hills Room             |
| T29. Quaternary Landscape Evolution in the Midcontinent: Improved Insights from Geochronology | 1:30–5:45 p.m.      | Alcove Room                  |

| Geology Club Meet-Up                                                | 2–3 p.m.           | McDowell Room                |
| Posters/Exhibits Reception                                          | 4–5:45 p.m.        | Big Basin/Kaw Nation Rooms   |
| GSA North-Central Section All-Member Business Meeting              | 5:45–6 p.m.        | Konza Prairie/Kings/Flint Hills Rooms |
| Keynote Presentation by Allyson K. Anderson Book                    | 6–7 p.m.           | Konza Prairie/Kings/Flint Hills Rooms |

**TUESDAY, 26 MARCH**

| Registration                                                        | 6:30 a.m.–4:30 p.m. | Ballroom Prefunction        |
| Thank-you Breakfast for GSA Campus Reps                            | 7–8 a.m.            | Big Blue River Office       |
| Speaker Ready Room                                                 | 7:30 a.m.–5:30 p.m. | Cottonwood Room             |
| Exhibits Open                                                      | 8 a.m.–6 p.m.       | Big Basin/Kaw Nation Rooms  |

**Morning Oral Technical Sessions**

<p>| D4. Sedimentology and Stratigraphy                                 | 8 a.m.–noon         | Kings Room                   |
| T10. Rhyolite/Granite Magmatism I                                 | 8 a.m.–noon         | Konza Prairie Room           |
| T14. Geoscience Outreach and Engagement II                         | 8 a.m.–noon         | Tuttle Room                  |
| T23. The Low Down on the High Plains: Geologic and Hydrogeologic Studies of the High Plains Aquifer | 8 a.m.–noon         | Flint Hills Room             |
| T34. Pleistocene Records of Climatic and Environmental Change in the Rocky Mountains, Great Plains, and Midwest | 8 a.m.–noon         | Alcove Room                  |</p>
<table>
<thead>
<tr>
<th>EVENT</th>
<th>TIME</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td><strong>Poster Sessions:</strong> Authors will be present from 4 to 5:45 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D6. Geochemistry (Posters)</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D7. Hydrogeology (Posters)</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D8. Paleontology (Posters)</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>T1. Conventional and Unconventional Reservoir Rocks: Advances in</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>Experiments, Modeling, and Simulations (Posters)</td>
<td></td>
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<tr>
<td>T3. Injection-Induced Seismicity in the U.S. Midcontinent: Where Are</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
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<tr>
<td>We after a Decade? (Posters)</td>
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<tr>
<td>T8. Cenozoic Magmatic and Tectonic Processes of Colorado–New Mexico:</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
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<tr>
<td>Understanding Voluminous Volcanism during the Transition from</td>
<td></td>
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<tr>
<td>Laramide Contraction to Rio Grande Rift Extension (Posters)</td>
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</tr>
<tr>
<td>T24. Karst Processes and Speleology (Posters)</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>T32. Geology of the Greater Kansas City Area (Posters)</td>
<td>8:30 a.m.–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>Geoscience Career Workshop Part 3. Cover Letters, Résumés, and CVs</td>
<td>9–10 a.m.</td>
<td>McDowell Room</td>
</tr>
<tr>
<td>John Mann Mentors in Applied Hydrogeology Program</td>
<td>noon–1:30 p.m.</td>
<td>McDowell Room</td>
</tr>
<tr>
<td><strong>Afternoon Oral Technical Sessions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2. Environmental Geology</td>
<td>1:30–5:45 p.m.</td>
<td>Flint Hills Room</td>
</tr>
<tr>
<td>T4. Crustal Structure of the Midcontinent using Geophysical and</td>
<td>1:30–5:45 p.m.</td>
<td>Tuttle Room</td>
</tr>
<tr>
<td>Geodynamic Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10. Rhyolite/Granite Magmatism II</td>
<td>1:30–5:45 p.m.</td>
<td>Konza Prairie Room</td>
</tr>
<tr>
<td>T24. Karst Processes and Speleology</td>
<td>1:30–5:45 p.m.</td>
<td>Alcove Room</td>
</tr>
<tr>
<td>T26. Midcontinent Paleoclimatology</td>
<td>1:30–5:45 p.m.</td>
<td>Kings Room</td>
</tr>
<tr>
<td>Posters/Exhibits Reception</td>
<td>4–5:45 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>GSA South-Central, and Rocky Mountain Sections Open Meeting</td>
<td>5:45–6 p.m.</td>
<td>Konza Prairie/Kings/Flint Hills Rooms</td>
</tr>
<tr>
<td>Keynote Presentation by Robbie R. Gries</td>
<td>6–7 p.m.</td>
<td>Konza Prairie/Kings/Flint Hills Rooms</td>
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</table>

**WEDNESDAY, 27 MARCH**

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Registration</td>
<td>6:30–11 a.m.</td>
<td>Ballroom Prefunction</td>
</tr>
<tr>
<td>Speaker Ready Room</td>
<td>7:30–11 a.m.</td>
<td>Cottonwood Room</td>
</tr>
<tr>
<td>Exhibits Open</td>
<td>8 a.m.–noon</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td><strong>Morning Oral Technical Sessions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1. Energy Geology</td>
<td>8 a.m.–noon</td>
<td>Konza Prairie Room</td>
</tr>
<tr>
<td>D3. Quaternary Geology, Geomorphology, Paleoclimate, and</td>
<td>8 a.m.–noon</td>
<td>Alcove Room</td>
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<tr>
<td>Limnogeology</td>
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<tr>
<td>D5. Structural Geology</td>
<td>8 a.m.–noon</td>
<td>Kings Room</td>
</tr>
<tr>
<td>T5. Mantle Dynamics and Lithospheric Deformation</td>
<td>8 a.m.–noon</td>
<td>Flint Hills Room</td>
</tr>
<tr>
<td>EVENT</td>
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<tr>
<td><strong>Poster Sessions: Authors will be present from 10 to 11:45 AM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1. Energy Geology (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D2. Environmental Geology (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D3. Quaternary Geology, Geomorphology, Paleoclimate, and Limnogeology (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D4. Sedimentology and Stratigraphy (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D5. Structural Geology (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D9. Planetary Geology (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D10. Science and Society (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>D11. Volcanoes and Igneous Rocks (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>T4. Crustal Structure of the Midcontinent using Geophysical and Geodynamic Data (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td>T9. Mafic and Ultramafic Magmatism in the Mid-Continent and Beyond (Posters)</td>
<td>8:30–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td><strong>Posters/Exhibits Coffee</strong></td>
<td>10–11:45 a.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td><strong>Outstanding Student Presentation Awards Ceremony</strong></td>
<td>11:45 a.m.–12:15 p.m.</td>
<td>Konza Prairie/Kings/Flint Hills Rooms</td>
</tr>
<tr>
<td><strong>Exhibits Tear Down</strong></td>
<td>noon–9 p.m.</td>
<td>Big Basin/Kaw Nation Rooms</td>
</tr>
<tr>
<td><strong>FT9. Kansas River Alluvial Aquifer: Water Use and Real-Time Water-Level Monitoring (Field Trip)</strong></td>
<td>1–5:30 p.m.</td>
<td>Hilton Garden Inn Manhattan</td>
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**THURSDAY, 28 MARCH**

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<thead>
<tr>
<th>EVENT</th>
<th>TIME</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>FT11. Geology of the Flint Hills, Kansas: Sea-Level and Climate Changes in the Permian (Field Trip)</td>
<td>8 a.m.–5 p.m.</td>
<td>Hilton Garden Inn Manhattan</td>
</tr>
</tbody>
</table>
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

MONDAY, 25 MARCH 2019

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 1
T1. Conventional and Unconventional Reservoir Rocks: Advances in Experiments, Modeling, and Simulations (GSA Continental Scientific Drilling Division; GSA Energy Geology Division)

8:00 AM, Hilton Garden Inn Manhattan, Konza Prairie Room
Behzad Ghanbarian, Chi Zhang, Reza Barati and Manika Prasad, Presiding

1-1 8:00 AM Hasiuk, Franciszek*; Harding, Chris: 3D PRINTING MUDROCKS: EXPERIMENTS IN VALIDATING THE 3D-PRINTING PROCESS WHEN USING KAOLINITE CLAY AS A BUILD MATERIAL

1-2 8:20 AM Agbogun, Henry M.D.*: A LABORATORY EXPERIMENT TO CHARACTERIZE CHANGES IN POROSITY, PERMEABILITY, AND WORMHOLE FORMATION IN A CARBONATE ROCK

1-3 8:40 AM Ghanbarian, Behzad*; Ioannidis, Marios; Hunt, Allen G.: ESTIMATING WATER RELATIVE PERMEABILITY FROM CAPILLARY PRESSURE CURVE AND ELECTRICAL RESISTIVITY

1-4 9:00 AM Achang, Mercy*; Pashin, Jack C.; Atekwana, Eliot; Xiaoqun, Cui: HOW PARTICLE SIZE, MICROFRACTURES, AND MOISTURE CONTENT INFLUENCE THE PERMEABILITY OF CRUSHED SHALE SAMPLES

1-5 9:20 AM Vera, Alexandre*; Nakata, Nori: ACOUSTIC ANISOTROPY CHARACTERIZATION OF WOODFORD SHALE AND ITS IMPACT ON HYDRAULIC FRACTURING: NUMERICAL SIMULATION OF FRACTURES

1-6 9:40 AM Yang, Zhi*: RESOURCE POTENTIAL OF THE CONTINENTAL SHALE OIL IN CHINA

1-7 10:00 AM Mews, Kim S.*; Albuabia, Mustafa M.; Barati, Reza R.; Barati, Reza Gh.: A REVIEW OF BRITTLENESS INDEX CORRELATIONS FOR UNCONVENTIONAL TIGHT AND ULTRA-TIGHT RESERVOIRS

1-8 10:20 AM Djezzar, Sofiane*; Rasouli, Vamegh; Bouslam, Aldja; Rabiei, Minou: INTEGRATION OF SEISMIC CURVATURE AND ILLUMINATION ATTRIBUTES IN FRACTURE DETECTION ON A DIGITAL ELEVATION MODEL: METHODOLOGY AND INTERPRETATIONAL IMPLICATIONS

1-9 10:40 AM Hoffmann, Anna A.*; Thompson, Audrey; Borrok, David: THE ORIGIN AND EVOLUTION OF PRODUCED WATERS FROM THE TUSCALOOSA MARINE SHALE IN MISSISSIPPI AND LOUISIANA

1-10 11:00 AM Borrok, David M.*; Hoffmann, Anna A.; Wei, Mingzhen; Yang, Wan: HETEROGENEITY OF THE MINERALOGY AND ORGANIC CONTENT IN THE TUSCALOOSA MARINE SHALE

1-11 11:20 AM Zhao, Wenyu*: NUMERICAL SIMULATION OF OVERPRESSURE DURING SEDIMENTATION

1-12 11:40 AM Zheng, Han*; Sun, Xiaomeng; Wang, Pujun; Chen, Wei: CHARACTERISTICS AND FACTORS CONTROLLING RESERVOIR SPACE IN SELSIC LAVAS

SESSION NO. 2
T8. Cenozoic Magmatic and Tectonic Processes of Colorado–New Mexico: Understanding Voluminous Volcanism during the Transition from Laramide Contraction to Rio Grande Rift Extension

8:00 AM, Hilton Garden Inn Manhattan, Tuttle Room
Gary S. Michelfelder, Jacob O. Thacker, Conor O’Dowd, Brooke E. Benz, Shari Kelley; Jason W. Ricketts and Jesse Kelsch, Presiding

2-1 8:00 AM Puckette, James O.*; Wallace, Chester: EVIDENCE OF LATE PALEOZOIC LATERAL-SLIP FAULTING, FRONT RANGE, COLORADO

2-2 8:20 AM Thacker, Jacob O.*; Kelley, Shari; Karlstrom, Karl E.; Kendall, Jerry; Crow, Ryan S.: REGIONAL LARAMIDE DEFORMATION TIMING AND ITS IMPLICATIONS FOR CRETAICEOUS-PALEOGENE TECTONIC PROCESSES

2-3 8:40 AM Nelson, W. John*; Elinck, Scott D.; Lucas, Spencer G.: LARAMIDE DEFORMATION IN THE FRA CRISTOBAL RANGE, SOUTHERN NEW MEXICO
SESSION NO. 3

T11. Microanalyses, Macro Implications: Using Microscale Analyses to Decipher System-to-Regional Scale Processes

8:00 AM, Hilton Garden Inn Manhattan , Kings Room

Tenley J. Banik and Benjamin W. Hallett, Presiding

2-4 9:00 AM Kelley, Shari*: THERMAL STRUCTURE AND EXUHATION HISTORY OF THE SAN JUAN BASIN, NEW MEXICO

2-5 9:20 AM Sanabria, Mateo*: Gonzales, David A.: CONSTRAINT ON TIMING AND HISTORY OF LATE MESOZOIC TO CENOZOIC PLUTONS IN THE SAN MIGUEL MOUNTAINS, SOUTHWESTERN COLORADO

2-6 9:40 AM BREAK

2-6 9:55 AM Rader, Mikaela A.; Kempton, Pamela D.; Möller, Andreas: ZIRCON GEOCHRONOLOGY OF GRANULITE XENOLITHS FROM THE GERONIMO VOLCANIC FIELD AND IMPLICATIONS FOR TECTONIC EVOLUTION OF THE LOWER CRUST OF THE SW UNITED STATES

2-7 10:15 AM O'Dowd, Conor L.; Michelfelder, Gary S.: PETROGENETIC EVOLUTION OF INTERMEDIATE MAGMAS FROM THE MOLLOGON-DATIL VOLCANIC FIELD DURING ARC-RIFT TRANSITION: INSIGHTS FROM WHOLE-ROCK GEOCHEMISTRY OF THE BEARWALLOW MOUNTAIN ANDESITE

2-8 10:35 AM Carsrud, Corbin T.: PATTERNS OF CONGLOMERATE DEPOSITION ASSOCIATED WITH THE UNROOFING OF THE SOLITARIO DOME, PRESIDIO AND BREWSTER COUNTY, TEXAS

2-9 10:55 AM Rodriguez-Gonzalez, Georgina; Ricketts, Jason W.: FAULT KINEMATICS AND PALEOSTRAIN ANALYSIS OF THE SOUTHERN RIO GRANDE RIFT: A COMPARATIVE STUDY TO THE CENTRAL RIFT

SESSION NO. 4

T18. Unconventional Aquifers and Aquifer Management (GSA Hydrogeology Division; GSA Geology and Health Division; GSA Geology and Society Division)

8:00 AM, Hilton Garden Inn Manhattan , Flint Hills Room

Andrea Croskey, Mandy L. Stone and Craig Painter, Presiding

4-1 8:05 AM Croset, Andrea*: Meyer, John; Suydam, Alyssa: UTILIZING RESISTIVITY LOGS AND THE RWA METHOD TO MAP SALINITY ZONES IN THE EOCENE QUEEN CITY AQUIFER, CENTRAL TEXAS

4-2 8:25 AM Spencer, Kevin J.; Leal, Jesus: DEVELOPMENT OF BRACKISH GROUNDWATER RESOURCES IN THE LOWER RIO GRANDE VALLEY, TEXAS

4-3 8:45 AM Finch, Steve*: EXPLOITATION POTENTIAL FOR THE CAPITAN REEF COMPLEX AQUIFER, DELAWARE BASIN, SOUTHEASTERN NEW MEXICO AND FAR WEST TEXAS

4-4 9:05 AM Cameron, Katie A.; Olafsen Lackey, Susan: HYDROGEOLOGIC FRAMEWORK OF EASTERN NEBRASKA – RECENT DEEPER (EARLY CRETACEOUS TO CENOMANIAN) EXPLORATION

4-5 9:25 AM BREAK

4-6 9:40 AM Klager, Brian*: MODELING THE EFFECTS OF AN ARTIFICIAL RECHARGE PROJECT ON STORAGE VOLUME IN THE EQUUS BEDS AQUIFER IN SOUTH-CENTRAL KANSAS

4-6 10:00 AM Stone, Mandy L.; Klager, Brian; Ziegler, Andrew C.: WATER QUALITY IN THE LITTLE ARKANSAS RIVER AND EQUUS BEDS AQUIFER, SOUTH-CENTRAL KANSAS, 2001-16

4-7 10:20 AM Juracek, Kyle E.: STREAMFLOW ALTERATION IN KANSAS: ASSESSMENT, CAUSES AND HABITAT IMPLICATIONS

4-8 10:40 AM CONCLUDING REMARKS

SESSION NO. 5

T28. Exciting New Interdisciplinary Themes in Quaternary Geochronology (GSA Geochronology Division; GSA Geochronology Division)

8:00 AM, Hilton Garden Inn Manhattan , Alcove Room

Joel Q.G. Spencer, Presiding

5-1 8:05 AM Ruleman, Cat*: Mitchell, Mark D.; Turner, Kenzie J.; Gray, Harrison; Mahan, Shannon A.: GEOMORPHIC EVOLUTION OF THE LA BOTICA ARCHAEOLOGICAL SITE AND LA JARA CANYON: RELATIONSHIPS TO MIDDLE PLEISTOCENE LAKE ALAMOSA AND THE RIO GRANDE GORGE, SAN LUIS VALLEY, SOUTH-CENTRAL COLORADO, USA

2019 GSA South-Central/North-Central/Rocky Mountain Section Meeting 13
### POSTER TECHNICAL SESSIONS

**SESSION NO. 6**

**T33. Undergraduate Student Research (Posters)** (Council on Undergraduate Research Geosciences Division; GSA Energy Geology Division; GSA Geoaarchaeology Division; GSA Geology and Health Division; GSA Soils and Soil Processes Division)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Authors will be present from 4 to 5:45 PM, Booth #

<table>
<thead>
<tr>
<th>Booth #</th>
<th>Authors</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>6-1</td>
<td>Helm, Tyler R.; Pope, John Paul</td>
<td>PRESERVATION OF MIDDLE PENNSYLVANIAN RADIOCARIANS IN EARLY DIAGENETIC CARBONATE CONCRETIONS</td>
</tr>
<tr>
<td>6-2</td>
<td>Harrington, Matthew; Widga, Chris; Wanamaker, Alan D.; Walker, Douglas</td>
<td>IDENTIFYING DIETARY AND MIGRATORY PATTERNS OF ILLINOIS MAMMUTHUS PRIMIGENIUS POPULATIONS USING ISOPTUE ANALYSIS OF CARBON, OXYGEN, AND STRONTIUM</td>
</tr>
<tr>
<td>6-3</td>
<td>Perkins, Andrew J.; Rittenour, Tammy</td>
<td>AGE CONTROL FOR THE BIG WATER MAMMOTH SITE, BIG WATER, UTAH</td>
</tr>
<tr>
<td>6-4</td>
<td>Manker, Jaclyn; Teed, Rebecca</td>
<td>MOLLUSKS AS LAKE-LEVEL INDICATORS IN CRYSTAL LAKE, OKIO</td>
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<td>6-5</td>
<td>Judge, Lauren E.; Arkle, Kelsey M.; Murphy, Kimberly A.; Stessman, Holly A.F.</td>
<td>GENETIC SEQUENCING FOR MEASURING BIODIVERSITY IN RECENT AND ANCIENT MARINE SEDIMENTS</td>
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<td>6-6</td>
<td>Kindley, Sierra N.</td>
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<td>6-7</td>
<td>Saavedra, Marcelo A.; Gonzalez, Juan Luis</td>
<td>MINERALOGICAL AND TEXTURAL CHARACTERIZATION OF MIXED-SOURCE EOLIAN SANDS ON THE SOUTH TEXAS SAND SHEET</td>
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<td>6-8</td>
<td>Reger, Brandi; Hintorne, James; Flores, Adam; Perez, Julian; Flores, Madelyn; Trevino, Mia</td>
<td>THE ZIRCON PICKERS: AN UNDERGRADUATE GEOLOGY CLUB PROJECT</td>
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<td>TO COLLECT, ANALYZE AND INTERPRET DETRITAL ZIRCONS FROM THE LOWER RIO GRANDE RIVER FLOODPLAIN</td>
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<td>6-9</td>
<td>Smith, Lindsey Michelle; Houston, W.S.</td>
<td>GROUND PENETRATING RADAR OF BAY MILLS POINT: STRATIGRAPHIC ARCHITECTURE AND BASE STRUCTURE</td>
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<td>6-10</td>
<td>Sealander, Alessandra; Pujana, Ignacio</td>
<td>CALCISPHERES FROM THE LOWER CRETAICEOUS, NORTH TEXAS DUCK CREEK FORMATION</td>
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<td>6-11</td>
<td>Cook, Alex D.; Stafford, Kevin W.</td>
<td>GIS-BASED CHARACTERIZATION AND SPELEOGENESIS OF GYPSUM KARST, ALABASTER CAVES STATE PARK, WOODWARD COUNTY, OKLAHOMA</td>
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<td>6-12</td>
<td>Francis, David; Kambesis, Patricia N.; Sumrall, Jeanne Lambert</td>
<td>MORPHOLOGICAL COMPARISON OF CAVES ON SAN SALVADOR ISLAND, THE BAHAMAS</td>
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<td>6-13</td>
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<td>6-14</td>
<td>Murbarger, Brodie J.; Gorman, Seth L.; Doss, Paul K.; Weinzapel, Adam M.; Young, Ryan K.</td>
<td>QUANTIFYING VARIABLE EVAPOTRANSPIRATION ACROSS A RIPARIAN ZONE, MANISTEE NATIONAL FOREST, MICHIGAN</td>
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<td>6-15</td>
<td>Thoresen, Haley; Currie, Brian; Stubbins, Blake; Adedugbe, Emmanuel; Ries, Rosamrie; Pallo, Emma; Swearingen, Seth; Knutson, Ellie; Blake, Daniel; Nash, T. Andrew</td>
<td>BEDROCK TOPOGRAPHY OF THE FOUR-MILE CREEK BURIED VALLEY NEAR OXFORD, OHIO: IMPLICATIONS FOR GROUNDWATER RESOURCES AND LATE WISCONSINAN LANDSCAPE EVOLUTION</td>
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<td>6-16</td>
<td>Broadus, Carson L.; Hanna, Kimberly A.; Krantz, Robert W.</td>
<td>THE EFFECT OF FAULT GOUGE ON FLUID FLOW, LISBON VALLEY, UT</td>
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<td>6-17</td>
<td>Morgan, Tanner F.; Hanna, Kimberly A.; Krantz, Robert W.</td>
<td>MAPPING SURFACE GEOCHEMICAL DATA WITH GIS IN LOWER LISBON VALLEY, UTAH</td>
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<td>6-18</td>
<td>Broadus, Connor M.; Hanna, Kimberly A.; Gianniny, Gary L.; Krantz, Robert W.</td>
<td>THE IMPACT OF FACIES HETEROGENEITY ON FLUID STORAGE AND TRANSPORT IN THE LOWER BURRO CANYON FORMATION, LISBON VALLEY, UTAH</td>
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<td>6-19</td>
<td>Adams, Colleen A.</td>
<td>ENHANCED BIOMETHANATION FROM MUNICIPAL SOLID WASTE (MSW):CONCENTRATION AND MESH SIZE EFFECTS OF ZERO VALENT IRON (ZVI)-MEDIATED HYDROGEN PRODUCTION</td>
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<td>6-20</td>
<td>Lashley, Victoria; Straley, Charlotte; Sumrall, Jeanne Lambert; Kambesis, Patricia N.</td>
<td>ENVIRONMENTAL AND HUMAN EFFECTS OF PRODUCING AND USING COOKING OIL BIODIESEL</td>
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<td>6-21</td>
<td>Bell, Matt Ede; Duthler, Brandon; Rocheford, M.Kathryn</td>
<td>REMOTE SENSING EVALUATION OF HUMAN IMPACTS ON THE LOWER MUSKEGON RIVER, MI</td>
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<td>6-22</td>
<td>Carlson, Claire; Milbrandt, Eric; Cramer, Bradley D.</td>
<td>MACROALGAE ACQUACULTURE IN SOUTHWESTERN FLORIDA AS A POTENTIAL TOOL FOR NUTRIENT SEQUESTRATION</td>
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<td>6-23</td>
<td>Perera, Sonasha G.; Price, Jonathan D.</td>
<td>NITROGEN CONVERSION OF PRODUCING AND USING COOKING OIL BIODIESEL</td>
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<td>6-24</td>
<td>Jonas, Troy S.; Stoltzman, Kacie C.; Kairies-Beatty, Candace L.; Elswick, Erika R.</td>
<td>PRELIMINARY ASSESSMENT OF METALS PARTITIONING IN SOIL AND VEGETATION IN A SUBALPINE WETLAND (BISMARK MINE, SOUTHWEST MONTANA)</td>
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<td>6-25</td>
<td>Klein, Dillon J.; Dere, Ashlee L.</td>
<td>INVESTIGATING NUTRIENT SOLUBILITY AND RETENTION IN NO TILL AND TILLED AGRICULTURAL SOILS</td>
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<td>6-26</td>
<td>Grund, Deny M.; Osborn, Alan; Dere, Ashlee L.</td>
<td>ARCHAEOLOGY AT GLACIER CREEK PRESERVE AND THE MOVEMENTS OF PEOPLE TRACKED THROUGH THE GEOLOGIC RECORD</td>
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<td>6-27</td>
<td>Borgetti, Adam J.; Malone, Dave H.</td>
<td>DETRITAL ZIRCON GEOCHRONOLOGY OF LATE WISCONSIN GLACIAL ERRATICS</td>
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MONDAY, 25 MARCH

SESSION NO. 7

T3. Injection-Induced Seismicity in the U.S. Midwest: Where Are We after a Decade? (GSA Continental Scientific Drilling Division; GSA Energy Geology Division; GSA Hydrogeology Division; GSA Geology and Society Division)

T3A. Introduction—Seismicity in the Midwest

3:00 PM

GSA South-Central/North-Central/Rocky Mountain Section Meeting 15
MONDAY, 25 MARCH

SESSION NO. 8

T9. Mafic and Ultramafic Magmatism in the Mid-Continent and Beyond

1:30 PM, Hilton Garden Inn Manhattan, Kings Room
Matthew E. Brueseke and Pamela D. Kempton, Presiding

8-1 1:30 PM Hanger, Brendan Joseph*; Jollands, Michael C.; Yaxley, Greg M.; Herrmann, Jörg: SHORT TIMESCALES BETWEEN MANTLE METASOMATISM AND KIMBERLITE ASCENT AS INDICATED BY DIFFUSION PROFILES IN GARNET CRYSTALS FROM SOUTH AFRICAN PERIDOTITE XENOLITHS

8-2 1:50 PM Dunn, Dennis*: A POSSIBLE ARCHEAN SOURCE FOR ARKANSAS DIAMONDS?


8-4 2:30 PM Kempton, Pamela D.; Brueseke, Matthew E.; Rogers, KayLeigh: WHY DOES KANSAS HAVE KIMBERLITES – A REVIEW

2:50 PM BREAK

8-5 3:05 PM Clark, Ryan J.*; Anderson, Raymond R.; Peate, David W.: THE NORTHEAST IOWA INTRUSIVE COMPLEX: A MAGMATIC CONUNDRUM RELATED TO THE MIDCONTINENT RIFT SYSTEM

8-6 3:25 PM Graettinger, Alison*; Bennis, Kadie; Reynolds, Emma: MAGMA SEDIMENT MINGLING AND POSSIBLE SEDIMENT MELTING IN A BASALTIC PHREATOMAGMATIC FISSURE ERUPTION

8-7 3:45 PM Peate, David W.*; Siebach, Jacob A.; Maruszczak, Alex D.; Burney, David: AN OVERVIEW OF THE ALKALINE OFF-AXIS MAGMATISM OF THE SNAEFELLNES PENINSULA, ICELAND

8-8 4:05 PM Lee, Yung Ping*; Snow, Jonathan E.; Gao, Yongjun: PETROGENESIS OF GABBRO FROM ARCTIC GAKKEL MID-OCEAN RIDGE

SESSION NO. 9

T14. Geoscience Outreach and Engagement I (GSA Energy Geology Division; GSA Geology and Health Division; GSA Geology and Society Division)

1:30 PM, Hilton Garden Inn Manhattan, Tuttle Room
Lisa Anderson, Peter J. Voice, Beth A. Johnson, Susan Stover, Liane M. Stevens and Michael T. DeAngelis, Presiding

9-1 1:30 PM Veatch, Steven Wade; Hair, Jonathan David*; Salvat, Jenna M.; Elick, Benjamin Hayden; Crucikshanks, Alist; Bogart, Destin; Reeves, Theodore S.; Reher, Blake: THE PIKES PEAK PEBBLE PUPS/EARTH SCIENCE SCHOLARS: INNOVATIVE OUTREACH METHODS THAT ENGAGE STUDENTS

9-2 1:50 PM Lamm, Sarah N.*; Bosch, Jeanette S.; Bosch, Lynette D.: ONLINE OUTREACH PRESENTING GEOLOGY CAREERS TO UNDERREPRESENTED OR RURAL COMMUNITIES

9-3 2:10 PM Diffendal, Jr., R.F.*: WITH A SPOONFUL OF SUGAR THE MEDICINE GOES DOWN: USING AN EXISTING INTEREST TO INITIATE GEOSCIENCE ENGAGEMENT

9-4 2:30 PM Maxson, Julie*: A COMMUNITY-UNIVERSITY COLLABORATION FOR SOIL HEALTH IN URBAN AGRICULTURAL SETTINGS IN ST. PAUL, MN

2:50 PM BREAK

9-5 3:05 PM Westgaard, John*; Hankis, H. Douglas; Willing, Steve; Korf, Jason J.: HILL ANNEX PALEONTOLOGY PROJECT: ADAPTING TO A NEW HOME

9-6 3:25 PM Caruthers, Andrew H.; Gillespie, Robb; Voice, Peter J.*: DINOSAUR PARK: THE MULTI-PURPOSE GEOLOGICAL PLATFORM AT WESTERN MICHIGAN UNIVERSITY

9-7 3:45 PM Honey, Jeannine*: Iris, Dawn: USGS CORE RESEARCH CENTER: A GATEWAY TO SUBTERRANEAN DISCOVERY FOR GEOSCIENCE RESEARCH

4:05 PM Voice, Peter J.*; Grammer, Susan; Grammer, G. Michael; Harrison, William B.; Petoovic, Heather; Yellich, John A.: WESTERN MICHIGAN UNIVERSITY’S COREKIDS PROGRAM: K-12 OUTREACH USING STUDENT EDUCATORS

SESSION NO. 10


1:30 PM, Hilton Garden Inn Manhattan, Flint Hills Room
Andrea Brookfield, Behzad Ghanbarian, Vahid Rahmani, J.F. Devlin and Brian Kelly, Presiding

10-1 1:35 PM Tian, Lijun*; Rodriguez, Alexander; Weissling, Blake; Ackley, Stephen; Gao, Yongli: CONTROLS ON STABLE ISOTOPE VARIABILITY IN PRECIPITATION DURING 2015-2018 IN SAN ANTONIO, CENTRAL TEXAS

10-2 1:55 PM Whitemore, Donald O.*; Butler, James J.; Wilson, B. Brownie: SPATIAL VARIATION IN INFLOW TO THE HIGH PLAINS AQUIFER IN KANSAS DERIVED FROM A NEW WATER-BALANCE APPROACH

10-3 2:15 PM Hallum, Douglas R.*: OBSERVATIONS OF STREAM-GROUNDWATER INTERACTION AT PARCEL, RANCH, AND REACH SCALE, WEST-CENTRAL NEBRASKA

10-4 2:35 PM Hager, John P.*; Hallihan, Todd; Guertault, Lucie; Fox, Garey: LABORATORY ELECTRICAL RESISTIVITY IMAGING OF MACROPOROUS FLOW

2:55 PM BREAK

10-5 3:10 PM Kramer, Ariele*: 20 YEARS OF CONTINUOUS WATER-QUALITY MONITORING IN THE CHENEY RESERVOIR WATERSHED, SOUTH-CENTRAL KANSAS

10-6 3:30 PM Kelly, Brian*: CONTINUOUS WATER-QUALITY SURROGATE MODELS

10-7 3:50 PM Williams, Thomas J.*: USE OF SURROGATE MODELS AS AN EARLY WARNING SYSTEM FOR CHANGING WATER-QUALITY CONDITIONS IN THE KANSAS RIVER, KS

10-8 4:10 PM Loiacomo, Dalia*: Schwartz, Benjamin F.; Nowlin, Weston: STATISTICAL ANALYSIS OF FACTORS CONTROLLING NONPOINT SOURCE POLLUTANT LOADS IN A SMALL URBAN WATERSHED, SAN MARCOS, TX, USA

4:30 PM CONCLUDING REMARKS
SESSION NO. 11

T29. Quaternary Landscape Evolution in the Midcontinent: Improved Insights from Geochronology (GSA Geochronology Division; GSA Geochronology Division; GSA Quaternary Geology and Geomorphology Division)

1:30 PM, Hilton Garden Inn Manhattan, Alcove Room
Paul Hanson, Joel Q.G. Spencer, Elizabeth G. Ceperley, Lucas K. Zoet and J.E. Rawling III, Presiding

11-1 1:30 PM Layzell, Anthony L.*; Mandel, Rolle D.: HOLOCENE LANDSCAPE EVOLUTION IN THE REPUBLICAN RIVER VALLEY, SOUTH-CENTRAL NEBRASKA

11-2 1:50 PM Muttel, Sage*; McKay, Matthew P.: SEDIMENTARY PETROCHRONOLOGY FOR DETRITAL PROVENANCE ANALYSIS: U-PB AND RARE-EARTH ELEMENT COMPOSITIONS IN ZIRCON FROM THE MODERN MISSISSIPPI RIVER DRAINAGE BASIN

11-3 2:10 PM Joeckel, R.M.*: FIRST REPORT OF WIDESPREAD POLYGONAL GROUND IN NEBRASKA AND ITS ASSOCIATION WITH EOLIAN LANDFORMS

11-4 2:30 PM Ceperley, Elizabeth G.*; Marcott, Shaun A.; Rawling, J. Elmo; Zoet, Lucas K.; Zimmerman, Susan H.: THE ROLE OF PERMAFROST ON THE MORPHOLOGY OF AN MIS 3 MORAINE FROM THE SOUTHERN LAURENTIDE ICE SHEET

11-5 3:05 PM Kerr, Phillip J.*; Tassier-Surine, Stephanie A.; Kohrt, Casey: TRENDS IN EOLIAN FEATURES ON THE IOWAN EROSION SURFACE

11-6 3:25 PM Cyr, Andrew J.*; Nicovich, Sylvia Rose; Johnstone, Samuel; Hudson, Adam M.; Welch, Jessica Lynn; Ruleman, Cal: TEMPORAL AND SPATIAL PATTERNS OF DEGLACIATION AND ALLUVIAL FAN DEPOSITION IN THE SOUTHERN ROCKY MOUNTAINS, COLORADO, USA

11-7 3:45 PM Headley, Rachel*; Hipcek, Mark: GRAIN-SIZE VARIATION AMONG MORAINES OF A RETREATING LAURENTIDE ICE SHEET LOBE


SESSION NO. 13

T10. Rhyolite/Granite Magmatism

TUESDAY, 26 MARCH

TUESDAY, 26 MARCH 2019

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 12

D4. Sedimentology and Stratigraphy

8:00 AM, Hilton Garden Inn Manhattan, Kings Room
Alison Graettinger, Presiding

12-1 8:00 AM Anglim, Trey*; Obrist-Farmer, Jonathan: EVOLUTION OF A SHELF LOCK-IN BASIN MARGIN: PRELIMINARY RESULTS FROM FLUME TANK EXPERIMENTS


12-3 8:40 AM Foreman, Brady Z.*; Rasmussen, Dirk: PROVENANCE OF THE WASATCH FORMATION AND OHIO CREEK CONGLOMERATE IN THE PICEANCE CREEK BASIN (NORTHWEST COLORADO, U.S.A.)

12-4 9:00 AM Vahling, Jessica*; Clark, C. Kit; Longman, Mark; Shanley, Keith: ASSESSING HYPOTHESIS FOR THE ORIGIN OF THE GIANT LOWER NIOTRA “CHANNEL” IN THE SOUTHERN POWDER RIVER BASIN, CAMPBELL AND CONVERSE COUNTIES, WYOMING

12-5 9:20 AM Zheng, Dongyu*; Yang, Wan: PETROFOACIES AND PROVENANCE OF UPPER PERMIAN-LOWEST TRIASSIC SANDSTONES, WUTONGGOU LOW-ORDER CYCLE. BOGDA MOUNTAINS, GREATER TURPANGJUNGGAR RIFT BASIN, NW CHINA: IMPLICATIONS ON UNROOFING HISTORY OF NORTH TIANSHAN

12-6 9:40 AM Grosskopf, Jacob*: Vickers, Hunter; Lawhon, Hunter: UNLOCKING THE UPPER ATOKA SEDIMENTATION HISTORY USING THE ROCK PROPERTY OF MAGNETIC SUSCEPTIBILITY

12-7 10:00 AM Mayo, Dave P.*; Testa, Maurice P.; Knuble, Christopher; Gutierrez, Pedro E.: MINERALOGY OF SIDERITE NODULES IN THE PENNSYLVANIAN COAL MEASURES OF WESTERN ARKANSAS

12-8 10:20 AM Westjohn, David B.*; Harrison, William B.; Shaw, Nicholas D.: CARBONIFEROUS STRATIGRAPHY OF MICHIGAN REVISITED: IMPLICATIONS OF REVISED BEDROCK GEOLOGY MAPS OF CENTRAL JACKSON COUNTY, MICHIGAN, USA

12-9 10:40 AM Zhao, Chen*; Hogan, John P.; Chapman, Alan D.; Obrist-Farmer, Jonathan: U-PB DETRITAL ZIRCON GEOCHRONOLOGY OF PALEOZOIC CLASTICS OF THE OZARK PLATEAU: IMPLICATION FOR SEA-LEVEL FLUCTUATIONS AND FAR-FIELD TECTONICS

12-10 11:00 AM Zambito, James J.*; Haas, Lisa D.: ORIGIN OF IRON OXIDE CEMENTS IN THE CAMBRIAN WONEWOC FORMATION SANDSTONE OF WISCONSIN

SESSION NO. 13

8:00 AM, Hilton Garden Inn Manhattan, Konza Prairie Room
Don F. Parker, Matthew E. Brueseke and Richard Hanson, Presiding

13-1 8:05 AM Barnes, Melanie A.*; Sweet, Dustin E.; Ewing, Thomas E.: THE GRANITE RHYOLITE PROVINCE OF NORTH AMERICA


13-3 9:05 AM Chavez, Eduardo A.*: PETROLOGY AND GEOCHEMISTRY OF THE PRECAMBRIAN ILLINOIS BASEMENT AND RELATED ROCKS FROM ST. FRANCOIS MOUNTAINS, MISSOURI

13-4 9:25 AM Hooker, Jacob C.*; Baird, Graham B.; Chumley, Adam S.; Muller, Simone R.: PALEOPROTEROZOIC IGNEOUS ROCKS OF THE COLORADO FRONT RANGE AS INDICATORS OF SUBDUCTION ZONE PROCESSES DURING BASIN CLOSURE AND ACCRETION

13-4 9:45 AM Zambito, James J.*; Haas, Lisa D.: ORIGIN OF IRON OXIDE CEMENTS IN THE CAMBRIAN WONEWOC FORMATION SANDSTONE OF WISCONSIN

SESSION NO. 13

T10. Rhyolite/Granite Magmatism

8:00 AM, Hilton Garden Inn Manhattan, Konza Prairie Room
Don F. Parker, Matthew E. Brueseke and Richard Hanson, Presiding

13-1 8:05 AM Barnes, Melanie A.*; Sweet, Dustin E.; Ewing, Thomas E.: THE GRANITE RHYOLITE PROVINCE OF NORTH AMERICA


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13-4 9:25 AM Hooker, Jacob C.*; Baird, Graham B.; Chumley, Adam S.; Muller, Simone R.: PALEOPROTEROZOIC IGNEOUS ROCKS OF THE COLORADO FRONT RANGE AS INDICATORS OF SUBDUCTION ZONE PROCESSES DURING BASIN CLOSURE AND ACCRETION

13-5 9:45 AM Zambito, James J.*; Haas, Lisa D.: ORIGIN OF IRON OXIDE CEMENTS IN THE CAMBRIAN WONEWOC FORMATION SANDSTONE OF WISCONSIN
TUESDAY, 26 MARCH

SESSION NO. 14

T14. Geoscience Outreach and Engagement II (GSA Geology Division; GSA Geology and Health Division; GSA Geology and Society Division)

10:00 AM, Hilton Garden Inn Manhattan, Tuttle Room
Lisa Anderson, Peter J. Voice, Beth A. Johnson, Susan Stover, Liane M. Stevens and Michael T. DeAngelis, Presiding

14-1 8:00 AM Ali, Hendratts1; Prasad, Manika: GENDER TRENDS AMONG GEOSCIENCE FACULTY AND STAFF IN HIGHER EDUCATION: A REVIEW FROM TOP GEOSCIENCE INSTITUTIONS

14-2 8:20 AM Schneider, Blair B.2; Holmes, Mary Anne: THE CRITICAL ROLE THAT WHITE MEN AND WOMEN PLAY IN CREATING AN EQUITABLE STEM WORKFORCE

14-3 8:40 AM Holmes, Mary Anne2; Schneider, Blair Benson: BEGINNING BYSTANDER INTERVENTION STRATEGIES

14-4 9:20 AM Stover, Susan G.; Lanier, Hayley C.: WOMEN GEOSCIENTISTS AT STATE GEOLOGICAL SURVEYS

14-5 9:40 AM Johnson, Beth A.: THE INVISIBILITY OF WOMEN GEOSCIENTISTS IN CHILDREN'S NONFICTION BOOKS

10:00 AM BREAK

14-6 10:15 AM Spinler, Kalya N.; Shroat-Lewis, René A.; DeAngelis, Michael T.: EARTH SCIENCE IN ACTION! ACTIVE LEARNING STRATEGIES IN PHYSICAL GEOLOGY LABS

14-7 10:35 AM Cockrell, Jay Alan; Petcovic, Heather L.: ASSESSING THE IMPACT OF 3D PRINTED TERRAIN ON TEACHING TOPOGRAPHY IN INTRODUCTORY EARTH SCIENCE LABS

14-8 10:55 AM Stevens, Liane M.; Faulkner, Melinda: INCREASING STUDENT ENGAGEMENT AND RECRUITMENT THROUGH MODIFICATION AND ADAPTATION OF TRADITIONAL SERVICE FIELD TRIPS

14-9 11:15 AM McMillan, Margaret E.; DeAngelis, Michael T.; Connelly, Jeffrey B.: ALTERNATE FIELD CAMP ACTIVITIES AT THE UNIVERSITY OF ARKANSAS AT LITTLE ROCK THAT INCORPORATE DIGITAL TECHNIQUES AND LOCALITIES NEAR AND FAR

SESSION NO. 15

T23. The Low Down on the High Plains: Geologic and Hydrogeologic Studies of the High Plains Aquifer (GSA Geology Division; GSA Geology and Health Division)

8:00 AM, Hilton Garden Inn Manhattan, Flint Hills Room
Jon J. Smith and Randy L. Stotler, Presiding

15-1 8:00 AM Korus, Jesse T.; Joeckel, R.M.; Tucker, S.T.: GIANT BOULDERY FLUVIAL BARS IN AN EXHUMED MIOCENE PALEOVALLEY, NEBRASKA PANHANDLE

15-2 8:20 AM Divine, D.P.; Cherry, Mikaela; Gilmire, Troy; Onvis, Kevin; Little, Nolan; Thorburn, John; Onnen, Mike: CHARACTERIZING AQUIFER PROPERTIES IN THE VICINITY OF A GROUNDWATER MOUND IN THE HIGH PLAINS AQUIFER, SOUTH-CENTRAL NEBRASKA

15-3 8:40 AM Stotler, Randy L.; Sailey, Kaatlin A.; Johnson, William C.; Ryuh, Yo-Gyung: EVALUATING PLAYS AS SOURCES OF RECHARGE TO THE HIGH PLAINS AQUIFER IN WESTERN KANSAS

15-4 9:00 AM Brookfield, Andrea E.; Hill, Mary C.; Rodell, Matthew; Loomis, Bryan; Stotler, Randy L.; Porter, Misty E.; Bohling, Geoffrey C.; Shankar, Siddharth; Stearns, Leigh A.; Smith, Jon J.: USING IN-SITU AND SATELLITE-BASED OBSERVATIONS TO STUDY THE HIGH PLAINS AQUIFER IN KANSAS

15-5 9:35 AM Smith, Jon J.; Field, Holly L.; Joeckel, R.M.; Ludvigson, Greg A.; Möller, Andreas; Tucker, Shane T.; Layzell, Anthony L.: NEW APPROACH TO U-PB ZIRCON DATING AND CARBON ISOTOPE GEOCHEMISTRY OF PALEOSOLS IN THE MIOCENE OGGALLA GROUP, NORTH-CENTRAL NEBRASKA, USA

15-6 9:55 AM Ludvigson, Greg A.; Layzell, Anthony L.; Smith, Jon J.; Fox, David L.; Stotler, Randy L.: PALEOHYDROLOGICAL EVALUATIONS OF CENOZOIC CALCIFERES FROM THE HIGH PLAINS OF WESTERN KANSAS

15-7 10:15 AM Möller, Andreas1; Smith, Jon J.; Ludvigson, Greg A.; McLean, Noah M.; Joeckel, R.M.; Hallman, Jason A.; Graham, Maggie; Sitek, Brian C.; Turner, Elijah: IMPROVING CHRONOSTRATIGRAPHY OF CONTINENTAL DEPOSITS WITH INTEGRATED GEOCHRONOLOGY AND GEOCHEMISTRY: CASE STUDIES ON THE MID-CONTINENT US HIGH PLAINS

SESSION NO. 16

T34. Pleistocene Records of Climatic and Environmental Change in the Rocky Mountains, Great Plains, and Midwest

8:00 AM, Hilton Garden Inn Manhattan, Alcove Room
Benjamin J. Laabs, B. Brandon Curry and Sebastien Huot, Presiding

16-1 8:00 AM Slade, Noah1; Myrbo, Amy; MacGregor, Kelly: THE PLEISTOCENE-HOLOCENE TRANSITION IN EASTERN GLACIER NATIONAL PARK AS EVIDENCED BY LAKE SEDIMENT LITHOSTRATIGRAPHY

16-2 8:20 AM Sortor, Rachel N.; Ruleman, Cal; Goehring, Brent M.; Caffee, Marc W.; Hudson, Adam M.: THE CENTRAL CITY GRAVEL: COSMOGENIC NUCLIDE DATING OF A MID-PLEISTOCENE GLACIAL TILL IN THE FRONT RANGE, COLORADO

16-3 8:40 AM Ruleman, Cal1; Hudson, Adam M.; Caffee, Marc W.; Goehring, Brent M.; Sortor, Rachel N.; Brugger, Keith A.; Frothingham, Michael G.; Nicovich, Sylvia Rose: MIS 12-11 (478-374 KA) MIDDLE PLEISTOCENE GLACIATION OF THE SOUTHERN ROCKY MOUNTAIN-GREAT PLAIN REGION: LINKS TO LANDSCAPE EVOLUTION OF MAJOR CENTRAL NORTH AMERICAN RIVERS

16-4 9:00 AM Brugger, Keith A.; Laabs, Benjamin J.: LATE PLEISTOCENE GLACIATION IN THE MOSQUITO RANGE, COLORADO: CHRONOLOGY AND CLIMATE

9:20 AM BREAK

16-5 9:35 AM Kohl, Barry2; Curry, B. Brandon; Miller, Merrell A.: FROM SOURCE TO SINK, LATE DEVONIAN ALGAL CYSTS (TASMANITES) DELIVERED TO THE GULF OF MEXICO DURING THE LAST GLACIATION: PART I, THE SINK

16-6 9:55 AM Curry, B. Brandon2; Kohl, Barry; Miller, Merrell A.: FROM SOURCE TO SINK, LATE DEVONIAN ALGAL CYSTS (TASMANITES) DELIVERED TO THE GULF OF MEXICO DURING THE LAST GLACIATION: PART II, THE SOURCE

16-7 10:15 AM Rovey, Charles W.; Balco, Greg: STRATIGRAPHIC COMPLEXITY WITHIN THE EARLY AND MIDDLE PLEISTOCENE TILL SEQUENCE IN NEBRASKA AND WESTERN IOWA

16-8 10:35 AM Dorale, Jeffrey A.: A CHRONOLOGY OF BIG PLEISTOCENE EVENTS FROM CREVICE CAVE, MISSOURI
POSTER TECHNICAL SESSIONS

SESSION NO. 17
D6. Geochemistry (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 4 to 5:45 PM
Booth #

17-1 1 Tamborello, Britteny Lynn*; Philip, R. Paul: GEOCHEMICAL COMPARISON OF OILS FROM UPPER PENNSYLVANIAN KANSAS RESERVOIRS, NW KANSAS TO WOODFORD SHALE SOURCE ROCKS: A CASE FOR LONG DISTANCE MIGRATION

17-2 2 Balumi, Wakil Bunu*; Puckette, James: INVESTIGATION OF CHANGES IN CRETACEOUS PALEOREDOX CONDITIONS DURING OCEAN ANOXIC EVENTS WITHIN THE COLORADO SECTION OF THE WESTERN INTERIOR SEAWAY

17-3 3 Thompson, Leah N.*; Finkelman, Robert B.; Arbusov, Sergey I.: POSSIBLE GENESIS OF AN UNUSUAL MINERAL IN A SIBERIAN COAL

17-4 4 Andrews, William*; Atewiana, Eliot; Morton, Dylan; Wu, Tao: TEMPORAL VARIATION OF STABLE HYDROGEN AND OXYGEN ISOTOPES FOR PRECIPITATION IN STILLWATER, OKLAHOMA

17-5 5 Chisholm, James*; Shonnard, Christine; Fryxell, J.E.; Currano, Ellen D.; Dunn, Regan E.; Foreman, Brady Z.; Dechesne, Marieke: EVALUATION OF BULK ORGANIC CARBON ISOTOPE RECORDS FROM EARLY PALEOGENE STRATA IN THE HANNA BASIN (WYOMING U.S.A.) SPANNING THE PALEocene-Eocene THERMAL MAXIMUM

17-6 6 Key, Amanda*; Mayo, Dave P.; Testa, Maurice P.; Knublely, Christopher: EXAMINATION OF AN ALTERNATIVE METHOD OF OPAL SYNTHESIS

SESSION NO. 18
D7. Hydrogeology (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 4 to 5:45 PM
Booth #

18-1 7 Vega, Jordan*; Gouzie, Douglas: GEOCHEMICAL ANALYSIS OF THE MAJOR SPRINGS OF THE OZARK AQUIFER WITHIN THE BIG FOUR REGION OF SOUTH-CENTRAL, MISSOURI

18-2 8 Davis, Chantelle*: EFFECTS OF EPEHERMAL FLOW ON BANK STORAGE, AQUIFER RECHARGE, AND WATER CHEMISTRY IN WESTERN KANSAS STREAMS

18-3 9 Conrad, Lily*; Iqbal, Mohammad: A SPATIAL AND TEMPORAL COMPARISON OF Ion CHEMISTRY WITHIN THE CEDAR RIVER AND WEST OKOBOJI LAKE

18-4 10 Stafford, Kevin W.*; Faulkner, Melinda: GEOCHEMICAL CHARACTERIZATION OF SEDIMENT AND WATER CONTRIBUTIONS TO LAKE BELTON, CENTRAL TEXAS

18-5 11 Zdanowski, Sarah E.*; Costigan, Katie H.: GEOMORPHIC CLASSIFICATION OF INTERMITTENT RIVERS AND EPEHERMAL STREAMS IN DIFFERENT ECOREGIONS OF THE CONTINENTAL UNITED STATES

18-6 12 Peterman, Cara*; Fryar, Alan; Edwards, Dwayne; Gorman-Sanisaca, Lillian; Geilts, Allen C.: SENSITIVITY OF FLUVIAL SOURCE CONTRIBUTIONS IN A MIXED LAND-USE ENVIRONMENT: OTTER CREEK, FORT KNOX, KENTUCKY

18-7 13 Engelbart, Tyler W.*; Gouzie, Douglas: INVESTIGATION OF TUFA ON THE SPRING RIVER IN NORTHERN ARKANSAS

18-8 14 Toth, Kevin J.*; Hallinan, Todd: GEOLOGIC CONTROLS ON EROSION AT COW CREEK ENGINEERED STREAM IN STILLWATER, OKLAHOMA

SESSION NO. 19
D8. Paleontology (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 4 to 5:45 PM
Booth #

19-1 17 Munoz, Christopher Joaquin*; Gonzalez, Juan L.; Cheng, Chu-Lin: THE ROLE OF SAND THICKNESS AND PALEOTOPOGRAPHY ON PHYRATOPHYTE AND NON-PHYRATOPHYTE SPECIES DISTRIBUTION ALONG A NORTH - SOUTH TRANSECT OF THE SOUTH TEXAS SAND SHEET

19-2 18 Hartley, James C.*: SMALL MAMMAL EXTINCTION THROUGH THE PLEISTOCENE IN THE AMERICAN SOUTHWEST

19-3 19 Khameiss, Belkasim*; Pluegerman, Richard; Mulah, Ahmad; Hoyt, William H.; Malone, Shawn J.; Grigsby, Jeffy D.; Bernot, Randall; Zubuk, Tykhon; El Ebadi, Saad K.: CORAL-ALGAL COMPETITION ON TERTIARY REEFS: GREENHOUSE TO ICEHOUSE TRANSITIONS

19-4 20 Polsak, Jake*; Nace, Keifer E.; Currano, Ellen; Foreman, Brady Z.; Deschesne, Marieke; Dunn, Regan E.: VARIABILITY IN VEGETATION DENSITY ACROSS LATERALLY COEVAL STRATIGRAPHIC SECTIONS WITHIN THE HANNA BASIN, WY

19-5 21 Nace, Keifer E.*; Polsak, Jake; Dunn, Regan E.; Foreman, Brady Z.; Currano, Ellen D.: VEGETATION AND LITHOLOGY RESPONSE TO THE PALEocene-Eocene THERMAL MAXIMUM IN THE HANNA BASIN, WY

19-6 22 Buntin, Rogers C.C.*; Hasicott, Stephen T.; Flaig, Peter P.: EVALUATING THE ICHNOFOSSIL TEREDOLITES AS AN INDICATOR OF SALINITY AND PALEENVIRONMENT IN THE GEOLOGICAL RECORD, EXAMPLES FROM CRETACEOUS STRATA KANSAS, COLORADO, UTAH


19-8 24 Hanks, H. Douglas*; Haire, Scott A.; Erickson, Bruce R.: A NEW OCCURRENCE OF POLYACRodus, (CHONDRICTHYES; POLYACRodontidae) FROM THE LATE CRETACEOUS CARLILLE SHALE (TURONIAN) OF GRANT COUNTY, SOUTH DAKOTA

19-9 25 Byrum, Steven*; Lieberman, Bruce S.: PHYLOGENETIC AND BIOGEOGRAPHIC PATTERNS IN SPATANGOID ECHINOIDS FROM THE CRETACEOUS WESTERN INTERIOR SEAWAY

19-10 26 Grove, Joseph*; Vogegele, Kristyn K.; Ullmann, Paul Victor; Nellermoe, Ron: ASSESSING THE IDENTITY OF A NEW ALLOSaurus SKELETON FROM THE JURASSIC MORRISON FORMATION OF WYOMING


19-12 28 Ciampaglio, C.N.*; Shell, Ryan; Ginter, Michal; Cicimurri, David J.: SYMMORIIFORM SHARKS OF THE INDIAN CAVE SANDSTONE (PENNSYLVANIAN OF NEBRASKA) AND THEIR STRATIGRAPHIC CONTEXT

19-13 29 Thomas, Christopher D.*; Thomka, James R.: MICROFOSSILS FROM THE MIDDLE ORDOVICIAN ICEBOX MEMBER OF THE WINNIPEG FORMATION, NORTHERN BLACK HILLS,
TUESDAY, 26 MARCH

SESSION NO. 20
T1. Conventional and Unconventional Reservoir Rocks: Advances in Experiments, Modeling, and Simulations (Posters) (GSA Continental Scientific Drilling Division; GSA Energy Geology Division)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Booth #

19-14 30 Dorward, Rebecca Ashley*; Selden, Paul A.: A NEW HALKIERIID FROM THE MIDDLE CAMBRIAN SPENCE SHALE, UTAH

19-15 31 Thomka, James R.*; Tsoflias, George*; Selden, Paul A.: THE TRACE FOSSIL ZOOPHYCOS IN THE CAMBRIAN-AGE GALLATIN FORMATION, BIGHORN MOUNTAINS, WYOMING

SESSION NO. 21
T3. Injection-Induced Seismicity in the U.S. Midcontinent: Where Are We after a Decade? (Posters) (GSA Continental Scientific Drilling Division; GSA Energy Geology Division; GSA Hydrogeology Division; GSA Geology and Society Division)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Booth #

21-1 38 Chase, Brandon F.*; Kolawole, Folariin; Atekwana, Estella A.; Walter, Jake; Carpenter, Brett M.: THE SEISMIC HAZARD OF BURIED STRUCTURES AROUND THE WICHITA-AMARILLO UPLIFTS IN THE SOUTHERN OKLAHOMA AULACOGEN

21-2 39 Hollenbach, Andrew Michael*; Bidgoli, Tandis S.; Ansari, Esmaeil: SIMULATING INJECTION-PRESSURE RESPONSE WITH REAL-WORLD DATA AND A HIGH-RESOLUTION MODEL OF THE ARBuckle GROUP, SOUTH-CENTRAL KANSAS

21-3 40 Sundberg, Sarah A.*; Chen, Xiaowei; Walter, Jake; Qin, Yan: HYDRAULIC FRACTURING INDUCED SEISMICITY IN OKLAHOMA

21-4 41 Tsolfias, George*; Nolte, Keith A.; Molina, Zalma P.; Profitt, Hannah R.; Freking, Collin J.; Bidgoli, Tandis S.; Watney, W. Lynn: FAULT DETECTION IN SOUTH-CENTRAL KANSAS USING CLUSTER ANALYSIS OF INDUCED EARTHQUAKES

21-5 42 Ansari, Esmaeil*; Bidgoli, Tandis S.; Hollenbach, Andrew Michael: HISTORY MATCHING PRESSURE IN THE ARBuckle GROUP AQUIFER TO MANAGE MIDCONTINENT SEISMICITY

SESSION NO. 22
T8. Cenozoic Magmatic and Tectonic Processes of Colorado–New Mexico: Understanding Voluminous Volcanism during the Transition from Laramide Contraction to Rio Grande Rift Extension (Posters)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Booth #

22-1 43 Burberry, Caroline M.*; Hatfield, Marques E.; Lowe, James B.: ANALOG MODELING OF PENETRATIVE STRAIN AROUND LARAMIDE STRUCTURES AND IN THE LARAMIDE FORELAND

22-2 44 Hoffman, Charles F.; Michelfelder, Gary S.: TIMING AND SOURCE OF HYDROTHERMAL FLUIDS IN THE MOGOLLON MINING DISTRICT, CATRON COUNTY, NM

22-3 45 Humphreys, Mary*; Michelfelder, Gary S.; Benz, Brooke E.: PETROLOGY AND U-PB ZIRCON GEOCHRONOLOGY OF OLIGOGENE AND MIOCENE RHYOLITE TUFFS FROM THE NORTHERN MOGOLLON-DATIL VOLCANIC FIELD

22-4 46 Wegmann, Mackenzie*; Michelfelder, Gary S.: CHARACTERIZING THE MANTLE BENEATH THE SOUTHERN RIO GRANDE RIFT: INSIGHTS FROM MINERAL PETROLOGY OF PERIDOTITE xenoliths FROM THE POTRILLO VOLCANIC FIELD, NEW MEXICO

SESSION NO. 23
T24. Karst Processes and Speleology (Posters) (GSA Hydrogeology Division)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Booth #

23-1 48 Salmis, Robert B.*; Gao, Yongli; Tian, Lijun; Li, Yunxia: INVESTIGATION OF WATER QUALITY AND GROUNDWATER FLOW IN A KARST WATERSHED IN BLANCO COUNTY, TEXAS

23-2 49 Okpokho, Ini S.*; White, John Charles: DETECTION OF SINKHOLES AND OTHER KARST FEATURES USING ELECTRICAL RESISTIVITY TOMOGRAPHY IN RICHMOND, KENTUCKY

23-3 50 Emerson, Elizabeth M.*; Sumrall, Jonathan B.; Kambesis, Patricia N.: USING PETROLOGY TO DETERMINE MORPHOLOGY CONTROLS ON PASSAGE DEVELOPMENT IN RUSSELL CAVES, ALABAMA

23-4 51 Barnett, Rebecca M.*; Sumrall, Jonathan B.: ANALYSIS OF TUFACEOUS SPELEOTHEMS FROM BARBADOS

23-5 52 Howard, Larissa A.*; Sumrall, Jonathan B.; Kambesis, Patricia N.: LITHOCLOGIC INFLUENCE ON THE FORMATION OF DOGWOOD CAVE IN WESTERN KENTUCKY, USA

23-6 53 Camelo, Jonathan M.*; Sumrall, Jonathan B.; Kambesis, Patricia N.: FLOOD BANK ANALYSIS OF CAVE SEDIMENT IN RUSSELL AND MONTAGUE CAVES IN NORTHEASTERN ALABAMA

SESSION NO. 24
T32. Geology of the Greater Kansas City Area (Posters)

8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms

Booth #

24-1 54 Layzell, Anthony L.*; Newell, K. David; Mandel, Rolfe D.; Dunham, John W.: PRELIMINARY SURFACE GEOLOGIC MAP OF MIAMI COUNTY, KANSAS

SESSION NO. 25
D2. Environmental Geology
1:30 PM, Hilton Garden Inn Manhattan, Tuttle Room
Kevin L. Mickus, Presiding
1:30 PM, Hilton Garden Inn Manhattan, Tuttle Room

SESSION NO. 26
T4. Crustal Structure of the Midcontinent using Geophysical and Geodynamic Data
1:30 PM, Hilton Garden Inn Manhattan, Tuttle Room
Kevin L. Mickus, Presiding

SESSION NO. 27
T10. Rhyolite/Granite Magmatism II
1:30 PM, Hilton Garden Inn Manhattan, Konza Prairie Room
Don F. Parker, Matthew E. Brueseke and Richard Hanson, Presiding

SESSION NO. 28
T24. Karst Processes and Speleology (GSA Hydrogeology Division)
1:30 PM, Hilton Garden Inn Manhattan, Alcove Room
Kaitlyn Gauvey and Jonathan B. Sumrall, Presiding
### SESSION NO. 29

**T26. Midcontinent Paleoclimatology (GSA Continental Scientific Drilling Division)**

<table>
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<tr>
<th>Time</th>
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<tr>
<td>1:30 PM</td>
<td>Karin Goldberg and Keith B. Miller, Presiding</td>
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<td>1:30 PM</td>
<td>Hilton Garden Inn Manhattan, Kings Room</td>
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<td>1:35 PM</td>
<td>Nazworth, Caroline M.; Blum, Mike: EVALUATING MODELS FORCRETACEOUS PALEODRAINAGE AND SEDIMENT RUTING USING DETRITAL ZIRCON U-PB PROVENANCE AND GEOCHRONOLOGY IN THE COLORADO FRONT RANGE</td>
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<td>1:55 PM</td>
<td>Allred, Isaac; Blum, Mike: INSIGHTS INTO EARLY PENNSYLVANIAN SEDIMENT RUTING FROM DETRITAL ZIRCON U-PB AND HF ISOTOPIC DATA, DEEPWATER OUACHITA BASIN</td>
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**CONCLUDING REMARKS**

### SESSION NO. 30

**D1. Energy Geology**

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<th>Time</th>
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<tr>
<td>8:00 AM</td>
<td>Marc L. Buursink and Behzad Ghanbarian, Presiding</td>
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<td>8:00 AM</td>
<td>Hilton Garden Inn Manhattan, Konza Prairie Room</td>
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<td>8:05 AM</td>
<td>Halford, Daniel T.: ISOTOPIC ANALYSES OF HELIUM FROM WELLS LOCATED IN THE FOUR CORNERS AREA, SOUTHWESTERN, US</td>
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<td>8:20 AM</td>
<td>Djezzar, Sofiane; Rasouli, Vamegh; Boualam, Aldjia; Rabiei, Minou: FRACTOGRAPHY ANALYSIS OF CAMBO-ORDOVICIAN RESERVOIRS THROUGH SURFACE ANALOG. MOYUDIR BASIN, ALGERIA</td>
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<td>8:40 AM</td>
<td>Wang, Lan; Lin, Tong: A LACUSTRINE BLACK SHALE DEPOSITION MODEL IN THE SONGLIAO BASIN, NORTHEASTERN CHINA</td>
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<td>9:00 AM</td>
<td>Rinderknecht, Chanse; Hasiu, Franciszek: SCANNING ELECTRON MICROSCOPY AND ENRGY DISPERVIVE SPECTROSCOPY PARAMETERS: ANALYZING SURFACE CHEMISTRY OF EKOFISK TOR FORMATION TO PREDICT PROPER WETTABILITY ALTERING IONIC COMPOSITIONS</td>
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<td>9:20 AM</td>
<td>Wu, Yinye; LV, Jialei; Fang, Xiang; Yang, Zhi; Wang, Lan: SEDIMENTARY CHARACTERISTICS OF LACUSTRINE STROMATOLITE LIMESTONE AND ITS PETROLEUM GEOLOGICAL SIGNIFICANCE IN QAIDAM BASIN</td>
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<td>9:40 AM</td>
<td>Fang, Xiang; Guo, Xuguang; Wu, Yinye: TIGHT OIL FORMATION AND DISTRIBUTION OF MIDDLE PERMIAN LUCAOUGOU FORMATION IN JIMSRAG SAG, JUNGGAR BASIN, NORTHWESTERN CHINA</td>
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### SESSION NO. 31

**D3. Quaternary Geology, Geomorphology, Paleoclimate, and Limnogeology**

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<tr>
<td>8:00 AM</td>
<td>Aubrey L. Hillman, Presiding</td>
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*WEDNESDAY, 27 MARCH*
31-6  9:55 AM Duarte, Edward*; Obrist-Farmer, Jonathan; Watrus, Nigel: SEDIMENTARY PROCESSES AND FACIES IN AN ACTIVE PULL-APART: INTERPRETATIONS OF SHORT-SEDIMENT CORES AND GEOPHYSICAL DATA FROM LAKE IZABAL BASIN, GUATEMALA

31-7  10:15 AM Mongol, Erdoo*; Oboh-Ikuenobe, Francisca E.; Obrist-Farmer, Jonathan: A 1,000-YEAR PALYNOLOGICAL RECORD OF LAKE IZABAL, EASTERN GUATEMALA

SESSION NO. 32
D5. Structural Geology
8:00 AM, Hilton Garden Inn Manhattan, Kings Room
Shari Kelley, Presiding

32-1  8:00 AM Muller, Simone R.*; Baird, Graham B.; Hooker, Jake: LOCALIZATION OF CONCENTRIC RING FAULTS IN SEDIMENTS OVERLAPPING EVAPORITE SEQUENCES DURING ACTIVE SALT DIAPIR EMPLACEMENT: INSIGHTS FROM NUMERICAL MODELING

32-2  8:20 AM Nso, Peter*; Eckert, Andreas: ROLL-OVER BREAK-THRUST FORMATION AND ADVANCEMENT OF THE LEADING EDGES OF FOLD AND THRUST BELTS THROUGH FAULT PIRACY

32-3  8:40 AM Mahler, Harmon*; Helmer, Kelly Elizabeth; Pope, Jeffrey J.: HISTORY OF CENOCOFRUCTURE DEVELOPMENT AT SLIM BOUTTES, SOUTH DAKOTA

32-4  9:00 AM Chandonia, William*; Hogan, John P.; Eckert, Andreas: THE ORIGIN OF PERICLINES IN THE OZARK PLATEAU, MISSOURI

32-5  9:20 AM Liu, Chao*; Hogan, John P.; Eckert, Andreas: ANOMALOUS BACK-ARC VOLCANISM DUE TO SUBDUCTING LINEAR TOPOGRAPHIC FEATURES

32-6  9:40 AM Hogan, John P.*; Welker, Avery Joseph; Eckert, Andreas; Tindall, Sarah E.: ANOMALOUS BACK-ARC VOLCANISM DUE TO SUBDUCTING LINEAR TOPOGRAPHIC FEATURES

SESSION NO. 33
T5. Mantle Dynamics and Lithospheric Deformation
8:00 AM, Hilton Garden Inn Manhattan, Flint Hills Room
Claudia Adam, Presiding

33-1  8:00 AM Ichihara, Mie; Adam, Claudia; Grosse, Pablo; Vidal, Valerie*: ANOMALOUS BACK-ARC VOLCANISM DUE TO SUBDUCTING LINEAR TOPOGRAPHIC FEATURES

33-2  8:20 AM Sparks, C. Renee*; Jacques, Issac J.: GEOLIGIC MAPPING AND LITHOSPHERIC DEFORMATION IN THE STRUCTURALLY COMPLEX REGION OF CENTRAL-WESTERN HONDURAS

33-3  8:40 AM Sun, Qiaoqi*; Eckert, Andreas; Obrist-Farmer, Jonathan: TITHE: STRAIN PARTITIONING ACROSS THE POLOCHIC-MOTAGUA FAULT SYSTEM, GUATEMALA: INSIGHTS FROM KINEMATIC NUMERICAL MODELING

33-4  9:00 AM Alemu, Tadesse B.*; Abdelsalam, Mohamed G.: TOPOGRAPHIC AND CRUSTAL THICKNESS VARIATIONS ALONG THE WESTERN ESCARPMENTS OF THE AFAR DEPRESSION

33-5  9:20 AM Pandit, Bimal*; Adam, Claudia: CHARACTERIZATION OF SECONDARY MANTLE CONVECTION FROM GEOPHYSICAL DATA AND MODELS

33-6  9:40 AM Adam, Claudia*: STRESS MODELS OVER THE CENTRAL NORTH AMERICAN CONTINENT

SESSION NO. 34
D1. Energy Geology (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

34-1  1 Schneider, Marcus*; Testa, Maurice P.; Mayo, Dave P.; Krubley, Christopher: PETROGRAPHIC ANALYSIS OF THE SMACKOVER FORMATION IN SOUTHERN ARKANSAS

34-2  2 Halverson, Brenna Ayn*; Kenderes, Stuart M.; Merriman, Jesse; Whittington, Alan: COOKING WITH SALT 2.0: THERMAL PERTURBATIONS CAUSED BY SALTDIAPERS, AND THE RAMIFICATIONS FOR THE MATURATION OF SURROUNDING HYDROCARBONS

34-3  3 Toth, Kevin J.*; Puckette, James O.: EFFECTS OF MISSISSIPPIAN PALEOTOPOGRAPHY AND PALEOSTRUCTURE ON DISTRIBUTION OF THE PENNSYLVANIAN LOWER SKINNER AND RED FORK SANDSTONES IN PARTS OF NOBLE, PAMEE AND OSAGE COUNTIES

34-4  4 Kneedy, Sheyanne*; Wang, Yulun; Grammer, G. Michael: CORRELATING REBOUND HARDNESS TO MINERALOGY AND POROSITY OF CARBONATE RESERVOIRS- APPLICATION TO GROUNDWATER AQUIFERS AND PETROLEUM RESERVOIRS

SESSION NO. 35
D10. Science and Society (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

35-1  5 Aloitiabi, Mislat*; Aly, Mohamed H.; Nanis, Hatid: FUZZY LOGIC MODELING FOR SUSTAINABLE URBAN DEVELOPMENT IN MAKKAH, SAUDI ARABIA

35-2  6 Wethington, Conn*; Pashin, Jack C.: GEOLOGIC FRAMEWORK OF AN ANTHROPOGENIC CARBON CAPTURE AND SEQUESTRATION SYSTEM AT THE KEMPER COUNTY ENERGY FACILITY, EAST-CENTRAL MISSISSIPPI

35-3  7 Arzt, Joe*: PRESERVATION OF HOLOCENE ALLUVIAL SEQUENCES BENEATH HEAVILY DEVELOPED CITYSCAPES IN IOWA: IMPLICATIONS FOR THE ARCHAEOLOGICAL POTENTIAL OF “DISTURBED” URBAN LAND

35-4  8 Schoenfeld, Taylor Earl*; EchoHawk, Barbara: DIGGING FOR DIAMONDS: COULD COLORADO FOLLOW THE ARKANSAS MODEL?

35-5  9 Evans, Kevin Ray*: HUGH MILLER (1802-1856), SCOTTISH GEOLOGIST AND ADVENTURE WRITER

35-6 10 Mikulic, Donald G.*; Kluessendorf, Joanne: FIRST GEOLOGICAL MAP OF MILWAUKEE AND ITS ROLE IN THE DISCOVERY OF FOSSIL REEFS

SESSION NO. 36
D11. Volcanoes and Igneous Rocks (Posters)
8:30 AM, Hilton Garden Inn Manhattan, Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

36-1  11 Ohmumd, Sierra C.*; Hanson, Richard E.; Caves, Lindsay R.: COMPLEX SHALLOW-LEVEL ANDESITIC MAGMA PLUMBING SYSTEMS AND MAGMA/SEDIMENT INTERACTION IN A MESOPROTEROZOIC VOLCANIC ARC SETTING IN NAMIBIA

36-2 12 Drop, Stephen*; van Alderwerelt, Brennan; Peate, David W.; Ukstins, Ingrid: PETROLOGY & GEOCHEMISTRY OF THE EL NEGRILLAR VOLCANIC FIELD, NORTHERN CHILE
WEDNESDAY, 27 MARCH

SESSION NO. 37

D2. Environmental Geology (Posters)
8:30 AM, Hilton Garden Inn Manhattan , Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

37-1 13 Montano, Jonathan*; Cole, Callie; Harvey, Jonathan E.: QUANTIFICATION OF RESIDUAL URANIUM IN SOIL AT THE DURANGO DOG PARK, DURANGO, COLORADO

37-2 14 Bostick, Wyatt Andrew*; Bell, Matt Ede; Rocheford, M. Kathryn: APPLIED TERRESTRIAL PHOTOGRAMMETRY OF SOIL SLUMPS ON ASHMUN CREEK, SAULT SAINTE MARIE, MI

37-3 15 Horn, Jonathon*; Paladino, Patrick; McMillan, Margaret E.: ANALYSIS OF SHORT-TERM CHANGES IN BANK EROSION AND SEDIMENT DISTRIBUTION IN COLEMAN CREEK, LITTLE ROCK, AR

37-4 16 Reger, Brandi*; Gonzalez, Juan L.; Hardage, Sarah: AN ISOLATED SAND DUNE’S RESPONSE TO SEVERE DROYT IN SOUTHERN BROOKS COUNTY, TEXAS

37-5 17 Faulkner, Melinda*: Stafford, Kevin W.: HEAVY METAL CONCENTRATIONS IN BIG CYPRESS AND BLACK CYPRESS BAYOUS, CADDI LAKE WATERSHED, TEXAS

SESSION NO. 38

D3. Quaternary Geology, Geomorphology, Paleoclimate, and Limnogeology (Posters)
8:30 AM, Hilton Garden Inn Manhattan , Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

38-1 18 Loope, David B.*; Burberry, Caroline M.; Searles, Mindi L.: THERMAL CONTRACTION CRACKS IN UTAH SLICKROCK

38-2 19 Barber, Jeneane T.;* EchoHawk, Barbara: SAND AND SAGE: A MATCH MADE IN WYOMING

38-3 20 Broden, Emmett;* Wanless, Harold R.;* Brill, Kathleen A.: GEOLOGIC CHANGES IN THE WHITE RIVER BADLANDS, SOUTH DAKOTA, AS RECORDED BY THE HISTORICAL PHOTOGRAPHS OF HAROLD ROLLIN WANLESS

38-4 21 Koper, Kristin*; Teed, Rebecca: VEGETATION SENSITIVITY DURING THE MID-HOLOCENE WARMING IN WESTERN OHIO

38-5 22 Tassier-Surine, Stephanie*; Kerr, Phillip J.; Goff, Kathleen R.; Leffler, Nick: APPLICATION OF PORTABLE XRF TO STRATIGRAPHIC STUDIES AND EVENT TIMING IN IOWA GLACIAL DEPOSITS

38-6 23 Schilling, Keith*; Rowey, Charles; Kerr, Phillip J.; Tassier-Surine, Stephanie: THE FREMONT CHANNEL IN WESTERN IOWA: A POSSIBLE ARCHIVE OF EARLY AND MIDDLE HOLOCENE GLACIATIONS IN THE MIDWESTERN U.S.

38-7 24 De La Garza, Randolph G.; Gonzalez, Juan L.*; Shen, Xiexiong: THE RAYMONDVILLE FLUVIAL SYSTEM: A SEDIMENTARY UNIT WITH AN IDENTITY CRISIS


38-9 26 Hickman, Aubrey L.*; St. Romain, Scott: RECORDS OF LAKE LEVEL CHANGE FROM THREE PONDS IN SE ALABAMA

38-10 27 Felt, Melina*: Benito Granell, Xavier; Fritz, Sherilyn C.; Steinitz-Kannan, Miriam; Mosquera, Pablo V.: COMPARING ANDEAN AND INTERANDEAN LAKES AT DECADAL AND CENTENNIAL SCALES

38-11 28 Brown, Victoria*; Mihindukulasooriya, Lorita; Campbell, Alisha: MEASUREMENTS OF MICROBIAL AND ALGAL COMMUNITIES ASSOCIATED WITH HARMFUL ALGAL BLOOMS IN OLD WOMEN CREEK NATIONAL ESTUARY OF LAKE ERIE USING REFLECTANCE SPECTROSCOPY AND QUANTITATIVE PCR

SESSION NO. 39

D4. Sedimentology and Stratigraphy (Posters)
8:30 AM, Hilton Garden Inn Manhattan , Big Basin/Kaw Nation Rooms
Authors will be present from 10 to 11:45 AM
Booth #

39-1 30 Hernández González, Paola N.*; Santos-Mercado, Hernan; Ramirez, Wilson: PLIO-PLEISTOCENE SEA-LEVEL CURVE OF THE DUVERGÉ PROVINCE IN THE DOMINICAN REPUBLIC

39-2 31 Shonnard, Christine; Chisholm, James; Zambito, James J.; Foreman, Brady Z.; Currano, Ellen D.; Dechesne, Marieke; Dunn, Regan E.: EVALUATING CYCLES IN DISTAL FLOODPLAIN DEPOSITION WITHIN THE EARLY PALEOGENE HANNA BASIN, WYOMING, USA


39-4 33 Nogueira, Xavier Rojas*; Semerano, Anthony; Sharmar, Glenn; Foreman, Brady Z.; Currano, Ellen D.; Dunn, Regan E.; Dechesne, Marieke: PROVENANCE CHANGE IN FLUVIAL AND DELTAIC SANDSTONE BODIES ACROSS THE PALEOGENE-EOCENE BOUNDARY WITHIN THE HANNA BASIN

39-5 34 Andrews, William;* Petralia, Joseph; Puckette, James: DETERMINING MINERALOGY TO IDENTIFY STRATIGRAPHIC UNITS IN A HIGHLY-WEATHERED ZONE, GRAPE CREEK ECOCLOGICAL PARK, CAÑON CITY, COLORADO

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