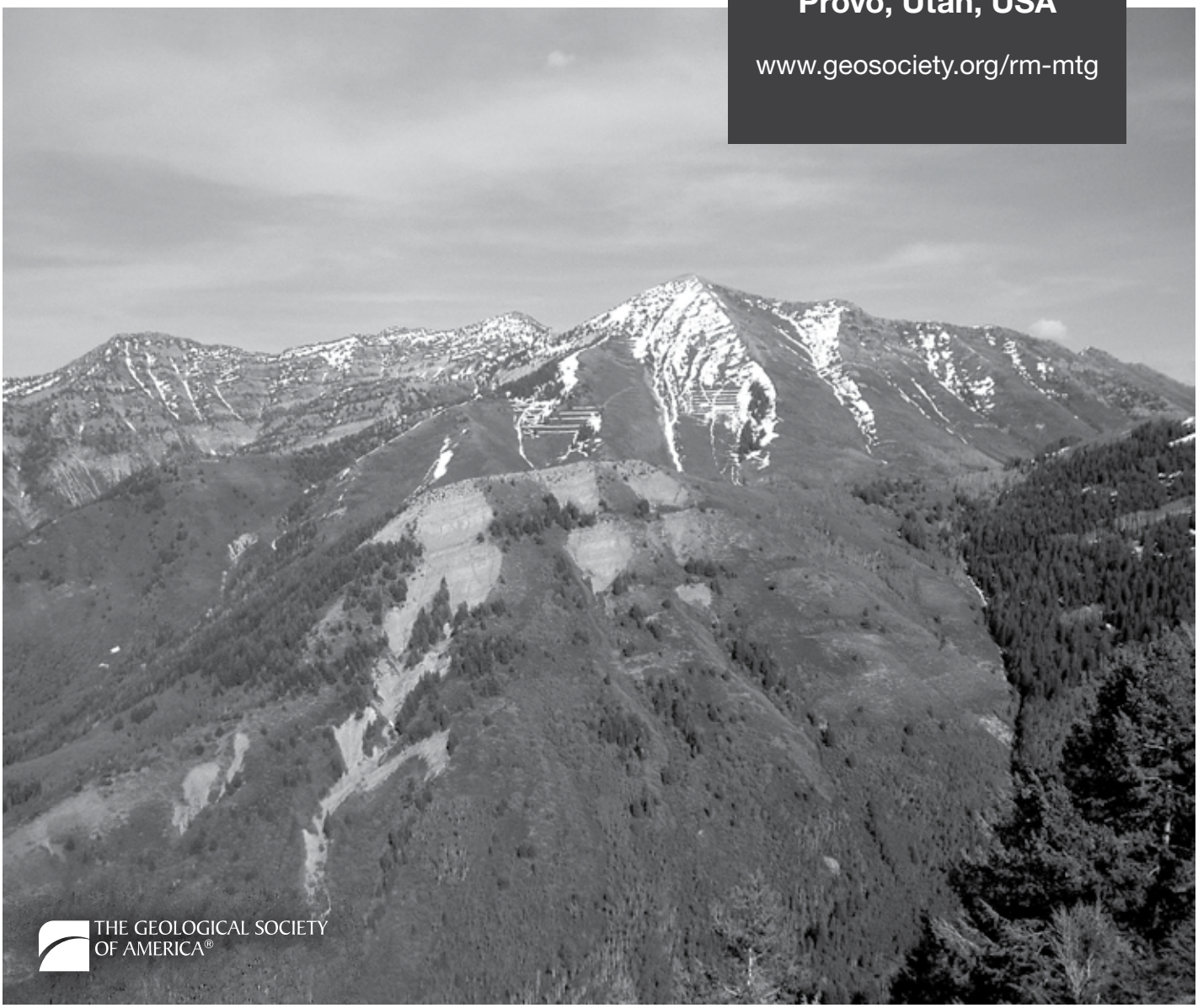
2020 Program

VOL. 52, NO. 3

Rocky Mountain

4–5 May
Provo, Utah, USA

www.geosociety.org/rm-mtg



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Provo Peak from the top of Y-Mountain. Public domain via Wikimedia Commons.

Sponsors

Please take time to thank the following sponsors for their contributions to help make this meeting a success!

Department of Earth Science at Utah Valley University

Strap Tank Brewery

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, 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.

Final Announcement
ROCKY MOUNTAIN SECTION

72nd Annual Meeting, Rocky Mountain Section, GSA
Provo, Utah, USA
3–5 May 2020
https://www.geosociety.org/rm-mtg

Committee for the 2020 Meeting

General Chair . . . . . Daniel Horns
Technical Program Co-Chairs . . . . . Michael Bunds, Nathan Toké, Daren Nelson
Field Trip Co-Chairs . . . . . Michael Stearns, Patricia Garcia
Exhibits Chair . . . . . Daniel Horns
Student Volunteer Co-Chairs . . . . . Justin White, Patricia Garcia
Sponsorship Chair . . . . . Daniel Horns
Budget/Finance Chair . . . . . Daniel Horns

Rocky Mountain Section GSA Officers for 2019–2020

Chair . . . . . David W. Marchetti
Past Chair . . . . . Thomas J. Williams
Chair-elect . . . . . Sarah Wheeler Keenan
Vice-Chair . . . . . Harland L. Goldstein
Secretary . . . . . Shannon Mahan

General Information

Location

The 2020 meeting of the GSA Rocky Mountain Section is hosted by the Department of Earth Science at Utah Valley University and is being held at the Utah Valley Convention Center located at 221 Center Street in the heart of Provo, Utah. Provo Center Street is a pedestrian-friendly, four-block cluster of restaurants, shops, and bars. Provo is less than an hour from the Salt Lake City International Airport and was ranked by *Outside* magazine as one of the best places to live in the United States. Downtown Provo is just a couple miles from the nearest Wasatch Range trailheads at Slate Canyon and Rock Canyon, and less than a 25-minute drive from the spectacular Sundance Mountain Resort. Provo is about 45 miles from the historic mining town of Park City and the high alpine resorts of Snowbird and Alta (as of press time, Snowbird is planning to be open for lift-served skiing and snowboarding in early May). You can combine your visit to the 2020 Rocky Mountain meeting with a spectacular vacation by setting out on a road trip to Arches and Canyonlands National Parks (just over three hours away), Zion National Park (about four hours), or Yellowstone and Grand Teton National Parks (about five hours).

Venue

The meeting location is at the Utah Valley Convention Center, which was significantly upgraded in 2018. The Provo Marriott Hotel is just across the street. Field trips will depart from the parking lot on the northwest side of the convention center.

Transportation

The Utah Valley Convention Center is just east of I-15, about 50 miles south of Salt Lake City and the Salt Lake International Airport. For those flying in who prefer to not rent a car, the site is accessible from the airport by busses and trains run by the Utah Transit Authority. For those staying at the Provo Marriott, parking at the hotel is free. There is also free parking at the Utah Valley Convention Center (41 spaces) and in a lot two blocks north of the convention center on Freedom Blvd. (400 spaces).

Eating and Drinking

There are more than 50 restaurants within seven blocks of the convention center, ten of which serve wine and beer (see downtown Provo dining guide). These include delis and burger joints as well as restaurants that focus on fine American dining and food from Mexico, Brazil, Peru, Thailand, Vietnam, China, and Japan. Seven miles from downtown Provo is Strap Tank Brewery (596 S 1750 W, Springville, UT), Utah Valley's only brew pub.

Weather

In early May, average daily high and low temperatures in Provo are 70 °F (21 °C) and 44 °F (7 °C). On average, there is rain in Provo about one out of every five days in May, and the city receives an average of 1.7 inches (44 mm) for the whole month. There is typically still snow in the high mountains near Provo in early May. Storms dropping a few inches (several centimeters) of snow in Provo and up to about a foot in the mountains are not uncommon that time of year. Visitors are encouraged to check forecasts ahead of time and prepare for dealing with snow if cold storms are forecast when they plan to go to the mountains.

Utah Valley Geology

The meeting is being held in one of the most geologically diverse sites in America. Utah Valley is the easternmost basin of the Basin and Range, and is just a few miles from the physiographic "triple junction" between the Basin and Range, Rocky Mountain, and Colorado Plateau provinces. The convention center is two miles from the base of the tectonically active, fault-bounded Wasatch Range. Bedrock in the Wasatch Range includes Precambrian tillites, Mississippian marine sediments, and Tertiary intrusives and ore bodies. The range contains structures associated with the Sevier and Laramide orogenies.

Quaternary geology in and near Utah Valley includes shoreline features associated with Pleistocene Lake Bonneville (e.g., wave-cut platforms, shoreline spits, Gilbert deltas) and alpine glacial morphologic features (e.g., cirques, aretes, and moraines). There are well-preserved scarps of the late Holocene Wasatch fault, complete with slickensided limestone, and active creeping landslides along the base of the Wasatch Range.

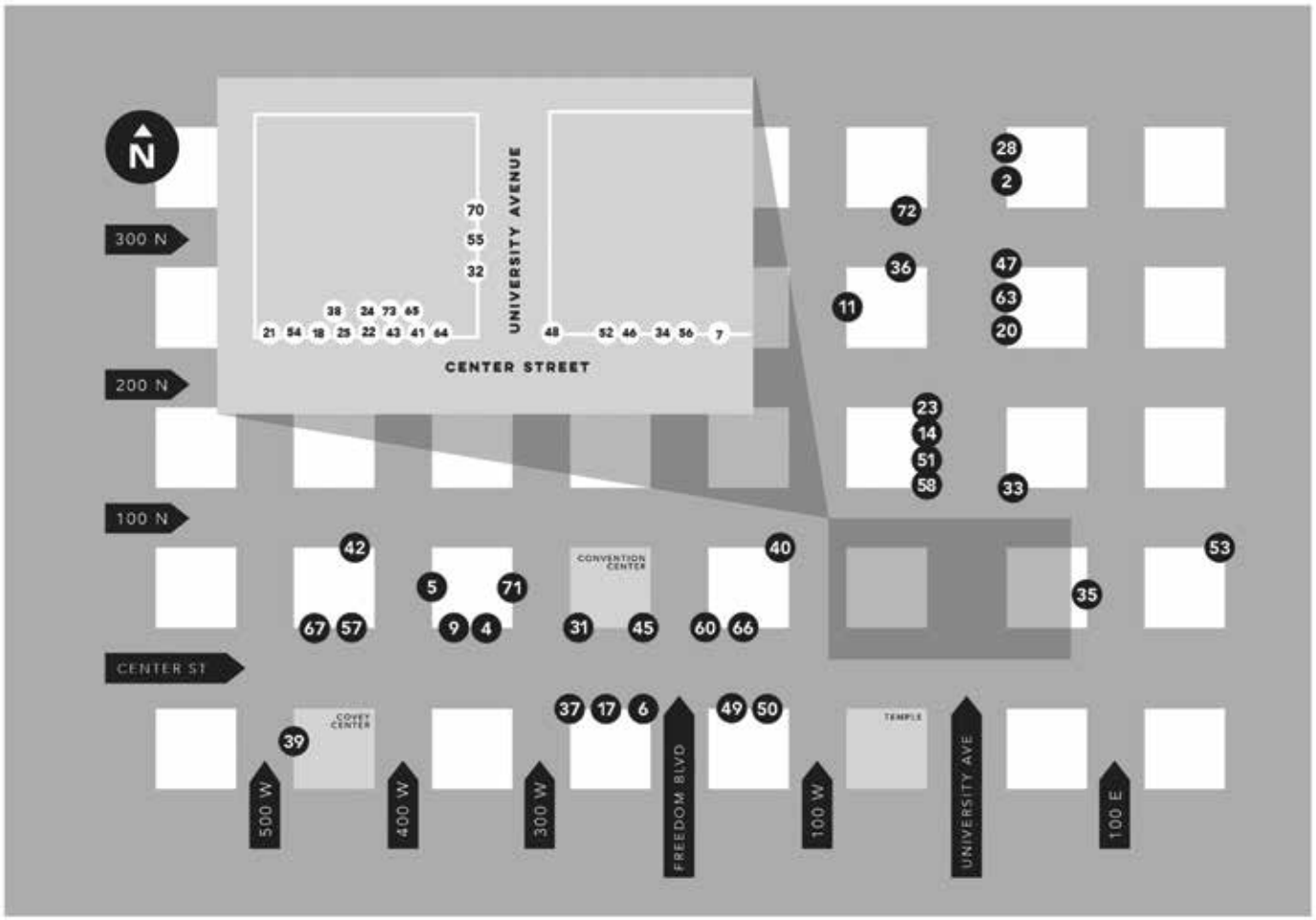
REGISTRATION

Registration is required to participate in all events associated with the meeting, including technical sessions, field trips, short courses, exhibits, and special meetings. 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.

On-site Registration Fees shown in U.S. dollars.

	Full Mtg.	One day
Professional Member	$210	$160
Professional Member 70+	$110	$75
Professional Nonmember	$260	$200
Early Career Professional Member	$150	$100
Student Member	$90	$75
Student Nonmember	$125	$75
K–12 Professional	$55	$30
Guest or Spouse	$55	n/a
Field Trip/Short Course Only	$65	n/a

Guest registration is intended for non-geoscientists accompanying a registered professional, student or K–12 professional. Guest registration does not include attendance at short courses or field trips. All guests, volunteers, exhibitors, GSA staff, service providers and others in attendance are expected to abide by the GSA Events Code of Conduct, which outlines specific expectations for participants at GSA-supported events.



DOWNTOWN PROVO RESTAURANTS

LATIN

1. Brassas Mexican Grill 238 W 100 S*
2. El Gallo Giro Mexican Grill 346 N UNIVERSITY AVE
3. El Mexcal • 325 S 200 W*
4. El Salvador Restaurante • 332 W CENTER ST
5. El Tropical 54 S 400 W
6. Joe Vera's Mexican Restaurant • 201 CENTER ST
7. Los Hermanos Mexican Restaurant 71 E CENTER ST
8. Mi Lindo Guadalajara 446 FREEDOM BLVD*
9. Se Llama Peru 368 W CENTER ST
10. Taco Paraiso 279 E 300 S*
11. Taqueria El Vaquero 286 N 100 W
12. Ricas Pupusas 610 CENTER ST*
13. Tacos CDMX 75 S 500 W*
14. Lucy's Brazilian Kitchen 165 N UNIVERSITY AVE
15. Taqueria San Marcos 490 S FREEDOM BLVD*

ASIAN

16. Bombay House • 463 N UNIVERSITY AVE*
17. China Garden 225 W CENTER ST
18. Demae • 82 W CENTER ST
19. Five Sushi Brothers 445 FREEDOM BLVD 200 W* • ▲
20. Four Seasons Hot Pot and Dumplings 236 N UNIVERSITY AVE
21. India Palace • 98 W CENTER ST
22. Lotus Garden • 56 W CENTER ST
23. Noodle King 163 N UNIVERSITY AVE
24. Osaka 46 W CENTER ST
25. PhoPlus 68 W CENTER ST
26. Sushi Burrito 283 S 300 S*
27. Thai Village 480 N UNIVERSITY AVE*
28. Wild Ginger 366 N UNIVERSITY AVE
29. Saigon Cafe • 440 W 300 S*
30. Yummy's BBQ & Sushi 287 E 300 S*
31. Silver Dish Thai Cuisine 278 CENTER ST

DINER, GRILL, CASUAL DINING

32. Black Sheep Cafe • 19 N UNIVERSITY AVE
33. Communal • 102 N UNIVERSITY AVE
34. Good Thyme Eatery 63 E CENTER ST
35. La Dolce Vita Ristorante • 61 N 100 E ST
36. CHOM Burger 45 W 300 N
37. Broke Eatery 155 N UNIVERSITY AVE
38. Two Jack's Pizza • 80 W CENTER ST
39. Rocky Mountain Drive-In 43 S 500 W
40. Slate • ▲ 101 W 100 N
41. Station 22 Cafe 22 W CENTER ST
42. Tommy's Burgers 405 W 100 N

CAFÉ & DELI

43. Bruges Waffles & Frites 42 W CENTER ST
44. Cafe 300 465 UNIVERSITY AVE*
45. Center Street Cafe 220 W CENTER ST
46. Guru's Cafe 45 E CENTER ST
47. Red Deli • 288 N 100 W
48. Good Move Cafe • 1 CENTER ST
49. Sensuous Sandwich 163 W CENTER ST
50. The Spoon 75 W CENTER ST
51. Cultura Bakery & Cafe 151 N UNIVERSITY AVE

DESSERT & BAKERY

52. Edition Bakery & Cafe 43 E CENTER ST
53. Provo Bakery 190 E 100 N
54. Bianca's La Petite French Bakery 90 W CENTER ST
55. Rockwell's Ice Cream Parlour 43 N UNIVERSITY AVE
56. Roll With It Creamery 63 E CENTER ST
57. Hruska's Kolaches 434 CENTER ST
58. Taste 117 N UNIVERSITY AVE
59. The Mighty Baker 50 E 500 N*
60. Fruta Crush 198 W CENTER ST
61. Delipan Bakery 335 S 200 W*
62. Chip Cookies 159 S 500 N*
63. Dulce Cookie Dough 286 N UNIVERSITY AVE
64. Sweet Tooth Fairy 8 CENTER ST
65. Sub Zero 62 CENTER ST

BAR & BEVERAGE

66. AFG's Libation Emporium • ▲ 190 W CENTER ST
67. City Limits • ▲ 440 W CENTER ST
68. Rugged Grounds* 136 W 500 N
69. Juice 'n java 241 FREEDOM BLVD*
70. Ivie Juice Bar 45 N UNIVERSITY AVE
71. Peace on Earth • 315 S 300 W #200
72. Sodalicious 30 W 300 N
73. Heart & Seoul Karaoke 52 CENTER ST
74. State Liquor Store • 166 S FREEDOM BLVD*

* not on map
• serves alcohol
■ does delivery
▲ open late

Registration Schedule

On-site registration and badge pick-up is located in the Cascade North Prefunction and is available on the following schedule:

Sunday, 3 May: 3–6:30 p.m.
Monday, 4 May: 6:30 a.m.–5:30 p.m.
Tuesday, 5 May: 6:30 a.m.–2:30 p.m.

Accommodations

A block of rooms was reserved at the Provo Marriott Hotel & Conference Center (101 West 100 North, Provo, Utah 84601) located in the heart of vibrant Provo. The hotel offers many amenities (restaurants, bar, pool, Wi-Fi), and the Convention Center is just steps away. Reservations can be made by calling +1-800-228-9290. Complimentary parking is available at the hotel.

Continuing Education Credits (CEU)

The Rocky Mountain Section Meeting offers an excellent opportunity to earn CEUs toward your continuing education requirements for your employer, K–12 school or professional registration. Please check the meeting website after the meeting to download your CEU certificate.

Cancellations, Changes, and Refunds

Requests for additions, changes, and cancellations must have been made in writing to GSA Headquarters, in writing, by 6 April. No refunds will be made on cancellation notices received after this date. GSA cannot provide refunds for on-site registration or event ticket sales. Refunds will be mailed from GSA after the meeting; refunds for fees paid by credit card will be credited to the card identified on the registration form.

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/2020RM/meetingapp.cgi.

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.

SOCIAL ACTIVITIES AND SPECIAL EVENTS

Sunday, 3 May

Opening Ceremony and Welcome Reception. 5–7:30 p.m., Ballrooms A. Enjoy snacks and a complimentary beverage while connecting with your colleagues. Each participant receives a coupon for one free beer or non-alcoholic beverage in their registration packet. Cash bar is available.

Monday, 4 May

Session Chair Orientation. 7:15–7:30 a.m., Cascades C. This meeting provides a review of session time management, AV procedures, and other information affecting the conduct of the day's sessions.

Coffee Break. 10–11 a.m. and 2:30–3:15 p.m., Ballroom A.

Geology Club Officer Meet-Up. 2–3 p.m., Soldier Creek Room. If you are a geology club officer or are interested in starting a club on your campus plan to Meet-Up and chat with other representatives about their activities, goals, and accomplishments.

Posters and Exhibits Reception. 4–5 p.m., Ballroom A. Beer, and light snacks and a cash bar is provided.

GSA Rocky Mountain Section Business Meeting. 5:30–6 p.m. Utah Valley Convention Center Soldier Creek Room.

Tuesday, 5 May

Session Chair Orientation. 7:15–7:30 a.m., Cascades C. This meeting provides 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., Hobble Creek Room. 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.

Coffee Break. 10–11 a.m., Ballroom A.

Posters and End of Conference Reception. 3–5 p.m., Ballroom A. Enjoy snacks and a beverage while connecting with your colleagues.

BUSINESS MEETINGS

GSA Rocky Mountain Section Management Board Meeting. Monday, 4 May, 5:30–6:30 p.m., Soldier Creek Room.

TECHNICAL PROGRAM

The Meeting's Technical Program consists of theme and discipline sessions arranged in oral and poster sessions. On Monday, 4 May and Tuesday, 5 May, the Technical Program begins at 8:15 a.m. and end at 4:30 p.m.

SPEAKER READY ROOM

The Speaker Ready Room is located in the Silver Creek Room, and is available during the following times:

Sunday, 3 May	3–7 p.m.
Monday, 4 May	6:30 a.m.–5:30 p.m.
Tuesday, 5 May	6:30 a.m.–3 p.m.

Oral Presentations

Computers and assistance are available in the Speaker Ready Room 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 before for morning sessions, and at least 2 hours prior to the beginning of their session for afternoon sessions. Monday morning speakers should upload their talks Sunday if possible, but no later than 7 a.m. on the same day.

Poster Presentations

Presenters should bring posters that are no more than 46" wide by 46" tall. Posters can be hung with pins, which will be provided. Posters are located in Ballroom A, adjacent to the exhibitors. Presenters are expected to have their posters up by 8:30 a.m. on the day of presentation, and are expected to be present at their posters from either 9:30 to 11:30 a.m. or 2:30 to 4:30 p.m., depending on whether the poster presentation is part of the morning or afternoon session. Check the program for presentation times. Presenters should take down their posters at the end of the session. Any posters not taken down will be discarded.

Session Chair Orientations

Each Session Chair is requested to attend a 15 minute "Session Chairs Orientation" held in the Cascades C room from 7:15 to 7:30 on the morning of the day on which your session is to take place. This meeting includes a review of session time management, AV procedures, and other information important to the conduct of the day's sessions.

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 a break or discussion period and begin the following presentation at its scheduled time.

A student volunteer is assigned to each oral session. Session chairs are asked to meet with the assigned student volunteer before the start of the session. The volunteers are there to help the sessions run smoothly and to contact the AV Coordinator in the event of technical problems.

Technical program

Please see page 9 for the technical session schedule. Direct questions to the Technical Program co-chairs: Nathan Toké (nathan.toke@uvu.edu), Michael Bunds, (michael.bunds@uvu.edu), and Daren Nelson (nelsonda@uvu.edu).

FIELD TRIPS

All Field trips depart from the parking lot on the northwest side of the convention center (100 North St., between 200 West St. and 300 West St.). Please direct questions to the Field Trip co-chairs: Michael Stearns (mstearns@uvu.edu) and Patricia Garcia (pgarcia@uvu.edu).

Pre-Meeting

F1.**Tracking Dinosaurs in Canyon County (Moab).** Fri.–Sun., 1–3 May. Max.: 10 participants. US$380. Check in at 8 a.m., Friday, 1 May. *Trip departs promptly at 8:30 a.m.* ReBecca Hunt-Foster; Neffra A. Matthews; Hugh McDonald.

The Moab area is well-known for extensive Upper Triassic–Lower Cretaceous exposures rich in ichnofossils, particularly those of dinosaurs. This three-day field trip will visit a number of interpreted and undeveloped sites, where Mesozoic ecosystems are understood through research done on the diverse trace fossil record and the associated geology.

F2. **Tectonic Evolution of the Sevier and Laramide Belts in Northern Utah.** Sat.–Sun., 2–3 May. Max.: 25 participants. US$190. Check in at 7:30 a.m., Saturday, 2 May. *Trip departs promptly at 8 a.m.* Adolf Yonkee; Doug Sprinkel; Liz Balgord

This field trip explores fascinating interactions among the Sevier fold-thrust belt, Laramide thick-skin belt, and foreland basin system. Participants will explore spectacular outcrops of the Charleston thrust sheet, synorogenic strata of the Uinta basin, and the Split Mountain anticline near Vernal, Utah, the first day. During the second day, we will continue exploring classic exposures of the Laramide Uinta arch near Flaming Gorge, the Absaroka thrust system, and synorogenic strata that provide one of the most complete records of thrust timing of any retroarc mountain system on Earth.

F3. **Lake Bonneville and Great Salt Lake (a field trip to locations within the vicinity of Provo and Salt Lake City, Utah).** Sun., 3 May, 7:30–5 p.m. Max.: 40 participants. US$75. Check in at 7:30 a.m. on Sunday, 3 May. *Trip departs promptly at 8 a.m.* Charles (Jack) G. Oviatt.

This field trip visits some of the localities near Provo and Salt Lake City that were first studied by G.K. Gilbert in the late 1800s. We'll examine Gilbert's descriptions and interpretations, and present new data from field and laboratory investigations of the geomorphology, sedimentology, geophysics, and geochronology of features related to Lake Bonneville, mountain glaciation, and the Wasatch fault. The last stop of the day will be at the south shore of Great Salt Lake, which is the post-Bonneville, low-elevation component of the lacustrine system in the basin. The trip lasts one day and will start and end at the Provo Convention Center.

Post-Meeting

F4. **Dinosaur National Monument and Other Mesozoic sites of Northeastern Utah.** Wed.–Thurs., 6–7 May. Max.: 25 participants. US$230. Check in at 7 a.m. on Wednesday, 6 May. *Trip departs promptly at 7:30 a.m.* ReBecca Hunt-Foster; Ben Buger; Jim Kirkland; Ken Carpenter; Brooks Britt; Doug Sprinkel.

Join us for a two-day field trip to the Mesozoic outcrops of northeastern Utah. Participants will visit the Carnegie, Abydosaurus, and the Saints and Sinners Quarries in and around Dinosaur National Monument. Tours of the Brigham Young University Paleontology Museum and the Utah Field House of Natural History collections will be provided.

F5. **The Integrated Ten-Million-Year History of the Little Cottonwood–Alta Stock System from Pluton to Aureole.** Wed., 6 May. Max.: 33 participants. US$115. Check in at 7:30 a.m. on Wednesday, 6 May. *Trip departs promptly at 8 a.m.* Mike Stearns; John Bartley; John Bowman; Carl Beno.

Recent and ongoing work on the Little Cottonwood–Alta system has highlighted the importance of its protracted magmatic and hydrothermal processes. This system allows for an amazing perspective into crustal processes at a variety of structural levels due to the tilted cross section from ~11 km depth at the mouth of Little Cottonwood Canyon to the volcanic rocks at the paleosurface in Park City, Utah. This field trip will showcase the most up-to-date and integrated field and petrochronology data from the stocks and the contact metamorphic aureoles. These data have helped to reshape our understanding of the internal anatomy and emplacement mechanisms of the stocks, the episodicity of incremental magma and hydrothermal flow, and importance of permeability structures in these systems. We will begin the day with the satellite Ferguson stock and Little Cottonwood contact aureole and work upward in the crust toward the Alta stock and its contact aureole.

F6. **Geology of Bryce Canyon and Zion National Parks.** Wed.–Fri., 6–8 May. Max.: 40 participants. US$450. Check in on Wednesday May 6 either at 6 a.m. at the Utah Geological Survey (1594 West North Temple, Salt Lake City, Utah 84116) or at 7 a.m. at the northwest entrance of the Utah Valley Convention Center Limit (on 100 North St., between 200 West St. and 300 West St.). Return Friday May 8 at 6:30 p.m. (Utah Valley Convention Center) or 8 p.m. (Utah Geological Survey). *Trip departs from convention center promptly at 7:30 a.m.* Grant C. Willis; Adam McKean.

Southwestern Utah is justly famous for its spectacular scenery and extraordinary geologic diversity. This trip focuses on Bryce Canyon and Zion National Parks, but will also explore the High Plateaus transition zone between the Colorado Plateau and Basin and Range Province. We will discuss the local geology of the parks, the regional framework geology, and recent discoveries and theories based on decades of geologic mapping and research in the region. Trip includes optional hikes of 1 to 2 miles. This is a good trip for spouses/partners.

F7. **The Gigantic Markagunt and Sevier Gravity Slides Resulting from Mid-Cenozoic Catastrophic Mega-Scale Failure of the Marysvale.** Wed.–Fri., 6–8 May. Max.: 24 participants. US$345. Check in at 7:30 a.m. on Wednesday, 6 May. *Trip departs promptly at 8 a.m.* Robert F. Biek; David B. Hacker; Peter D. Rowley.

We will introduce three gigantic, newly discovered gravity slides in southwestern Utah that exhibit the full range of structural features commonly seen in modern landslides, but on an enormous scale. Each slide is nearly 100 km long with runouts over the former land surface of at least 35 km; collectively, they form a gravity-slide complex covering an area >8000 km^2 and are among Earth's largest terrestrial landslides. These gravity slides resulted from catastrophic failure of the southern flank of the Marysvale volcanic field near the end of its peak magmatic activity about 25 to 18 Ma. Participants will see a variety of extensional, translational, and compressional structures—hallmarks of any small modern landslide—and learn how they relate to the overall gravity slide complex. Each slide is cut longitudinally by post-gravity-slide basin-range faults, revealing stunning basal breccia layers and slip surfaces, clastic dikes, jigsaw-puzzle fracturing, older-on-younger thrust relationships, and rare pseudotachylytes indicative of high-velocity movement aided by overpressured fluids. *Thanks to generous support from the Utah Geological Association, we can offer a reduced registration fee of approximately half off to a limited number of students; the difference in cost will be reimbursed once we have a final student count.*

Short Courses

Short Courses take place at the Utah Valley University, 800 West University Pkwy, Orem, UT 84108, in Room SB 175. The Utah Valley University is easily accessible from the Utah Valley Convention Center via the free UVX bus (UTA route 830).

SC1. **Introduction to High Resolution Topography (Lidar and Structure from Motion)**. Wednesday, 6 May, 9 a.m.–5 p.m., Utah Valley University, Room SB 175. US$35 student/US$75 all others. Christopher Crosby; Michael Bunds; Mathew Beckley; Nathan Toké.

This one day course is designed for people looking to utilize high resolution topography (HRT). Students will be introduced to what HRT is, where to obtain it, and some of the myriad of applications of it in the geosciences. The basics of point clouds, digital elevation models (DEMs) and their various manifestations (e.g., DSMs and DTMs), and an overview of the methods to acquire them such as lidar and Structure-from-Motion (SfM) from UAS, will be covered. Hands-on work with data will be emphasized, and while basic knowledge of GIS software will be helpful, no prior knowledge of HRT is needed by attendees.

SC2. **Introduction to Acquisition and Manipulation of High Resolution Topography Point Clouds.** Thursday, 7 May. 9 a.m.–5 p.m., Utah Valley University, Room SB 175. US$25 student/US$50 all others. Christopher Crosby; Michael Bunds; Mathew Beckley; Nathan Toké.

This one-day course is designed for students with a basic background in HRT, and who are interested in acquiring their own data and/or manipulating point clouds HRT data. Attendees will generate a point cloud from photographs using Structure-from-Motion (SfM), compare and contrast with lidar point clouds, work with basic point cloud interrogation tools, and be introduced to topographic change detection methods. Hands-on work with data will be emphasized and basic knowledge of SfM and lidar will be expected (for example from the associated short course 'Introduction to High Resolution Topography' on the day prior or other activities).

STUDENT OPPORTUNITIES

Roy J. Shlemon Mentor Program in Applied Geoscience. Monday, 4 May, noon–1:30 p.m., Utah Valley Convention Center, Soldier Creek Room. GSA student members 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, 5 May, noon–1:30 p.m., Utah Valley Convention Center, Soldier Creek Room. 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.

Career Workshop Series

This three-part series will feature career development planning, an exploration of geoscience job sectors, and information on best practices for crafting a résumé and cover letter. No registration is required, and everyone is welcome.

Geoscience Career Workshop Part 1: Career Planning and Informational Interviewing. Mon., 4 May, 9–10 a.m., Utah Valley Convention Center, Soldier Creek 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. Mon., 4 May, 10–11 a.m., Utah Valley Convention Center, Soldier Creek 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? Workshop presenters and professionals in the field will address these issues.

Geoscience Career Workshop Part 3: Cover Letters, Résumés and CVs. Tues., 5 May, 9–10 a.m., Utah Valley Convention Center, Soldier Creek Room. How do you prepare a cover letter? Does your résumé need a good edit? Whether you are currently in the market for a job 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.

To learn more about mentors and career workshops, go to www.geosociety.org/mentors or contact Jennifer Nocerino at jnocerino@geosociety.org.

Student Volunteer Opportunities may earn deeply discounted registration. Student members of GSA who commit to working at least 8 hours during the meeting will be offered a full meeting registration for just $15 (compared to the full student member rate of $65). Student nonmembers who commit to at least 8 will be offered a full meeting registration for just $25 (compared to the full student nonmember rate of $90). Students interested in volunteering must contact Dr. Justin White (justin.white@uvu.edu).

Exhibits

Exhibits are in Ballroom A of the Utah Valley Convention Center. Exhibitors are asked to set up starting at noon on Sunday, 3 May, to be set up in time for the 5 p.m. welcome reception. Exhibit tear-down begins at 5 p.m. on Tuesday, 5 May. All exhibitors should be out of the Utah Valley Convention Center by 7 p.m. on 5 May. Please contact the exhibits chair, Daniel Horns, hornsda@uvu.edu, +1-801-230-4886, for the exhibit application or with any questions related to the exhibits.

Exhibits are located in Ballroom A.
Set up: Sunday, 3 May, noon–5 p.m.
Open: Sunday, 3 May, 5–7:30 p.m.
Open: Monday, 4 May, 8:30 a.m.–5 p.m.
Open: Tuesday, 5 May, 8:30 a.m.–5 p.m.
Tear down: Tuesday, 5 May, 5–7 p.m.

Exhibitors (as of February 2020)

2021 Meeting of the Rocky Mountain Section of the GSA
American Institute of Professional Geologist (AIPG)
GSA Bookstore
GSA Foundation
Utah State University

SPONSORSHIP

Sponsors help the Geological Society of America reach a broad audience through partnerships with local meetings. Please consider supporting the meeting. For more information, contact Daniel Horns, hornsda@uvu.edu.

Organizing Committee:

Meeting Chair: Daniel Horns, hornsda@uvu.edu

Technical Program Co-Chairs: Nathan Toké Nathan.toke@uvu.edu; Michael Bunds, michael.bunds@uvu.edu; Daren Nelson, nelsonda@uvu.edu.

Field Trip Co-Chairs: Michael Stearns, mstearns@uvu.edu; Patricia Garcia, pgarcia@uvu.edu

Exhibits Chair: Daniel Horns, hornsda@uvu.edu

Technical Session Schedule

Monday, 4 May 2020			
Session	**Time**	**Sponsor/Description**	**Location**
1	8:15 AM	D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond	Cascades E
2	8:15 AM	T2. Geohazards of the Rocky Mountain West and Beyond	Cascades C
3	8:30 AM	D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond (Posters) *Authors will be available 2:30 to 4:30 p.m*	Ballroom A
4	8:30 AM	T2. Geohazards of the Rocky Mountain West and Beyond (Posters) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
5	8:30 AM	T16. Effective and Innovative Teaching and Curricula in the College Geoscience Classroom (Posters) (GSA Geoscience Education Division) *Authors will be available 9:30 to 11:30 a.m.*	Ballroom A
6	8:30 AM	T17. Undergraduate Research I (Posters) (GSA Geoscience Education Division) *Authors will be available 9:30 to 11:30 a.m.*	Ballroom A
7	8:30 AM	T17. Undergraduate Research II (Posters) (GSA Geoscience Education Division) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
8	1:25 PM	D2. Geology of the San Rafael Swell and Other Areas of Stratigraphic Significance in the Rocky Mountain Region	Cascades C
9	1:25 PM	T8. Mining in the Rocky Mountain Region and Beyond: Risks and Opportunities	Cascades E
Tuesday, 5 May 2020			
Session	**Time**	**Sponsor/Description**	**Location**
10	8:15 AM	T12. Advances and Applications of River Science in the West (GSA Quaternary Geology and Geomorphology Division)	Cascades E
11	8:15 AM	T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes	Cascades C
12	8:30 AM	T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary (Posters) *Authors will be available 9:30 to 11:30 a.m.*	Ballroom A
13	8:30 AM	T7. Geologic Maps and GIS—The Foundation of Research and Exploration (Posters) *Authors will be available 9:30 to 11:30 a.m.*	Ballroom A
14	8:30 AM	T11. Federal and State Geologists of the Rocky Mountain Section: Who Are They, What Are They Working On, and How Can Everyone Collaborate? (Posters) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
15	8:30 AM	T12. Advances and Applications of River Science in the West (Posters) (GSA Quaternary Geology and Geomorphology Division) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
16	8:30 AM	T13. Geomorphic and Paleoclimate Records from the Intermountain West (Posters) *Authors will be available 9:30 to 11:30 a.m.*	Ballroom A
17	8:30 AM	T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes (Posters) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
18	8:30 AM	T15. Hydrology of the Western United States (Posters) *Authors will be available 2:30 to 4:30 p.m.*	Ballroom A
19	1:25 PM	T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary	Cascades C
20	1:25 PM	T13. Geomorphic and Paleoclimate Records from the Intermountain West	Cascades E

Schedule of Events

EVENT	TIME	LOCATION
FRIDAY, 1 MAY		
F1.Tracking Dinosaurs in Canyon County (Moab) (Field Trip)	8 a.m.	Northwest side of Convention Center
SATURDAY, 2 MAY		
F2. Tectonic Evolution of the Sevier and Laramide Belts in Northern Utah (Field Trip)	7:30 a.m.	Northwest side of Convention Center
SUNDAY, 3 MAY		
F3. Lake Bonneville and Great Salt Lake (a field trip to locations within the vicinity of Provo and Salt Lake City, Utah) (Field Trip)	7:30 a.m.–5 p.m.	Northwest side of Convention Center
Exhibitor Set Up	noon–5 p.m.	Ballroom A
Registration Open	3–6:30 p.m.	Cascades North Prefunction
Speaker Ready Room	3–7 p.m.	Silver Creek
Opening Ceremony and Welcome Reception	5–7:30 p.m.	Ballroom A
Exhibits Open	5–7:30 p.m.	Ballroom A
MONDAY, 4 MAY		
Registration Open	6:30 a.m.–5:30 p.m.	Cascades North Prefunction
Speaker Ready Room	6:30 a.m.–5:30 pm	Silver Creek
Session Chair Orientation	7:15–7:30 am	Cascades C
Exhibits Open	8:30 a.m.–5 p.m.	Ballroom A
Geoscience Career Workshop Part 1: Career Planning and Informational Interviewing	9–10 a.m.	Soldier Creek
Coffee Break	10–11 a.m.	Ballroom A
Geoscience Career Workshop Part 2: Geoscience Career Exploration	10–11 a.m.	Soldier Creek
Morning Oral Technical Sessions		
D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond	8:15 a.m.–noon	Cascades E
T2. Geohazards of the Rocky Mountain West and Beyond	8:15 a.m.–noon	Cascades C
Poster Sessions: *See page 9 for Authors availability.*		
D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond (Posters)	8:30 a.m.–4:30 pm	Ballroom A

EVENT	TIME	LOCATION
T2. Geohazards of the Rocky Mountain West and Beyond (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T16. Effective and Innovative Teaching and Curricula in the College Geoscience Classroom (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T17. Undergraduate Research I (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T17. Undergraduate Research II (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
Roy J. Shlemon Mentor Program in Applied Geoscience	noon–1:30 p.m.	Soldier Creek
Afternoon Oral Technical Sessions		
D2. Geology of the San Rafael Swell and Other Areas of Stratigraphic Significance in the Rocky Mountain Region	1:25–4:30 p.m.	Cascades C
T8. Mining in the Rocky Mountain Region and Beyond: Risks and Opportunities	1:25–4:30 p.m.	Cascades E
Geology Club Officer Meet-Up	2–3 p.m.	Soldier Creek
Coffee Break	2:30–3:15 p.m.	Ballroom A
Posters and Exhibits Reception	4–5 p.m.	Ballroom A
GSA Rocky Mountain Section Business Meeting	5:30–6 p.m.	Soldier Creek
GSA Rocky Mountain Section Management Board Meeting	5:30–6:30 p.m.	Soldier Creek
TUESDAY, 5 MAY		
Registration Open	6:30 a.m.–2:30 p.m.	Cascades North Prefunction
Speaker Ready Room	6:30 a.m.–3 p.m.	Silver Creek
GSA Campus Representative Appreciation Breakfast	7–8 a.m.	Hobble Creek
Session Chair Orientation	7:15–7:30 a.m.	Cascades C
Exhibits Open	8:30 a.m.–5 p.m.	Ballroom A
Geoscience Career Workshop Part 3: Cover Letters, Résumés and CVs	9–10 a.m.	Soldier Creek
Coffee Break	10–11 a.m.	Ballroom A
Morning Oral Technical Sessions		
T12. Advances and Applications of River Science in the West	8:15 a.m.–noon	Cascades E
T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes	8:15 a.m.–noon	Cascades C
Poster Sessions: *See page 9 for Authors availability.*		
T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T7. Geologic Maps and GIS—The Foundation of Research and Exploration (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T11. Federal and State Geologists of the Rocky Mountain Section: Who Are They, What Are They Working On, and How Can Everyone Collaborate? (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T12. Advances and Applications of River Science in the West (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A

EVENT	TIME	LOCATION
T13. Geomorphic and Paleoclimate Records from the Intermountain West (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
T15. Hydrology of the Western United States (Posters)	8:30 a.m.–4:30 p.m.	Ballroom A
John Mann Mentors in Applied Hydrogeology Program	noon–1:30 p.m.	Soldier Creek
Afternoon Oral Technical Sessions		
T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary	1:25–4:30 p.m.	Cascades C
T13. Geomorphic and Paleoclimate Records from the Intermountain West	1:25–4:30 p.m.	Cascades E
Posters and End of Conference Reception	3–5 p.m.	Ballroom A
Exhibitor Tear Down	5–7 p.m.	Ballroom A
WEDNESDAY, 6 MAY		
F4. Dinosaur National Monument and Other Mesozoic sites of Northeastern Utah (Field Trip)	7 a.m.	Northwest side of Convention Center
F6. Geology of Bryce Canyon and Zion National Parks (Field Trip)	7 a.m.	Northwest side of Convention Center
F7. The Gigantic Markagunt and Sevier Gravity Slides Resulting from Mid-Cenozoic Catastrophic Mega-Scale Failure of the Marysvale (Field Trip)	7:30 a.m.–5 p.m.	Northwest side of Convention Center
F5. The Integrated Ten-Million-Year History of the Little Cottonwood–Alta Stock System from Pluton to Aureole (Field Trip)	7:30 a.m.–6 p.m.	Northwest side of Convention Center
SC1. Introduction to High Resolution Topography (Lidar and Structure from Motion) (Short Course)	9 a.m.–5 p.m.	Utah Valley University, Room SB 175
THURSDAY, 7 MAY		
SC2. Introduction to Acquisition and Manipulation of High Resolution Topography Point Clouds (Short Course)	9 a.m.–5 p.m.	Utah Valley University, Room SB 175

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.

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

NOTE INDEX SYSTEM

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

*denotes speaker

MONDAY, 4 MAY 2020

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 1

D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond

8:15 AM, Utah Valley Convention Center, Cascades E

James I. Kirkland, Landon Burgener and Brooke L. Long, Presiding

8:15 AM **INTRODUCTORY REMARKS**

1-1 8:20 AM Sanchez, Mary L.*; Butler, Jaimi K.; Martin, Cayla; Kimberly, David: **WHAT IN TARNATION? MONITORING ANIMAL ENTRAPMENTS AND PRESERVATIONS AT THE ROZEL TAR SEEPS**

1-2 8:40 AM Keenan, Sarah W.*; DeBruyn, Jennifer M.: **SURFACE AND SUBSURFACE VERTEBRATE DECOMPOSITION RESULT IN PROTRACTED SOIL NITROGEN STABLE ISOTOPIC ENRICHMENT**

1-3 9:00 AM Burgener, Landon*; Gates, Terry A.; Hyland, Ethan G.; Mitasova, Helena; Zanno, Lindsay: **CLIMATIC AND ENVIRONMENTAL DRIVERS OF LATE CRETACEOUS VERTEBRATE ENDEMISM**

1-4 9:20 AM Meyer, Herbert W.*: **MULTIMEDIA APPROACHES FOR USING PALEONTOLOGY TO ENGAGE PUBLIC APPRECIATION OF GEOHERITAGE AND RESOURCE PRESERVATION AT FLORISSANT FOSSIL BEDS NATIONAL MONUMENT**

1-5 9:40 AM Hunt-Foster, ReBecca*; Breithaupt, Brent; Matthews, Neffra A.; Schumacher, Bruce A.: **PUBLIC PALEONTOLOGICAL TRACKSITES OF EASTERN UTAH**

10:00 AM **BREAK**

1-6 10:15 AM Breithaupt, Brent*; Matthews, Neffra A.; Hunt-Foster, ReBecca; McDonald, H. Gregory; Lockley, Martin: **A "PALEOCAMP" IN AN EARLY JURASSIC SAND SEA: OPPORTUNITIES FOR YOUNG CITIZEN SCIENTISTS TO PRESERVE AND PROTECT AND ANCIENT TRACKSITE**

1-7 10:35 AM Matthews, Neffra A.*; Breithaupt, Brent: **CHECKING IN AT THE BLM MOCCASIN MOUNTAIN TRACKSITE, UTAH: TEN YEARS OF SCIENCE AND PUBLIC INVOLVEMENT**

1-8 10:55 AM Kirkland, James I.*; Hunt-Foster, ReBecca; DeBlieux, Donald D.; Hayden, Martha: **FOSSILS IN THEIR NATURAL HABITAT: INTERPRETING PALEONTOLOGY SITES IN UTAH**

SESSION NO. 2

T2. Geohazards of the Rocky Mountain West and Beyond

8:15 AM, Utah Valley Convention Center, Cascades C

Emily Kleber and Zachery M. Lifton, Presiding

8:15 AM **INTRODUCTORY REMARKS**

2-1 8:20 AM Giraud, Richard E.*; Erickson, Ben; Hiscock, Adam I.: **THE AUGUST 8, 2019, DEBRIS FLOWS IN LITTLE COTTONWOOD CANYON AND DAMAGE TO STATE ROUTE 210, SALT LAKE COUNTY, UTAH**

2-2 8:40 AM Meyer, Eric*; Harris, Ron: **DISCOVERY OF THE BIG BALDY LANDSLIDE NEAR URBAN AREAS ALONG THE CENTRAL WASATCH RANGE, UTAH**

2-3 9:00 AM Morriss, Matthew C.*; Giraud, Richard E.; McDonald, Greg N.: **SURFACE ROUGHNESS-BASED SEMI-AUTOMATED LANDSLIDE MAPPING IN WEBER COUNTY, UTAH**

2-4 9:20 AM Reed, Tomsen*; Rittenour, Tammy; Bradbury, Kelly K.: **HAZARD ANALYSIS OF A SEGMENT OF HIGHWAY SR-12 THROUGH BRYCE CANYON NATIONAL PARK**

2-5 9:40 AM Finnegan, Riley*; Moore, Jeffrey R.; Geimer, Paul R.: **VIBRATION OF ROCK ARCHES AND TOWERS STIMULATED BY ANTHROPOGENIC TRANSIT ACTIVITY**

10:00 AM **BREAK**

2-6 10:15 AM Hiscock, Adam I.*; Kleber, Emily J.; McDonald, Greg N.; McKean, Adam P.; Anderson, Zachary W.; Bowman, Steve D.; Bennett, Scott: **MAPPING AND CHARACTERIZING ACTIVE FAULTS IN UTAH**

2-7 10:35 AM Bunds, Michael P.*; Toke, Nathan A.; Fletcher, Andrew; Andreini, Jeremy; Larsen, Kenneth L.: **LATE QUATERNARY**

ACTIVITY AND SEGMENTATION ON THE NORTHERN OQUIRRH FAULT AND ISOSTATIC REBOUND GRADIENTS IN THE TOOELE VALLEY FROM PLEISTOCENE LAKE BONNEVILLE SHORELINE ELEVATIONS, UTAH, USA

2-8 10:55 AM McDonald, Greg N.*; Hiscock, Adam I.; Hylland, Michael D.: **PALEOSEISMIC INVESTIGATION OF THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE, UTAH**

2-9 11:15 AM Toke, Nathan A.*; Marchetti, David W.; Bailey, Christopher M.; Biek, Robert F.; Bartram, Hanna C.; Phillips, Joseph E.; Forster, Clayton; Ward, Sally; Richards, Rachel; Ideker, Carlie J.; Rittenour, Tammy: **THE THOUSAND LAKE FAULT: A LONG RECURRENCE NORMAL FAULT THAT HAS SLOWED DOWN AT THE EASTERN EDGE OF THE BASIN AND RANGE**

2-10 11:35 AM Ashcraft, Claire E.*; Harris, Ron A.; Rey, Kevin A.; Fretha, Julian; Sulaeman, Hanif; Prasetyadi, Carolus; Pradipta, Giovanni C.; Hanifa, N. Rahma; Bell, Ian R.; Westfall, Ethan J.; Mangum, Abby L.; Willmore, Rachel; Berrett, Bryce E.: **FIELD INVESTIGATIONS, NUMERICAL MODELING AND BAYESIAN ANALYSIS OF EARTHQUAKE, TSUNAMI AND LANDSLIDE RISK IN EASTERN INDONESIA**

POSTER TECHNICAL SESSIONS

SESSION NO. 3

D1. Paleontology: Education, Preservation, and Research in the Rocky Mountain Region and Beyond (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

3-1 1 Schmeisser McKean, Rebecca L.*; Gillette, David D.: **TAPHONOMY OF A WELL-PRESERVED PARTIAL PLESIOSAUR SKELETON FROM THE TROPIC SHALE (EARLY TURONIAN) IN GLEN CANYON NATIONAL RECREATION AREA, SOUTHERN UTAH**

3-2 2 Slagle, Mariah P.*; Goldsmith, David W.: **MICROFOSSILS FROM THE CARBONIFEROUS OCHRE MOUNTAIN LIMESTONE, LAKESIDE MOUNTAINS, UTAH**

3-3 3 Lockley, Martin*; Breithaupt, Brent H.; Matthews, Neffra A.; Shibata, Kenichiro; Hunt-Foster, ReBecca; McDonald, H. Gregory: **A LOWER JURASSIC EUBRONTES-DOMINATED TRACKSITE IN THE NAVAJO FORMATION,EASTERN UTAH: PROPOSED PROTOCOLS FOR UNRAVELLING TRACKSITE HISTORY**

SESSION NO. 4

T2. Geohazards of the Rocky Mountain West and Beyond (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

4-1 4 Grasso, Kyla*; Thackray, Glenn D.: **INFLUENCES OF TECTONIC AND GEOMORPHIC PROCESSES ON FAULT SCARP HEIGHT VARIABILITY IN AN EXTENSIONAL TECTONIC TERRANE, TETON FAULT, WYOMING**

4-2 5 Howe, Julia C.*; Piety, Lucille A.: **NEW INSIGHTS INTO QUATERNARY ACTIVITY ON THE DEADWOOD FAULT FROM LIDAR AND GEOMORPHIC MAPPING, WEST-CENTRAL IDAHO**

4-3 6 Yakovlev, Petr V.; Stickney, Mike; Weldon, Ray; Elliott, Colleen*; Stanton, Kelsay: **PALEOSEISMIC INVESTIGATION OF AN ACTIVE FAULT NEAR BUTTE, MT**

4-4 7 Richards, Rachel*; Tolman, Alex; Whitney, Brigham; Ward, Sally; Rittenour, Tammy; Ideker, Carlie J.; Bunds, Michael P.; Toke, Nathan A.: **EARTHQUAKE HISTORY OF THE TOPLIFF HILLS FAULT: EVIDENCE OF SIX EVENTS SINCE 69.3 KA**

4-5 8 Riemann, Rebekah A.*; Evans, James P.; Janecke, Susanne U.; Donnellan, Andrea; Parker, Jay: **USING CREEP RELATED FEATURES AND GEODETIC ANALYSES TO DEFINE THE LOCATION, SLIP RATE, AND GEOMETRY OF OFF FAULT DEFORMATION, HIDDEN SPRING FAULT ZONE, SOUTHERN CALIFORNIA**

4-6 9 Jänecke, Susanne U.*; Ellis, Nathan M.; Oaks, Robert Q.; Lee, Carly M.; Evans, James P.: **CONFIRMED: WEST CACHE FAULT ZONE WAS FAR MORE ACTIVE THAN EAST CACHE FAULT ZONE SINCE BONNEVILLE PLUVIAL**

4-7 10 Lee, Carly M.*; Jänecke, Susanne U.; Oaks, Robert Q.: **EARTHQUAKES AND DEEP-SEATED LANDSLIDES ASSOCIATED WITH THE BONNEVILLE FLOOD NEAR ITS OUTLET IN NORTHERN CACHE VALLEY, IDAHO: FIRST RESULTS**

4-8 11 Taggart, Ryan*; Weed, Natalie; Wetterlin, Lily; Johnson, Christopher: **LANDSLIDE IDENTIFICATION USING LIDAR, CACHE COUNTY, UTAH**

4-9 12 Fairchild, Megan E.*; Dodson, Marcus K.; Rivera, Tiffany A.; Amburgey, Jonathan: **EXPLORING THE USE OF AN EXPERIENTIAL SEISMOMETER DISPLAY TO IMPROVE EARTHQUAKE PREPAREDNESS**

4-10 13 Paulding, Anna A.*; Bradbury, Kelly K.; Smith, Kayla D.; Kehoe, Kenneth W.; Lonero, Andrew: **COMPARISON OF PORTABLE FIELD XRF (PXRF) AND LABORATORY XRF MEASUREMENTS ALONG A FAULTED NONCONFORMITY INTERFACE**

4-11 14 Smith, Kayla D.*; Bradbury, Kelly K.; Paulding, Anna A.; Petrie, Elizabeth; Evans, James P.: **GEOLOGIC CHARACTERIZATION OF A DRILLCORE ANALOG FOR AREAS WITH INJECTION-INDUCED SEISMICITY**

4-12 15 Loffer, Zachary J.*; Hacker, David B.; Malone, David H.; Biek, Robert F.; Rowley, Peter D.: **ZIRCON GEOCHRONOLOGY OF THE BASAL LAYER OF THE SEVIER GRAVITY SLIDE, MARYSVALE VOLCANIC FIELD, UTAH, USA**

4-13 16 Chacon, Cameron*; Winsor, Kelsey: **GEOHAZARD ASSESSMENT OF A POTENTIAL RIM COLLAPSE AT DEVILS KITCHEN: RISK TO VISITORS AT AN ACTIVE SINKHOLE NEAR SEDONA, NORTHERN ARIZONA**

4-14 17 Angeles, Hugo*: **REDEFINITION OF THE UNCONFORMITY BETWEEN THE MOENKOPI FORMATION AND THE CHINLE FORMATION IN SOUTHERN UTAH FOR GEOLOGICAL ENGINEERING PURPOSES**

4-15 18 Whitney, Brigham*; Bunds, Michael; Forsythe, Dillon; Campbell, David: **DETECTION OF EARTHFLOW CREEP FROM TOPOGRAPHIC DIFFERENCING OF AIRBORNE LIDAR AND SUAS – DERIVED HIGH RESOLUTION TOPOGRAPHY, SHURTZ LAKE, UTAH, USA**

SESSION NO. 5

T16. Effective and Innovative Teaching and Curricula in the College Geoscience Classroom (Posters) (GSA Geoscience Education Division)

8:30 AM, Utah Valley Convention Center, Ballroom A

Authors will be present from 9:30 to 11:30 AM

Booth #

5-1 19 Tewksbury, Barbara J.; Resor, Phillip G.; Fusseis, Florian; Wenner, Jennifer M.; Murray, Kendra E.*; Blisniuk, Kimberly; Condit, Cailey B.; Egger, Anne E.; Fredrick, Kyle C.; Kirkpatrick, James; Mana, Sara; Pratt-Sitaula, Beth; Regalla, Christine; Tewksbury-Christle, Carolyn: **ON-RAMPS TO MORE EFFECTIVE TEACHING: QUICK-START GUIDES TO STRATEGIES FOR ACTIVELY ENGAGING STUDENTS IN THE CLASSROOM TO IMPROVE LEARNING**

5-2 20 Collins, Larry*; Premo, Joshua; Cavagnetto, Andy: **PERFORMANCE-BASED ASSESSMENTS: TOOLS FOR SUPPORTING GEOLOGICAL LITERACY**

5-3 21 Premo, Joshua*; Collins, Larry: **OPTIMIZING STUDENT-STUDENT SCIENCE DISCOURSE: HOW SHOULD STUDENTS BE INTERACTING IN MY CLASSROOM?**

SESSION NO. 6

T17. Undergraduate Research I (Posters) (GSA Geoscience Education Division)

8:30 AM, Utah Valley Convention Center, Ballroom A

Authors will be present from 9:30 to 11:30 AM

Booth #

6-1 22 Barrier, Jackson Kimber*; Runyon, Simone E.; Chapman, James B.; Stein, H.J.; Brown, Timothy R.: **RATTLESNAKE HILLS ALKALINE PORPHYRY AU OF CENTRAL WYOMING: EVOLUTION OF AN IGNEOUS COMPLEX AND MINERALIZATION**

6-2 23 Brodeur, Nicholas D.*; Gonzales, David A.: **INSIGHT INTO CONTROLS ON THE CRYSTALLIZATION HISTORY OF GABBROIC DIKES IN THE BAKERS BRIDGE GRANITE, SOUTHWESTERN COLORADO**

6-3 24 Weigel, Peyton*; Gonzales, David A.: **AGE AND PETROLOGY OF IGNEOUS CLASTS IN THE CUTLER FORMATION NEAR OURAY, COLORADO: NEW EVIDENCE FOR MESOPROTEROZOIC VOLCANISM IN SOUTHWESTERN COLORADO**

6-4 25 Velasquez, Jason A.*; Holland, Mark E.; Regan, Sean P.: **STRUCTURAL ANALYSIS OF THE MOORE GULCH SHEAR ZONE: TESTING ALTERNATIVE MODELS OF THE PROTEROZOIC EVOLUTION OF CENTRAL ARIZONA**

6-5 26 Smith, Jackson*; Anderson, Chantelle; Smout, Brooklyn; Arcaris, Kylie; Williams, Elizabeth; Balgord, Elizabeth; Yonkee, Adolph: **GEOLOGIC MAPPING, GEOCHEMISTRY, AND GEOCHRONOLOGY OF THE SILVER ISLAND MOUNTAINS OF WESTERN UTAH**

6-6 27 Kobe, Skadi*; Jensen, Austin; Berniche, Alexander; Potter, Katherine E.; Yonkee, Adolph; Balgord, Elizabeth: **THE ORIGIN AND CHEMICAL EVOLUTION OF PRECAMBRIAN BASEMENT UNITS IN NORTHERN UTAH AND SOUTHERN IDAHO**

6-7 28 Cruz, Olivia M.*; Krantz, Robert W.; Hannula, Kimberly A.; Gianniny, Gary L.: **WHAT LIES BENEATH: THE STORY OF THE FAULTS AND FRACTURES OF THE HOGBACK MONOCLINE**

6-8 29 Schaeffer, Elizabeth M.*; Huskey, Miles; EchoHawk, Barbara; Kackstaetter, Uwe: **STRATIGRAPHIC SEQUENCE OF PALEOCENE DACITE INTRUSIONS AND THE FOUNTAIN ARKOSE WITHIN THE AGGREGATE QUARRY SOUTHWEST OF LYONS, COLORADO**

6-9 30 Baird, Payton Grey*; Gianniny, Gary L.: **HYPERSALINITY AND STROMATOLITIC BIOHERM GROWTH IN THE DEVONIAN ELBERT FORMATION OF THE SOUTHERN SAN JUAN MOUNTAINS, COLORADO**

6-10 31 Howard, Chelsi K.*; Pritchard, Chad J.: **EXPERIMENTAL SYNTHESIS OF SOFT-SEDIMENTARY FEATURES AND CLASTIC DIKES**

6-11 32 Navarra, Alexander M.*; Howard, Chelsi K.; Andersen, Allen K.: **PETROLOGY OF CARBONATE-RICH SILICATE ROCKS OF THE BEAR LODGE ALKALINE COMPLEX AND ORIGIN OF CARBONATE MINERALIZATION**

6-12 33 Owen, Logan A.*; Gonzales, David A.: **THE ENVIRONMENTAL IMPACTS OF MINING IN THE EAST MANCOS RIVER BASIN AS REVEALED BY DENDROCHEMICAL SIGNATURES FROM TREE-RING ANALYSES**

6-13 34 Johnson, Ryan K.*; Gonzales, David A.: **EXPLORING THE TIMING AND ORIGIN OF THE MINERALIZED BRECCIA SYSTEM IN SILVER GULCH, SOUTHWESTERN COLORADO**

6-14 35 Couldridge, Adam*; Runyon, Simone E.: **SYBILLE PIT FE-TI OXIDE BODY, LARAMIE ANORTHOSITE COMPLEX: MINERAL ASSEMBLAGES AND COMPOSITIONS**

6-15 36 Ketring, Alan M.*; Keith, Jeffrey D.; Christiansen, Eric H.; Kowallis, Bart J.; Martin, Alec J.; Jensen, Collin G.; Henze, Porter; Chadburn, Ryan; Webb, Haley D.M.: **TITANITE IN PEBBLE DIKES IN THE EAST TRAVERSE MOUNTAINS, CENTRAL UTAH, AND ITS IMPLICATIONS FOR THE FORMATION OF MO-W DEPOSITS**

SESSION NO. 7

T17. Undergraduate Research II (Posters) (GSA Geoscience Education Division)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

7-1 37 Mayback, Danika F.*; D'Emic, Michael D.; Hoffmann, Simone: **USING CEMENTUM HISTOLOGY TO ESTIMATE AGE IN *CORYPHODON***

7-2 38 Willson, Mary Blakely*; Matzen, Benjamin Lyle: **INITIAL DESCRIPTION AND IDENTIFICATION OF LARGEST KNOWN LONGNOSE GAR, *LEPISOSTEUS BEMISI*, FROM THE GREEN RIVER FORMATION OF WYOMING, U.S.A**

7-3 39 Sageman, Isaac*; D'Emic, Michael D.; Hoffmann, Simone; Foreman, Brady Z.; Randall, Emily; Hurtgen, Matthew T.: **CLIMATIC AND PALEOENVIRONMENTAL CHANGES ASSOCIATED WITH THE EVOLUTION OF THE FIRST MAMMALIAN MEGAHERBIVORE *CORYPHODON* DURING PALEOGENE HYPERTHERMAL EVENTS, BIGHORN BASIN, WYOMING**

7-4 40 Landau, Lydia*; Levine, Rebekah; Dyreson, Eric: **IMPACTS OF MESIC RESTORATION STRUCTURES ON SOIL MOISTURE IN A HIGH-ELEVATION SAGEBRUSH STEPPE TRIBUTARY IN SOUTHWEST MONTANA, USA**

7-5 41 Bowers, Grant Walter*; Hoffmann, Simone; D'Emic, Michael D.: **LONG BONE HISTOLOGY OF THE LARGE PALEOGENE MAMMAL *CORYPHODON***

7-6 42 Forster, Clayton*; Bylund, Kevin G.; Axelsen, Lana; Perdue, Nathan; DeNittis, Alyson; Stearns, Michael A.; Zanazzi, Alessandro; Stephen, Daniel A.: **UPPER CRETACEOUS AMMONITE BIOSTRATIGRAPHY AND PALEOCEANOGRAPHY OF THE MANCOS SHALE IN THE SAN RAFAEL SWELL, EAST-CENTRAL UTAH**

7-7 43 Randall, Emily N.*; D'Emic, Michael D.; Foreman, Brady Z.; Hoffmann, Simone; Sageman, Isaac; Wilson, Mark A.: **PALEOENVIRONMENTS CONTAINING *CORYPHODON* IN THE FORT UNION AND WILLWOOD FORMATIONS SPANNING THE PALEOCENE-EOCENE THERMAL MAXIMUM (PETM), BIGHORN BASIN, WYOMING**

7-8 44 Gonzalez, Richard*; D'Emic, Michael D.; Hoffmann, Simone; Adams, Thomas L.; Foreman, Brady Z.: **ESTIMATING THE MASS OF THE LARGE PALEOGENE MAMMAL *CORYPHODON* THROUGH PALEOGENE HYPERTHERMAL EVENTS**

7-9 45 Wiebe, Olivia Pat-Nano*; MacKenzie, Lindsay Ann: **TAPHONOMY EXPERIMENTS AIMED AT CLARIFYING THE PROCESS OF PYRITIZATION IN PLANTS**

7-10 46 Huntsman, Stepfan Von*; Balgord, Elizabeth: **UNDERSTANDING THE PALEOECOLOGY OF THE CENTRAL VARISCAN MOUNTAINS OF SOUTHERN FRANCE USING PALEOBOTANICAL DATA**

7-11 47 Ducken, Ethan J.*; Pritchard, Chad J.: **ASSESSING LANDSLIDES WITH SUAV'S**

7-12 48 Lingbloom, Joshua*; Harvey, Jonathan E.; Gillam, Mary L.: **GEOCHRONOLOGICAL CONSTRAINTS ON THE PERINS PEAK LANDSLIDE COMPLEX NEAR DURANGO, COLORADO**

7-13 49 Nova, Lisa*: **WHY PEOPLE LIVE IN HIGH RISK VOLCANIC REGIONS**

7-14 50 Weinstein, Paul*; Marsellos, Antonios E.; Tsakiri, Katerina: **SEASONAL VARIATIONS OF THE GPS SITES OF WHAKAARI VOLCANO, NEW ZEALAND**

7-15 51 Tarmichael, Megan Lee*; Levine, Rebekah: **INVESTIGATIONS OF LATERAL CHANNEL MIGRATION ON BEAVER DOMINATED STREAMS IN SOUTHWESTERN MONTANA, USA**

7-16 52 Hinzmann, Alice*; Foky, Trent; Iosso, Chantal; Phinney, April I.; Van Wetter, Eliza; Persico, Lyman P.: **THE EFFECTS OF FLOOD EVENTS ON FLOODPLAIN AND CHANNEL FORM ON THE GALLATIN RIVER IN NORTHWESTERN YELLOWSTONE**

7-17 53 Thomson, Alexander*; Harvey, Jonathan E.; Gillam, Mary L.: **NEW CONSTRAINTS ON THE LATE PLEISTOCENE INCISION HISTORY OF THE ANIMAS RIVER, SOUTHWEST COLORADO**

7-18 54 Phinney, April I.*; Foky, Trent; Hinzmann, Alice; Iosso, Chantal; Van Wetter, Eliza; Persico, Lyman P.: **UNDERSTANDING YELLOWSTONE STREAM MORPHOLOGY AND DYNAMICS THROUGH FLOODPLAIN INUNDATION MODELING**

7-19 55 Van Wetter, Eliza*; Foky, Trent; Hinzmann, Alice; Iosso, Chantal; Phinney, April I.; Persico, Lyman P.: **EVERY PEBBLE COUNTS: A RECONSTRUCTION OF THE FLUVIAL HISTORY OF BLACKTAIL DEER CREEK**

7-20 56 Foky, Trent*; Hinzmann, Alice; Iosso, Chantal; Van Wetter, Eliza; Persico, Lyman P.: **UNRAVELING THE GEOMORPHIC HISTORY OF BLACKTAIL DEER CREEK**

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 8

D2. Geology of the San Rafael Swell and Other Areas of Stratigraphic Significance in the Rocky Mountain Region

1:25 PM, Utah Valley Convention Center, Cascades C

Thomas C. Chidsey Jr., Presiding

1:25 PM **INTRODUCTORY REMARKS**

8-1 1:30 PM Chidsey, Thomas C.*: **GEOLOGY OF THE SAN RAFAEL SWELL, EAST-CENTRAL UTAH**

8-2 1:50 PM Chan, Marjorie A.*; Wheatley, David F.; Steele, Peter A.: **EOLIAN RESERVOIR TARGETS FOR CARBON CAPTURE AND SEQUESTRATION, CENTRAL UTAH**

8-3 2:10 PM Zuchuat, Valentin*; Midtkandal, Ivar; Poyatos-Moré, Miquel; Da Costa, Sigrid; Brooks, Hannah L.; Halvorsen, Kristine; Sundal, Anja; Cote, Nathan; Braathen, Alvar: **BREXIT, MEGXIT, AND THE J-3 UNCONFORMITEXIT: HOW THEY ALL LOST IT**

8-4 2:30 PM Zuchuat, Valentin*; Sleveland, Arve R.N.; Sprinkel, Douglas A.; Pettigrew, Ross P.; Dodd, Thomas J.H.; Clarke, Stuart M.; Braathen, Alvar; Midtkandal, Ivar: **WHEN UTAH WAS A BLUE STATE: THE SEDIMENTOLOGY AND DEPOSITIONAL HISTORY OF THE TIDALLY-INFLUENCED UPPER JURASSIC CURTIS FORMATION**

2:50 PM **BREAK**

8-5 3:05 PM Cross, Sarah*; Clarke, Stuart; Pettigrew, Ross; Zuchuat, Valentin: **THE RELEVANT DOMINANCE OF ALLO-CONTROLS AND LOCAL-SCALE SEDIMENTARY PROCESSES UPON PRESERVED SUCCESSIONS OF ARID CONTINENTAL MARGINS: IMPLICATIONS FOR RESERVOIR CHARACTERIZATION**

8-6 3:25 PM Kirkland, James I.*; Suarez, Celina A.; Suarez, Marina B.; Willis, Grant C.; DeBlieux, Donald D.: **SYNDEPOSITIONAL TECTONICS DURING THE LATE JURASSIC TO BEGINNING OF LATE CRETACEOUS ALONG THE SAN RAFAEL SWELL, UTAH: NOT JUST A LARAMIDE STRUCTURE**

8-7 3:45 PM Judge, Shelley*; Sheban, Mara; Millan, Cristina; Crawford, Alex D.; Maletic, Erica Lynn: **ENVIRONMENTAL AND MORPHOLOGIC DIVERSITY OF FLUVIAL AND LACUSTRINE ONCOIDS FROM TWO LOCALITIES IN THE FLAGSTAFF FORMATION (SAN PITCH MOUNTAINS, CENTRAL UTAH)**

8-8 4:05 PM Link, Paul K.*; Brennan, Daniel T.; Pearson, David M.; Milton, Jacob; Gates, Ryan: **GEOLOGIC MAPPING OF NEOPROTEROZOIC TO ORDOVICIAN STRATA IN THE LOST RIVER AND LEMHI RANGES AND SALMON RIVER MOUNTAINS, CENTRAL IDAHO**

SESSION NO. 9

T8. Mining in the Rocky Mountain Region and Beyond: Risks and Opportunities

1:25 PM, Utah Valley Convention Center, Cascades E

Steven H. Emerman, Presiding

1:25 PM **INTRODUCTORY REMARKS**

9-1 1:30 PM Mills, Stephanie E.*; Redfern, Richard R.: **MAGMATISM DURING FLAT SLAB SUBDUCTION – METALLOGENIC IMPLICATIONS FOR UTAH'S GREAT BASIN**

9-2 1:50 PM Martin, Alec J.*; Keith, Jeffrey D.; Christiansen, Eric H.; Kowallis, Bart J.; Jensen, Collin G.; Henze, Porter; Ketring, Alan M.; De Crescenzo, Levi J.; Webb, Haley D.M.; Chadburn, Ryan: **USING TITANITE COMPOSITIONS TO IDENTIFY INTRUSIVE PHASES AND MO-W MINERALIZATION PATTERNS IN THE OLIGOCENE LITTLE COTTONWOOD STOCK, UTAH**

9-3 2:10 PM Emerman, Steven H.*: **CASE STUDIES OF SAFETY AUDITS OF MINING DAMS WITH NON-COOPERATING DAM OWNERS**

9-4 2:30 PM Abate, April*: **REGULATING THE UTAH HARDROCK MINING INDUSTRY - RESOURCE AND RECLAMATION MANAGEMENT IN A CHALLENGING REGULATORY FRAMEWORKUTAH DIVISION OF OIL, GAS AND MINING**

2:50 PM **BREAK**

9-5 3:05 PM Emerman, Steven H.*: **A MODEL FOR COAL PRODUCTION BY PRISONERS IN NORTH KOREA**

9-6 3:25 PM Senguler, Ilker*: **GEOLOGICAL PROPERTIES OF THE SAN JUAN COAL FIELD (CERREJON FORMATION, GUAJIRA, COLOMBIA)**

TUESDAY, 5 MAY 2020

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 10

T12. Advances and Applications of River Science in the West (GSA Quaternary Geology and Geomorphology Division)

8:15 AM, Utah Valley Convention Center, Cascades E

Sharon Bywater-Reyes and Alan Kasprak, Presiding

8:15 AM **INTRODUCTORY REMARKS**

10-1 8:20 AM Hynek, Scott A.*; Rowland, Ryan C.; Fernandez, Diego P.: **TRACKING SALINITY SOURCES IN THE UPPER COLORADO RIVER BASIN: STREAMS CROSSING MESOZOIC MARINE STRATA OF THE SAN RAFAEL SWELL, UTAH**

10-2 8:40 AM Brown, Haylie*; Bywater-Reyes, Sharon; Franklin, Scott: **EVALUATING RESTORATION SUCCESS FOR THE LITTLE THOMPSON RIVER (CO) THROUGH A FUNCTIONAL TRAITS FRAMEWORK**

10-3 9:00 AM Moody, John*: **SPECTRUM OF BANK EROSION ALONG POWDER RIVER**

10-4 9:20 AM Mueller, Erich R.*; Grams, Paul E.: **USING A SIMPLE PHYSICAL MODEL TO EVALUATE SANDBAR DYNAMICS IN GRAND CANYON**

10-5 9:40 AM Root, Jonathan Casey*; Hynek, Scott A.: **RECENT DEVELOPMENTS AND A REVIEW OF SEDIMENTATION MONITORING IN LAKE POWELL**

SESSION NO. 11

T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes

8:15 AM, Utah Valley Convention Center, Cascades C

Adam P. McKean and Michael Vanden Berg, Presiding

8:15 AM **INTRODUCTORY REMARKS**

11-1 8:20 AM Oaks, Robert Q.*; Janecke, Susanne U.; Rittenour, Tammy; Erickson, Thad L.; Nelson, Michelle S.: **PRE-BONNEVILLE LAKES IN CACHE VALLEY AND EXCAVATION OF CUTLER NARROWS ACROSS THE CACHE BUTTE DIVIDE IN THE WEST, NORTH-CENTRAL UTAH AND SOUTHEASTERN IDAHO**

11-2 8:40 AM Atwood, Genevieve*: **BONNEVILLE BASIN ENIGMA, TECTONIC DROP OF LAKEBED CAN RESULT IN RAISED SHORELINE EVIDENCE**

11-3 9:00 AM Kirby, Stefan; Inkenbrandt, Paul C.*; Payne, Nathan: **MAPPING GROUNDWATER CONDITIONS AROUND GREAT SALT LAKE**

11-4 9:20 AM Perry, Kevin D.*: **IDENTIFICATION OF DUST SOURCE "HOT SPOTS" ON THE EXPOSED PLAYA OF THE GREAT SALT LAKE, USA**

11-5 9:40 AM Jagniecki, Elliot A.; Vanden Berg, Michael D.*; Thompson, Allison: **ORIGIN, CHEMISTRY, AND GEOMICROBIOLOGY OF TERRACED, CRYSTALLINE MIRABILITE MOUNDS ON THE SOUTHEASTERN SHORE OF GREAT SALT LAKE, UTAH**

10:00 AM **BREAK**

11-6 10:15 AM Frantz, Carie M.*; Ingalls, Miquela; Trower, Elizabeth J.; Snell, Kathryn E.: **THOSE PESKY MICROBES: BIOTIC INFLUENCE ON GEOCHEMICAL HETEROGENEITY IN THE MODERN GREAT SALT LAKE CARBONATE RECORD**

11-7 10:35 AM Newell, Dennis L.*; Vanden Berg, Michael D.; Fernandez, Diego P.; Frantz, Carie M.; Jensen, Jordan Leo: **RADIOCARBON AND U-TH DOUBLE-DATING AND ISOTOPE GEOCHEMISTRY OF GREAT SALT LAKE MICROBIALITES: IMPLICATIONS FOR THE ^{14}C RESERVOIR AND PALEOLAKE BIOGEOCHEMICAL EVOLUTION**

11-8 10:55 AM Bernau, Jeremiah A.*; Bowen, Brenda B.; Radwin, Mark H.: **TECTONIC AND CLIMATIC CONTROLS ON DESERT SEDIMENTATION AND SALINE PAN STABILITY: INSIGHTS FROM THE GREAT SALT LAKE DESERT AND BONNEVILLE SALT FLATS**

POSTER TECHNICAL SESSIONS

SESSION NO. 12

T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

Authors will be present from 9:30 to 11:30 AM

Booth #

12-1 1 Hamilton, Sarah*; Lambart, Sarah: **CHEMICAL VARIABILITY AND CHARACTERIZATION OF SAN CARLOS OLIVINE FOR GEOCHEMICAL CALIBRATIONS AND EXPERIMENTAL STUDIES**

12-2 2 Odlum, Margaret*; Ault, Alexis K.; Calzolari, Gabriele; Channer, Michael A.: **MULTI-METHOD THERMOCHRONOMETRIC RECORD OF EXHUMATION AND FAULT SLIP IN THE CENTRAL RIO GRANDE RIFT, SANDIA MOUNTAINS**

12-3 3 Wetzel, Kelsey F.*; Stanley, Jessica R.: **CONSTRAINTS ON RIFT-RELATED EXHUMATION IN THE FLANKS OF THE WESTERN SNAKE RIVER PLAIN, IDAHO, FROM APATITE (U-TH)/HE THERMOCHRONOMETRY**

12-4 4 Murray, Kendra E.*; Niemi, Nathan A.; Clark, Marin K.: **THERMOCHRONOLOGY LINKS GROWTH OF THE ROCKY MOUNTAIN FRONT RANGE TO INVERSION OF A NEOPROTEROZOIC RIFT SYSTEM**

12-5 5 Rascoe, Sean*; Gray, K.: **ROTATIONAL TECTONICS OF THE OREGON–IDAHO–MONTANA CORDILLERA**

12-6 6 Park, Rhys*; Sample, James C.; Ort, Michael H.; Regalla, Christine; Umhoefer, Paul J.: **UNDERSTANDING TECTONIC STRAIN AND SYN-TECTONIC FLUID FLOW PROCESSES USING MAGNETIC FABRICS IN DIAMAGNETIC ROCKS: EXAMPLE FROM THE EAST KAIBAB MONOCLINE, SOUTHERN UTAH**

12-7 7 Hilderman, Robin X.*; Gilmer, Amy K.; Souders, Kate; Noblett, Jeffrey B.: **EVOLUTION OF THE MAGMATIC SYSTEM BENEATH THE SAN JUAN MOUNTAINS: COMPARING THE LAVA FLOWS OF THE CONEJOS AND HINSDALE FORMATIONS**

12-8 8 Gilmer, Amy K.*; Thompson, Ren A.: **VOLUMINOUS POSTCALDERA ANDESITIC VOLCANISM ASSOCIATED WITH THE PLATORO CALDERA, SAN JUAN VOLCANIC LOCUS, COLORADO**

12-9 9 Lambert, Kimberly A.*; Campbell, Jessica; Krol, Michael A.: **GEOCHEMICAL STUDY OF THE TIMBER HILL BASALT AND ADJACENT BASALT PLUGS WITHIN THE BLACKTAIL AND RUBY MOUNTAINS, SOUTHWEST MONTANA**

12-10 10 Warhurst, Adym*; Kaiser, Jason F.: **CONSTRAINING THE COLORADO PLATEAU CRUSTAL THICKNESS USING SR/Y AND LA/YB RATIOS TO SHOW CHANGES IN PEAK SUBDUCTION-RELATED VOLCANISM FROM THE OLIGOCENE TO THE HOLOCENE**

12-11 11 Stevens, Peter*; Sample, James: **CONSTRAINING THE ORIGIN AND EVOLUTION OF FLUIDS ON THE EAST KAIBAB MONOCLINE USING THE ISOTOPE GEOCHEMISTRY OF CARBONATES**

SESSION NO. 13

T7. Geologic Maps and GIS—The Foundation of Research and Exploration (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

Authors will be present from 9:30 to 11:30 AM

Booth #

13-1 12 Milton, Jacob*; Link, Paul: **GEOLOGIC MAPPING AND STRATIGRAPHIC CORRELATION OF NEOPROTEROZOIC TO LOWER ORDOVICIAN STRATA, CENTRAL LOST RIVER AND SOUTHERN LEMHI RANGES, EAST-CENTRAL IDAHO**

13-2 13 McKean, Adam P.*; Anderson, Zachary W.: **NEW GEOLOGIC MAPPING OF THE SALT LAKE VALLEY**

13-3 14 Anderson, Zachary W.*: **NEW GEOLOGIC MAPPING OF THE BOUNTIFUL PEAK 7.5' QUADRANGLE, DAVIS AND MORGAN COUNTIES, UTAH**

13-4 15 Clark, Donald L.*; Constenius, Kurt N.: **GEOLOGIC MAP OF THE PROVO 30' X 60' QUADRANGLE, UTAH, WASATCH, AND SALT LAKE COUNTIES, UTAH**

13-5 16 Willis, Grant C.*; Doelling, Hellmut H.; Kuehne, Paul A.; Brown, Kent D.: **NEW GEOLOGIC MAP OF THE WESTERN HALF OF THE SALINA 30´ X 60´ QUADRANGLE, SEVIER COUNTY, UTAH**

13-6 17 Thompson, Ren A.*; Gilmer, Amy K.; Chan, Christine F.: **GEOLOGIC MAP OF PETROGLYPH NATIONAL MONUMENT, NM – MONOGENETIC VOLCANISM OF ALBUQUERQUE VOLCANOES, RIO GRANDE RIFT, USA**

13-7 18 Turner, Kenzie J.*; Workman, Jeremiah B.; Gilmer, Amy K.; Colgan, Joseph P.; Johnstone, Samuel A.; Thompson, Ren A.; Sweetkind, Donald; VanSistine, Paco: **MODIFIED GEOLOGIC MAPPING SCHEMA (GEMS) FOR REGIONAL GEOLOGIC MAP COMPILATION: AN EXAMPLE FROM THE USGS GEOLOGIC FRAMEWORK OF THE INTERMOUNTAIN WEST PROJECT**

13-8 19 Anderson, Zachary W.*; McKean, Adam P.: **USING THE ESRI COLLECTOR APP FOR GEOLOGIC MAPPING - A MOSTLY GOOD EXPERIENCE**

13-9 20 Stanley, Jessica R.*: **SPATIAL INTERPOLATION OF THE BASAL SURFACE OF THE HUCKLEBERRY RIDGE TUFF: CLUES TO PALEO-RELIEF AND POST 2 MA DEFORMATION?**

13-10 21 Lee, Joshua Kelly*; Roselle, Gregory T.: **USING GIS TO REVISIT STABLE ISOTOPE AND GEOTHERMOMETRY DATA TO IDENTIFY ZONES OF INFILTRATION BY MAGMATIC FLUIDS, UBEHEBE PEAK, DEATH VALLEY NATIONAL PARK, CALIFORNIA**

13-11 22 Jahnsen, Seth Adam*: **SPATIAL ANALYSIS OF SHORELINE EROSION AND COASTAL INFRASTRUCTURE IN MONTEREY BAY**

13-12 23 Wilding, Hailey A.*; Yue, Kenny; Lovell, Mark; Willis, Julie B.: **PORCUPINE CREEK LANDSLIDE, ALPINE, WY**

SESSION NO. 14

T11. Federal and State Geologists of the Rocky Mountain Section: Who Are They, What Are They Working On, and How Can Everyone Collaborate? (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

14-1 24 Wallace, Janae*; Inkenbrandt, Paul C.; Hurlow, Hugh; Jordan, J. Lucy; Kirby, Stefan; Schlossnagle, Trevor; Mcdermott, Emily; Payne, Nathan: **UTAH'S CONTRIBUTION TO THE USGS NATIONAL GROUND-WATER MONITORING NETWORK**

14-2 25 Wyshnytzky, Cianna*; Sieber, Todd: **NATURAL RESOURCES CONSERVATION SERVICE PROGRAMS & EXAMPLES UTAH PROJECTS**

14-3 26 Meyer, Herbert W.*: **FUNDING PROJECTS AND FINDING PARTNERS TO ADVANCE COLLABORATIVE GEOLOGIC RESEARCH AT FLORISSANT FOSSIL BEDS NATIONAL MONUMENT**

14-4 27 Kleber, Emily J.*; Bowman, Steve D.; Castleton, Jessica J.; Giraud, Richard E.; Erickson, Ben; Knudsen, Tyler R.; Hiscock, Adam I.; McKean, Adam P.; McDonald, Greg N.; Douglass, Gordon; Hylland, Michael D.: **THE UTAH GEOLOGICAL SURVEY - ACTIVE PARTNERSHIPS AND OPPORTUNITIES IN GEOLOGIC HAZARDS**

14-5 28 Jordan, J. Lucy*; Smith, Stanley D.: **GROUNDWATER DOES NOT FLOW IN A VACUUM—HOW COLLABORATION IS IMPERATIVE FOR REGIONAL-SCALE GROUNDWATER STUDIES: A CASE STUDY IN OGDEN VALLEY, UTAH**

14-6 29 Mahan, Shannon*; Gray, Harrison: **BRINGING THE ROCKY MOUNTAIN REGION TO LIGHT: A SUMMARY OF THE USGS LUMINESCENCE GEOCHRONOLOGY LAB SHARED PROJECTS, RESEARCH, AND NEW UTILITIES OF THE TECHNIQUE IN FEDERAL AND STATE COLLABORATIONS**

14-7 30 Hurlow, Hugh A.*; Jordan, J. Lucy; Wallace, Janae; Schlossnagle, Trevor; McDermott, Emily: **HYDROLOGIC MONITORING OF ENVIRONMENTAL RESTORATION PROJECTS**

14-8 31 Hunt-Foster, ReBecca*: **GEOLOGICAL AND PALEONTOLOGICAL WORK IN DINOSAUR NATIONAL MONUMENT**

SESSION NO. 15

T12. Advances and Applications of River Science in the West (Posters) (GSA Quaternary Geology and Geomorphology Division)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

15-1 32 Cowgill, Ethan*; Garza, Brooke; Wetterlin, Lily; Johnson, Christopher: **SPATIAL ANALYSIS OF DISSOLVED CADMIUM, ZINC, AND COPPER IN THE IMPAIRED LITTLE COTTONWOOD CREEK, UTAH**

15-2 33 Bogart, Sedi*; Rivera, Alesha; Scofield, Mallory; Garcia, Jasmine; Wetterlin, Lily; McIlwain, Hannah; Johnson, Christopher: **HIGH-RESOLUTION SPATIAL AND TEMPORAL WATER QUALITY SAMPLING OF THE JORDAN RIVER, SALT LAKE CITY, UTAH**

15-3 34 Culbertson, Adam*; Wetterlin, Lily; McIlwain, Hannah; Johnson, Christopher: **EFFECTIVENESS OF BEAVER DAM ANALOGS AS A RESTORATION STRATEGY TO MITIGATE INCREASED WATER TEMPERATURES AND DECREASED DISSOLVED OXYGEN**

15-4 35 Ashurst-McGee, Logan*; Wetterlin, Lily; McIlwain, Hannah; Johnson, Christopher: **SURFACE MOBILITY OF HEAVY METALS IN SOIL FROM HISTORIC MINE WASTE PILES IN THE CARDIFF TRAIL AREA, ALTA, UTAH**

15-5 36 Meyr, Katherine Irma*: **EVALUATION OF WATER QUALITY IN THE TAKU WATERSHED, B.C**

15-6 37 Jukes, Thomas*; Leonard, Christina; Schmidt, John C.: **CHARACTERIZING THE GRAIN SIZE DISTRIBUTION OF ALLUVIAL DEPOSITS IN THE LOWER YAMPA RIVER TO LINK A PARTITIONED FLUX-BASED SEDIMENT BUDGET TO CHANNEL CHANGE**

SESSION NO. 16

T13. Geomorphic and Paleoclimate Records from the Intermountain West (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

Authors will be present from 9:30 to 11:30 AM

Booth #

16-1 38 Dort, Wakefield; Funk, James M.*; Funk, Sherree G.: **CLIMATIC AND TECTONIC IMPLICATIONS OF PRE-BULL LAKE GLACIAL DEPOSITS, MIDDLE RIDGE, LEMHI VALLEY, EAST-CENTRAL IDAHO**

16-2 39 Barlow, B. Clayton*; Capaldi, Tomas N.; Rittenour, Tammy; Pederson, Joel: **TRACKING EROSION AND SEDIMENT TRANSPORT IN THE BEAR RIVER, UT, WY, AND ID USING DETRITAL ZIRCON AND OPTICALLY STIMULATED LUMINESCENCE PROVENANCE**

16-3 40 Blount, Charles W.*: **TERRACE GRAVEL DEPOSITS OF WESTWATER CREEK, GRAND COUNTY, UTAH AND THEIR POSSIBLE RELATIONSHIP TO PLEISTOCENE CLIMATE**

16-4 41 Last, George V.*; Rittenour, Tammy M.: **CHRONOLOGY OF MISSOULA FLOOD DEPOSITS AND THE DEMISE OF THE COYOTE CANYON MAMMOTH, BENTON COUNTY, WASHINGTON**

SESSION NO. 17

T14. Bonneville Basin: Geology of Pleistocene and Holocene Lakes (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

17-1 42 Waters, Natalie Jayne*; Frantz, Carie M.: **CHARACTERIZATION OF ABIOGENIC VS. BIOGENIC CARBONATE PRECIPITATION IN SIMULATED MODERN GREAT SALT LAKE CONDITIONS**

17-2 43 Bernau, Jeremiah A.*; Bowen, Brenda B.: **DYNAMIC EVAPORITE CRYSTALLIZATION AND DISSOLUTION IN A SALINE PAN: ENVIRONMENTAL AND PETROGRAPHIC OBSERVATIONS OF EVAPORITE CRUSTS AT THE BONNEVILLE SALT FLATS, UTAH, USA**

17-3 44 Perry, Kevin D.*: **ELEMENTAL COMPOSITION OF THE RESPIRABLE FRACTION OF MINERAL DUST FROM THE EXPOSED PLAYA OF THE GREAT SALT LAKE, USA**

17-4 45 Gunnell, Nathan V.*; Nelson, Steve T.; Engstrom, Daniel R.: **ISOTOPIC AND ELEMENTAL ANALYSIS OF THE ANTHROPOGENIC IMPACT IN FARMINGTON BAY**

SESSION NO. 18

T15. Hydrology of the Western United States (Posters)

8:30 AM, Utah Valley Convention Center, Ballroom A

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

Booth #

18-1 46 Schlossnagle, Trevor*; Wallace, Janae; McDermott, Emily: **GROUNDWATER RESIDENCE TIMES IN THE BRYCE CANYON AREA, GARFIELD COUNTY, UTAH**

18-2 47 Jordan, J. Lucy*; Smith, Stanley D.; Wallace, Janae: **INSIGHTS INTO GROUNDWATER—SURFACE-WATER INTERACTION IN OGDEN VALLEY, UTAH, FROM STABLE ISOTOPES OF WATER**

18-3 48 Forsythe, Dillon*; Nelson, Daren T.; Bunds, Michael P.: **EVAPORATION FROM SHALLOW PONDS AT UTAH VALLEY UNIVERSITY: AN ANALOGY FOR UTAH LAKE**

18-4 49 Smith, Connor J.*; Lachmar, Thomas E.; Shervais, John; Evans, James P.; Newell, Dennis L.: **EVALUATION OF THE GEOTHERMAL POTENTIAL OF THE CAMAS PRAIRIE, SOUTH-CENTRAL IDAHO**

18-5 50 Matyjasik, Marek*; Tems, Caitlin; Hart, Lilian; Weech, Ian; Rasmussen, Kristi; Manifold, Douglas; Frantz, Carie M.; Lieberman, Adam: **HEAVY METALS IN WATER MIXING ZONES OF GREAT SALT LAKE, UTAH, USA**

18-6 51 Shaw, Nicholas; Matyjasik, Marek; Hart, Lilian*; Hernandez, Michael W.; Lew, Roger; Arave, Taylor; Fifer, Michael: **SIMULATIONS OF NUTRIENT FLUXES FROM WILD FIRES USING THE NUTRIENT LOSS MODEL**

18-7 52 Spendlove, Joseph F.*: **DETERMINING THE IMPACT OF THE MARYSVALE VOLCANIC FIELD ON PRESENT DAY HYDROLOGICAL SYSTEMS IN SEVIER COUNTY, UTAH**

18-8 53 Morrow, Christopher*; MacKenzie, Lindsay Ann: **A SEDIMENTOLOGIC ANALYSIS OF THE LATAH FORMATION OF LAKE CLARKIA (MIOCENE), IDAHO**

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 19

T1. Tectonics in the Rocky Mountain Region from the Precambrian to the Quaternary

1:25 PM, Utah Valley Convention Center, Cascades C

Jason W. Ricketts and Mark E. Holland, Presiding

1:25 PM **INTRODUCTORY REMARKS**

19-1 1:30 PM Voorhees, Jake*; Harris, Ron: **PRECAMBRIAN COLLISIONAL METAMORPHISM, SUBMARINE SLIDING, AND LOW-ANGLE NORMAL FAULTING IN THE BEAVER DAM MOUNTAINS, SW UT**

19-2 1:50 PM Bader, Jeffrey W.*: **STRUCTURAL INHERITANCE AND THE ROLE OF BASEMENT ANISOTROPIES IN THE LARAMIDE STRUCTURAL AND TECTONIC EVOLUTION OF THE NORTH AMERICAN CORDILLERAN FORELAND, WYOMING: TOWARDS A UNIFIED HYPOTHESIS**

19-3 2:10 PM Dunham, John B.*: **CONTINENTAL SUBDUCTION AS A MECHANISM FOR EMPLACEMENT OF THE ROBERTS MOUNTAINS THRUST IN NEVADA**

19-4 2:30 PM McDermott, Robert G.*; Ault, Alexis K.: **HEMATITE (U-TH)/HE THERMOCHRONOMETRY REVEALS FAULT REACTIVATION AND STRAIN LOCALIZATION IN THE WASATCH FAULT ZONE, NORTHEASTERN UT, USA**

19-5 2:50 PM Thacker, Jacob O.*; Kelley, Shari A.: **LOW TEMPERATURE COOLING HISTORY AND "THERMOSTRUCTURAL ANALYSIS" OF THE LARAMIDE ZUNI ARCH, WEST-CENTRAL NEW MEXICO**

19-6 3:10 PM Zuchuat, Valentin*; Hafner, Alison; Osmond, Johnathon L.; Liberty, Lee; Petrie, Elizabeth; Arvesen, Brock; Evans, James P.; Sundal, Anja; Midtkandal, Ivar; Skurtveit, Elin; Braathen, Alvar: **CO_2 CONTAINMENT AND MONITORING TECHNIQUES ALONG LITTLE GRAND WASH FAULT, EAST-CENTRAL UTAH, USA**

SESSION NO. 20

T13. Geomorphic and Paleoclimate Records from the Intermountain West

1:25 PM, Utah Valley Convention Center, Cascades E

Tammy M. Rittenour, Presiding

1:25 PM **INTRODUCTORY REMARKS**

20-1 1:30 PM Krautz, Jana*; Hofmann, Mandy; Linnemann, Ulf; Kleber, Arno: **U-PB-DATING OF DETRITAL ZIRCONS APPLIED TO QUATERNARY SLOPE DEPOSITS: REGIONAL DIFFERENCES IN THE SOUTHWESTERN USA**

20-2 1:50 PM Harvey, Jonathan E.*; Gillam, Mary L.; Thomson, Alexander; Lingbloom, Joshua: **PLEISTOCENE INCISION HISTORY OF THE ANIMAS-SAN JUAN RIVER SYSTEM**

20-3 2:10 PM Cornachione, Harriet S.*; Rittenour, Tammy; Nelson, Michelle S.: **SHIFTING SANDS: DUNE ACTIVITY RECORDS OF NATURAL MOISTURE VARIABILITY IN THE CENTRAL COLORADO PLATEAU**

2:30 PM **BREAK**

20-4 2:45 PM Rittenour, Tammy*; Short, Alexander K.; Perkins, Andrew J.; Millsap, Evan Dallas: **MIDDLE TO LATE PLEISTOCENE ALLUVIAL DEPOSITS AND ENVIRONMENTAL CHANGE, GRAND STAIRCASE, SOUTHERN UTAH**

20-5 3:05 PM Persico, Lyman P.*; Foky, Trent; Hinzmann, Alice; Iosso, Chantal; Phinney, April I.; Van Wetter, Eliza: **WHAT CONTROLS STREAM DYNAMICS IN NORTHERN YELLOWSTONE NATIONAL PARK?**

20-6 3:25 PM Laabs, Benjamin J.*; Munroe, Jeffrey S.: **THE PATTERN OF PLEISTOCENE MOUNTAIN GLACIATION IN THE INTERIOR GREAT BASIN, WESTERN UNITED STATES**

20-7 3:45 PM Mahan, Shannon*; Hauser, Neil; Ellwein, Amy L.; Hauser, Teri; Watchman, Alan: **COMPARISON OF TERRACE LEVELS, PALEO CLIMATE INCISION RATES, AND ARCHEOLOGICAL SITES NEAR MONTROSE, COLORADO**

Index of Authors

How to use the indexing system:

The first number (preceding the dash) represents the session number in which the paper will be presented. The second number (following the dash) indicates the presentation order of the paper within its session.

Example: Landau, Lydia … 7-4*
Find Session #7 in the Technical Session portion of the Program, and look at the fourth paper in the session.

Page numbers are not listed in this index. Refer to session number and order of presentation to locate the author you are searching for.

*denotes presenter

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