

2024 Joint Cordilleran/Rocky Mountain Section Meeting Program

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Spokane Falls. Photo credit: Chad Pritchard.

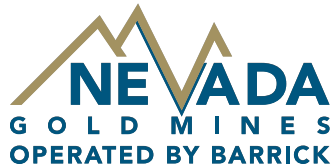
Spokane, Washington | 15–17 May

www.geosociety.org/cd-mtg

Sponsors (as of press time)

We are grateful to several societies, companies, and agencies that made substantial contributions to underwrite the cost of the 2024 meeting. Look for their names prominently displayed on signs throughout the meeting. Please take time to thank these sponsors for their contributions to help make this meeting a success. Listed below are sponsorship received by time of press in February 2024.

The Falls Sponsors



Havermale Sponsors



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NOTICE

By registering for this meeting, you have acknowledged that you have read and will comply with the GSA Code of Conduct for Events (full code of conduct located on GSA's website: <https://www.geosociety.org/GSA/Events/EventConductCode/GSA/Events/Conduct.aspx>).

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

- Please ask questions or report concerns—openly or anonymously—to our third-party hotline provider via:
 - Internet: geosociety.ethicspoint.com
 - Phone: +1-844-237-8688
 - Mobile: geosociety.navexone.com
- Or, direct any questions or concerns to ethics@geosociety.org or any GSA staff member or RISE Liaison, identified by their RISE buttons.

Program Book

**CORDILLERAN AND ROCKY MOUNTAIN
SECTIONS JOINT MEETING**

**120th Annual Meeting of the Cordilleran Section, GSA
74th Annual Meeting of the Rocky Mountain Section, GSA**

**15–17 May 2024
Davenport Grand Hotel, Spokane, Washington**



Sharing at the Falls

Cordilleran Section GSA Officers for 2023–2024

ChairDr. Jay Chapman
Vice-ChairDr. John Wakabayashi
Secretary-Treasurer Dr. Calvin G. Barnes

Rocky Mountain Section GSA Officers for 2023–2024

ChairDr. David M. Pearson
Past Chair.....Dr. Elizabeth Balgord
Chair-electEmily J. Kleber
Secretary-Treasurer Shannon Mahan

Committee for the 2024 Meeting

General Co-Chairs.....Chad Pritchard, Peter Larson, Tom Williams, Jerry Fairley
Technical Program..... Kelsay Stanton
Exhibits/Sponsorship..... Chris Dail
Field TripsMark McFaddan, Chad Pritchard
Student Volunteers..... Nigel Davies

REACH NEW HEIGHTS

With Your GSA Membership

LEARN

- Expand your career by attending professional meetings
- Amplify science by publishing in our top-rated scientific journals
- Explore with our field trips and short courses while earning CEUs

GROW

- Discover internships, research grants, and scholarships
- Build your network to improve your future
- Connect with an international community doing cutting-edge science

LEAD

- Express yourself—We advocate on your behalf to affect change
- Support and promote diversity, equity, and inclusion
- Make your résumé stand out with GSA membership

GIVE

- Guide and motivate others to inspire the future
- Gain recognition as an active leader
- Find your place where everyone is welcome and respected

*JOIN or RENEW your MEMBERSHIP
in person at the GSA Membership &
Publications Booth and SAVE 20%!*



Marrio Arango/E+ via Getty Images

General Information



Welcome

The local committee and GSA officers are excited to welcome you to the 2024 Joint Meeting of the Cordilleran and Rocky Mountain Sections of the Geological Society of America in beautiful Spokane, Washington. The meeting is proudly hosted by representatives of the Department of Geosciences at Eastern Washington University, the School of the Environment at Washington State University, the Department of Earth and Spatial Sciences at the University of Idaho, Washington Department of Natural Resources, Perpetua Resources, and North Idaho College.

We ask that you help us make this meeting Respectful, Inclusive, Scientific Event (RISE) with an open and constructive exchange of ideas and information. Please be mindful to conduct yourself in a safe and healthy manner, and respect different comfort levels within group interactions.

Location

Spokane is located along the eastern border of Washington state and minutes from Idaho, making it an excellent location for a joint meeting. More importantly, Spokane has always been a hotspot of geology. From the margin of the Proterozoic Belt Basin and piercing points for supercontinent Nuna, the leading edge of Laurentia during the Sevier Orogeny, one of the few locations with multiple core complexes, the home of feeder dikes for the Columbia River Basalt Group, and the main drainage of Ice Age megafloods, this meeting will have it all.

To the north are granitic hills of the Kanisku Batholith or the Priest River Complex. Ares to the north, like Tum Tum, Washington offer exquisite outcrops and climbing on granitic rocks that have yet to truly be deciphered by geologists, all while uranium mines have been operating for decades and some are undergoing remediated.

East of Spokane are the southern Selkirk Mountains, generally associated with the Priest River Core Complex and the foothills of the Rocky Mountains. Further to the east in Idaho, the Coeur d'Alene Mountains are home to the one of the largest silver deposits in the world the Coeur d'Alene mining district, so rich that it is known as the Silver Valley.

South of Spokane are terraces of Columbia River Basalt Group lavas with more of the Selkirk Mountain ranges, Priest River Complex geology with Eocene tin and tungsten deposits, and further out the Palouse loess soils and expansive landscape of rolling hills of one of the more prolific wheat farming areas in the world.

The west are small protruding hills from the Rocky Mountains surrounded by layers of the Miocene Columbia River Basalt Group overlain by younger Pleistocene Missoula Flood deposits. Aquifers in the West Plains within both units are currently one of the nation's focuses on Poly and Per-fluorinated alkyl substances (PFAS) concentrations in groundwater, associated with the multiple local airports

and past use of high-temperature flame retardants. Though groundwater contamination is not a good thing, there have been decades of research conducted in the area to delineate complex subsurface structures emanating from Proterozoic Nuna tectonism to Pleistocene megaflood deposits.

The final afternoon of the meeting includes a walking field trip around Riverfront Park. If you cannot join the entire group on Friday afternoon to view the historic Upper Falls Powerhouse and Combined Sewer Overflow structures, please take the opportunity to use the trip guide to explore the diverse and exciting geology and human history of the inland northwest on your own. If you are in the city area, explore the amazing basement geology at Dishman Hills, Minnehaha, or Joe Shields Parks, the Saltese Uplands Conservancy, or Iller Creek Trail. The basaltic geology is well exposed at Mystic Falls along Palisades City Park or at the Bowl and Pitcher location in Riverside State Park. Interesting scabland topography can be seen all across the inland northwest, including Fish Lake or Medical Lake parks. Please check out the Washington Department of Natural Resources, Geologic Information Portal for interactive geologic maps of many scales: <https://www.dnr.wa.gov/geologyportal>.

This meeting includes outstanding sessions and field trips that will showcase local and regional geology. Following the meeting, explore the many 44th anniversary events for the eruption of Mount St. Helens. During the meeting we will also be part of the 50-year anniversary of the Spokane EXPO in 1974, which reshaped the railroad-focused downtown of the city into a large park system and Centennial Trail now recognized as one of the top riverwalks in the nation. Whatever your geologic or younger historical interest is, there is something for you to enjoy about Spokane!

Climate

The weather in Spokane can change quickly, so staying up to date with the latest weather forecasts is vital to any visit. Spokane's climate is impacted by its location between the Cascade Mountain Range to its west and the Rocky Mountains to the East and North. The mountains shield the city from weather patterns experienced in other parts of the Pacific Northwest. The region sees more distinct and dramatic four seasons than the western part of Washington state. In May, the average daily high temperatures increase from 65°F to 73°F and it is overcast or mostly cloudy about 51% of the time. Please be prepared for all possibilities, especially if participating in any field trips.

Transportation and Directions

The Spokane International Airport (GEG) is served by Alaska, Allegiant, American, Delta, Southwest (Summer Seasonal), Sun Country, and United, with direct flights to/from Seattle (SEA), Portland (PDX), Boise (BOI), Salt Lake

City (SLC), San Francisco (SFO), Los Angeles (LAX), Sacramento (SMF), San Jose (SJC), Las Vegas (LAS), San Diego (SAN), Phoenix (PHX), Phoenix-Mesa (AZA), Denver (DEN), Dallas Fort Worth (DFW), Minneapolis (MSP), Chicago O'Hare (ORD) and Atlanta (ATL).

Car rental is available through several major companies at the airport near baggage claim. Alternate ground transportation, ride-share, and taxis can also be arranged for about \$30 one-way by using ride-share apps or calling Curbside Taxi Services at (509) 455-6490. The Davenport Grand Hotel is approximately 8 miles from the airport. Whatever you do, please don't try to take the big red wagon in Riverfront Park for anything other than an amazing slide!

From Spokane International Airport or West of Spokane (i.e. Seattle)

Take Highway 2 East to I-90 East or stay on I-90 as you enter Spokane. Continue on I-90 past the Latah River bridges as you enter Spokane. Continue past the first Walnut and Maple Exit, don't worry nobody will let you over anyways – bunch of south hill snobs, ha! There will be two on-ramps, so please watch to the right as people merge onto I-90. Then on the right side of I-90, take Exit 281 for Division Street.

Once you have exited I-90 via Exit 281 keep to the left so that you can take the left at the y-in the road, to North Highway 395 (and East Hwy 2, don't overthink the even numbers when you drive north). Driving north on S Division Road (N 395 and E Hwy2) you should see Dick's Hamburgers and Lumberbeard Brewery to your right (east). Continue north for approximately nine-blocks to take a left (west) on West Spokane Falls Blvd. You should see Fast Eddies' bar and pizza joint on your left side and Spoke-n-Sport bike shop to your right. Take the left and continue West Spokane Falls Boulevard until you enter the Davenport Grand. There is valet parking along West Spokane Falls Boulevard or take a left on Washington Avenue to enter the parking structure. As a GSA registrant staying at the hotel, you should get overnight parking for \$15 while you are staying there; otherwise it is one of the more expensive parking structures in the city. There are numerous nearby parking areas; pay lots are easiest at the Mall another three blocks to the west, or street parking is available north of Spokane River.

From the South

Take Highway 395 North into Spokane, merging onto I-90 East. Enter I-90 East and continue past the first exit to Walnut and Maple Streets. There will be two additional on-ramps, so please watch to the right as people merge onto I-90. Then on the right side of I-90, take Exit 281 for Division Street. Once you have exited I-90 via Exit 281 keep to the left so that you can take the left at the y-in the road to North Highway 395 (and East Hwy 2, don't overthink the even numbers when you drive north). Driving north on S Division Road (N 395 and E Hwy2) you should see Dick's Hamburgers and Lumberbeard Brewery to your right (east). Continue north for approximately nine-blocks to take a left (west) on West Spokane Falls Blvd. You should see Fast

Eddies' bar and pizza joint on your left side and Spoke-n-Sport bike shop to your right. Take the left and continue West Spokane Falls Blvd until you enter the Davenport Grand. There is valet parking available.

From the North

Take Highway 395 South or Highway 2 (North Newport Highway) to North Division Street. Follow North Division Street south until you cross the Spokane River, then take a wide (four-lane) right (west) turn on West Spokane Falls Blvd around the Spokane Convention Center and some neat fishy art. Continue along West Spokane Falls Blvd for two blocks until you reach the Davenport Grand Hotel.

From the East

Take I-90 West, exiting at Exit 281. Continue north for approximately nine-blocks to take a left (west) on West Spokane Falls Blvd. You should see Fast Eddies' bar and pizza joint on your left side and Spoke-n-Sport bike shop to your right. Take the left and continue on West Spokane Falls Blvd for about two blocks, until you enter the Davenport Grand.

Accommodations

We strongly encourage meeting participants to reserve rooms at the Davenport Grand Hotel, 333 West Spokane Falls Boulevard, Spokane, Washington 99201, USA, located in the center of downtown Spokane. The hotel offers many amenities including a restaurant, bar, Wi-Fi, and fitness center. The hotel can be reached at 509-458-3330. Please be sure to identify yourself as an attendee of the joint Cordilleran and Rocky Mountain Section Meeting of the Geological Society of America. The Davenport Grand hotel is an exceptional facility, and we highly recommend all meeting attendees to reserve rooms.

Parking

Parking is available at the hotel, 333 west Spokane Falls Boulevard, Spokane, Washington, for a reduced rate for hotel guests of \$15 daily for overnight self-parking, or valet for \$35 daily. There are 37,000 parking spaces in or near downtown Spokane. Visit Downtown Spokane Partnership to locate lots best suited for your needs.

Restaurants within Walking Distance

- The Grand Restaurant and Lounge, Davenport Grand Hotel, 509-598-4300
- O'Doherty's Irish Grille, 525 W Spokane Falls Blvd. (509) 747-0322
- Atticus Coffee, 222 N Howard St. (509)747-0336
- Steelhead Bar and Grille, 218 N Howard St (509) 747-1303
- Mizuna Restaurant and Wine Bar, 214 N Howard St, (509) 747-2004
- Sushi.Com, 430 W Main Ave. (509) 838-0630
- The Mango Tree, 401 W Main Ave. (509) 242-3943
- Boida Brazilian Grill, 245 W Spokane Falls Blvd. (509) 474-1150

- The High Nooner Sandwich Shop, 237 W Riverside Ave. (509) 838-5288
- And many more; along Main Ave and Division are a number of establishments, and the River Park Square Mall has a food court and many other restaurants at 777 W Spokane Falls Blvd.

Registration

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

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

	Full	1-Day
Professional Member	\$350	\$250
Professional Member 70+ & 30-year member	\$270	\$175
Professional Nonmember	\$405	\$320
Early Career Professional	\$250	\$175
Student Member	\$125	\$110
Student Nonmember	\$185	\$145
K-12 professional	\$160	\$120
Guest/Spouse	\$155	n/a
Field Trip/Short Course only	\$70	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 workshops 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.

Registration Schedule

On-site registration and badge pick-up is located in the Lobby outside the Grand Ballroom on the ground floor of the hotel and is available on the following schedule:

- Tuesday, 14 May: 4–8 p.m.
- Wednesday, 15 May: 7 a.m.–6 p.m.
- Thursday, 16 May: 7 a.m.–6 p.m.
- Friday, 17 May: 7 a.m.–1:00 p.m.

Cancellations, Changes, and Refunds

Requests for additions, changes, and cancellations must be made to GSA Headquarters, in writing, by 15 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 Program and Abstracts

An online meeting program is available for this meeting. This program allows you to view and search the entire meeting program and create your own schedule of events to attend. You can also view the full abstracts text from there. Please view the online program at: <https://gsa.confex.com/gsa/2024CD/meetingapp.cgi>.

Accessibility

GSA is committed to ensuring full participation for all meeting attendees. You may indicate special requirements on your registration form; please inform the local organizing committee of these requirements at least one month prior to the meeting. Accessible rooms at the hotel are available and can be reserved.

Continuing Education Units (CEU credit)

Continuing Education Unit (CEU) credits are available for attending GSA Meetings, Field Trips, and Short Courses. This is an excellent opportunity to earn CEUs toward your requirements for your employer, K–12 school, or professional license. A contact hour is defined as a typical 60-minute classroom instructional session or its equivalent. Each meeting day equals 0.8 CEU, offering 1.6 CEUs for the meeting technical program, with additional CEUs available from field trips and short courses. After the Meeting, there will be a link on the meeting website for you to generate your CEU certificate.

Special Events and Activities

We graciously thank our sponsors for support of these special events! Please see the signage at the meeting and list of sponsors at the beginning of the program.

Tuesday, 14 May

Welcoming Reception. 5–7:30 p.m. Join us in the Grand Ballroom to visit with friends and colleagues, and officially kick-off the meeting.

5–5:30 p.m. Introductions, land acknowledgement and Salish telling of observations of what is considered the megafloods by Craig Hill, č'tapsqé - Hill is a Spokane Tribal member working with the Spokane Language House, with the goal to elevate the language so that one day he can live in the Salish language and culture.

5:30–7 p.m. The Moscow Mules, a high energy string band from Moscow, Idaho will play bluegrass and acoustic music for the evening! Exhibits will be open, and hors d'oeuvres and one complementary drink are included with each registration. A cash bar is also available.

Wednesday, 15 May

Low Impact Fitness Class. 6:15 to 7 a.m., Terrace Room West, 2nd floor.

Session Chair Orientation. 7–7:15 a.m., Meeting Room 2 (next to the Speaker Ready Room in Meeting Room 3) on the first floor. This meeting will include a review of session time management, AV procedures, and other information affecting the conduct of the day's sessions.

Geoscience Career Program Workshop Part 1: Career Planning and Informational Interviewing. 9–10

a.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

Geoscience Career Program Workshop Part 2: Geoscience Career Exploration. 10–11 a.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

Roy J. Shlemon Mentors Program in Applied Geoscience. Noon–1:30 p.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

Geology Club Meetup. 2–3 p.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

Happy Hour. 5–6 p.m., Grand Ballroom, Exhibits Hall.

Keynote Speaker: Nicholas Zentner, 6–7:30 p.m. Cedar Ballroom, join Nick Zentner, Department of Geological Sciences at Central Washington University, for a screening of his recent public television show, “Nick on the Rocks!” followed by a Q&A.

Thursday, 16 May

Low Impact Fitness Class. 6:15–7 a.m., Terrace Room West, 2nd floor.

Session Chair Orientation. 7–7:15 a.m., Meeting Room 2 (next to the Speaker Ready Room in Meeting Room 3) on the first floor. This meeting will include a review of session time management, AV procedures, and other information affecting the conduct of the day’s sessions.

GSA Rocky Mountain Executive Committee Management Board Meeting Breakfast. 7–8:30 a.m., Terrace Room East, 2nd floor

Geoscience Career Program Workshop Part 3: Cover Letters, Résumés, and CVs. 9–10 a.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

John Mann Mentors Program in Applied Hydrogeology. Noon–1:30 p.m., Terrace Room East, 2nd floor. See “Opportunities for Students” for description.

GSA Rocky Mountain and Cordilleran Executive Committee Section Business Meeting. 5–6 p.m., Terrace Room East, 2nd floor

Happy Hour. 5–6:00 p.m. Grand Ballroom, Exhibits Hall.

Keynote Speaker: Dr. Jon Major, 6–7:30 p.m. Cedar Ballroom. Listen to Dr. Jon Major, Scientist-in-Charge at the US Geological Survey, Cascade Volcano Observatory, present “Four Decades of Mount St. Helens as a Master Teacher.” This is part of a recognition of the 44th anniversary of the eruption of Mount St. Helens on May 18th, 1980.

Friday, 17 May

Low Impact Fitness Class. 6:15–7:00 a.m., Terrace Room West, 2nd floor.

Session Chair Orientation. 7–7:15 a.m., Meeting Room 2 (next to the Speaker Ready Room in Meeting Room 3) on the first floor. This meeting will include a review of session time management, AV procedures, and other information affecting the conduct of the day’s sessions.

Guide-yourself Field Trip of Riverfront Park. 1:30–4 p.m., Leave the Davenport Grand and walk through

Riverfront Park. Upper Falls Dam Powerhouse (Stop 4) will be open to see the turbine and historic building from 2:00 to 3:00. The combined sewer overflow (CSO) tank (Stop 7) will be open 2:30 to 3:30. Volunteers will be stationed at each of the seven stops to help. A .pdf of the field guide is available to download from the meeting website (during the meeting and for a couple weeks following, after which it will be available in the bookstore for purchase). Additionally, you can access a virtual field trip guide at: <https://storymaps.arcgis.com/stories/ac6eaa8743ed47949be3226bbf0e4027> or by scanning the QR code below.



OPPORTUNITIES FOR STUDENTS

Roy J. Shlemon Mentors Program in Applied Geoscience. Wed., 15 May, noon–1:30 p.m., Terrace Room East, 2nd floor. The Shlemon Mentor Program is designed to extend the mentoring reach of individual professionals from applied geology to students and early career professionals attending GSA section meetings. Over free lunches, mentors and attendees discuss real-life issues including professional opportunities and challenges. This is a ticketed event and GSA student members will receive priority; any remaining space will be offered on a first-come, first-served basis.

John Mann Mentors Program in Applied Hydrogeology. Thur., 16 May, noon–1:30 p.m., Terrace Room East, 2nd floor. The Mann Mentor Program presents mentoring opportunities for undergraduate and graduate students, as well as recent graduates with a declared interest in applied hydrogeology as a career to interact and network with practicing hydrogeology professionals. This relaxed, small-scale event features a free lunch for attendees and mentors. This is a ticketed event and GSA student members will receive priority; any remaining space will be offered on a first-come, first-served basis.

Geology Club Meetup. Wed., 15 May, 2–3 p.m., Terrace Room East, 2nd floor. If you are a geology club member 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.

GSA Career Workshops

We graciously thank our sponsors for their support of these workshops!

Geoscience Career Program Workshop Part 1: Career Planning and Informational Interviewing. Wed., 15 May, 9–10 a.m., Terrace Room East, 2nd floor. Your job-hunting process should begin with career planning, not when you apply to jobs. This workshop will help you begin this process and will introduce you to informational interviewing. This section is highly recommended for freshman, sophomores, and juniors. The earlier you start your career planning, the better.

Geoscience Career Program Workshop Part 2: Geoscience Career Exploration. Wed., 15 May, 10–11 a.m., Terrace Room East, 2nd floor. 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 Program Workshop Part 3: Cover Letters, Résumés, and CVs. Thur., 16 May, 9–10 a.m., Terrace Room East, 2nd floor. 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 résumés helping you to learn important résumé dos and don'ts.

Student Volunteers

Students accepted as meeting volunteers must check in at the Student Volunteer and Information Desk, located in the lobby outside the Grand Ballroom.

Exhibits

Exhibits are located in the Grand Ballroom on the ground floor of the hotel. Hours of Exhibits are:

- Set Up: Tuesday, 14 May: noon–4 p.m.
- Open: Tuesday, 14 May: 5:30–8 p.m.
- Wednesday, 15 May: 8 a.m.–6 p.m.
- Thursday, 16 May: 8 a.m.–6 p.m.
- Friday, 17 May: 8 a.m.–2 p.m.
- Tear Down: Friday, 17 May: 2–5 p.m.

As of late April, Exhibitors include:

America's Gold and Silver
Association for Women Geoscientists Pacific NW Chapter
Brunton International LLC
Bureau of Land Management
Geological Society of America Cordilleran Section
2025 Meeting
Geological Society of America Foundation
Geological Society of America Membership and
Publications
Geological Society of America Rocky Mountain Section
2025 Meeting
Geological Society of America Scientific Divisions
GeoSep Services
Guideline Geo - ABEM | MALÅ
Hecla
Ice Age Floods Institute
Idaho Geological Survey
Mountain Press
National Association of Geoscience Teachers (NAGT)
Nevada Gold Mines Operated by Barrick
Nu Instruments
Perpetua Resources
Real World Globes
Stone Quilt Design

University of Pennsylvania, Masters of Science in
Applied Geosciences
Utah Geological Survey
Washington State University
Yellowstone-Bighorn Research Association

Technical Program

The technical program consists of Theme and Discipline sessions organized into oral and poster sessions. The technical program begins at 8 a.m., Wednesday, 15 May and concludes by 5:30 p.m. on Friday, 17 May. All technical sessions (oral and poster) will be in the Davenport Grand Hotel, in rooms on the 1st floor. Check your program schedule for details.

Oral Sessions

Most oral sessions have 20 minutes per presentation (17 minutes, presentation; 3 minutes, question and discussion). The two exceptions are T15 (Distributed Volcanic Fields of Western North America) and T4 (Undergraduate and Graduate Geoscience Student Lightning Talk Showcase) lightning talk sessions that have 3-minute talks followed by 2-minute questions/switching of speakers. Refer to the session descriptions and emailed presenter instructions for details on time limits in those sessions. Presentations must be prepared using PowerPoint or PDF formats, using a 16:9 screen ratio. One laptop with Windows 7 (no Macs available) with PowerPoint, one LCD projector, and one screen is provided for all oral sessions. In addition, each room is equipped with a lectern, microphone, wireless computer mouse and slide advancer, and a speaker timer.

Speaker Ready Room

All oral session presenters must visit the Speaker Ready Room in Meeting Room 3 on the 1st floor before their scheduled presentation to ensure their PowerPoint or PDF file is properly configured and operating and load it on one of the laptops. Failure to do so may result in presentations being omitted from sessions. Speaker Ready Room hours are as follows:

- Tuesday, 14 May: 4–8 p.m.
- Wednesday, 15 May: 7 a.m.–5 p.m.
- Thursday, 16 May: 7 a.m.–5 p.m.
- Friday, 17 May: 7 a.m.–10 a.m.

Each speaker must bring their PowerPoint or PDF presentation on a USB-compatible flash drive (a.k.a. thumb drive or memory stick) to the Speaker Ready Room to upload to the appropriate session folder according to the deadlines below. Morning presentations must be uploaded by the end of the day prior to the presentation. All afternoon presentations must be uploaded by noon on the day of the presentation. If you can't make it to the Speaker Ready Room by the requested time, please stop by at your earliest convenience when the SRR is open, and the staff there will assist you to get your talk uploaded in the correct location.

Session Chair Orientations

Each Session Chair is requested to attend a 15-minute “Session Chairs Orientation” held in Meeting Room 2 (next door to the Speaker Ready Room – Meeting Room 3) 1st floor, from 7:30–7:45 a.m. on the morning of the day on which your session is to take place. This meeting will include a review of session time management, AV procedures, and other information affecting 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.

Poster Sessions

Poster Sessions are located in the Grand Ballroom. Poster presenters have one 4’ vertical x 8’ horizontal (landscape) poster display surface. Numbers on the display surfaces correspond to the poster booth numbers listed in the Program. Push pins are recommended to mount posters, and some pins are furnished for each poster board. Please have posters displayed by 9 a.m.

Poster presentations are scheduled on Wednesday, 15 May, and Thursday, 16 May from 4-5:30 p.m. On Friday, 17 May, presentations are from 12-1:30 p.m. Presenters are expected to be at their posters during presentations. Please check the program for specific dates and locations.

Lightning Talks

If your acceptance notice said that your abstract is in a Lightning Talk session, that means that you have a poster presentation as well as a lightning talk. For the poster presentation, prepare your poster as you normally would, using the guidelines for poster presenters detailed above.

Your lightning talk takes place in a five-minute time slot, which includes three minutes for the talk and two minutes for Q&A or transitioning to the next talk.

You may have one slide to project in the session room during your lightning talk, this can be a PDF of your poster, or any other slide of your choosing. Please upload your slide (in PowerPoint or PDF format) in the Speaker Ready Room using the guidelines under “Speaker Ready Room” above.

Technical Sessions

Discipline Sessions:

- D1. Recent Advances in Geosciences and Geoscience Education

Theme Sessions:

- T1. Recent Advances in Mineral Resources Research and Exploration
- T2. Magmatic Rare Earth Element Ore Deposits and Minerals for the Future

- T3. Mineral Deposits of the Western United States I: A View from the States and Industry
- T4. Undergraduate and Graduate Geoscience Student Lightning Talk Showcase Lightning Session
- T5. The Boring Billion was not so Boring! Mesoproterozoic Tectonics, Sedimentation, and Geochronology of Northwest Laurentia
- T6. Advancements in Geologic Carbon Sequestration in Basalt
- T7. Faults, Fractures, and Fluids: Structural Control of Fluid Flow, Fault Zones, and Hydrothermal Processes
- T8. Geochemistry, Hydrology, and Microbiology in the Yellowstone and Other Western North American Hydrothermal Systems
- T10. Paleontology in the West: Fossils, Localities, Research, and Education in the Rocky Mountain and Cordilleran Regions
- T13. New Developments in the Magmatic Drivers of Cascades Volcanism
- T14. Continental Mafic Volcanism I: Honoring the Career of Vic Camp
- T15. Distributed Volcanic Fields in Western North America (Posters)
- T17. The Highest and the Deepest: the U.S. Frontier of Cave and Karst Research
- T18. Using Geologic and Geophysical Data to Unravel Neotectonics and Long-term Deformation across Cascadia (Posters)
- T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains I
- T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains
- T20. Neotectonics Across the Intermountain West from New Data to Classic Concepts
- T21. Implications of Lithosphere-Crust interactions within the Northern Cordillera
- T22. Management of Hydrologic and Geologic Resources I
- T25. Exceptional Floods in the Cordillera
- T26. Landscape Evolution and Geomorphology of the Greater Pacific Northwest and Northern Rockies
- T27. Undergraduate Research (Posters)
- T28. Mapping the West (Posters)

FIELD TRIPS

Most trips leave from the Davenport Grand Hotel, Hotel Lobby. Please check below for specific field trip departure and return times.

FT401. Elbow Tectonics: Smashing, Translating, and Rotating Outboard Terranes of the Syringa Embayment of the Laurentian Accretionary Margin of Western Idaho. Sun.–Tue, 12–14 May. US\$400. Depart 12 May at 8 a.m., return 14 May by 6 p.m. Russell V. Di Fiori, Idaho Geological Survey, russelld@uidaho.edu; Keegan L. Schmidt, Lewis-Clark State College, klschmidt@lsc.edu; Cody Steven, University of Idaho, csteven@uidaho.edu; Basil Tikoff, University of Wisconsin, basil@geology.wisc.

edu; Ellen Nelson, University of Wisconsin, emnelson8@geology.wisc.edu.

Description: This trip will showcase an array of impressive structures and exotic/continental rock assemblages along the N–S to E–W elbow in the arc-continent boundary of western Idaho. Includes transects across the N–S boundary along the Salmon and South Fork Clearwater Rivers and along the E–W boundary on the main Clearwater River. We will be camping both nights at Hammer Creek Campground near White Bird, ID. For those that want to stay in a hotel there are proximal lodgings, White Bird Motel, Confluence Resort, or Salmon River Resort (but we're leaving it up to the participants to decide and book their own rooms). Pick up/drop off options are available for people not camping. We plan on being back for the rocking Welcome Reception on May 14th!

FT402. Arc Versus River: The Geology of the Columbia River Gorge. Sun.–Tue, 12–14 May. US\$385. Depart 12 May (From Portland) at 8 a.m., return 14 May by 6 p.m. Jim O'Connor, U.S. Geological Survey (USGS), oconnor@usgs.gov; Ray Wells, USGS, rwells@usgs.gov; Scott Bennett, USGS, sekbennett@usgs.gov; Charles Cannon, USGS, ccannon@usgs.gov; Lydia Staisch, USGS, lstaisch@usgs.gov.

Description: The Columbia River Gorge is a deep chasm cutting through the Cascade Range. The unique setting of a continental-scale river crossing an active and deforming volcanic arc has created a dynamic landscape where lava flows, landslides, and tectonic and magmatic deformation compete against fluvial processes to shape the river corridor.

FT403. Geologic Cross Section of the Mesoproterozoic Belt Basin from Rogers Pass, Montana to Sandpoint, Idaho. Sun.–Tue, 12–14 May. US\$450. Meet 12 May (in Missoula) at 7 p.m., return 14 May by 6 p.m. Jim Sears, Emeritus Professor, University of Montana, james.sears@umt.edu; Stuart Parker, Montana Bureau Mines and Geology, sparker1@mtech.edu.

Description: The field trip will focus on the stratigraphy and paleotectonic evolution of the Mesoproterozoic Belt Basin on an E–W transect from the shallow-water facies of the east margin of the basin at Rogers Pass through its deep-water interior near Sandpoint. The transect crosses the northern Rocky Mountains, with beautiful scenery and excellent exposures of the Belt Supergroup. The first day is just an evening meeting in Missoula for discussion, etc.

FT404. Biostratigraphy of Cambrian Metaline Limestone Exposed in the Lafarge Quarry. Tue., 14 May. US\$75. Depart 14 May at 8 a.m., return 14 May at 5 p.m. Glen Schofield, FCGLN01@msn.com.

Description: Explore the Cambrian fossils and tectonic deformation of the Metaline Limestone at the LaFarge quarry in Metaline Falls, NE Washington, Trilobites and other Cambrian fossils reported in 2011 from these quarries refined the age to Early Middle Cambrian and identified new variations of trilobites. Sheared trilobites, deformed pyrite,

and calcite filled fractures also display amazing NW to SE compression from the Severe Orogeny and likely deformation associated with the Newport fault. Come and collect fossils and strain structures with us and enjoy the view.

FT405. Depositional Contacts of Loess-CRB as Analogs for Lunar Regolith, Martian Dust, and the Matrix of Impact Ejecta Breccia Lobes. Tue., 14 May. US\$15. Depart 14 May at 8 a.m., return 14 May at 5 p.m. Shawn Wright, Planetary Science Institute, swright@psi.edu; Mark Sweeney, University of South Dakota, Mark.Sweeney@usd.edu.

Description: Several outcrops in the Spokane region will be investigated. The guidebook and discussion will focus on the composition of the loess from multiple sources, including CRB, along with the amorphous content and composition of Martian dust (remotely), Martian soil (Curiosity Rover), and basaltic impact ejecta (Lunar Crater and theoretical from basalt source). See <https://mars.asu.edu/~spwright/loess-CRB/> for additional information. Field Trip costs offset by NASA Topical Workshops, Symposia, and Conferences.

FT406. Basement, Belt, and Batholith: Bedrock Geology of the Idaho Panhandle. Sat–Sun., 18–19 May. US\$210. Depart 18 May at 8 a.m., return 19 May by 6 p.m. Richard Gaschnig, University of Massachusetts Lowell, richard_gaschnig@uml.edu; Andy Buddington, Spokane Community College, Andy.Buddington@scc.spokane.edu; Reed Lewis, Idaho Geological Survey, University of Idaho, reedl@uidaho.edu.

Description: This trip will showcase the geology of the Idaho Panhandle with a focus on Archean and Proterozoic basement gneisses, the Mesoproterozoic Belt Supergroup, and the Cretaceous Kaniksu batholith.

FT407. Stratigraphy, Eruption, and Evolution of the Columbia River Basalt Group. Sat.–Mon., 18–20 May. Cost: US\$450. Depart 18 May at 8 a.m., return 20 May by 6 p.m. Vic Camp, San Diego State University, vcamp@sdsu.edu; John Wolff, Washington State University, jawolff@wsu.edu; Arron Steiner, Washington State University, arron@wsu.edu; Evan Soderberg, Washington State University, evan.soderberg@wsu.edu; Rachele Hart, Washington State University, rachele.hart@wsu.edu.

Description: The Columbia River Basalt Group is world famous as the best studied continental flood basalt province on Earth. This two-and-a-half-day field trip to the eastern Columbia Plateau will focus on the basalt flow sequence, dikes, vents, evolution of the basaltic magmas, and their relation to the larger Yellowstone Hotspot Province. The locations to be visited are in and adjacent to the canyon country of southeast Washington, western Idaho, and northeast Oregon, and feature feeder dikes, near-vent associations, and thick plateau basalt lava sequences. The formations to be examined include the Imnaha, Grande Ronde, and Wanapum Basalts. The stops are mostly roadside and involve walking a short distance (no strenuous physical

activity). Accommodation is double-occupancy hotel rooms (single rooms available at extra cost). The trip will depart from and return to Spokane.

FT408. Unscrambling the Proterozoic Supercontinent Record of Northeastern Washington State. Sat., 18 May. Cost: US\$75. Depart 18 May at 8 a.m., return 18 May by 6 p.m. Daniel T. Brennan, Montana Bureau of Mines and Geology, dbrennan@mtech.edu; Stephen E. Box, United States Geological Survey, sbox@usgs.gov; Athena Eyster, Tufts University, Athena.Eyster@tufts.edu.

Description: Northeastern Washington State contains a unique Proterozoic record that spans two Supercontinents, and is perhaps the most complete stratigraphic record of the “Boring Billion” in the western US. This field trip includes 11 planned stops over a single day and will cover the geology of the Belt Supergroup, Deer Trail Group, Buffalo Hump Formation and Windermere Supergroup in the region just north of Spokane. Topics will span from historic regional economic geology, to original mapping and more recent isotopic provenance data, with discussion of their local to global implications. This field trip will start and end at the Spokane convention center, and will consist of mostly roadside stops with minimal hiking.

FT409. A Tour of the Fabulous Coeur d’Alene Mining District, Shoshone County, Idaho. Sat., 18 May. Cost: US\$50. Bus Transportation sponsored by HECLA. Depart 18 May at 8 a.m., return 18 May by 6 p.m. Earl Bennet, University of Idaho, bennett@uidaho.edu; Steve Petroni, HECLA (retired), petronisteve@gmail.com.

Description: The Coeur d’Alene Mining District in northern Idaho is one of the largest silver-producing districts in the world. From the beginning of lode mining in 1884, the district’s mines have produced over 1.25 billion ounces of silver, 8.5 million tons of lead, 3.4 million tons of zinc, and byproduct antimony, cadmium, copper, and gold. The total historic value of this production is over \$7.4 billion. This one-day bus tour will discuss the regional geology and history of Silver Valley, Idaho. Includes lunch stop at Wallace Inn.

FT410. Cataclysmic, Ice Age Megafloods through the Cheney-Palouse Scabland Tract. Sat.–Sun., 18–19 May. Cost: US\$330. Depart 18 May at 8 a.m., return 19 May by 6 p.m. Bruce Bjornstad, bjorn99352@yahoo.com; Eugene Kiver, Eastern Washington University, frogghollow@sisna.com.

Description: It’s been a hundred years since J. Harlen Bretz first presented his outrageous hypothesis for ice age megafloods within the Channeled Scablands of eastern Washington. This two-day field excursion will examine the evidence for multiple megafloods within the Cheney-Palouse Scabland Tract, including some going back to the early Pleistocene.

FT411. Uncovering a Miocene Forest in Ancient Lake Clarkia. Sat., 18 May. Cost: US\$75. Depart 18 May at 8 a.m., return 18 May by 6 p.m. Lindsay MacKenzie, Eastern Washington University, lmackenzie1@ewu.edu; Renee Love, University of Idaho, rlove@uidaho.edu; Ian Spendlove, University of Idaho, spen2878@vandals.uidaho.edu.

Description: Discover the ancient flora and fauna preserved in ancient Lake Clarkia during the mid-Miocene Climatic Optimum. Modern and historical paleobiological sites of the Clarkia Fossil Beds Lagerstätte in northern Idaho will be investigated. Current and future research of the sites will be discussed and fossil collection will be permitted.

SHORT COURSES

Short courses are located at the Davenport Grand. Please see below for specific location and time of short course.

SC501: Preparing Your Students for the Jobs They Want. Tues., 14 May, 9 a.m.–noon. Meeting Room #1, 1st floor. Cost: US\$25 students/US\$50 professionals. Anne Egger, NAGT and Central Washington University, Anne.Egger@cwu.edu; Karen Viskupic, Boise State University, karenviskupic@boisestate.edu.

Description: In this short course, we will help you make more explicit connections between the skills you are building in your undergraduate geoscience programs and the skills that geoscience employers seek. You will explore what we know about what employers want and strategies to integrate workforce skills into your courses and programs.

SC502: Getting the Most Out of Your TA Experience. Tues., 14 May, 1–4 p.m. Meeting Room #1, 1st floor. Cost: US\$25 students/US\$50 professionals. Anne Egger, NAGT and Central Washington University, Anne.Egger@cwu.edu; Karen Viskupic, Boise State University, karenviskupic@boisestate.edu.

Description: In this short course, we will help graduate students build their skills as teaching assistants (TAs) and articulate those skills for future careers. Participants will develop skills in facilitating learning activities, explore strategies for fostering inclusive learning environments, and recognize and communicate the skills they develop as a TA.

SC503: Teaching Quantitative Reasoning Using Data: Project EDDIE. Tues., 14 May, 1–4:30 p.m. Meeting Room #2, 1st floor. Cost: US\$25 students/US\$50 professionals. Carmen Nezat, Eastern Washington University, cnezat@ewu.edu.

Description: This short course will focus on teaching scientific concepts using data exploration and open inquiry. Participants will build expertise in teaching quantitative reasoning using Environmental Data-Driven Inquiry and Exploration (EDDIE) modules that include topics from multiple environmental disciplines with a flexible structure to fit

all teaching situations. Visit <https://serc.carleton.edu/eddie/index.html> for more information on Project EDDIE.

KEYNOTE SPEAKERS

Wednesday, 15 May, 6–7:30 p.m., Cedar Ballroom



Keynote Speaker: Nicholas Zentner, join Nick Zentner, Department of Geological Sciences at Central Washington University, for a screening of his recent public television show, “Nick on the Rocks!” followed by a Q&A. To prepare for the evening please join his 85k+ subscribers and check out Nick’s amazing YouTube collection of illuminating films and amazing interviews, <https://www.youtube.com/@GeologyNick>.” Or check out his website at: <https://www.nickzentner.com/>

Thursday, 16 May, 6–7:30 p.m., Cedar Ballroom



Keynote Speaker: Dr. Jon Major, Jon Major is the Scientist-in-Charge, and a research hydrologist, with the

U.S. Geological Survey Cascades Volcano Observatory in Vancouver, Washington. He received his B.S. from University of Dayton, M.S. from Penn State, and Ph.D. from the Department of Geological Sciences at the University of Washington. His research focuses on physical responses to landscape disturbances, particularly in volcanic river systems. He has worked at volcanoes in Washington, Oregon, Alaska, El Salvador, Chile, and the Philippines. He has been working at Mount St. Helens since 1981 and has been with the USGS Cascades Volcano Observatory since 1983.

ENJOY A 45-MINUTE FULL-BODY FITNESS CLASS!

Join Anita Monk-Ryan, GSA Finance Director, in a 6:15 a.m. low-impact fitness class in the Terrace Room West, 2nd floor. Each class we will do a warm-up, low-impact cardio, muscle toning, and a cool-down. What do you need?

- **Athletic shoes** – running, cross trainers, walkers, court shoes any of these will work as long as you are comfortable and can move in them.
- **Comfortable clothing** – leggings, sweatpants, shorts, t-shirts, tank tops. Anything that you will feel comfortable sweating in.
- **Water bottle** – hydration and it can be used as resistance for the muscle toning sections.
- **Towel** – used to wipe sweat and for the floor if you decide to take on the extra challenge.
- **SMILE!** – even if you can’t when you get there, I hope the class will give you positive energy for the rest of the day.

OTHER RESOURCES

- Right across the road from The Davenport Grand is a 64-mile long paved trail, know as the Centennial Trail. It is an excellent place to walk, run, or bike: <https://spokanecentennialtrail.org/>
- Visit Spokane, <https://www.visitspokane.com/> has a lot of great information on hiking, climbing and mountain biking: <https://www.visitspokane.com/things-to-do/recreation/>
- We will be celebrating the 50th anniversary of the Spokane EXPO 74, with lots of activities: <https://www.visitspokane.com/expo-50/>
- Some local research of Spokane County Conservation areas: <https://www.spokanecounty.org/1702/Research>
- Walking tour of geology of building stones in Spokane: https://www.dnr.wa.gov/Publications/ger_spokane_building_stone.pdf
- Interactive Geologic Map of Washington: <https://www.dnr.wa.gov/geologyportal>

FIELD TRIP FRIDAY!

Friday, 17 May, 1:30–4 p.m. Leave the Davenport Grand and walk through Riverfront Park. Upper Falls Dam Power house (Stop 4) will be open to see the turbine and historic building from 2 –3 p.m.. The combined sewer overflow (CSO) tank (Stop 7) will be open from 2:30–3:30 p.m. Volunteers will be stationed at each of the seven stops to

help. A .pdf of the field guide is available to download from the meeting website (during the meeting and for a couple weeks following, after which it will be available in the bookstore for purchase). Additionally, you can access a virtual field trip guide at: <https://storymaps.arcgis.com/stories/ac6eaa8743ed47949be3226bbf0e4027> or by scanning the QR code below.

The Geological Society of America
Field Guide 69

*Geologic and anthropologic history of Riverfront Park, Spokane, Washington, USA**

C.J. Pritchard
T. Morton
J. Imel
S. King
B. Vandenhaak
S. Warren

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ABSTRACT

Riverfront Park in Spokane, Washington, USA, hosts a wide range of sites that highlight the interplay between prominent geologic features and the cultural development of Spokane. Stops in this field guide illustrate such topics as the impacts of historic Silver Valley mining, extraordinary fluvial incisions in Miocene Columbia River Basalt Group flows, cataclysmic alterations to the Spokane River valley from Pleistocene megafloods, earthquake hazards, hydroelectric generation, stormwater management solutions, and fascinating historical tidbits. Human interactions with the land began with the Interior Salish-speaking tribes, who have inhabited this region for thousands of years and historically gathered at the falls to fish. After European American influx, the Spokane River has been harnessed for many uses, including mills, water supply, irrigation, flood control, and hydropower. Today, Riverfront Park is the core of downtown Spokane, providing community access to the river and the largest urban waterfall in the United States.

INTRODUCTION

The City of Spokane was originally an area in which the Spokane Tribe resided. After the initial influx of European Americans in the early nineteenth century, regional mining discoveries and the arrival of railways contributed to a boom in

population growth. On 29 November 1881, Spokane became an incorporated city. In 1889, the Great Spokane Fire destroyed the downtown area and helped shape much of the city development as will be discussed later. The 1974 World's Fair, known as the International Exposition of the Environment (EXPO), was hosted by Spokane 50 years ago in 1974 from 4 May to 3 November.

*Please see the associated story map for this field trip at <https://storymaps.arcgis.com/stories/ac6eaa8743ed47949be3226bbf0e4027> or scan the QR code.



Pritchard, C.J., Morton, T., Imel, J., King, S., Vandenhaak, B., and Warren, S., 2024, Geologic and anthropologic history of Riverfront Park, Spokane, Washington, USA, in McFadden, M.D., and Pritchard, C.J., eds., Proterozoic Nuna to Pleistocene Megafloods: Sharing Geology of the Inland Northwest: Geological Society of America Field Guide 69, p. 67–79. [https://doi.org/10.1130/2024.0069\(04\)](https://doi.org/10.1130/2024.0069(04)). © 2024 The Geological Society of America. All rights reserved. For permission to copy, contact editing@geosociety.org.

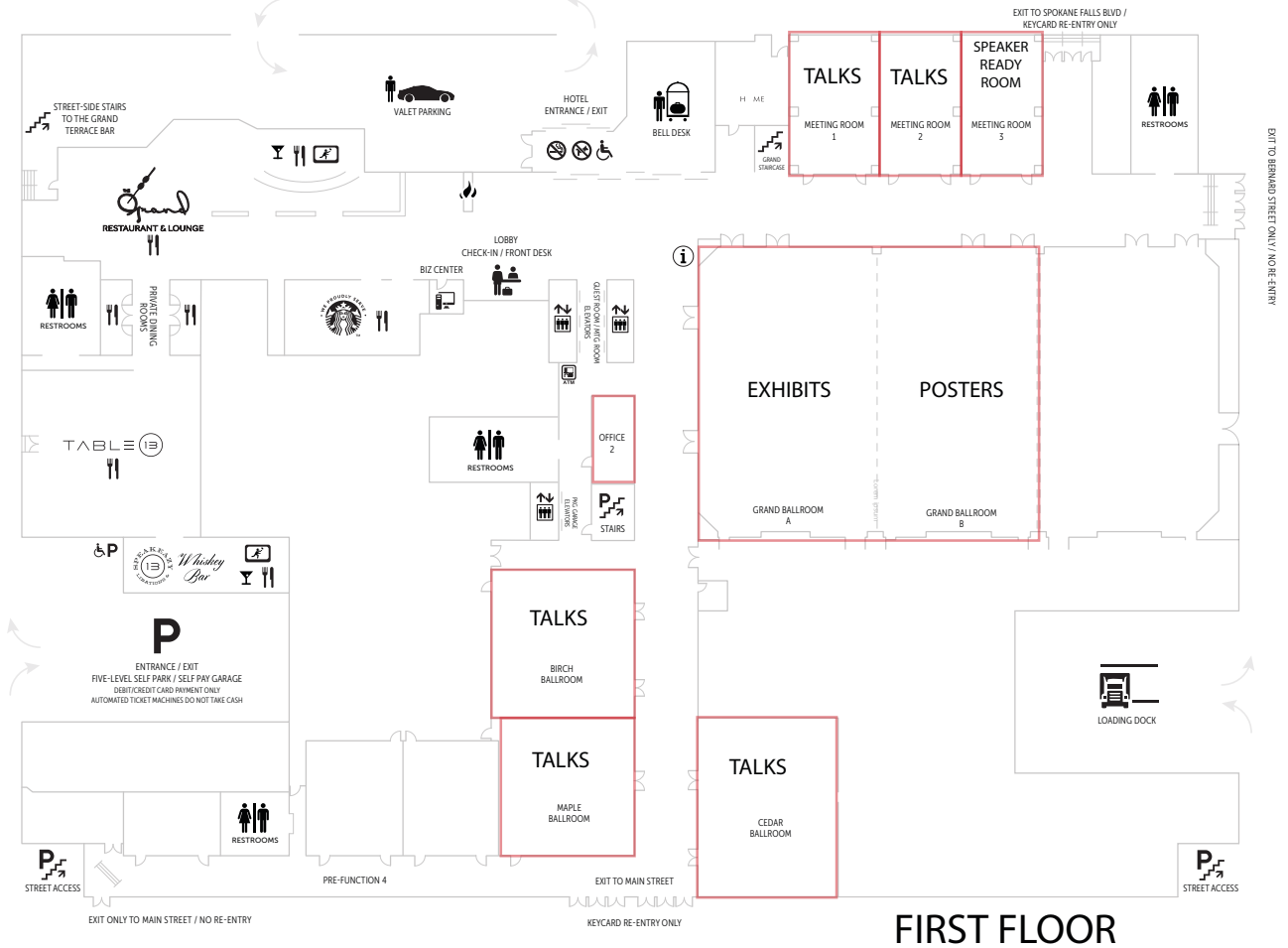
Schedule of Events

EVENT	TIME	LOCATION
SUNDAY, 12 MAY		
Field Trip 401. Elbow Tectonics: Smashing, Translating, and Rotating Outboard Terranes of the Syringa Embayment of the Laurentian Accretionary Margin of Western Idaho	<i>Depart 12 May at 8 a.m.; return 14 May by 6 p.m.</i>	Lobby
Field Trip 402. Arc Versus River: The Geology of the Columbia River Gorge	<i>Depart 12 May at 8 a.m.; return 14 May by 6 p.m.</i>	Lobby
Field Trip 403. Geologic Cross Section of the Mesoproterozoic Belt Basin from Rogers Pass, Montana to Sandpoint, Idaho	<i>Depart 12 May at 7 p.m.; return 14 May by 6 p.m.</i>	Leaving from Missoula
TUESDAY, 14 MAY		
Field Trip 404. Biostratigraphy of Cambrian Metaline Limestone Exposed in the Lafarge Quarry	8 a.m.–5 p.m.	Lobby
Field Trip 405. Depositional Contacts of Loess–CRB as Analogs for Lunar Regolith, Martian Dust, and the Matrix of Impact Ejecta Breccia Lobes	8 a.m.–5 p.m.	Lobby
Short Courses 501. Preparing Your Students for the Jobs They Want	9 a.m.–noon	Meeting Room 1
Short Courses 502. Getting the Most Out of Your TA Experience	1–4 p.m.	Meeting Room 1
Short Courses 503. Teaching Quantitative Reasoning Using Data: Project EDDIE	1–4:30 p.m.	Meeting Room 2
Exhibits: Set Up	noon–4 p.m.	Grand Ballroom
Registration	4–8 p.m.	Hallway outside Grand Ballroom
Speaker Ready Room	4–8 p.m.	Meeting Room 3
Welcoming Reception	5–7:30 p.m.	Grand Ballroom
Exhibits Open	5:30–8 p.m.	Grand Ballroom
WEDNESDAY, 15 MAY		
Low Impact Fitness Class	6:15–7 a.m.	Terrace Room West
Session Chair Orientation	7–7:15 a.m.	Meeting Room 2
Speaker Ready Room	7 a.m.–5 p.m.	Meeting Room 3
Registration	7 a.m.–6 p.m.	Hallway outside Grand Ballroom
Exhibits	8 a.m.–6 p.m.	Grand Ballroom
Morning Oral Technical Sessions		
T1. Recent Advances in Mineral Resources Research and Exploration	8 a.m.–noon	Birch Ballroom
T6. Advancements in Geologic Carbon Sequestration in Basalt	8 a.m.–noon	Meeting Room 2
T14. Continental Mafic Volcanism I: Honoring the Career of Vic Camp	8 a.m.–noon	Meeting Room 1
T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains I	8 a.m.–noon	Maple Ballroom
T25. Exceptional Floods in the Cordillera	8 a.m.–noon	Cedar Ballroom
Poster Sessions (presenters available from 4–5:30)		
T1. Recent Advances in Mineral Resources Research and Exploration (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T6. Advancements in Geologic Carbon Sequestration in Basalt (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T10. Paleontology in the West: Fossils, Localities, Research, and Education in the Rocky Mountain and Cordilleran Regions (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T13. New Developments in the Magmatic Drivers of Cascades Volcanism (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T18. Using Geologic and Geophysical Data to Unravel Neotectonics and Long-term Deformation across Cascadia (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T22. Management of Hydrologic and Geologic Resources (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T25. Exceptional Floods in the Cordillera (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
Geoscience Career Program Workshop Part 1: Career Planning and Informational Interviewing	9–10 a.m.	Terrace Room East

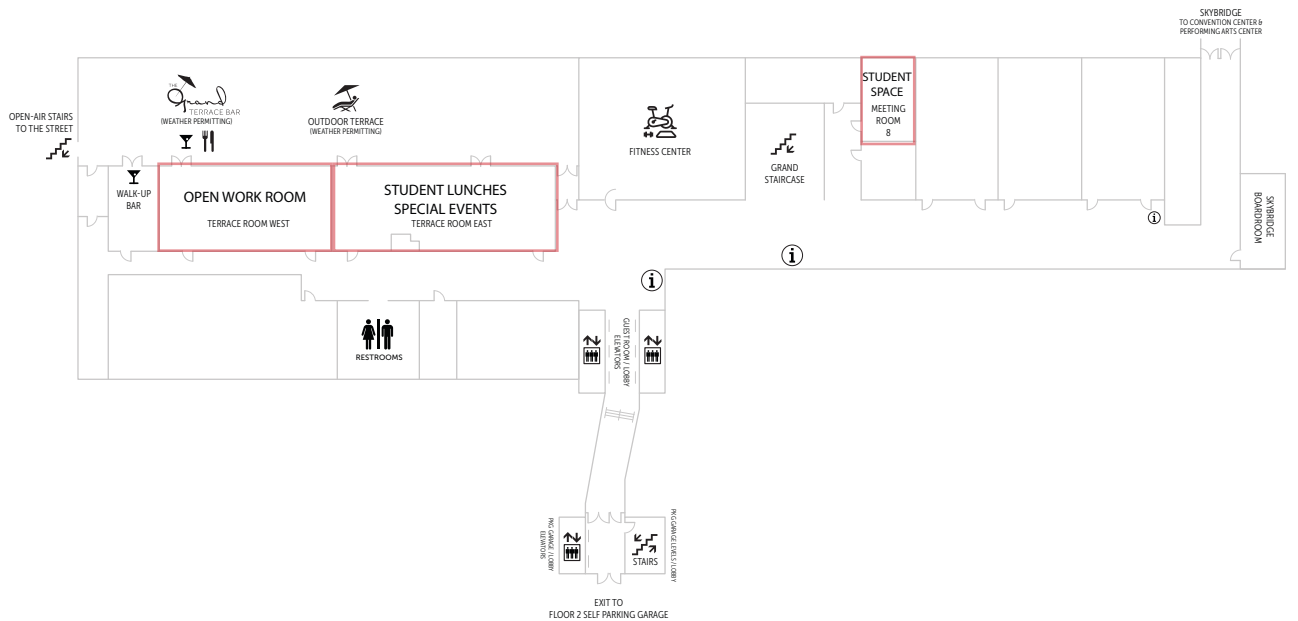
EVENT	TIME	LOCATION
Geoscience Career Program Workshop Part 2: Geoscience Career Exploration	10–11 a.m.	Terrace Room East
Roy J. Shlemon Mentors Program in Applied Geoscience	12–1:30 p.m.	Terrace Room East
Afternoon Oral Technical Sessions		
T2. Magmatic Rare Earth Element Ore Deposits and Minerals for the Future	1:30–5:30 p.m.	Birch Ballroom
T7. Faults, Fractures, and Fluids: Structural Control of Fluid Flow, Fault Zones, and Hydrothermal Processes	1:30–5:30 p.m.	Meeting Room 2
T14. Continental Mafic Volcanism II: Honoring the Career of Vic Camp	1:30–5:30 p.m.	Meeting Room 1
T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains II	1:30–5:30 p.m.	Maple Ballroom
T26. Landscape Evolution and Geomorphology of the Greater Pacific Northwest and Northern Rockies	1:30–5:30 p.m.	Cedar Ballroom
Geology Club Meetup	2–3 p.m.	Terrace Room East
Happy Hour	5–6 p.m.	Grand Ballroom, Exhibits Hall
Keynote Speaker: Nicholas Zentner	6–7:30 p.m.	Cedar Ballroom
THURSDAY, 16 MAY		
Low Impact Fitness Class	6:15–7 a.m.	Terrace Room West
GSA Rocky Mountain Executive Committee Management Board Meeting Breakfast (Invitation Only)	7–8:30 a.m.	Terrace Room East
Session Chair Orientation	7–7:15 a.m.	Meeting Room 2
Speaker Ready Room	7 a.m.–5 p.m.	Meeting Room 3
Registration	7 a.m.–6 p.m.	Hallway outside Grand Ballroom
Exhibits	8 a.m.–6 p.m.	Grand Ballroom
Morning Oral Technical Sessions		
T3. Mineral Deposits of the Western United States I: A View from the States and Industry	8 a.m.–noon	Birch Ballroom
T5. The Boring Billion was not so Boring! Mesoproterozoic Tectonics, Sedimentation, and Geochronology of Northwest Laurentia I	8 a.m.–noon	Cedar Ballroom
T10. Paleontology in the West: Fossils, Localities, Research, and Education in the Rocky Mountain and Cordilleran Regions	8 a.m.–noon	Meeting Room 1
T15. Distributed Volcanic Fields in Western North America	8 a.m.–noon	Meeting Room 2
T22. Management of Hydrologic and Geologic Resources I	8 a.m.–noon	Maple Ballroom
Poster Sessions (presenters available from 4–5:30 p.m.)		
T3. Mineral Deposits of the Western United States: A View from the States and Industry (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T15. Distributed Volcanic Fields in Western North America (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
T27. Undergraduate Research (Posters)	9 a.m.–5:30 p.m.	Grand Ballroom
Geoscience Career Program Workshop Part 3: Cover Letters, Résumés, and CVs	9–10 a.m.	Terrace Room East
John Mann Mentors Program in Applied Hydrogeology	12–1:30 p.m.	Terrace Room East
Afternoon Oral Technical Sessions		
D1. Recent Advances in Geoscience and Geoscience Education	1:30–5:30 p.m.	Meeting Room 1
T3. Mineral Deposits of the Western United States II: A View from the States and Industry	1:30–5:30 p.m.	Birch Ballroom
T5. The Boring Billion was not so Boring! Mesoproterozoic Tectonics, Sedimentation, and Geochronology of Northwest Laurentia II	1:30–5:30 p.m.	Cedar Ballroom
T17. The Highest and the Deepest: the U.S. Frontier of Cave and Karst Research	1:30–5:30 p.m.	Meeting Room 2
T22. Management of Hydrologic and Geologic Resources II	1:30–5:30 p.m.	Maple Ballroom

EVENT	TIME	LOCATION
GSA Rocky Mountain and Cordilleran Executive Committee Section Business Meeting	5–6 p.m.	Terrace Room East
Happy Hour	5–6 p.m.	Grand Ballroom, Exhibits Hall
Keynote Speaker: Dr. Jon Major	6–7:30 p.m.	Cedar Ballroom
FRIDAY, 17 MAY		
Low Impact Fitness Class	6:15–7 a.m.	Terrace Room West
Session Chair Orientation	7–7:15 a.m.	Meeting Room 2
Speaker Ready Room	7–10 a.m.	Meeting Room 3
Registration	7 a.m.–1 p.m.	Hallway outside Grand Ballroom
Exhibits	8 a.m.–2 p.m.	Grand Ballroom
Morning Oral Technical Sessions		
T4. Undergraduate and Graduate Geoscience Student Lightning Talk Showcase	8 a.m.–noon	Birch Ballroom
T8. Geochemistry, Hydrology, and Microbiology in the Yellowstone and Other Western North American Hydrothermal Systems	8 a.m.–noon	Meeting Room 2
T13. New Developments in the Magmatic Drivers of Cascades Volcanism	8 a.m.–noon	Meeting Room 1
T20. Neotectonics Across the Intermountain West from New Data to Classic Concepts	8 a.m.–noon	Maple Ballroom
T21. Implications of Lithosphere–Crust interactions within the Northern Cordillera	8 a.m.–noon	Cedar Ballroom
Poster Sessions (presenters available from noon–1:30)		
D1. Recent Advances in Geoscience and Geoscience Education (Posters)	9 a.m.–1:30 p.m.	Grand Ballroom
T4. Undergraduate and Graduate Geoscience Student Lightning Talk Showcase (Posters)	9 a.m.–1:30 p.m.	Grand Ballroom
T28. Mapping the West (Posters)	9 a.m.–1:30 p.m.	Grand Ballroom
Guide Yourself Field Trip of Riverfront Park	1:30–4 p.m.	Davenport Grand Hotel
Exhibits: Tear Down	2–5 p.m.	Grand Ballroom
SATURDAY, 18 MAY		
Field Trip 406. Basement, Belt, and Batholith: Bedrock Geology of the Idaho Panhandle	Depart 18 May at 8 a.m.; return 19 May by 6 p.m.	Lobby
Field Trip 407. Stratigraphy, Eruption, and Evolution of the Columbia River Basalt Group	Depart 18 May at 8 a.m.; return 20 May by 6 p.m.	Lobby
Field Trip 408. Unscrambling the Proterozoic Supercontinent Record of Northeastern Washington State	8 a.m.–6 p.m.	Lobby
Field Trip 409. A Tour of the Fabulous Coeur d'Alene Mining District, Shoshone County, Idaho	8 a.m.–6 p.m.	Lobby
Field Trip 410. Cataclysmic, Ice Age Megafloods through the Cheney–Palouse Scabland Tract	Depart 18 May at 8 a.m.; return 19 May by 6 p.m.	Lobby
Field Trip 411. Uncovering a Miocene Forest in Ancient Lake Clarkia	8 a.m.–6 p.m.	Lobby

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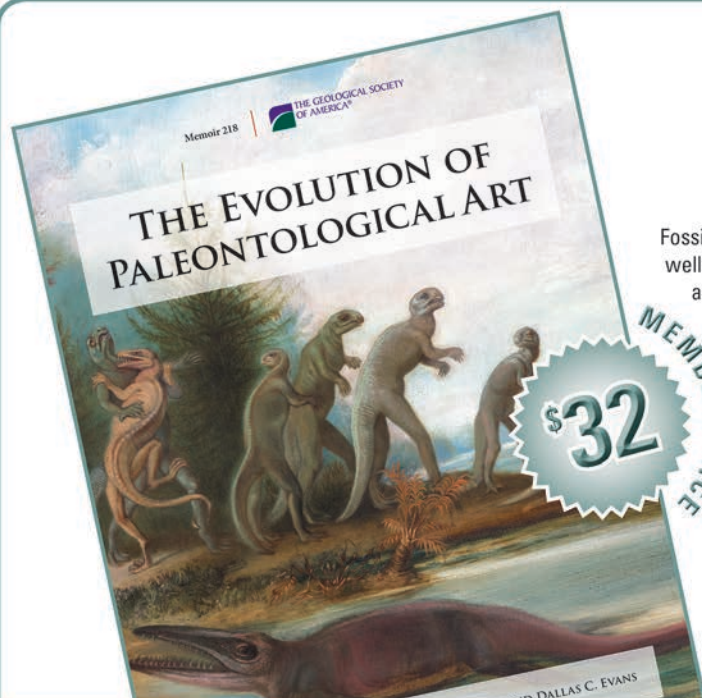
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Technical Sessions



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* denotes speaker

WEDNESDAY, 15 MAY 2024

ORAL TECHNICAL SESSIONS

SESSION NO. 1

T1. Recent Advances in Mineral Resources Research and Exploration (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

8:00 AM, Davenport Grand Hotel, Birch Ballroom

Niki Wintzer and Allen Andersen, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 1-1 8:05 AM Funk, Jonathan*; Anderson, Eric D.: **PRELIMINARY GEOLOGIC INTERPRETATIONS DERIVED FROM EARTH MRI GEOPHYSICAL DATA COLLECTED OVER THE BULL MOUNTAIN AREA, SOUTHWEST MONTANA**
- 1-2 8:25 AM Anderson, Eric*; Funk, Jonathan; Eastman, Kyle; Scarberry, Kaleb C.; Rossi, Amanda; Guzman, Mario; Magnin, Benjamin; Mercer, Cameron; Cosca, Michael; Lund, Karen; Dilles, John: **EARTH MRI GEOPHYSICAL DATA PROVIDE INSIGHTS INTO THE GEOLOGY AND MINERAL SYSTEMS OF THE RADERSBURG AND ELKHORN MINING DISTRICTS, MONTANA**
- 1-3 8:45 AM Guzman, Mario*: **AN INVESTIGATION OF QUARTZ-SULFIDE VEIN FORMATION AND DEPTH CONDITIONS BY QUARTZ AND FLUID INCLUSION PETROGRAPHIC ANALYSES FROM THE WINSTON AND DIAMOND HILL MINING DISTRICTS, ELKHORN MOUNTAINS, MONTANA**
- 1-4 9:05 AM Brimhall, George*: **AN OPERATIVE PORPHYRY COPPER MODEL BASED ON THE REDOX THERMODYNAMICS AND TRANSPORT OF GASEOUS HYDROGEN**
- 1-5 9:25 AM Gammons, Christopher*; Eastman, Kyle; Beaucamp, Celine; Thompson, Jay: **TRACE METAL COMPOSITION OF FLUORESCENT SPHALERITE FROM BUTTE, MONTANA**
- 9:45 AM **BREAK**
- 1-6 10:00 AM Hendrix, Marc S.*; Van Rythoven, Adrian: **RARE EARTH ELEMENTAL ANALYSIS OF PHOSPHATIC FACIES**

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- 1-7 10:20 AM Hammerli, Johannes*; Rein, Isabelle; Jenkins, David; Boroughs, Scott; Collins, David: **TRACING THE ORIGINS OF FLUIDS IN MINERALIZED SYSTEMS THROUGH HALOGEN RATIOS IN SCAPOLITE: TRANSITIONING FROM EXPERIMENTAL STUDIES TO PRACTICAL APPLICATION**
- 1-8 10:40 AM Carey, Nathan*; Jowitt, Simon M.; Mills, Stephanie: **EXPLORATION FOR OVERPRINTING DEPOSIT STYLES IN THE BASIN AND RANGE; INSIGHTS FROM A DETAILED STUDY OF W-MO-CU MINERALIZATION IN GOLD HILL, UTAH**
- 1-9 11:00 AM Watts, Kathryn E.*; Henry, Christopher D.: **MELT INCLUSION RECORD OF LITHIUM-RICH MAGMAS AT MCDERMITT CALDERA, WESTERN USA**
- 1-10 11:20 AM Case, George*; Regan, Sean P.: **GEOCHEMICAL CONSTRAINTS ON MELT SOURCE AND FRACTIONATION OF LITHIUM-MINERALIZED RARE METAL GRANITES, SEWARD PENINSULA, ALASKA**
- 11:40 AM **CONCLUDING REMARKS**

SESSION NO. 2

T6. Advancements in Geologic Carbon Sequestration in Basalt (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

8:00 AM, Davenport Grand Hotel, Meeting Room 2

Lee Florea, William Gallin and Todd Schaeff, Presiding

- 2-1 8:00 AM Gallin, William*; Florea, Lee: **THE CURRENT STATE OF RESEARCH AND COMMERCIAL GEOLOGIC CARBON SEQUESTRATION IN BASALT AND ULTRAMAFIC ROCKS**
- 2-2 8:20 AM Snæbjörnsdóttir, Sandra*; Helgason, Kári; Sigfusson, Bergur; Davidson, Casie; Schaeff, Todd: **ADVANCING CO₂ STORAGE THROUGH CARBON MINERALIZATION IN THE US**

- 2-3 8:40 AM Snæbjörnsdóttir, Sandra; Sigfússon, Bergur; Voigt, Martin; Helgason, Kári*: **SEASTONE: THE FIRST INJECTION OF SEAWATER-DISSOLVED CO₂ INTO REACTIVE BASALT**
- 2-4 9:00 AM Miller, Quin*; Bartels, Madeline F.; Battu, Anil; Cao, Ruoshi; Lahiri, Nabajit; Nagurney, Allie; Nienhuis, Emily; Stanfield, C. Heath; Schaef, Todd: **STORAGE POTENTIAL, REACTION KINETICS, AND POROSITY EVOLUTION DURING CARBON MINERALIZATION IN BASALT FORMATIONS**
- 2-5 9:20 AM Atkinson, Trevor*; Neupane, Ghanashyam; McLing, Travis L.; Kumar, Ram; Li, Mengnan; Smith, Robert W.; Earnest, Evan; Cheshire, Michael C.; Wigand, Marcus: **BATCH REACTION EXPERIMENTAL RESULTS AND REACTIVE TRANSPORT MODELING EVALUATION OF AQUEOUS CO₂-BASALT REACTIVITY IN THE SNAKE RIVER PLAIN, IDAHO, USA**
- 2-6 9:40 AM Nienhuis, Emily*; Miller, Quin; Nagurney, Allie; Lahiri, Nabajit; Marcial, Jose; Schaef, Todd: **PARAMETERIZING THE REACTIVITY OF THE GLASSY MESOSTASIS IN BASALT RESERVOIRS**
- 10:00 AM **BREAK**
- 2-7 10:15 AM Cao, Ruoshi*; Reidel, Stephen; Simo, Jana; Schaef, Todd: **HIGH INJECTIVITY AND REACTIVITY HYALOCLASTITE RESERVOIRS FOR CARBON MINERALIZATION STORAGE IN COLUMBIA RIVER BASIN**
- 2-8 10:35 AM Terry, Olivia*; Kou, Zuhao; Shen, Tianxiao; Kelly, Shaina: **UNDERSTANDING LONG-TERM CO₂-DRIVEN ALTERATION OF BASALT PORE STRUCTURES THROUGH NEWBERRY VOLCANO, OREGON, USA**
- 2-9 10:55 AM Earnest, Evan*; Huebner-Diaz, Laura; Vitel, Sarah; Rasouli, Pejman; Colldeweih, Rachael; Atkinson, Trevor; McLing, Travis L.: **SITE CHARACTERIZATION AND MODELING FOR AN IN-SITU CARBON MINERALIZATION PILOT IN THE EASTERN SNAKE RIVER PLAIN BASALTS, IDAHO, USA**
- 2-10 11:15 AM Okoko, George*; Pahwa, Aveer; Goldberg, David S.; Kolawole, Folarin; Kinney, Sean; Olsen, Paul E.: **CENTRAL ATLANTIC MAGMATIC PROVINCE BASALTS: CORE-LOG CORRELATION, INTEGRATION AND CO₂ STORAGE OPPORTUNITIES**
- 2-11 11:35 AM Nagurney, Allie*; Miller, Quin; Lahiri, Nabajit; Motkuri, Radha; Gallin, William; Marcial, Jose; Jain, Prarabdh; Gadikota, Greeshma; Schaef, Todd: **POTENTIAL FOR CARBON MINERALIZATION AND CRITICAL MINERAL RECOVERY IN THE TWIN SISTERS DUNITE, NORTHWESTERN WASHINGTON, UNITED STATES**
- 11:55 AM **CONCLUDING REMARKS**

SESSION NO. 3

T14. Continental Mafic Volcanism I: Honoring the Career of Vic Camp (GSA Geophysics and Geodynamics Division)

8:00 AM, Davenport Grand Hotel, Meeting Room 1

Arron Steiner, John Wolff and Emily Cahoon, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 3-1 8:05 AM Humphreys, Eugene*: **SEISMIC STRUCTURE BENEATH THE COLUMBIA RIVER FLOOD BASALT EVENT, AND ITS SIGNIFICANCE**
- 3-2 8:25 AM Camp, Victor*; Wolff, John: **TWO-STAGE MODEL FOR YELLOWSTONE PLUME EMPLACEMENT AND EVOLUTION OF THE COLUMBIA RIVER FLOOD BASALT**
- 3-3 8:45 AM Wolff, John*; Camp, Victor; Ramos, Frank; Hart, Rachelle: **A SEVERED HEAD: CHEMICAL LINKS BETWEEN SILETZIA AND THE COLUMBIA RIVER FLOOD BASALTS**
- 3-4 9:05 AM Self, Stephen*: **HOW THE CRB TAUGHT US TO INTERPRET LAVAS IN THE DECCAN PROVINCE**
- 3-5 9:25 AM Sisson, Thomas*; Bedrosian, Paul; Calvert, Andy; Champion, Duane; Dietterich, Hannah; Downs, Drew; Langenheim, Vickie; Mahood, Gail; Mooney, Walter; Peacock, Jared;

Robinson, Joel; Salters, Vincent; Sherrod, Dave; Stelten, Mark: **HARRAT RAHAT REVISITED – NEW RESULTS ON AN ARABIA PLATE VOLCANIC FIELD PREVIOUSLY STUDIED BY VIC CAMP AND JOHN ROOBOL**

- 3-6 9:45 AM Grunder, Anita*; Streck, Martin J.: **SILICIC VOLCANISM AS A TRACER FOR COLUMBIA RIVER FLOOD BASALT VOLCANISM**
- 3-7 10:05 AM Streck, Martin*; Cahoon, Emily; Swenton, Vanessa: **REVISITING COMPOSITION AND TIMING OF EARLIEST CRBG VOLCANISM AND CONTEXT TO LATER CRBG UNITS AS WELL AS TO ASSOCIATED SILICIC MAGMATISM**
- 10:25 AM **BREAK**
- 3-8 10:40 AM Biasi, Joseph*: **FIELD INDICATORS OF DIKE LONGEVITY IN FLOOD BASALT PROVINCES**
- 3-9 11:00 AM Sweeten, Rachel*; Streck, Martin J.; Ziff, Heather; Wolff, John; Koppers, Anthony A.P.; Muirhead, James D.: **GEOCHEMISTRY AND GEOCHRONOLOGY OF THE STEENS AND MONUMENT DIKE SWARM: IMPLICATIONS AND RELATIONSHIPS TO LAVA FLOWS OF THE PICTURE GORGE AND STEENS BASALT**
- 3-10 11:20 AM Mass, Mary J.*; Streck, Martin J.; Wolff, John; Koppers, Anthony A.P.; Muirhead, James D.; Steiner, Ashley: **NEW INSIGHTS INTO THE GEOCHEMICAL AND GEOCHRONOLOGICAL HISTORY OF THE CHIEF JOSEPH DIKE SWARM AND THE FLOW DYNAMICS OF DIKE EMPLACEMENT**

SESSION NO. 4

T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains I (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

8:00 AM, Davenport Grand Hotel, Maple Ballroom

David Pearson and Ryan B. Anderson, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 4-1 8:05 AM Balgord, Elizabeth*; Yonkee, Adolph; Henroid, Jon; Olsen, Kara; Knight, Logan; Tanner, Nathan; Rabosky, Kristin: **AGE, PROVENANCE, AND HF ISOTOPIC SIGNATURES OF THE FARMINGTON CANYON COMPLEX, NORTHERN UTAH: IMPLICATIONS FOR PALEOPROTEROZOIC CRUSTAL EVOLUTION OF WESTERN LAURENTIA**
- 4-2 8:25 AM Clemens-Knott, Diane*; Chen, Nancy M.; Gevedon, Michelle; Buchen, Christopher, deceased; Concha, Christian A.; Tomita, Kevin; Murrieta, Rosa; Kohler, Zoe; Knott, Samuel: **DETRITAL ZIRCON-BASED RECONSTRUCTION OF THE RIFTED LAURENTIAN MARGIN IN THE SOUTHWESTERN SIERRA NEVADA MOUNTAINS: FROM PROTEROZOIC BASEMENT, THROUGH NEOPROTEROZOIC RIFT ZONE, TO EXOTIC EARLY MESOZOIC TURBIDITES**
- 4-3 8:45 AM Siddoway, Christine*: **NEOPROTEROZOIC ORIGIN OF THE UTE PASS FAULT (SOUTHERN FRONT RANGE) AND STRUCTURAL CONTROL UPON THE PRESERVATION OF A SNOWBALL EARTH SEDIMENTARY RECORD IN COLORADO**
- 4-4 9:05 AM Dunham, John*: **SLAB ROLLBACK INDUCED THE COLLISION OF AN INTRA-OCEANIC ISLAND ARC WITH THE PALEOZOIC PASSIVE MARGIN OF WESTERN LAURENTIA, LEADING TO THE ANTLER EVENT AND EMPLACEMENT OF THE ROBERTS MOUNTAINS ALLOCHTHON**
- 4-5 9:25 AM Anderson, L. Page; Bardoux, Marc*; Chamberlain, Kevin R.; Griesel, Gerry; Jansen, Andrew; Nozdrya, Egor; Stock, Elizabeth: **BADDELEYITE GEOCHRONOLOGY; PROVING ALLOCHTHONOUS STRATIGRAPHY AT THE TURQUOISE RIDGE GOLD DISTRICT, NORTHERN NEVADA USA**

- 4-6 9:45 AM Taerum, Robert*: **EVIDENCE OF TECTONIC INVERSION IN THE SOUTHERN CANADIAN ROCKIES: CONTRACTIONAL DEFORMATION SUPERIMPOSED ON EXTENSIONAL FAULTS REVEALED THROUGH FINE-SCALE MAPPING**
- 10:05 AM **BREAK**
- 4-7 10:20 AM Shimabukuro, David*; Black, Jo; Skinner, Steven M.; Wakabayashi, John; DesOrmeau, Joel; Cecil, Robinson: **HIGH-TEMPERATURE PARTIAL-MELT EVENT RECORDED IN THE FIRST CONFIRMED ECLOGITE FROM THE SIERRA NEVADA METAMORPHIC BELTS, CALIFORNIA**
- 4-8 10:40 AM Nelson, Ellen*; Ruggles, Claire; Tikoff, Basil; Patzke, Mollie; Surpless, Kathleen; Vervoort, Jeffrey; Gaschnig, Richard: **THE JURASSIC-CRETACEOUS HAZARD CREEK ARC, WESTERN IDAHO**
- 4-9 11:00 AM Richardson, Andrea*; Long, Sean; Barba, William; McKay, Matthew: **THE CONTRIBUTION OF DUCTILE STRETCHING TO EXHUMATION AND MASS TRANSFER IN FOLD-THRUST AND TRANSPRESSIONAL SYSTEMS: AN INVESTIGATION OF STRAIN AND KINEMATICS IN THE SALMON RIVER SUTURE ZONE AND WESTERN IDAHO SHEAR ZONE**
- 4-10 11:20 AM Schmidt, Keegan*; Ames, Miriam E; Wilson, Kylie C.: **CORNER TECTONICS: KINEMATICS OF A LATE CRETACEOUS TRANSPRESSIONAL TERMINATION IN THE SYRINGA EMBAYMENT OF NORTH-CENTRAL IDAHO**
- 4-11 11:40 AM Michalak, Melanie J.*; Dorsey, Rebecca; Baughman, Jaclyn; Sousa, Francis J.; Darin, Michael: **EVIDENCE FOR LATE CRETACEOUS-PALEOGENE BASIN INVERSION, UPLIFT, AND EROSIONAL STRIPPING IN THE KLAMATH MOUNTAINS, PRIOR TO EOCENE COLLISION OF SILETZIA**

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T25. Exceptional Floods in the Cordillera

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Jim O'Connor and Richard Waitt, Presiding

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- 5-2 8:25 AM Waitt, Richard*: **FLOW CATASTROPHES AT SPIRIT LAKE NEW MOUNT ST. HELENS 18 MAY 1980—PYROCLASTIC SURGE, LANDSLIDE, GIANT WAVE**
- 5-3 8:45 AM Brugman, Melinda*: **LARGE TSUNAMI IN THE SALISH SEA: GEOLOGICAL EVIDENCE FROM LILY POINT, POINT ROBERTS, WASHINGTON STATE AND POTENTIAL GENERATION MECHANISMS**
- 5-4 9:05 AM Persico, Lyman*; Meyer, Grant: **EXPLORING VARIABILITY IN PEAK DISCHARGE AND EROSION CAUSED BY THE JUNE 2022 ATMOSPHERIC RIVER FLOOD IN NORTHERN YELLOWSTONE NATIONAL PARK**
- 5-5 9:25 AM Smith, Larry*; Montejo, Carlos; Bobst, Andrew L.: **FLATHEAD LOBE RECESSION IN THE FLATHEAD VALLEY: IMPLICATIONS FOR ICE-MARGINAL LAKE DRAINING**
- 5-6 9:45 AM Baker, Victor*: **MEGA-FLOOD EROSION OF THE CHANNЕLED SCABLAND**
- 5-7 10:05 AM McCollum, Michael*: **ONLY THE FACTS: PLEISTOCENE GLACIAL OUTBURST MEGAFLOOD OR FLASH FLOOD DEPOSITS, A DEDUCTIVE APPROACH**
- 10:25 AM **BREAK**
- 5-8 10:40 AM O'Connor, Jim*; Lehnigk, Karin E.; Larsen, Isaac: **DID HEADWARD EROSION COMPLETE THE GRAND**

- 5-9 11:00 AM Lesemann, Jerome-Etienne*; Cooley, Skye; Gombiner, Joel: **OUTBURST FLOODS FROM THE CORDILLERAN ICE SHEET AFFECTING AREAS NORTH OF THE CHANNЕLED SCABLAND**
- 5-10 11:20 AM Bjornstad, Bruce*: **CASE FOR >1 MILLION-YEAR-OLD, ICE-AGE MEGAFLOODS IN EASTERN WASHINGTON**
- 5-11 11:40 AM Burns, Scott*; Medley, Erica: **ANCIENT CATAclySMIC FLOODS OF THE ICE AGE FLOODS OF THE PACIFIC NORTHWEST**

**POSTER
TECHNICAL SESSIONS**

SESSION NO. 6

T1. Recent Advances in Mineral Resources Research and Exploration (Posters) (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

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| 6-2 | 2 Cleghorn, Zane*; Schweiger, Anna; Myers, Madison: UTILIZING EMIT'S IMAGING SPECTROSCOPY SATELLITE FOR GEOLOGIC CLASSIFICATION AND LITHIUM DETECTION IN THE MCDERMITT CALDERA |
| 6-3 | 3 Schiffer, W. Joel*; Murchland, Madeline; Lewis, Reed S.; Gillerman, Virginia; Steven, Cody; Knudsen, Liam D.: NEW GEOLOGIC MAPPING IN THE MINERAL HILL REE DISTRICT, LEMHI COUNTY, IDAHO |
| 6-4 | 4 Taylor, Mikayla*; Gammons, Christopher; Childs, John: GEOLOGY AND STABLE CARBON ISOTOPES OF THE RUBY GRAPHITE DEPOSIT, BEAVERHEAD COUNTY, MONTANA |
| 6-5 | 5 Miller, David*; Mattinson, Christopher G.: ASSESSING THE ORE MINERALIZATION DEPTH AND CRUSTAL HISTORY OF PLUTONS IN NORTHEASTERN WASHINGTON USING THERMODYNAMIC MODELING OF WALL ROCK ASSEMBLAGES |
| 6-6 | 6 Magnin, Benjamin; Anderson, Eric*: THE EFFECT OF GEOCHEMICAL COMPOSITION ON THE MAGNETIC RESPONSE OF IGNEOUS INTRUSIONS NEAR BUTTE, MONTANA: USING OPEN-SOURCE GEOCHEMISTRY TO INTERPRET EARTH MRI DATA |
| 6-7 | 7 Brooks, William*; Garcia, Martha N.: VOLCANOGENIC LITHIUM AT THE ANDERSON URANIUM MINE, DATE CREEK BASIN, ARIZONA |
| 6-8 | 8 Good, Nathan*; Martinez-Gomez, N. Cecilia: DEVELOPMENT OF A MICROBIAL PLATFORM FOR RARE EARTH LEACHING AND RECOVERY |
| 6-9 | 9 Brown, Rebecca; Struhs, Ethan; Mirkouei, Amin*: BIOLEACHING PATHWAY FOR MIXED RARE EARTH ELEMENTS EXTRACTION FROM IDAHO-SOURCED MINERALS |
| 6-10 | 10 Di Fiori, Russell*; Anderson, Ryan B.; Lifton, Zachery M.; Berti, Claudio; Giddens, Mary Hannah; Faulds, James: INITIAL ASSESSMENT OF FAVORABLE STRUCTURAL SETTINGS FOR HIDDEN GEOTHERMAL POTENTIAL IN SOUTHERN IDAHO |

SESSION NO. 7

T6. Advancements in Geologic Carbon Sequestration in Basalt (Posters) (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

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7-2	12	Lahiri, Nabajit*; Miller, Quin; Kovarik, Libor; Cao, Ruoshi; Crum, Jarrod; Schaef, Todd: UNDERSTANDING THE FATE OF INJECTED CARBON DIOXIDE IN BASALT RESERVOIRS

SESSION NO. 8

T10. Paleontology in the West: Fossils, Localities, Research, and Education in the Rocky Mountain and Cordilleran Regions (Posters)

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Authors will be present from 4 to 5:30 PM

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SESSION NO. 9

T13. New Developments in the Magmatic Drivers of Cascades Volcanism (Posters) (GSA Geophysics and Geodynamics Division)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

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9-3	22	Genero, James*; O'Leary, Yusei; Shamloo, Hannah; Wall, Kellie: PRE-ERUPTIVE TIMESCALES OF DEVILS WASHBASIN BASALT AND HOGBACK MOUNTAIN BASALTIC-ANDESITE DEPOSITS IN THE GOAT ROCKS AREA, CASCADE ARC, WA

9-4	23	Andersen, Nathan*; Dechert, Annika E.; Ruth, Dawn; Sas, May (Mai); Chouinard, Julie; Dufek, Josef: PROTRACTED RECHARGE ASSOCIATED WITH INDEPENDENT RHYOLITE ERUPTIONS FROM SOUTH SISTER VOLCANO, OREGON CASCADES, USA
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9-6	25	Calvert, Emma*; Sas, May: GEOCHEMICAL AND MINERALOGICAL INVESTIGATION INTO MAGMA RESERVOIR PROCESSES AND CONNECTIVITY AT MIDDLE SISTER AND SOUTH SISTER VOLCANOES, OREGON, USA
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SESSION NO. 10

T18. Using Geologic and Geophysical Data to Unravel Neotectonics and Long-term Deformation across Cascadia (Posters) (GSA Geophysics and Geodynamics Division)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

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10-2	28	Mickus, Kevin*: GRAVITY ANALYSIS OF THE NATURE OF EARTHQUAKE ACTIVITY IN NORTHERN SPOKANE, WASHINGTON
10-3	29	Staisch, Lydia*; Connell, Dylan; Blakely, Richard J.; Steely, Alex: HIGH-RESOLUTION AIRBORNE MAGNETIC AND RADIOMETRIC SURVEY OF THE REPUBLIC GRABEN, OKANOGAN AND KETTLE METAMORPHIC CORE COMPLEXES, KOOTENAY ARC AND SURROUNDING REGIONS, NORTHEASTERN WASHINGTON STATE
10-4	30	Blakely, Richard J.; Wells, Ray E.*; Bennett, Scott E.K.; Staisch, Lydia M.; O'Connor, Jim E.; Cannon, Charles M.: NEW AEROMAGNETIC SURVEYS REVEAL THE CRUSTAL STRUCTURE OF THE CASCADE RANGE IN OREGON AND WASHINGTON
10-5	31	Angster, Stephen*; Stephenson, William; Sherrod, Brian L.; Lasher, John P.; Huddleston, Gareth: NEW INSIGHTS ON ACTIVE FAULTS AND CRUSTAL ARCHITECTURE OF THE KITTITAS VALLEY, WASHINGTON, USA: A MULTI-SCALE LOOK UTILIZING SEISMIC REFLECTION PROFILES AND PALEOSEISMIC TRENCHING
10-6	32	Dragovich, Joe*; Anderson, Megan L.; Cakir, Recep; MacDonald, James H.; Mahan, Shannon A.; Smith, Dan: THE CORRELATION OF RECENT SEISMICITY WITH THE TOKUL CREEK, CHERRY CREEK, MONROE, AND CARPENTER CREEK FAULTS MAPPED IN THE MONROE AND FALL CITY REGION OF THE CASCADE FOOTHILLS--KING AND SNOHOMISH COUNTY AREA OF WEST CENTRAL WASHINGTON
10-7	33	Carlson, Michelle*; Streig, Ashley; Dunning, Andrew; Madin, Ian P.: LIDAR EVALUATION OF BLUE RIDGE FAULT DISPLACEMENT ALONG STRIKE, IN THE MT. HOOD FAULT ZONE
10-8	34	Belcastro, Marge*; Streig, Ashley; Graham-Davis, Jazzy: REFINING CASCADIA SUBDUCTION ZONE EARTHQUAKE TIMING IN NETARTS BAY, OREGON, WITH NEW AGE DATA FROM A GHOST FOREST TREE AND MARSH STRATIGRAPHY

SESSION NO. 11**T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains (Posters) (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)**

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

- | | Booth # | |
|-------|---------|---|
| 11-1 | 35 | Tewksbury-Christle, Carolyn*; Hawthorne, Sophia; Sulas, Hannah; Cottrell, Cali: STRESS AND STRAIN RATE ALONG A SHEARED PRECAMBRIAN CONTACT BETWEEN THE UNCOMPAGHRE GROUP AND IRVING FORMATION, SOUTHWESTERN COLORADO |
| 11-2 | 36 | Clark, Gillian*; Waldien, Trevor: NEW INTERPRETATIONS ON THE REINDEER HILLS MÉLANGE USING STRUCTURAL AND GEOCHRONOLOGICAL DATA |
| 11-3 | 37 | Murray, Breana, M*; Waldien, Trevor; Garcia-Lasanta, Cristina; Housen, Bernard: NEW GEOLOGIC BEDROCK MAPPING AND ANALYTICAL RESULTS FROM THE ANIAK VOLCANIC FIELD, SOUTHWESTERN ALASKA |
| 11-4 | 38 | Schmidtke, Eric*; Gibson, Daniel; Thorkelson, Derek; Crowley, James L.; Luffi, Peter: NEW CONSTRAINTS FROM THE CHALLIS-KAMLOOPS GROUP ON CRUSTAL EVOLUTION DURING EARLY EOCENE EXTENSION IN SOUTHEASTERN BRITISH COLUMBIA AND NORTHEASTERN WASHINGTON |
| 11-5 | 39 | Camargo Ramirez, Joana*; Metcalf, Kathryn: TIES IN AGE AND PROVENANCE OF THE EASTERN HAYFORK AND NORTH FORK TERRANES AND THEIR RELATIONSHIP TO THE WESTERN MARGIN OF NORTH AMERICA |
| 11-6 | 40 | Rack, Sierra*; Roeske, Sarah M.; Velazquez, Julianna; Cottle, John; Kylander-Clark, Andrew: TIMING AND CRUSTAL INFLUENCES OF THE LAKE COMBIE VOLCANIC COMPLEX, NORTHWESTERN SIERRA NEVADA FOOTHILLS |
| 11-7 | 41 | Hake, Jackson C.; Abel, Daniel J.; Bustos-Perez, Osvaldo; Bechtold, Erin A.; DiBenedetto, Gunnar A.; Martinez, Jane A.; Sousa, Francis J.; Baughman, Jaclyn*; Michalak, Melanie: CRETACEOUS TO MIOCENE EXHUMATION AND BURIAL HISTORY OF THE SOUTHERN KLAMATH MOUNTAINS PROVINCE |
| 11-8 | 42 | Sousa, Francis*; Michalak, Melanie; Baughman, Jaclyn S.; Martinez, Jane A.; DiBenedetto, Gunnar A.; Bechtold, Erin A.; Bustos-Perez, Osvaldo; Abel, Daniel J.; Hake, Jackson C.: THERMAL MODELING OF KLAMATH MOUNTAINS BEDROCK USING LOW TEMPERATURE THERMOCHRONOLOGY DATA FROM MULTIPLE SYSTEMS |
| 11-9 | 43 | Toto, Starla*; Grove, Marty; Seymour, Nikki M.: CRETACEOUS SUBDUCTION ARCHITECTURE AND MID-MIOCENE CALIFORNIA BORDERLAND EXTENSION THROUGH THE LENS OF THE SAN ONOFRE BRECCIA |
| 11-10 | 44 | Wagner, Victoria*; Di Fiori, Russell; Steven, Cody; Williams, Thomas J.: INVESTIGATING METAMORPHIC AND TEMPORAL TRENDS EAST OF THE ARC-CONTINENT BOUNDARY IN NORTH-CENTRAL IDAHO |
| 11-11 | 45 | Yokel-Deliduka, Andrew*; Anderson, Ryan B.; Pearson, David; Ruggiero, Matthew S.; Sistrunk, Kawner: DISMEMBERING THE PUTNAM THRUST: MIOCENE EXTENSION WITHIN THE FORELAND-HINTERLAND TRANSITION OF THE IDAHO-WYOMING SALIENT AND A REVISED KINEMATIC MODEL FOR THE PUTNAM THRUST SYSTEM |
| 11-12 | 46 | Gillette, Ian*; Capaldi, Tomas; Rittenour, Tammy M.; Di Fiori, Russell; Anderson, Ryan B.; Pederson, Joel: STRATIGRAPHIC RESPONSE TO CENOZOIC EXTENSION IN THE CORDILLERAN HINTERLAND: A CASE STUDY FROM THE NORTHEAST BASIN AND RANGE, IDAHO-UTAH-WYOMING |
| 11-13 | 47 | Brailer, Nicholas*; Thacker, Jacob O.; Michelfelder, Gary: MINERALOGICAL AND GEOCHEMICAL CHARACTERIZATION OF LINE CREEK PLATEAU PORPHYRY OUTCROPS (BEARTOOTH MOUNTAINS) AND FRONTIER FORMATION |

PORPHYRY COBBLES (BIGHORN BASIN), MONTANA AND WYOMING

- | | | |
|-------|----|--|
| 11-14 | 48 | Long, Sean*; Lee, Jeffrey; Blackford, Nolan: EXTREME DUCTILE THINNING OF CAMBRIAN MARBLES IN THE FOOTWALL OF THE NORTHERN SNAKE RANGE METAMORPHIC CORE COMPLEX, NEVADA: IMPLICATIONS FOR EXTENSION MAGNITUDE AND STRUCTURAL EVOLUTION |
| 11-15 | 49 | Blythe, Ann*; Lee, Jeffrey; Stockli, Daniel F.: CENOZOIC COOLING AND EXHUMATION OF THE EASTERN ESCARPMENT OF THE SOUTHERN SIERRA NEVADA, CA, FROM APATITE FISSION TRACK ANALYSES |
| 11-16 | 50 | Mack, Bradford*; Wetmore, Paul; Connor, Charles; Gallant, Elisabeth: A PYTHON PIPELINE FOR RAPID INVERSION OF GRAVITY DATA AIMED AT EARLY CAREER RESEARCHERS: APPLICATION TO THE LOST RIVER FAULT, IDAHO |
| 11-17 | 51 | Sturmer, Daniel*; Louie, John N.: EVALUATING RECENT TECTONIC EVOLUTION OF TWO RENO-AREA BASINS THROUGH DEEP REFRACTION-MICROTREMOR ANALYSIS, WESTERN NV |
| 11-18 | 52 | Smith, Paul*; Kratt, Christopher B.; Louie, John N.; Sturmer, Daniel; Gautschi, Odeza: PRELIMINARY 2.5-D GRAVITY MODELS FROM LEMMON VALLEY AND THE TAHOE-RENO INDUSTRIAL CENTER, WESTERN NEVADA |

SESSION NO. 12**T22. Management of Hydrologic and Geologic Resources (Posters) (GSA Energy Geology Division; GSA Hydrogeology Division)**

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

- | | Booth # | |
|------|---------|--|
| 12-1 | 53 | Moody, Alex*: ASSESSING REGIONAL AQUIFER MANAGEMENT EFFECTIVENESS WITH A COLLABORATIVELY BUILT MODEL ON THE EASTERN SNAKE RIVER PLAIN, IDAHO |
| 12-2 | 54 | Burke, Addison*; Jasbinsek, John: GEOPHYSICAL EXPLORATION OF A POTENTIAL HARD ROCK AQUIFER IN AN EXPOSURE OF SALINIAN BLOCK GRANITE, PASO ROBLES, CA |
| 12-3 | 55 | English, Alan*: GROUNDWATER LEVELS, SPRING DISCHARGE, WATER QUALITY MONITORING, AND WELL PERMITTING IN THE YELLOWSTONE CONTROLLED GROUNDWATER AREA, MONTANA |
| 12-4 | 56 | Gutierrez, Melida*: GEOLOGICAL AND GEOCHEMICAL CONSTRAINTS OF THE PRESENCE OF GROUNDWATER FLUORIDE IN CHIHUAHUA, MEXICO |
| 12-5 | 57 | Shimabukuro, David*; Sowers, Theron: EXTENT OF OPEN VERTICAL PATHWAYS IN "DRY HOLE" OIL AND GAS WELLS LOCATED OUTSIDE OF OIL FIELDS IN THE SAN JOAQUIN VALLEY, CALIFORNIA |
| 12-6 | 58 | Keefer, Rory*; Knight, Logan; Larson, Erik; Matyjasik, Marek: ENVIRONMENTAL IMPACT OF HISTORICAL MINING IN THE OQUIRRH MOUNTAINS, UTAH |

SESSION NO. 13**T25. Exceptional Floods in the Cordillera (Posters)**

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

- | | Booth # | |
|------|---------|---|
| 13-1 | 59 | Dawes, Ralph*: GLACIOTECTONICS OF THE OKANOGAN LOBE, NORTH CENTRAL WASHINGTON STATE: IMPLICATIONS FOR THE ORIGIN OF THE WITHROW MORAINES AND THE LANDSCAPE AROUND UPPER MOSES COULEE |
| 13-2 | 60 | Arnold, Victoria S*; Ridley, John: ENVIRONMENTAL EFFECTS OF THE 1978 SUNNYSIDE MINE FLOOD |

AM

WEDNESDAY

POSTERS

- 13-3 61 Susnik, Christopher*; Breckenridge, Andy; Stafford, Nathan; Fischer, Abigail; Larson, Phillip; Rowen, Jayda: **AN INVESTIGATION OF MASSIVE DUNE-LIKE LANDFORMS CREATED BY A FAILURE OF AN ICE DAM AND PROGLACIAL LAKE DRAINAGE WITHIN THE LAKE SUPERIOR BASIN (MICHIGAN)**
- 13-4 62 MacInnes, Breanyn*; Higman, Bretwood: **SEDIMENT SORTING AND DEPOSITION IN A LANDSLIDE GENERATED TSUNAMI, 1967 GREWINGK, ALASKA**
- 13-5 63 MacInnis, Jana*; MacInnes, Breanyn; Higman, Bretwood: **GROUNDING ICEBERG WAKE PATTERNS FOLLOWING CATASTROPHIC FLOOD EVENTS IN SOUTHCENTRAL ALASKA**

ORAL TECHNICAL SESSIONS

SESSION NO. 14

T2. Magmatic Rare Earth Element Ore Deposits and Minerals for the Future (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

1:30 PM, Davenport Grand Hotel, Birch Ballroom

Kathryn Watts and Erin Benson, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 14-1 1:35 PM Rukhlov, Alexei*; Cui, Yao; Cunningham, Quinn; Fortin, Gabe; Anderson, Cameron: **A CRITICAL MINERAL INDEX*: GEOCHEMICAL SIGNAL OF CARBONATITE-RELATED CRITICAL METALS IN PROVINCIAL DRAINAGE SEDIMENTS**
- 14-2 1:55 PM Gary, Michael*; Gammons, Christopher: **USING STREAM-SEDIMENT INDICATOR MINERALS TO EXPLORE FOR RARE EARTH ELEMENT DEPOSITS IN THE SHEEP CREEK AREA OF SOUTHWEST MONTANA**
- 14-3 2:15 PM Watts, Kathryn E.*; Mariano, Anthony; Mariano, Anthony N.: **ZIRCON GEOCHRONOLOGY AND GEOCHEMISTRY INSIGHTS INTO A SHONKINITE DIKE IN THE COLOSSEUM MINE AREA, SOUTHEASTERN MOJAVE DESERT, CA**
- 2:35 PM **BREAK**
- 14-4 2:50 PM Ririe, G. Todd*; Levy, Alan: **MOUNTAIN PASS, CALIFORNIA FROM GOLD TO RARE EARTHS**
- 14-5 3:10 PM Benson, Erin*; Watts, Kathryn; Haxel, Gordon B.: **SULFUR ISOTOPE INVESTIGATION OF SULFATE AND SULFIDE MINERALS IN THE MOUNTAIN PASS CARBONATITE INTRUSION, CALIFORNIA**
- 14-6 3:30 PM Andersen, Allen*; Watts, Kathryn: **CONTROLS ON THE DISTRIBUTION OF RARE-EARTH ELEMENTS IN CARBONATITE-HOSTED FLUOROCARBONATE ORES**
- 14-7 3:50 PM Bennett, Mitchell*; Andersen, Allen; Olinger, Danielle A.; Verplanck, Philip L.: **FATE AND TRANSPORT OF REE IN CARBONATITE-RELATED FLUIDS FROM THE BEAR LODGE ALKALINE COMPLEX, WY: EVIDENCE FROM FLUID INCLUSION STUDIES**
- 4:10 PM **DISCUSSION**

SESSION NO. 15

T7. Faults, Fractures, and Fluids: Structural Control of Fluid Flow, Fault Zones, and Hydrothermal Processes (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

1:30 PM, Davenport Grand Hotel, Meeting Room 2

Benjamin L. Melosh, Owen Callahan, Maxwell Wilmarth and Stanley Mordensky, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**

- 15-1 1:35 PM Griesel, Gerry*; Bardoux, Marc; Anderson, L. Page; Jansen, Andrew; Nozdrya, Egor; Stock, Elizabeth: **STRUCTURAL FEEDERS AND GOLD TRAPS EXPLAINED AT TURQUOISE RIDGE MINE, NORTHERN NEVADA USA**
- 15-2 1:55 PM Holk, Gregory*; Hartman, Sean M.; Walters, Polito: **CONTRASTING FLUID SYSTEMS RELATED TO THE BRITTLE-DUCTILE TRANSITION AND SHALLOW BRITTLE CRUST IN TWO STRIKE-SLIP FAULTS**
- 15-3 2:15 PM Melosh, Benjamin*: **A NEW STRUCTURAL MODEL OF FLUID UPWELLING IN AN ACTIVE TRANSPRESSIONAL FOLD HINGE ALONG THE STRIKE-SLIP BARTLETT SPRINGS FAULT ZONE, NORTHERN CALIFORNIA COAST RANGES**
- 15-4 2:35 PM Callahan, Owen*: **PERSISTENCE AND TRANSCIENCE IN HYDROTHERMAL SYSTEMS RECORDED IN HOT SPRINGS, TRAVERTINE, AND SINTER**
- 15-5 2:55 PM Milton, Alex; Siler, Drew*; Wilmarth, Maxwell; Colvin, Anna; Folsom, Matthew; Hinz, Nicholas H.; Fishbin, Amanda: **EVALUATING A DEEP-CIRCULATION, FAULT-HOSTED HYDROTHERMAL SYSTEM: GREENFIELD EXPLORATION AT THE CARVERS GEOTHERMAL AREA, NEVADA, USA**
- 15-6 3:15 PM Siler, Drew; Colvin, Anna; Hinz, Nicholas H.; Folsom, Matthew; Milton, Alex*; Wallis, Irene; Fishbin, Amanda; Wilmarth, Maxwell: **STRUCTURAL SETTING OF THE WEEPAH GEOTHERMAL FIELD, NEVADA, USA**
- 15-7 3:35 PM Dellerman, Nolan*; Rocha, Santiago; Xicara, Julian; Minguez, Daniel: **CONTROLS OF FRACTURE HOSTED PERMEABILITY IN BASIN AND RANGE GEOTHERMAL FIELDS: A CASE STUDY FROM THE THERMO GEOTHERMAL FIELD, SW UTAH**
- 3:55 PM **CONCLUDING REMARKS**

SESSION NO. 16

T14. Continental Mafic Volcanism II: Honoring the Career of Vic Camp (GSA Geophysics and Geodynamics Division)

1:30 PM, Davenport Grand Hotel, Meeting Room 1

Arron Steiner, John Wolff and Emily Cahoon, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 16-1 1:35 PM Steiner, Arron*; Steiner, Ashley; Wolff, John; Streck, Martin J.: **MAXIMIZING THE LEGACY: MINING THE COLUMBIA RIVER BASALT GROUP DATA AND SAMPLE ARCHIVE**
- 16-2 1:55 PM Pivarunas, Anthony*; Avery, Margaret S.: **PALEOMAGNETISM OF COLUMBIA RIVER BASALT GROUP DIKES: UTILITY AND APPLICATION TO LARGE IGNEOUS PROVINCE PLUMBING SYSTEMS**
- 16-3 2:15 PM Avery, Margaret*: **NEW PALEOMAGNETIC STRATIGRAPHY IN THE IMNAHA AND GRANDE RONDE BASALTS, COLUMBIA RIVER BASALT GROUP, NORTHEAST OREGON AND SOUTHEAST WASHINGTON, USA**
- 16-4 2:35 PM Soderberg, Evan*; Wolff, John; Ramos, Frank C.: **THE ORIGIN OF THE GRANDE RONDE BASALT OF THE COLUMBIA RIVER BASALT GROUP: LARGE MAGMA SYSTEMS, EVOLVING CRUSTAL STORAGE REGIMES, AND THERMODYNAMIC SIMULATIONS**
- 2:55 PM **BREAK**
- 16-5 3:10 PM Hart, Rachelle*; Steiner, Arron; Ramos, Frank C.; Wolff, John: **RELATIONSHIPS BETWEEN THE WANAPUM AND GRANDE RONDE LAVAS OF THE COLUMBIA RIVER BASALT GROUP**
- 16-6 3:30 PM Stetson, Angela*; Streck, Martin J.: **ORPHAN BASALTS OF THE GREATER JOHN DAY TO BURNS CORRIDOR, EASTERN OREGON: UNDERSTANDING THE ORIGINS OF UNASSIGNED BASALTS**
- 16-7 3:50 PM Sawlan, Michael*: **THE IMPORTANCE OF UNDERSTANDING CHEMICAL WATER-ROCK I**

INTERACTION AND ITS EFFECTS ON INTERPRETATIONS OF THE CHEMOSTRATIGRAPHY, PETROGENESIS, AND EMPLACEMENT MECHANISMS OF LAVAS OF THE COLUMBIA RIVER FLOOD BASALT PROVINCE

SESSION NO. 17

T19. Structure and Tectonics of the North American Cordillera and Rocky Mountains II (GSA Geophysics and Geodynamics Division; GSA Energy Geology Division)

1:30 PM, Davenport Grand Hotel, Maple Ballroom

David Pearson and Ryan B. Anderson, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 17-1 1:35 PM Anderson, Megan L.*; Lau, Todd R.; Blakely, Richard J.; Wells, Ray E.; Dragovich, Joe; Horst, Alison; Amaral, Chelsea; Bauer, Anita; Polenz, Michael: **TRACKING THE ACCRETION OF SILETZIA WITH MAGNETIC ANOMALIES: HOW ANCIENT SPREADING CENTERS AND THRUST STRUCTURES MAY IMPACT MODERN TECTONIC DEFORMATION**
- 17-2 1:55 PM Van Wagoner, Nancy*; Ootes, Luke: **EARLY EOCENE VOLCANISM IN THE CORDILLERAN OROGEN OF NORTHWESTERN NORTH AMERICA AND ITS TECTONIC IMPLICATIONS**
- 17-3 2:15 PM Schwartz, Joshua*; Miranda, Elena; Klepeis, Keith; Mora-Klepeis, Gabriela; Lackey, Jade Star; Tibaldi, Alina: **TECTONIC AND MAGMATIC CONSTRUCTION OF LOWER CRUST IN THE SOUTHERN CALIFORNIA BATHOLITH**
- 17-4 2:35 PM Chapman, Jay*; Fitz-Diaz, Elisa: **TIME TO ABANDON THE LARAMIDE: THE SOUTHWEST U.S. IS PART OF THE MEXICAN CORDILLERAN OROGENIC WEDGE**
- 17-5 2:55 PM McDonald, Scott*: **MONOLITHOLOGIC, POLYMYCTIC BRECCIAS REFLECT LATE CRETACEOUS TECTONIC DEVELOPMENT OF THE NEVADAPLANO CREST AND WESTWARD ENCROACHMENT OF THE SHEEP PASS BASIN, SEVIER OROGENIC HINTERLAND, CENTRAL NEVADA**
- 17-6 3:15 PM Jess, Scott*; Enkelmann, Eva: **EXAMINING CENOZOIC EXTENSION ACROSS THE CORDILLERA THROUGH LOW-TEMPERATURE THERMOCHRONOLOGY**
- 3:35 PM **BREAK**
- 17-7 3:50 PM Busby, Cathy*; Graettinger, Alison H.; López-Martínez, Margarita; Orozco-Esquivel, Teresa; Putirka, Keith; Niemi, Tina: **OLIGOCENE TO PLIOCENE MAGMATIC AND STRUCTURAL EVOLUTION OF THE GULF OF CALIFORNIA MARGIN IN CENTRAL BAJA CALIFORNIA (MEXICO)**
- 17-8 4:10 PM Rosenthal, Jacob*; Fitzgerald, P.G.; Benowitz, Jeffrey: **BETWEEN TWO FAULTS: STRUCTURALLY CONTROLLED EXHUMATION PATTERNS ALONG THE DENALI FAULT SYSTEM**
- 17-9 4:30 PM Regan, Sean*; Marble, Sean; Roeske, Sarah M.; Schmitz, Mark; Miller, McKenzie; Costigan, Jim: **INTERPLAY BETWEEN ARC PLUTONISM AND STRAIN PARTITIONING ALONG THE DENALI FAULT, ALASKA**
- 17-10 4:50 PM Stanton, Kelsay*; Crider, Juliet; Anderson, Megan; Lau, Todd R.; Staisch, Lydia; Kelsey, Harvey M.: **IDENTIFYING THE SIGNATURE AND MECHANISM OF LONG-TERM, PERMANENT STRAIN ALONG THE CASCADIA SUBDUCTION ZONE COASTLINE IN SOUTHWESTERN WASHINGTON**
- 17-11 5:10 PM Streig, Ashley; Madin, Ian P.; Dunning, Andrew*; Carlson, Michelle; Bennett, Scott E.K.; Roberts, Nick; Peterson, Johnathan; Balco, Greg; Amidon, William: **NEW SURFACE EXPOSURE AGES, SLIP RATES, AND PALEOSEISMIC EVIDENCE OF ACTIVE EXTENSIONAL FAULTING NEAR MOUNT HOOD, OREGON**

SESSION NO. 18

T26. Landscape Evolution and Geomorphology of the Greater Pacific Northwest and Northern Rockies

1:30 PM, Davenport Grand Hotel, Cedar Ballroom

Jessica Stanley, Joel Pederson, Sean Richard LaHusen and Carlos Montejo, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 18-1 1:35 PM Staisch, Lydia*; O'Connor, Jim E.; Walkup, Laura C.; Holm-Denoma, Chris: **PINPOINTING PALEO-DRAINAGE DIVIDES AND RIVER CONFLUENCES USING DETRITAL ZIRCON PROVENANCE ANALYSIS**
- 18-2 1:55 PM Willard, Jack*; Pederson, Joel; Rittenour, Tammy; Stanley, Jessica: **TESTING FOR UPLIFT BY THE YELLOWSTONE HOTSPOT USING GALLATIN RIVER TERRACES, SW MONTANA**
- 18-3 2:15 PM Price, Curtis*; Stetler, Larry: **DEVELOPMENT AND APPLICATION OF A GIS TOOL TO EXTRACT AND ANALYZE DEM-DERIVED STREAM CHANNEL LONGITUDINAL PROFILES**
- 18-4 2:35 PM Pinke, Brian*; Pfeiffer, Allison; Coffin, Finn: **VESICULARITY AND HYDROTHERMAL ALTERATION IN VOLCANIC-DERIVED MASS WASTING DEPOSITS AND THE IMPLICATIONS FOR DOWNSTREAM SEDIMENT PULSE ATTENUATION**
- 18-5 2:55 PM Haugerud, Ralph*: **GLACIO-ISOSTATIC RESPONSE EAST OF THE CASCADES**
- 18-6 3:15 PM Bernhardt, Gilbert*: **MODELING BACK BEACH EROSION AT BEVERLY AND MOOLACK BEACH, OREGON BY: GILBERT BERNHARDT AND SISAVATH VIRASAK**
- 18-7 3:35 PM Rigby, James G.*; Rigby, Susan A.: **A NEW OCCURRENCE OF SAILING STONES**
- 3:55 PM **CONCLUDING REMARKS**

THURSDAY, 16 MAY 2024

ORAL TECHNICAL SESSIONS

SESSION NO. 19

T3. Mineral Deposits of the Western United States I: A View from the States and Industry (GSA Energy Geology Division; Idaho Geological Survey)

8:00 AM, Davenport Grand Hotel, Birch Ballroom

Virginia Gillerman and Hayley Rambur, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 19-1 8:05 AM Rudko, Amy*: **AGGREGATE RESOURCE MAPPING IN WASHINGTON STATE**
- 19-2 8:25 AM Jowitt, Simon M.*: **NEVADA'S CRITICAL METAL AND MINERAL POTENTIAL; NOT JUST THE SILVER STATE**
- 19-3 8:45 AM Vikre, Peter*: **ASSOCIATION OF SILVER-DOMINANT PRECIOUS METAL DEPOSITS WITH PERALUMINOUS, SULFIDE-SATURATED AND SULFIDIZED IGNEOUS ROCKS, WESTERN US**
- 19-4 9:05 AM Anderson, L. Page*; Stock, Elizabeth; Thompson, Erica; Towne, Matthew; Aird, Hannah; Lecumberri-sanchez, Pilar; Bardoux, Marc; Jansen, Andrew; Nozdrya, Egor; Griesel, Gerry: **EVIDENCE OF MESOZOIC HYDROTHERMAL EVENTS PRIOR TO CARLIN-TYPE MINERALIZATION WITHIN AND BELOW THE TWIN CREEKS MEGA PIT GOLD DEPOSIT, TURQUOISE RIDGE DISTRICT, NORTHERN NEVADA USA**

AM THURSDAY

- 19-5 9:25 AM Longton, Christopher*: **HERCULES SILVER, MODERN METHODS LEAD TO DISCOVERY IN A HISTORIC DISTRICT IN IDAHO**
- 9:45 AM **BREAK**
- 19-6 10:00 AM Sepp, Michael*: **THE CUDDY MOUNTAIN PORPHYRY CU-MO (AU) SYSTEM: THE REVIVAL OF THE OFT-FORGOTTEN BLUE MOUNTAINS MINERAL BELT IN WESTERN IDAHO**
- 19-7 10:20 AM Murchland, Madeline*; Steven, Cody; Lewis, Reed S.; Gillerman, Virginia; Williams, Thomas J.: **RARE EARTH MINERALOGY OF THE MINERAL HILL CARBONATITES, EAST-CENTRAL IDAHO**
- 19-8 10:40 AM Gillerman, Virginia*; Morgan, Robert; Goddard, Rebecca; Steven, Cody; Pfaff, Katharina: **ND-ENRICHMENTS AND HYDROTHERMAL ALTERATION AT THE LEMHI PASS AND DIAMOND CREEK RARE EARTH (REE) - THORIUM DISTRICTS, LEMHI COUNTY, IDAHO**
- 19-9 11:00 AM Crouter, Mark*: **THE GEOLOGY OF THE BUNKER HILL MINE**
- 19-10 11:20 AM Wratchford, Brittanie*; Olson, Michael: **GEOLOGIC CONSIDERATIONS FOR UNDERHAND CLOSED BENCHING(UCB) AT THE LUCKY FRIDAY MINE**
- 19-11 11:40 AM Mistikawy, Justin*; Biasi, Joseph: **A HYDROTHERMAL PGE DEPOSIT IN SOUTHEASTERN WY**

SESSION NO. 20

T5. The Boring Billion was not so Boring! Mesoproterozoic Tectonics, Sedimentation, and Geochronology of Northwest Laurentia I

8:00 AM, Davenport Grand Hotel, Cedar Ballroom

Robert Thomas and Paul K. Link, Presiding

- 8:00 AM **INTRODUCTION PAUL LINK**
- 8:05 AM **INTRODUCTORY REMARKS**
- 20-1 8:25 AM Thomas, Robert*: **A TRIBUTE TO DON WINSTON, MONTANA FIELD GEOLOGIST**
- 20-2 8:45 AM Sears, James*: **BELT-SIBERIA CONNECTION: MATCHING LIPS TIGHTEN PROTEROZOIC RODINIA RESTORATION AND MAY IMPLY A MULTIPOLAR GEOMAGNETIC FIELD**
- 20-3 9:05 AM Slotznick, Sarah*; Zielinski, Laurie; Moehl, Olivia C.: **REVISITING RED BEDS: MAGNETIC ANALYSES OF THE SPOKANE, GRINNELL, AND APPEKUNNY FORMATIONS, BELT-PURCELL SUPERGROUP, MT**
- 20-4 9:25 AM Lonn, Jeffrey D.; Burmester, Russell F.; Lewis, Reed S.*: **THE MESOPROTEROZOIC BELT-LEMHI CONNECTION, WESTERN MONTANA AND EAST-CENTRAL IDAHO**
- 20-5 9:45 AM Webb, Lucy C.*; Ambrose, Tyler K.; Halverson, Galen P.; Sperling, Erik A.: **STRATIGRAPHY OF MESOPROTEROZOIC UNITS PR1 AND PR2 IN THE COAL CREEK INLIER, YUKON, CANADA: POSSIBLE PINGUICULA GROUP CORRELATIVES**
- 20-6 10:05 AM Schwartz, Darin*; Di Fiori, Russell: **ASSESSMENT OF THE TECTONIC HISTORY RECORDED WITHIN DETRITAL ZIRCONS RECOVERED FROM HIGH GRADE METASEDIMENTARY ROCKS IN THE ELK CITY REGION OF CENTRAL IDAHO**
- 10:25 AM **BREAK**
- 20-7 10:40 AM White, Brian G.*: **NOXON/LEMHI ARCH AND RIFT: A MAJOR PROTEROZOIC/PALEOZOIC NORTH AMERICAN PLATE BOUNDARY**
- 20-8 11:00 AM Pearson, David M.*; Sundell, Kurt E.; Parker, Stuart: **SPECULATION ON THE AGES AND RELATIVE STRATIGRAPHIC POSITIONS OF BELT SUPERGROUP-EQUIVALENT ROCKS OF THE LEMHI SUBBASIN, EAST-CENTRAL IDAHO AND SOUTHWESTERN MONTANA**
- 20-9 11:20 AM Brennan, Daniel*; Li, Zheng-Xiang; Johnson, Tim E.: **THE LATE MESOPROTEROZOIC, POST-BELT, TECTONIC**

RECORD OF NORTHEASTERN WASHINGTON AND NORTHERN IDAHO: EVIDENCE OF GRENVILLE-AGE TECTONISM?

- 20-10 11:40 AM Zieg, Jerry; Bouley, Logan*; Dietrich, Joel; Nacey, Kyle; Mahoney, J. Brian: **TIMING OF MIDDLE PROTEROZOIC MINERALIZATION AND MAGMATISM IN THE HELENA EMBAYMENT OF THE BELT BASIN**

SESSION NO. 21

T10. Paleontology in the West: Fossils, Localities, Research, and Education in the Rocky Mountain and Cordilleran Regions

8:00 AM, Davenport Grand Hotel, Meeting Room 1

Lindsay MacKenzie and John Orcutt, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 21-1 8:05 AM Woltz, Christina R.*; Webb, Samuel M.; Sperling, Erik A.: **INVESTIGATING THE EFFECTS OF LOCAL REDOX ON THE PRESERVATION OF ORGANIC MICROFOSSIL FROM THE LATE TONIAN CHUAR AND UINTA MOUNTAIN GROUPS OF WESTERN LAURENTIA**
- 21-2 8:25 AM Lucas, Spencer G.; Hunt, Adrian*; Harris, Susan K.; May, Paul T.: **REWORKED PERMIAN TETRAPOD FOSSILS NORTHEAST OF SOCORRO, NEW MEXICO: RESOLVING A DISCREPANCY IN THE WORK OF N. H. DARTON**
- 21-3 8:45 AM Broxson, Ian*; Case, Judd: **RECONSTRUCTING THE ECOLOGICAL RELATIONSHIPS OF THE LATEST CRETACEOUS ANTARCTIC DINOSAURS AND HOW FUNCTIONAL TOOTH MORPHOLOGY INFLUENCED DIET AND ECOLOGICAL NICHE AMONG BASAL ORNITHOPOD DINOSAURS**
- 21-4 9:05 AM Hunt, Adrian P.*; Lucas, Spencer G.: **VERTEBRATE BROMALITES FROM EOCENE LACUSTRINE STRATA – COMPARISON OF ICHNOFAUNAS FROM THE GREEN RIVER FORMATION OF THE WESTERN UNITED STATES AND THE MESSEL LAGERSTÄTTEN IN GERMANY**
- 21-5 9:25 AM Famoso, Nicholas*; Carroll, Beth R.; Cavin, Jennifer L.; Lin, Angela: **NEW MATERIAL OF THE HEDGEHOG AMPHECHINUS (ERINACEIDAE, EULIPOTYPHLA) FROM THE OLIGOCENE OF THE PACIFIC NORTHWEST, USA**
- 9:45 AM **BREAK**
- 21-6 10:00 AM Marrone, Tatiana*: **MORPHOMETRIC ASSESSMENT OF THE CENOZOIC ECHINOID GENUS ASTRODAPSIS**
- 21-7 10:20 AM Orcutt, John*: **RECONSTRUCTING BURROWING BEHAVIOR IN THE MIO-PLIOCENE SQUIRRELS OF THE COLUMBIA BASIN**
- 21-8 10:40 AM McLaughlin, Win*; Weldon, Nicholas; Tonn, Elisabeth; Coblenz, Vincent J; Stone, Michael; Hopper Meyers, Krystal: **FOSSIL POINT, COOS BAY OREGON; A NEW INVESTIGATION INTO THE FOSSILS, CHRONOLOGY, AND RELATIONSHIP TO CASCADIA MEGATHRUST EARTHQUAKES**
- 21-9 11:00 AM Allen, Jean; Spendlove, Ian; Love, Renee*: **BISON PRISCUS, THE STEPPE BISON, FROM SODA SPRINGS IDAHO**
- 21-10 11:20 AM Mahan, Shannon*: **LUMINESCENCE SAMPLING OF PALEONTOLOGICAL SITES: WHAT TO KNOW BEFORE, DURING, AND AFTER**
- 11:40 AM **CONCLUDING REMARKS**

SESSION NO. 22

T15. Distributed Volcanic Fields in Western North America (Lightning Talks) (GSA Geophysics and Geodynamics Division)

8:00 AM, Davenport Grand Hotel, Meeting Room 2

Kellie Wall, Nancy Riggs, Emily Johnson and Mark Stelten, Presiding.

- 8:00 AM **INTRODUCTORY REMARKS**

25-1	8:05 AM	Mickus, Kevin*: REGIONAL GRAVITY ANALYSIS OF THE YELLOWSTONE CALDERA, WYOMING
25-2	8:10 AM	Dietz, Haley*; Murray, Kendra; Pu, Xiaofei; Sutherland, Rebecca: QUANTIFYING PRE-ERUPTIVE MAGMATIC WATER CONTENT OF EASTERN SNAKE RIVER PLAIN BASALTIC MELTS USING OLIVINE AND PLAGIOCLASE HYGROMETRY WITH IMPLICATIONS FOR MAGMATIC DIFFERENTIATION
25-3	8:15 AM	Johnson, Emily*; Gardner, Cynthia; Pivarunas, Anthony F.; Scott, William: DISTRIBUTED VOLCANISM IN THE CENTRAL OREGON CASCADES: INSIGHTS INTO ERUPTION STYLES, DURATIONS, AND MAGMA COMPOSITIONS FROM THE TWIN LAKES-WUKSI BUTTE CHAIN
25-4	8:20 AM	Ruth, Dawn*: PETROLOGY OF THE NORTHWEST RIFT ZONE, NEWBERRY VOLCANO, OREGON
25-5	8:25 AM	Mitchell, Nathaniel*; Harp, Andrew; Wood, Wesley: EMPLACEMENT PROCESSES FOR BRECCIAS AT THE MOUNT YANA VOLCANIC CENTER, NORTHERN CALIFORNIA
	8:30 AM	BREAK
25-6	8:35 AM	Blatter, Dawnika*; Burgess, Seth D.: PRIMITIVE VOLCANISM AT CLEAR LAKE VOLCANIC FIELD, CA INDICATES A PERIOD OF DEEP MAGMA ACCESS FACILITATED BY TRANS-TENSIONAL STRESS FIELD
25-7	8:40 AM	Wall, Kellie*; Johnson, Emily; Gallant, Elisabeth; Nasholds, Morgan; Arroyo, Yesenia; Poland, Michael; Riggs, Nancy; Ort, Michael H.; Stelten, Mark: DIVERSE MAGMAS ERUPTED OVER SHORT TIME SCALES IN THE SAN FRANCISCO VOLCANIC FIELD, ARIZONA
25-8	8:45 AM	Parker, Don F.*; White, John C.: THE GOMEZ TUFF REVISITED: THE WORLD'S LARGEST PANTELLERITIC IGNIMBRITE
25-9	8:50 AM	Bryan, Rachel*; Frey, Holli; Manon, Matthew: OLIVINE DIFFUSION CHRONOMETRY REVEALS RAPID ASCENT RATES AND COMPLEX ERUPTIVE HISTORY OF RANGITOTO, AUCKLAND VOLCANIC FIELD, NEW ZEALAND
	8:55 AM	CONCLUDING REMARKS

ORAL TECHNICAL SESSIONS

SESSION NO. 23

T22. Management of Hydrologic and Geologic Resources I (GSA Energy Geology Division; GSA Hydrogeology Division)

8:00 AM, Davenport Grand Hotel, Maple Ballroom

Attila Fohnagy and Alan English, Presiding

	8:00 AM	INTRODUCTORY REMARKS
23-1	8:10 AM	Carstarphen, Camela*: USING PRECIPITATION AND GROUNDWATER ISOTOPE DATA TO DELINEATE AND MAP HYDROGEOLOGIC UNITS, RECHARGE SOURCES AND GROUNDWATER FLOW, PLAINS, MONTANA
23-2	8:30 AM	Kelly, Patrick*; Brandon, William C.; Wilkin, Rick; Harte, Philip; Anderson, Lydia; Juliano, Christopher: A NOVEL PASSIVE RADON DETECTOR FOR HYDROGEOLOGIC CHARACTERIZATION
23-4	9:10 AM	Strauch, Ayron*; Raming, Logan: EXPOSURE OF PERCHED GROUNDWATER BODIES AFFECTS STREAM BASEFLOW ON YOUNG VOLCANIC ISLANDS
23-5	9:30 AM	Dohman, Jenna M.*; Hanson, Ann E.H.; Myse, Todd: INVESTIGATION OF HYDROGEOLOGIC INFLUENCES ON WATER SUPPLY AND TEMPERATURE IN THE BIG HOLE RIVER, SOUTHWESTERN MT
	9:50 AM	DISCUSSION WITH SPEAKERS I

10:05 AM **BREAK**

23-6	10:20 AM	Fohnagy, Attila*; Rao, Maya; Wick, Richard: COMPACTS AS A TOOL TO MANAGE WATER: A MONTANA PERSPECTIVE
23-7	10:40 AM	Kelley, Christopher*: MANAGING A SOLE-SOURCE AQUIFER SYSTEM; COMBINING SCIENCE, POLICY, AND RESIDENTIAL DEVELOPMENT
23-8	11:00 AM	Heitshusen, Brett*: MONTANA DEPARTMENT OF AGRICULTURE: A GIS METHOD FOR AGRICULTURAL CHEMICAL GROUNDWATER MONITORING WELL SITE SELECTION
23-9	11:20 AM	Santiago, Hunter; Sander-Olhoeft, Morgan*: NEAR-SURFACE GEOPHYSICAL SURVEYING METHODS FOR THE MANAGEMENT OF HYDROGEOLOGIC RESOURCES
	11:40 AM	DISCUSSION WITH SPEAKERS II
	11:55 AM	CONCLUDING REMARKS

POSTER TECHNICAL SESSIONS

SESSION NO. 24

T3. Mineral Deposits of the Western United States: A View from the States and Industry (Posters) (GSA Energy Geology Division; Idaho Geological Survey)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

	Booth #	
24-1	1	Rudko, Amy*; Steely, Alex: AGGREGATE RESOURCE INVENTORY OF KITSAP COUNTY, WASHINGTON
24-2	2	Pierson, Justin*; Karl, Nicholas A.; Mauk, Jeffrey; San Juan, Carma A.; Helfrich, Autumn L.: USMIN NATIONAL SCALE DATABASE OF ABANDONED MINE FEATURES
24-3	3	Helfrich, Autumn*; Karl, Nicholas A.; Mauk, Jeffrey; San Juan, Carma A.; Pierson, Justin: PROGRESS ON THE UNITED STATES GEOLOGICAL SURVEY'S (USGS) NATIONAL INVENTORY OF NON-FUEL MINE WASTE FEATURES
24-4	4	Serrin, Blaine*: "RESTORING THE SITE" THROUGH MINING
24-5	5	Richardson, Kathryn; Mirkouei, Amin*: PHYTOMINING PATHWAY FOR MIXED RARE EARTH ELEMENTS EXTRACTION FROM IDAHO-SOURCED MINERALS
24-6	6	Gaudette, Robin*; Mattinson, Chris: USING ZIRCON TRACE ELEMENTS TO CONSTRAIN MAGMA OXYGEN FUGACITY AND ESTIMATE THE TUNGSTEN MINERAL RESOURCE POTENTIAL OF PLUTONS IN NORTHEASTERN WASHINGTON
24-7	7	LaBudda, Everett*; Eastman, Kyle; Gammons, Christopher; Lehman, Miranda; Scarberry, Kaleb: GEOCHEMISTRY AND HYPERSPECTRAL MINEROLOGY OF THE BOULDER PORPHYRY CU-MO PROSPECT, SOUTHWESTERN MONTANA
24-8	8	Pierce, Maggie*; Aird, Hannah M.: IOCG ALTERATION AND PETROGENESIS OF LIGHTS CREEK STOCK, PLUMAS COUNTY, CA
24-9	9	Beasley, Chloe*; Aird, Hannah M.: CHARACTERIZING AMPHIBOLE WITHIN THE LIGHTS CREEK STOCK, PLUMAS COUNTY, CALIFORNIA
24-10	10	Schultz, Leeah*: ENGELS GABBRO AND GRANITOID DIKE RELATIONSHIPS WITHIN THE LIGHTS CREEK STOCK
24-11	11	Towne, Matthew*; Aird, Hannah M.: EXTENT OF ALTERATION WITHIN THE SUPERIOR MINE AT THE LIGHTS CREEK STOCK (IOCG), PLUMAS COUNTY, CA
24-12	12	Miller, McKenzie*; Regan, Sean; Kreiner, Douglas C.: MONAZITE PETROCHRONOLOGY OF INTERIOR ALASKA'S POGO AU DEPOSIT

AM

THURSDAY

POSTERS

SESSION NO. 25**T15. Distributed Volcanic Fields in Western North America (Posters) (GSA Geophysics and Geodynamics Division)**

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

	Booth #	
25-1	13	Mickus, Kevin*: REGIONAL GRAVITY ANALYSIS OF THE YELLOWSTONE CALDERA, WYOMING
25-2	14	Dietz, Haley*; Murray, Kendra; Pu, Xiaofei; Sutherland, Rebecca: QUANTIFYING PRE-ERUPTIVE MAGMATIC WATER CONTENT OF EASTERN SNAKE RIVER PLAIN BASALTIC MELTS USING OLIVINE AND PLAGIOCLASE HYGROMETRY WITH IMPLICATIONS FOR MAGMATIC DIFFERENTIATION
25-3	15	Johnson, Emily*; Gardner, Cynthia; Pivarunas, Anthony F.; Scott, William: DISTRIBUTED VOLCANISM IN THE CENTRAL OREGON CASCADES: INSIGHTS INTO ERUPTION STYLES, DURATIONS, AND MAGMA COMPOSITIONS FROM THE TWIN LAKES-WUKSI BUTTE CHAIN
25-4	16	Ruth, Dawn*: PETROLOGY OF THE NORTHWEST RIFT ZONE, NEWBERRY VOLCANO, OREGON
25-5	17	Mitchell, Nathaniel*; Harp, Andrew; Wood, Wesley: EMPLACEMENT PROCESSES FOR BRECCIAS AT THE MOUNT YANA VOLCANIC CENTER, NORTHERN CALIFORNIA
25-6	18	Blatter, Dawnika*; Burgess, Seth D.: PRIMITIVE VOLCANISM AT CLEAR LAKE VOLCANIC FIELD, CA INDICATES A PERIOD OF DEEP MAGMA ACCESS FACILITATED BY TRANS-TENSIONAL STRESS FIELD
25-7	19	Wall, Kellie*; Johnson, Emily; Gallant, Elisabeth; Nasholds, Morgan; Arroyo, Yesenia; Poland, Michael; Riggs, Nancy; Ort, Michael H.; Stelten, Mark: DIVERSE MAGMAS ERUPTED OVER SHORT TIME SCALES IN THE SAN FRANCISCO VOLCANIC FIELD, ARIZONA
25-8	20	Parker, Don F.*; White, John C.: THE GOMEZ TUFF REVISITED: THE WORLD'S LARGEST PANTELLERITIC IGNIMBRITE
25-9	21	Bryan, Rachel*; Frey, Holli; Manon, Matthew: OLIVINE DIFFUSION CHRONOMETRY REVEALS RAPID ASCENT RATES AND COMPLEX ERUPTIVE HISTORY OF RANGITOTO, AUCKLAND VOLCANIC FIELD, NEW ZEALAND

SESSION NO. 26**T27. Undergraduate Research (Posters) (GSA Energy Geology Division)**

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 4 to 5:30 PM

	Booth #	
26-1	22	Haak, Samantha*; Lindsey, Jonah; Foley, Neil T.: ANTARCTIC AERIAL ELECTROMAGNETIC RESISTIVITY (AEM): UNDERSTANDING LOW-RESISTIVITY ANOMALIES IN MCMURDO DRY VALLEYS AND BRINE INFILTRATION IN THE MCMURDO ICE SHELF
26-2	23	Tucker, Leigh*; Richardson, Marquis T.; Crider, Juliet; Hoover, William; Davis, Elizabeth J.: USING GARNET INCLUSIONS TO TEST SHARED GLACIAL PROVENANCE IN COASTAL AND PUGET SOUND BEACH SANDS
26-3	24	Preator, Carley; James, Jasmine*; MacInnes, Breanyn: AGE AND DEPOSITIONAL ENVIRONMENTS OF THE WHITE CLIFFS OUTCROP (ELLENSBURG FORMATION), HWY 10 IN THORP, WA
26-4	25	Belasco, Alan*; Buddington, Andrew; Smith, Marilyn L.: ANTOINE PEAK CONSERVATION AREA FIELD STUDY: AN UNDERGRADUATE SERVICE-LEARNING RESEARCH PROJECT
26-5	26	Belasco, Alan*; Buddington, Andrew; Gamache, Kaitlin R.; Osgood, Jaly: MT. MAZAMA TEPHRA IDENTIFICATION USING

MICROPROBE GEOCHEMICAL ANALYSIS AT SALTESE FLATS, EASTERN SPOKANE COUNTY, WASHINGTON

26-6	27	Penaranda, Bryce*; Belasco, Alan; Buddington, Andrew; Rogers, Chris: MOYIE-PURCELL MAGMATISM AS SEEN FROM AMPHIBOLITES WITHIN THE SOUTHERN PRIEST RIVER COMPLEX
26-7	28	Smith, Marilyn*; Pritchard, Chad; Gaschnig, Richard: REFINING AGES OF GRANITIC ROCKS AT THE INTERSECTION OF THE SEVIER OROGENY AND PRIEST RIVER CORE COMPLEX IN THE SPOKANE AREA
26-8	29	Lawrence, Jessica*; Potter, Natalie; Pritchard, Chad: U/PB ZIRCON AGES OF SALTESE UPLAND CONSERVATION AREA, PRIEST RIVER CORE COMPLEX
26-9	30	Leonard, Max*; Taylor, Kevin; Potter, Natalie; Pritchard, Chad: AGE AND GEOCHEMISTRY OF SILLIMANITE GNEISS FROM A POSSIBLE CORE COMPLEX NEAR CHENEY, WA
26-10	31	McShane, McKenna*; Sands, Aneesah; Viealtsina, Ekaterina; Bakhtaliev, Mehrimo; Persico, Lyman: OSL DATING OF HILLSLOPE SEDIMENTS IN SOUTHEASTERN WASHINGTON: AN ANALYSIS OF TOPOCLIMATE-MEDIATED HILLSLOPE EVOLUTION PATTERNS IN SPRING GULCH
26-11	32	Greenough, Cameryn; Patterson, Rebecca*; Bader, Nicholas E.; Persico, Lyman P.: SHIFTING CLIMATES REFLECTED IN PALEOSOLS OF THE COLUMBIA RIVER BASALT GROUP BETWEEN 15.0 MA AND 10.5 MA
26-12	33	Chopra, Harshvardhan; Stark, Coden*; Bader, Nicholas E.; Persico, Lyman P.: DECREASE IN WEATHERING OVER TIME OBSERVED IN PALEOSOLS OF THE COLUMBIA RIVER BASALT GROUP, SE WASHINGTON AND NE OREGON, USA
26-13	34	Lee, Julia*; Campbell, Jessica; Krol, Michael: GEOCHEMICAL ANALYSIS OF ULTRAMAFIC BODIES WITHIN THE CENTRAL RUBY RANGE, SOUTHWESTERN MONTANA: INTRUSIVE OR TECTONIC EMPLACEMENT?
26-14	35	Ranck, Olivia*; Krol, Michael: TRACING THE EXTENT OF THE 6.0 MA TIMBER HILL BASALT INTO THE HEISE VOLCANIC FIELD: AGEOCHEMICAL APPROACH TO CORRELATING YOUNG BASALTIC LAVA FLOWS WITH THE YELLOWSTONE HOTSPOT TRACK
26-15	36	Stone, Michael*; McLaughlin, Win: INVESTIGATIONS INTO THE YACHATS BASALT
26-16	37	Tucker, Abigail*; Hendrix, Marc S.; Hofmann, Michael H.: ANALYSIS OF THE SEDIMENTOLOGY AND DIAGENESIS OF CORE FROM THE MIDDLE MEMBER OF THE SAPPINGTON FORMATION (LATE DEVONIAN), TOOLE COUNTY, MONTANA
26-17	38	Smith, Arlo J.*; Andersen, Allen; Nicolaysen, Kirsten P.: PETROGRAPHY AND COMPREHENSIVE WHOLE ROCK CHEMISTRY OF SODIC ALKALINE ROCKS FROM THE ROBINSON ANTICLINE COMPLEX, CRAZY MOUNTAINS, MONTANA
26-18	39	Brodale, Matthew*; Karl, Juliana; Finzel, Emily; Horkley, L. Kenneth: PALEOCENE TO EOCENE POWDER RIVER BASIN PROVENANCE BASED ON DETRITAL GARNET AND APATITE GEOCHEMISTRY
26-19	40	Karl, Juliana*; Brodale, Matthew; Finzel, Emily; Horkley, L. Kenneth: PROVENANCE OF THE PALEOCENE TURLOCK MEMBER USING DETRITAL GARNET AND APATITE, FORT UNION FORMATION, POWDER RIVER BASIN
26-20	41	Raab, Jillian*; Tierny, Casey: MINERAL INSIGHTS INTO THE MAGMATIC PROCESSES OF PRE-CALDERA ANDESITES AT BONANZA CALDERA, SAN JUAN VOLCANIC FIELD, COLORADO
26-21	42	Sharp, Morgan*; Surpless, Benjamin; Pogue, Kevin: FAULT DAMAGE ZONE DEVELOPMENT ON THE SEVIER NORMAL FAULT SYSTEM, UTAH
26-22	43	Diaz, Jennifer*; Metcalf, Kathryn: ORIGIN AND TECTONIC DEVELOPMENT OF THE RATTLESNAKE CREEK TERRANE, KLAMATH MOUNTAINS, NORTHERN CALIFORNIA

- 26-23 44 Coady, Grace*; Burke, Addison; Johnston, Scott; Kylander-Clark, Andrew R.C.: **QUANTIFYING THE VOLUME OF INHERITED ZIRCON IN LAYERED GRANITIC ROCKS OF THE TUOLUMNE INTRUSIVE SUITE, SIERRA NEVADA BATHOLITH, CALIFORNIA, USA**
- 26-24 45 Santos, Pedro*; Panian, Stephan; Johnston, Scott; Kylander-Clark, Andrew R.C.: **QUANTIFYING THE VOLUME OF INHERITED ANTECRYSTIC ZIRCON ACROSS THE CATHEDRAL PEAK GRANODIORITE OF THE TUOLUMNE INTRUSIVE SUITE, SIERRA NEVADA BATHOLITH, CALIFORNIA, USA**
- 26-25 46 DeBoer, Reghan*; Waldien, Trevor: **THE INFLUENCE OF PRECAMBRIAN FABRIC REACTIVATION ON FORMATION OF THE LARAMIDE WHITE GATES MONOCLINE, BLACK HILLS, SOUTH DAKOTA**
- 26-26 47 Braun, Rebecca*; Waldien, Trevor: **DEFORMATION KINEMATICS AND TEMPERATURE CONDITIONS OF THE DAKOTA TECTONIC ZONE WITHIN THE LITTLE ELK GRANITE IN THE BLACK HILLS NEAR NEMO, SOUTH DAKOTA**
- 26-27 48 Fry, Liam*; Wetzel, Laura R; Waldien, Trevor: **KINEMATIC ANALYSIS OF LITTLE ELK GRANITE SHEAR ZONES, BLACK HILLS SOUTH DAKOTA**
- 26-28 49 Obringer, Willa*: **ELUCIDATION OF AN UNDEFINED RELATIONSHIP: A STUDY OF THE LITTLE ELK GRANITE AND BOXELDER CREEK QUARTZITE AS TO DECIPHER PRECAMBRIAN BASIN DEVELOPMENT IN THE BLACK HILLS, SD**
- 26-29 50 Obringer, Willa*; Kandel, Hari: **EXPLORING RARE EARTH ELEMENT CONCENTRATIONS IN THE NORTHERN COMPLEX OF MARQUETTE, MI: INSIGHTS INTO GEOCHEMICAL PATTERNS AND GEOLOGICAL SIGNIFICANCE**
- 26-30 51 Dowdall, Kelsey*; Markus, Brendon; Van Hoven, Loet; Xiao, Beiyuan; Ortega, Yajaira; Mnich, Marissa: **ASSESSING CARBON DIOXIDE-INDUCED ACIDIFICATION ON CARBONATE-BEARING MATERIALS**
- 26-31 52 Poobua, Suphakorn*; Schmidt, David: **YAKIMA VALLEY DEFORMATION DETECTION BY INTERFEROMETRIC SYNTHETIC APERTURE RADAR (INSAR)**
- 26-32 53 Scoles, Alexander*; Fuzak, Aaron; Potter, Natalie; Smith, Marilyn; Toulou, Erin; Rychart, Ethan; Flores, Alida; Aghassi, Danial; Pritchard, Chad: **EWU HYDROGEOLOGIC EXPERIENCE IN SALTESE BASIN, EASTERN WASHINGTON**
- 26-33 54 Denby, Katalyn; Izaguirre, Yoel; Kaufer, Andrea; Powers, Sophia; Sanchez, Mia*; Hoffman, Sarah; Persico, Lyman P.: **A TALE OF TWO FLOODS: COMPARING PEAK DISCHARGES OF THE 1918 AND 2022 NORTHERN YELLOWSTONE NATIONAL PARK FLOODS**
- 26-34 55 Hoffman, Sarah*; Persico, Lyman P.: **RECONSTRUCTING PEAK DISCHARGE VARIABILITY OF THE JUNE 2022 FLOOD IN NORTHERN YELLOWSTONE NATIONAL PARK**
- 26-35 56 Roslan, Fikri*; Crider, Juliet; Gorman-Lewis, Drew: **COULD ENHANCED ROCK WEATHERING SEQUESTER CO₂ AND REDUCE THE HAZARD OF NATURALLY OCCURRING ASBESTOS DOWNSTREAM OF THE SWIFT CREEK LANDSLIDE (WHATCOM COUNTY WA)?**
- 26-36 57 Brandt, Hunter*; Sheets, Denver; Leonard, Karl W.: **STRATIGRAPHIC ANALYSIS OF THE AMSDEN AND BROOM CREEK FORMATIONS (PERMO-CARBONIFEROUS) IN THE WILLISTON BASIN: A STRATIGRAPHIC MODEL FOR A CARBON STORAGE UNIT**
- 26-37 58 Mindt, Ashley*; Teigen, Natalie J.; Leonard, Karl W.: **FUSULINIDS FROM THE UPPER PART OF THE BROOM CREEK FORMATION (PERMIAN?): A PALEOECOLOGICAL AND BIOSTRATIGRAPHIC ASSESSMENT OF A CARBON STORAGE INTERVAL IN THE WILLISTON BASIN**
- 26-38 59 Holiman, Ella*; Leonard, Karl W.: **METHANE EMISSIONS FROM THE CLAY COUNTY (MINNESOTA) SANITARY LANDFILL: AN ANALYSIS DONE DURING AN INTERNSHIP WITH THE CLAY COUNTY SOLID WASTE COMMISSION**
- 26-39 60 Wilke, Reed*; Von Bank, AJ; Peters, Ally; Leonard, Karl W.: **WATER QUALITY ANALYSIS OF RED RIVER VALLEY'S MUNICIPAL AND RURAL WATER SUPPLY: A COLLABORATION BETWEEN LOCAL HIGH SCHOOL SCIENCE CLASSES AND GEOSCIENCES AT MSUM**
- 26-40 61 Sulas, Hannah*; Gianniny, Gary; Clutter, Melissa: **SOURCE DELINEATION OF ARSENIC CONTAMINATION IN DRINKING WATER IN SOUTHEASTERN UTAH**
- 26-41 62 Fuzak, Aaron*; Pritchard, Chad: **PFAS VARIATION THROUGH A WASTE WATER TREATMENT FACILITY PROCESS**

ORAL TECHNICAL SESSIONS

SESSION NO. 27

D1. Recent Advances in Geoscience and Geoscience Education

1:30 PM, Davenport Grand Hotel, Meeting Room 1

Richard Gaschnig, Presiding

1:30 PM **INTRODUCTORY REMARKS**

- 27-1 1:35 PM Gray, Gary*; O'Sullivan, Paul; Bennett, Kyra; Johnson, Kenneth; Hauge, Tom; Rossen, Christine; Jackson, Jay; Waugh, Barb: **PALEOGENE BASALT-RHYOLITE COMPLEX EXPOSED IN THE PAISLEY HILLS, SOUTH-CENTRAL OREGON**
- 27-2 1:55 PM McCarville, Katherine*; Mahan, Shannon A.: **LEAVE NO STONE UNTURNED: PRELIMINARY OSL DATES FROM BENEATH A GIANT ERRATIC BOULDER, NORTHEAST IOWA**
- 27-3 2:15 PM Muhlbauer, Jason*; Mohr, Michael; Schmitz, Mark D.: **TANDEM U-PB GEOCHRONOLOGY AND TREE ANALYSIS OF DETRITAL ZIRCON IN THE CAMBRIAN BOLSA QUARTZITE, SOUTHERN ARIZONA, USA**
- 27-4 2:35 PM Steven, Cody*; Rangel, Jennifer; Lewis, Reed S.; Williams, Thomas J.: **METAMORPHISM OF OCEANIC ULTRAMAFIC ROCKS FROM WESTERN IDAHO**
- 27-5 2:55 PM Wright, Shawn*: **A WEALTH OF ANALOG PROCESSES, LITHOLOGIES, AND FIELD LOCALITIES AT LONAR CRATER, INDIA REGARDING BASALTIC VOLCANISM, ALTERATION, AND SHOCK**
- 27-6 3:15 PM Mitchell, Todd*; Mitchell, Karen Rittenhouse: **SWINOMISH PLACE-BASED SCIENCE, CULTURE, AND ENVIRONMENTAL EDUCATION: AN INDIGENOUS APPROACH TO ENVIRONMENTAL AND RESOURCE ISSUES**
- 3:35 PM **BREAK**
- 27-7 3:50 PM Halsey, Richard*: **HOW TO TEACH THE LOVE OF ROCKS: TRANSLATING THE LANGUAGE OF GEOLOGY TO INSPIRE CURIOSITY AND ATTRACT FUTURE GEOLOGISTS**
- 27-8 4:10 PM Sethi, Parvinder*; Wicander, Reed: **HARNESSING THE POWER OF ARC-GIS, STORYMAP, AND GIGAPAN TECHNOLOGY FOR CREATING VIRTUAL FIELD TRIPS FOR TEACHING AND LEARNING PHYSICAL GEOLOGY**
- 27-9 4:30 PM Smaglik, Suzanne*: **REFLECTIONS ON THE EVOLUTION OF AN ONLINE ASYNCHRONOUS LAB COURSE IN PHYSICAL GEOLOGY**

SESSION NO. 28

T3. Mineral Deposits of the Western United States II: A View from the States and Industry (GSA Energy Geology Division; Idaho Geological Survey)

1:30 PM, Davenport Grand Hotel, Birch Ballroom

Virginia Gillerman and Hayley Rambur, Presiding

1:30 PM **INTRODUCTORY REMARKS**

- 28-1 1:35 PM Dworjan, Nadia*; John, Barbara E.; Biasi, Joseph: **AN ENIGMATIC CU-AU DEPOSIT IN THE LARAMIE RANGE**
- 28-2 1:55 PM Henry, Christopher D.*: **LITHIUM CLAY DEPOSITS IN THE MCDERMITT CALDERA, NEVADA - OREGON: GEOLOGIC CHARACTERISTICS AND CONTRIBUTIONS FROM CLOSED-HYDROLOGIC SYSTEM DIAGENESIS (CHSD) AND POSSIBLE HYDROTHERMAL ACTIVITY**
- 28-3 2:15 PM Dilles, John*; Kirkland, Christopher L.; Olierook, Hugo K.H.; Dröllner, Maximilian; Clevenger, Joe; Way, Rachel A.M.; Miggins, Daniel P.; Acito, Sydney; Scarberry, Kaleb; Eastman, Kyle; Olson, Nansen: **ZIRCON AGE AND GEOCHEMISTRY OF GRANITES RELATED TO PORPHYRY AND POLYMETALLIC MINERAL DEPOSITS OF THE EASTERN ELKHORN MOUNTAINS AND BOULDER BATHOLITH, MONTANA**
- 28-4 2:35 PM Acosta, Marisa*; Eastman, Kyle; Reed, Mark; Moore, Jo; Griffith, Amanda: **QUARTZ-MOLYBDENITE MYLONITES OF THE BUTTE PORPHYRY CU-MO DEPOSIT**
- 28-5 2:55 PM Scarberry, Kaleb*; Korzeb, Stanley L.: **LATE CRETACEOUS MAGMATISM AND MINERAL DEPOSITS OF THE ELKHORN 7.5-MINUTE QUADRANGLE, JEFFERSON COUNTY, MONTANA**
- 28-6 3:15 PM Eastman, Kyle*; Rossi, Amanda; Anderson, Eric D.; Dilles, John; Lehman, Miranda: **CRITICAL MINERALS PROSPECTIVITY, GEOCHEMISTRY, AND ALTERATION MINERALOGY OF MAGMATIC-HYDROTHERMAL MINERAL SYSTEMS IN THE RADERSBURG AND GIANT HILL 7.5' QUADRANGLES, SOUTHWESTERN MONTANA**
- 3:35 PM **BREAK**
- 28-7 3:50 PM Kerner, Dale*: **STIBNITE: MORE THAN JUST A TOWN IN IDAHO**
- 28-8 4:10 PM Skov, Rian*; Damer, Nicole; Shafer, Ana; Stanton, Kelsay; Massey, Bryan: **INNOVATIVE SURFACE MINE RECLAMATION IN WASHINGTON STATE**
- 28-9 4:30 PM Mauk, Jeffrey*; Karl, Nicholas A.; Helfrich, Autumn L.; Pierson, Justin; San Juan, Carma A.: **ABANDONED MINES IN THE UNITED STATES: CHALLENGES, OPPORTUNITIES, AND COLLABORATIONS**
- 28-10 4:50 PM Donelick, Raymond*; White, Kaelyn; Craig, Benjamin: **SURFACE MINE CLOSURE THAT INCLUDES SEASONAL THERMAL ENERGY STORAGE AND RELATED ASSETS**
- 5:10 PM **DISCUSSION**

SESSION NO. 29

T5. The Boring Billion was not so Boring! Mesoproterozoic Tectonics, Sedimentation, and Geochronology of Northwest Laurentia II

1:30 PM, Davenport Grand Hotel, Cedar Ballroom

Robert Thomas and Paul K. Link, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 29-1 1:35 PM Winston, Don; Parker, Stuart*: **FINISHING WHAT DON WINSTON STARTED: PRELIMINARY CORRELATIONS OF THE MESOPROTEROZOIC APPEKUNNY FORMATION, LOWER BELT SUPERGROUP**
- 29-2 1:55 PM Lewis, Reed*; Burmester, Russell F.: **MAGNETITE IN THE BELT SUPERGROUP**
- 29-3 2:15 PM Pratt, Brian R.*: **SYNDEPOSITIONAL FAULTING IN THE BELT BASIN: JUST ONE DAMNED TSUNAMI AFTER ANOTHER**
- 29-4 2:35 PM Kah, Linda*; Kriscoutzky, Agustin; Bartley, Julie: **MOLAR-TOOTH MICROSPAR AS A WINDOW INTO PROTEROZOIC CARBONATE PRECIPITATION, STABILIZATION, AND DIAGENESIS**
- 29-5 2:55 PM Bartley, Julie*; Kah, L.C.: **STROMATOLITE DIVERSITY IN THE MESOPROTEROZOIC MIMICS ENVIRONMENTAL HETEROGENEITY**

3:15 PM **BREAK**

- 29-6 3:30 PM Johnson, D. Jay*: **PLASMIC FABRIC FROM THE 1450 MA HELENA FORMATION AT HUNGRY HOARSE DAM, MT**
- 29-7 3:50 PM Kuhn, Jeffrey*: **THE SNOWSLIP FORMATION OF GLACIER NATIONAL PARK AND THE BELT BASIN – RECENT OBSERVATIONS**

SESSION NO. 30

T17. The Highest and the Deepest: the U.S. Frontier of Cave and Karst Research (GSA Karst Division)

1:30 PM, Davenport Grand Hotel, Meeting Room 2

Lee Florea and Georgia Schneider, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 30-1 1:40 PM Florea, Lee*; Stenner, Christian: **THE COMPLEXITY OF CAVE ORIGIN AND KARST PROCESS IN THE PACIFIC NORTHWEST**
- 30-2 2:00 PM Montanez Munoz, Sarai*; Williams-Jones, Glyn; Sepúlveda, Sergio A.; Connelly, Jason: **MORPHOMETRIC ANALYSIS OF APE CAVE (WA, USA) FROM A HIGH-RESOLUTION 3D MODEL BASED ON HANDHELD LIDAR IMAGING**
- 30-3 2:20 PM Rahalski, Emma*; Bershaw, John: **STABLE ISOTOPE STUDY OF WATER IN OREGON CAVES NATIONAL MONUMENT**
- 30-4 2:40 PM Stenner, Christian*; Florea, Lee; Pflitch, Andreas; Riggs, David; Graham, Kathleen; Cartaya, Eduardo: **MORPHODYNAMICS, MORPHOLOGY, AND MICROCLIMATE OF THE GLACIOVOLCANIC CAVE SYSTEM AT THE SUMMIT OF MOUNT RAINIER, WASHINGTON, USA**
- 30-5 3:00 PM Hose, Louise*; DuChene, Harvey; Powell, J. Douglas; Polyak, Victor; Asmerom, Yemane: **THE KALEIDOSCOPE OF SPELEOGENESIS IN EAST-CENTRAL NEVADA, USA**
- 30-6 3:20 PM Schneider, Georgia*: **CAVE AND KARST DATA MANAGEMENT IN THE SPATIAL WILD WEST**
- 3:40 PM **DISCUSSION**
- 4:20 PM **CONCLUDING REMARKS**

SESSION NO. 31

T22. Management of Hydrologic and Geologic Resources II (GSA Energy Geology Division; GSA Hydrogeology Division)

1:30 PM, Davenport Grand Hotel, Maple Ballroom

Attila Fohnagy and Alan English, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 31-1 1:35 PM Burgel, Bill*: **THE DEVELOPMENT OF THE SCIENCE OF GEOLOGY DURING THE GROWTH OF THE RAILROAD INDUSTRY - HOW THESE TWO DISCIPLINES GREW SYNERGISTICALLY THROUGHOUT THE 19TH AND 20TH CENTURY**
- 31-2 1:55 PM Skaggs, Elizabeth*; Friedman, Jonathan M.; Holmquist-Johnson, Christopher; Perkins, Dusty W.; Enns, Kyle D.; Gommermann, Luke: **EFFECTS OF WATER MANAGEMENT ON CHANNEL AND VEGETATION CHANGES ALONG THE MIDDLE GREEN RIVER, UTAH**
- 31-6 3:15 PM Jesmok, Greg*; Fuhrmann, Byran C.; Hauswirth, S.C.; Beutel, Marc W.; Ganguli, Priya: **EVALUATING SOURCES OF BIOACCUMULATIVE MERCURY IN SOUTHERN CALIFORNIA RESERVOIRS: CASTAIC LAKE, LOS ANGELES COUNTY**
- 3:35 PM **DISCUSSION WITH SPEAKERS**
- 3:50 PM **CONCLUDING REMARKS**

FRIDAY, 17 MAY 2024

ORAL
TECHNICAL SESSIONS

SESSION NO. 32

T4. Undergraduate and Graduate Geoscience Student Lightning Talk Showcase (Lightning Talks) (GSA Energy Geology Division)

8:00 AM, Davenport Grand Hotel, Birch Ballroom

James MacDonald Jr. and Peter Davis; Chris Mattinson, Presiding.

- 8:00 AM **INTRODUCTORY REMARKS**
- 38-1 8:05 AM Klisura, Shayne*; Blythe, Ann; Seymour, Nikki M.: **UPLIFT AND EXHUMATION OF THE CENTRAL TEHACHAPI MOUNTAINS DERIVED FROM JOINT APATITE (U-TH)/HE AND FISSION-TRACK ANALYSES**
- 38-2 8:10 AM Burges, Jarrod*; Metcalf, Kathryn: **DESKTOP APPLICATION TO MANAGE AND STORE DETRITAL ZIRCON GEOCHRONOLOGICAL DATA IN A SQL DATABASE**
- 38-3 8:15 AM Carlson, Gabe*; Mattinson, Christopher; Ortega, Karla; Zencak, Peter: **ZIRCON "VACUUM CLEANER" FOR IMPROVED EFFICIENCY OF MINERAL SEPARATION**
- 38-4 8:20 AM Steckel, Amanda*; Clark, Roger; Hendrix, Amanda: **MINERAL IDENTIFICATION WITH HYPERSPECTRAL IMAGERY NEAR THE ATMOSPHERIC WATER ABSORPTION BAND**
- 38-5 8:25 AM Peckenpaugh, Jake*; Schmitz, Mark D.; Schwartz, Darin: **CHARACTERIZATION OF MALI ANDRADITE GARNETS AS U-PB REFERENCE MATERIALS**
- 38-6 8:30 AM Potter, Natalie*; Morton, Travis; Pritchard, Chad: **U/PB AGES OF ISOLATED BUTTES IN SPOKANE, WASHINGTON AREA TO HELP PROJECT DEFORMATION IN THE SUBSURFACE**
- 38-7 8:35 AM Hernandez, Iris*; Davis, Peter: **NEW DETRITAL ZIRCON AGE CONSTRAINTS FOR THE DARRINGTON PHYLLITE EAST OF THE STRAIGHT CREEK-FRASER RIVER FAULT**
- 38-8 8:40 AM Ames, Miriam E.*; Wilson, Kylie C.; Schmidt, Keegan: **A LATE CRETACEOUS SINISTRAL REVERSE SHEAR ZONE AT GREEN KNOB, IDAHO ALONG THE EAST-WEST TRENDING SEGMENT OF A CORNER IN THE CORDILLERAN MESOZOIC ACCRETIONARY BOUNDARY**
- 38-9 8:45 AM Vanlanen, Cassie*: **MAGNETOSTRATIGRAPHY AND MAGNETIC FABRICS OF THE MIOCENE COLUMBIA RIVER BASALTS IN SOUTHEASTERN WASHINGTON**
- 38-10 8:50 AM Martinez-Contreras, Mauricio Israel*; Aird, Hannah M.: **GEOCHEMICAL AND GEOCHRONOLOGICAL ANALYSIS OF THE ENGELS GABBRO AND DIORITE IN THE LIGHTS CREEK AREA, PLUMAS COUNTY, NORTHERN CALIFORNIA**
- 38-11 8:55 AM Flint, Miranda*; Harp, Andrew: **RECONSTRUCTING THE GEOLOGIC HISTORY OF ERODED MOUNT YANA BY USING THE GEOMETRY AND ORIENTATION OF EXPOSED DIKES**
- 38-12 9:00 AM Siciliano, Andrew*; Ruprecht, Philipp; Longo, Shasta; Johnson, Curtis; Ressel, Michael: **REDOX EVOLUTION OF EOCENE GREAT BASIN MAGMAS: IMPLICATIONS FOR AU MINERALIZATION IN NEVADA**
- 38-13 9:05 AM Zeigenfuss, Jess*; Gonzales, David: **ANALYZING THE ERUPTIVE HISTORY AND TRENDS OF MOUNT ST. HELENS, CASCADIA SUBDUCTION ZONE**
- 38-14 9:10 AM Hutchinson, Kimberly J.*; Pedersen, Gro B. M.; Pliispa, Elisa; Óskarsson, Birgir V.; Skúladóttir, Jóhanna M.: **THE IDENTIFICATION AND EVOLUTION OF LAVA TUBES WITHIN THE 2021 FAGRADALSFJALL LAVA FLOW FIELD IN ICELAND**
- 38-15 9:15 AM Johnson, Paige*; Maher, Teagan; Chmielowski, Celia; Dilley, Analeise; Forster, Lichen; Kohagura, Nanako; Mecham, Ski L.; Miller, Edward; Takeda, Natsumi; Lundblad, Steven: **GEODETTIC MONITORING OF 2021-2024 INTRUSIVE MAGMATIC EVENTS IN THE KOA'E FAULT SYSTEM OF KĪLAUEA VOLCANO, HAWAII**
- 38-16 9:20 AM Bussey, John*; Shuvo, Nabil; Lere-Adams, Josiah; Neuville, Daniel; Cormier, Laurent; Pearce, Carolyn; McCloy, John S.: **3D MICROSTRUCTURAL AND MAGNETIC ASSESSMENT OF CRYSTALLITES IN WESTERN NORTH AMERICAN OBSIDIANS**
- 38-17 9:25 AM Gillen, Abby*; de Silva, Shanaka; Burns, Dale; Salas, Guido: **PETROLOGICAL FORENSICS AND MAGMA DYNAMICS AT TICSANI VOLCANO IN SOUTHERN PERU**
- 38-18 9:30 AM Becerril-Gonzalez, Verenice*; de Silva, Shanaka L.; Cisneros de León, Alejandro; Jimenez, Nestor; Tepley, Frank J.: **CERRO VOLCÁN QUEMADO: AN ENIGMATIC HOLOCENE MONOGENETIC PHREATOMAGMATIC VOLCANO IN THE ALTIPLANO OF BOLIVIA**
- 38-19 9:35 AM Doyle, Madeline C.*; Gabet, Emmanuel J.: **PREDICTING SEDIMENT AGGRADATION FOLLOWING A SMALL DAM REMOVAL: MILL CREEK, CALIFORNIA, USA**
- 38-20 9:40 AM Moe, Rud*; Bershaw, John: **USING A STRATIGRAPHICALLY CONSTRAINED BASIN MODEL TO UNDERSTAND THE GEOLOGIC HISTORY OF THE CHEHALIS FOREARC BASIN, WASHINGTON STATE, USA**
- 38-21 9:45 AM Dias, Paulo H. A.*; Reis, Humberto, S; Valeriano, Claudio, M; Alkmim, Fernando F.; Rodrigues, Joseneusa, B; Silva, Marcio, A; Meireles Leite, Mariana; Silva, Wilker S.; Armond, Pedro, V.; Pires, Ana, C.: **THE TECTONIC EVOLUTION OF THE BRASILIANO/PAN-AFRICAN BRASÍLIA BELT: INSIGHTS FROM SEDIMENTARY BASINS**
- 38-22 9:50 AM Bauer, Brook*; Myers, Elif; Gazis, Carey; Ely, Lisa L.: **HYDROGEOLOGY AND POTENTIAL FOR GROUNDWATER RECHARGE AND STORAGE ON ALLUVIAL FANS IN THE YAKIMA BASIN**
- 38-23 9:55 AM Desimone, Carson*; Nezat, Carmen: **PLANT-AVAILABLE LEAD IN PRAIRIE RESTORATION SOIL PREVIOUSLY EXPOSED TO TRAPSHOOTING**
- 38-24 10:00 AM Meireles Leite, Mariana*; Amancio novo, Tiago; Reis, Humberto: **EXPLORING THE TUPI FIELD: INSIGHTS INTO STRUCTURAL CONTROLS ON DIAGENESIS IN BRAZIL'S LARGEST OIL RESERVE**

SESSION NO. 33

T8. Geochemistry, Hydrology, and Microbiology in the Yellowstone and Other Western North American Hydrothermal Systems (GSA Energy Geology Division)

8:00 AM, Davenport Grand Hotel, Meeting Room 2

Peter Larson, Kenneth Sims, Everett Shock, Jerry Fairley, Lee Florea and Aaron Rothfolk, Presiding

- 33-1 8:00 AM Reed, Mara*; Barth, Anna; Taira, Taka'aki; Farrell, Jamie; Manga, Michael: **CAN A SMALL EARTHQUAKE TRIGGER A BIG GEYSER ERUPTION?**
- 33-2 8:20 AM Pepin, Jeffrey*; Newman, Connor; Hall, Nicholas G.; Palko, Kelli M.; Russell, Cory A.; Flynn, Robert H.: **CHARACTERIZING THE STEAMBOAT SPRINGS, COLORADO, HOT-SPRINGS GEOTHERMAL RESOURCE**
- 33-3 8:40 AM Florea, Lee*; Svadlenak, Ellen: **ANALYSIS OF GEYSER BEHAVIOR OF THE KLICKITAT MINERAL SPRINGS, WASHINGTON**

- 33-4 9:00 AM Larson, Peter*; Zimmerman, Jarred; Fairley, Jerry:
RESPONSE OF THE YELLOWSTONE HYDROTHERMAL SYSTEM TO MANTLE PLUME PROGRESSION
- 33-5 9:20 AM Mordensky, Stanley*; Burns, Erick; Lipor, John J.; DeAngelo, Jacob: **INTEGRATING UNCERTAINTY INTO THE HYDROTHERMAL RESOURCE FAVORABILITY MAPS FOR THE GREAT BASIN, USA**
- 33-6 9:40 AM Caraccioli, Pascal*; Mordensky, Stanley; DeAngelo, Jacob; Burns, Erick; Lipor, John J.: **IMPROVING SUPERVISED MACHINE LEARNING PREDICTIONS FOR HYDROTHERMAL FAVORABILITY BY SEPARATING SIGNALS IN ELEVATION DATA**
- 33-7 10:00 AM Pepin, Jeffrey*; Burns, Erick R.; Cahalan, Ryan C.; Hayba, Daniel O.; Dickinson, Jesse E.; Duncan, Leslie L.; Kuniasky, Eve L.: **PRE-ASSESSMENT OF RESERVOIR THERMAL ENERGY STORAGE FOR THE UNITED STATES**

SESSION NO. 34

T13. New Developments in the Magmatic Drivers of Cascades Volcanism (GSA Geophysics and Geodynamics Division)

8:00 AM, Davenport Grand Hotel, Meeting Room 1

Nathan Andersen, Dawn Ruth, Dawnika Blatter and Emily Johnson, Presiding

- 34-1 8:00 AM Cunningham, Desiree*; Shamloo, Hannah; DeBari, Susan M.; Walowski, Kristina: **TIMESCALES OF MAGMA STORAGE AND ERUPTION INITIATION OF THE MOST RECENT LAVA FLOW IN THE MOUNT BAKER (KOMA KULSHAN) VOLCANIC FIELD, WA**
- 34-2 8:20 AM Yoder, Emily*; Shamloo, Hannah; DeBari, Susan M.; Walowski, Kristina: **ERUPTION INITIATION MECHANISMS AND TIMESCALES ACROSS MULTIPLE LAVA FLOWS AT A VERY HIGH THREAT CASCADE VOLCANO, MOUNT BAKER (KOMA KULSHAN), WA**
- 34-3 8:40 AM Tepper, Jeffrey*; White, Audrey; Dawes, Ralph: **ISOTOPICALLY DEPLETED MIOCENE ADAKITES IN THE CASCADIA REAR-ARC AND THEIR IMPLICATIONS FOR MANTLE FLOW**
- 34-4 9:00 AM Smith, Alyssa*; Streck, Martin J.; Conrey, Richard M.: **REGIONAL SCALE INVESTIGATION OF WIDESPREAD BASALTIC ANDESITES OF THE CENTRAL TO NORTHERN OREGON CASCADE ARC**
- 34-5 9:20 AM Sas, May (Mai)*; Halstead, Sean; Calvert, Emma; Peale, James; Cook, Madelyn; Newsom, Alex; Andersen, Nathan: **CRYSTAL RECORDS AT THE THREE SISTERS VOLCANIC COMPLEX, OREGON**
- 34-6 9:40 AM Cook, Madelyn*; Sas, May (Mai); Andersen, Nathan: **MAGMA MINGLING IN THE RHYOLITE OF SEPARATION CREEK, THREE SISTERS/KLAH KLAHNEE VOLCANIC COMPLEX, OREGON CASCADES, USA**
- 34-7 10:00 AM Newsom, Alex*; Sas, May; Andersen, Nathan: **EXPLORING THE IN-BETWEEN: A STUDY OF DACITE PETROGENESIS AT MIDDLE SISTER OF THE THREE SISTERS VOLCANIC COMPLEX (TSVC) IN CENTRAL OREGON, USA**
- 34-8 10:20 AM Templeton, Jeffrey*: **FIELD AND GEOCHEMICAL STUDY OF THE BALD MOUNTAIN VOLCANIC CENTER, CENTRAL OREGON: CONSTRAINTS ON THE EVOLUTION OF A SILICIC MAGMA SYSTEM IN A BACK-ARC SETTING**

SESSION NO. 35

T20. Neotectonics Across the Intermountain West from New Data to Classic Concepts

8:00 AM, Davenport Grand Hotel, Maple Ballroom

Cal Ruleman, David Lageson and Michael Stickney, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 35-1 8:05 AM Unruh, Jeffrey*; Bubeck, Alodie; Hammond, William C.: **TRANSTENSIONAL DEFORMATION KINEMATICS IN THE**

SEISMIC PARABOLA AROUND THE EASTERN SNAKE RIVER PLAIN, IDAHO, MONTANA, WYOMING, AND UTAH

- 35-2 8:25 AM Hartleb, Ross*; Hemphill, Jeffrey J.; Lindvall, Scott C.; Rockwell, Thomas K.; Unruh, Jeffrey R.; Zellman, Mark S.: **LIDAR-BASED OBSERVATIONS OF FAULTS IN WESTERN WYOMING AND IMPLICATIONS FOR SEISMIC SOURCE CHARACTERIZATION**
- 35-3 8:45 AM Stickney, Michael*: **RECENT SEISMICITY AND ITS RELATIONSHIP TO QUATERNARY FAULTS NORTH OF THE SNAKE RIVER PLAIN**
- 35-4 9:05 AM Reedy, Tabor*: **OBSERVATIONS OF TECTONIC DEFORMATION IN SOUTH CENTRAL IDAHO**
- 35-5 9:25 AM Matthews, Vince*; Cumella, Steve: **NEOGENE ROTATIONAL RIFTING OF THE COLORADO PLATEAU MICROPLATE: A MODEL FOR THE DISTRIBUTION OF DIVERGENT STRESS AND STRAIN IN THE UINTA BASIN**
- 35-6 9:45 AM Hobbs, Kevin*; Krupnick, Jon M.: **EVOLUTION OF THE CHUSKA MOUNTAIN FRONT, NAVAJO NATION, NEW MEXICO: CONSTRAINTS FROM GEOMORPHIC RELATIONSHIPS, MAPPING, AND GEOCHRONOLOGY**
- 10:05 AM **BREAK**
- 35-7 10:20 AM Palmquist, Robert*: **SEGMENTED HANGINGWALLS AT THE BASE OF SEGMENTED MOUNTAIN-FAULTS: BASIN AND RANGE, USA**
- 35-8 10:40 AM McCalpin, James*: **FAULTS IN INTERIOR BRITISH COLUMBIA EXPOSED IN QUATERNARY OUTCROPS; TECTONIC, LANDSLIDE, OR GLACIGENIC?**
- 35-9 11:00 AM Ruleman, Cal*; Hudson, Adam; Odom, William: **A FRAMEWORK MODEL FOR WESTERN NORTH AMERICAN LANDSCAPES: NEOTECTONICS PUNCTUATED BY GLACIAL AND PERIGLACIAL GEOMORPHOLOGY**
- 11:20 AM **DISCUSSION**

SESSION NO. 36

T21. Implications of Lithosphere-Crust interactions within the Northern Cordillera (GSA Geophysics and Geodynamics Division)

8:00 AM, Davenport Grand Hotel, Cedar Ballroom

Marlon Jean and Erin Todd, Presiding

- 8:00 AM **INTRODUCTORY REMARKS**
- 36-1 8:05 AM Wakabayashi, John*: **DETRITAL SERPENTINITE IN PALEO FOREARC BASIN AND SUBDUCTION COMPLEX ROCKS: RECORD OF MANTLE ROCK EXHUMATION AND DERIVATIVE DEPOSITION**
- 36-2 8:25 AM Cecil, Robinson*; Campbell, Joella: **TRACKING BASEMENT DOMAINS WITH ZIRCON LU-HF AND TRACE ELEMENT GEOCHEMISTRY IN THE NORTHERN SIERRA NEVADA BATHOLITH, CALIFORNIA**
- 36-3 8:45 AM Cousens, Brian*; Munteanu, Philippe; Novak, Daniel; Henry, Christopher D.; Boddy, Martina; Pegg, Brittany: **ISOTOPIC COMPOSITION OF GRANITOIDS VERSUS VOLCANIC ROCKS IN NORTHERN NEVADA: MAGMA SOURCES, BASEMENT PROVINCES, AND THE JURASSIC FACTOR**
- 36-4 9:05 AM Boddy, Martina*; Cousens, Brian; Henry, Christopher D.: **RADIOGENIC ISOTOPIC DATA FROM CENOZOIC VOLCANIC ROCKS IN THE EUREKA, ELY AND WELLS AREAS DOCUMENT SPATIALLY DISTINCT ARCHEAN AND PROTEROZOIC CRATONIC DOMAINS ACROSS NORTHERN NEVADA, USA**
- 36-5 9:25 AM Barnes, Calvin*; Snoke, Arthur; Romanoski, Anthony; Howard, Keith; Premo, W.R.; Hetherington, Callum J.; Frost, Carol: **LATE CRETACEOUS TO PALEOGENE GRANITIC MAGMATISM, LAMOILLE CANYON AREA, RUBY MOUNTAINS METAMORPHIC CORE COMPLEX, NE NEVADA**

- 36-6 9:45 AM Gaschnig, Richard*; Vervoort, Jeffrey: **EXTENDING THE CHALLIS MAGMATIC PROVINCE ACROSS THE 0.706 ISOPLETH**
- 10:05 AM **BREAK**
- 36-7 10:20 AM Boudreau, Ericka*; Gaschnig, Richard: **DECOUPLING OF ZIRCON-WHOLE ROCK TRACE ELEMENT SYSTEMATICS IN THE IDAHO BATHOLITH AND CHALLIS MAGMATIC SUITE**
- 36-8 10:40 AM Ogunrinde, Isaac*; Stowell, Harold; Cecil, Robinson; Rusmore, Margaret: **THE NATURE AND TIMING OF PLUTONISM ACROSS THE COAST MOUNTAINS BATHOLITH, STIKINE RIVER AREA: PART 1**
- 36-9 11:00 AM Stowell, Harold*; Ogunrinde, Isaac; Cecil, Robinson; Rusmore, Margaret: **THE NATURE AND TIMING OF PLUTONISM ACROSS THE COAST MOUNTAINS BATHOLITH, STIKINE RIVER AREA: PART 2**
- 36-10 11:20 AM Jean, Marlon*; Todd, Erin; Llewellyn, Genevieve E.; Thompson, Jay; Bizimis, Michael; Loewen, Matthew W.: **PETROGENESIS OF ULTRAMAFIC ROCKS FROM THE SEVENTYMILE OPHIOLITE, EASTERN ALASKA**
- 36-11 11:40 AM Todd, Erin*; Caine, Jonathan S.; Bizimis, Michael; Hammond, Robert; Lowers, Heather; Thompson, Jay: **THE KANUTI OPHIOLITE, INTERIOR ALASKA: GEOLOGY AND TECTONIC SETTING OF (POSSIBLE) SUPRA-SUBDUCTION OCEANIC LITHOSPHERE**
- 37-8 8 Constantopoulos, Jim*: **PETROGENESIS OF THE RAILROAD MOUNTAIN OLIVINE DIABASE DIKE, AN ALKLINE INTRUSION ON THE HIGH PLAINS OF EASTERN NEW MEXICO**
- 37-9 9 Nourse, Jonathan*; Silver, Leon T.: **LEON T. SILVER'S LEGACY OF U-PB-TH ZIRCON GEOCHRONOLOGY IN THE MAZATZAL PROVINCE OF SOUTHWEST ARIZONA**
- 37-10 10 Lucas, Spencer G.; Krainer, Karl; Hunt, Adrian*: **REVISED UPPER PALEOZOIC LITHOSTRATIGRAPHIC NOMENCLATURE IN THE TAOS TROUGH, NEW MEXICO**
- 37-11 11 Jordan, Brennan T.*; Sweeney, Mark; Wiebelhaus, Wyatt: **CHARACTERIZING MINERALOGICAL CONTRIBUTIONS TO DUST FROM AEOLIAN SAND ABRASION: METHODS DEVELOPMENT FOR PXRF ANALYSIS OF DUST AND SAND FROM PI-SWRL EXPERIMENTS**
- 37-12 12 Sweeney, Mark*; Wiebelhaus, Wyatt; Ewing, Ryan: **AEOLIAN ABRASION AND DUST EMISSION POTENTIAL OF BASALTIC AND OTHER VOLCANICALLY DERIVED SANDS: AN ANALOG FOR DUST PRODUCTION ON MARS**
- 37-13 13 Bishop, Ellen*; Amerman, Roger; Williamson-Cloud, Nakia; Cash, Phillip: **SEEING THE LANDSCAPE WITH TWO EYES: THE SCIENTIFIC VALUE OF NIMIIPUU ETHNOGEOLOGY**
- 37-14 14 Amerman, Roger*; Slickpoo, Harry; Bishop, Ellen Morris: **NIMIIPUU (NEZ PERCE) ETHNOGEOLOGY OF THE GREATER YELLOWSTONE REGION**
- 37-15 15 Durbin, James M*; Maria, Anton; Reid, Logan M; Lindall, Tristan J; Brown, Melissa A: **SEIZE THE DAY: OPPORTUNISTIC UNDERGRADUATE RESEARCH OF VOLCANICLASTICS COLLECTED DURING A FIELD TRIP TO CRATER LAKE NATIONAL PARK, OREGON**
- 37-16 16 Ortega, Yajaira*; Galarza, Daniel; Anfinson, Owen A.: **GEOLOGY FROM ABOVE: UTILIZING DRONES AND PHOTOGRAMMETRY TO CONSTRUCT A VIRTUAL GEOLOGIC FIELD TRIP**
- 37-17 17 McCarville, Katherine*: **USING THE FEW (FOOD, ENERGY, WATER) NEXUS AS A FRAMEWORK FOR INCREASING STUDENT ENGAGEMENT AND LEARNING IN UNDERGRADUATE EARTH AND ENVIRONMENTAL SCIENCE COURSES**

POSTER TECHNICAL SESSIONS

SESSION NO. 37

D1. Recent Advances in Geoscience and Geoscience Education (Posters)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 12 to 1:30 PM

Booth

- 37-1 1 Rahalski, Emma*; Johnstone, Sam; O'Connor, Jim E.; Booth, Adam: **DEEP LEARNING-BASED CLASSIFICATION OF MIMA MOUND PRESENCE IN PACIFIC NORTHWEST LANDSCAPES USING DIGITAL ELEVATION MODELS**
- 37-2 2 Montejo, Carlos*; Stanley, Jessica; Tremblay, Marissa; Weeks, Chloë: **EXAMINING THE LATE CENOZOIC EXHUMATION HISTORY OF THE GALLATIN RIVER CATCHMENT AND ITS RELATIONSHIP TO THE YELLOWSTONE HOTSPOT, GALLATIN COUNTY, SOUTHWEST MONTANA**
- 37-3 3 Young, Tage*; Gammons, Christopher: **FENITIZATION OF MAFIC WALLROCK ASSOCIATED WITH EMPLACEMENT OF REE-RICH CARBONATITES OF SHEEP CREEK, SOUTHERN RAVALLI COUNTY, MONTANA**
- 37-4 4 Toulou, Erin*; Phelps, Geoff; Watts, Kathryn E.: **A THEORETICAL GEOPHYSICAL ANALYSIS OF A SUBSURFACE CARBONATITE BODY AT MOUNTAIN PASS, CA**
- 37-5 5 Francis, Robert*; Altamirano, Richard; Holk, Gregory: **NOVEL "INTERSTITIAL QUARTZ VEINS" IN SILICIFIED CARBONATES OF A DETACHMENT FAULT, WHITE PINE RANGE, NYE COUNTY, NEVADA; IMPLICATIONS**
- 37-6 6 Murphy, John*: **TECTONIC ACTIVITY IN THE BORING BILLION RECORDED IN GARNET LU-HF AND SM-ND GEOCHRONOLOGY ALONG THE WESTERN MARGIN OF LAURENTIA**
- 37-7 7 Siddoway, Christine*; Breyak, Annie; Gevedon, Michelle; Pollatsek, Emory; Hemming, Sidney; Cox, Stephen E.: **INVESTIGATION OF TOURMALINE-MINERALIZED MIRRORED BRITTLE FAULTS FROM WEST ANTARCTICA USING $\delta^{18}\text{O}$ (QZ-TUR), TOURMALINE $^{40}\text{Ar}/^{39}\text{Ar}$ THERMOCHRONOLOGY, AND BRITTLE KINEMATIC ANALYSIS**

SESSION NO. 38

T4. Undergraduate and Graduate Geoscience Student Lightning Talk Showcase (Posters) (GSA Energy Geology Division)

9:00 AM, Davenport Grand Hotel, Grand Ballroom

Authors will be present from 12 to 1:30 PM

Booth

- 38-1 18 Klisura, Shayne*; Blythe, Ann; Seymour, Nikki M.: **UPLIFT AND EXHUMATION OF THE CENTRAL TEHACHAPI MOUNTAINS DERIVED FROM JOINT APATITE (U-TH)/HE AND FISSION-TRACK ANALYSES**
- 38-2 19 Burges, Jarrod*; Metcalf, Kathryn: **DESKTOP APPLICATION TO MANAGE AND STORE DETRITAL ZIRCON GEOCHRONOLOGICAL DATA IN A SQL DATABASE**
- 38-3 20 Carlson, Gabe*; Mattinson, Christopher; Ortega, Karla; Zencak, Peter: **ZIRCON "VACUUM CLEANER" FOR IMPROVED EFFICIENCY OF MINERAL SEPARATION**
- 38-4 21 Steckel, Amanda*; Clark, Roger; Hendrix, Amanda: **MINERAL IDENTIFICATION WITH HYPERSPECTRAL IMAGERY NEAR THE ATMOSPHERIC WATER ABSORPTION BAND**
- 38-5 22 Peckenpough, Jake*; Schmitz, Mark D.; Schwartz, Darin: **CHARACTERIZATION OF MALI ANDRADITE GARNETS AS U-PB REFERENCE MATERIALS**
- 38-6 23 Potter, Natalie*; Morton, Travis; Pritchard, Chad: **U/PB AGES OF ISOLATED BUTTES IN SPOKANE, WASHINGTON AREA TO HELP PROJECT DEFORMATION IN THE SUBSURFACE**
- 38-7 24 Hernandez, Iris*; Davis, Peter: **NEW DETRITAL ZIRCON AGE CONSTRAINTS FOR THE DARRINGTON PHYLLITE EAST OF THE STRAIGHT CREEK-FRASER RIVER FAULT**

FRIDAY

PM

POSTERS

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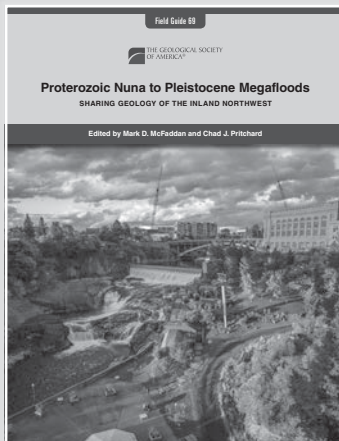

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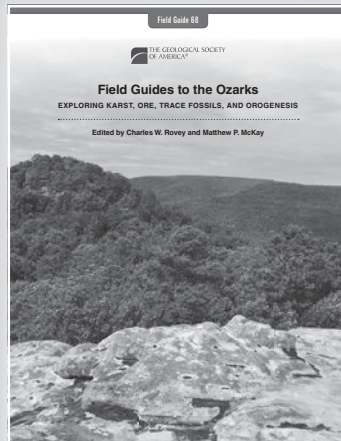
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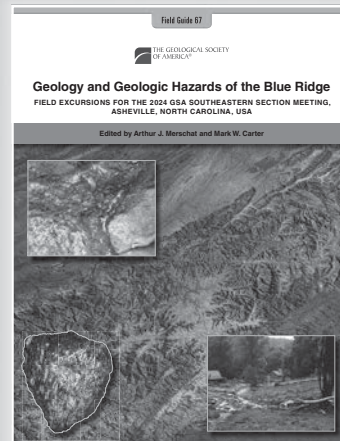
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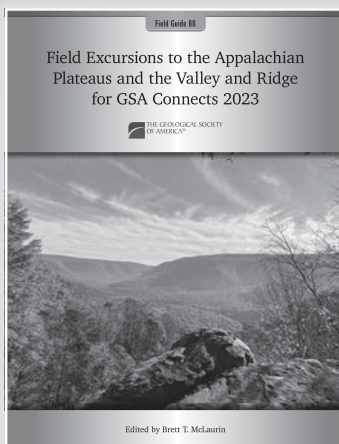
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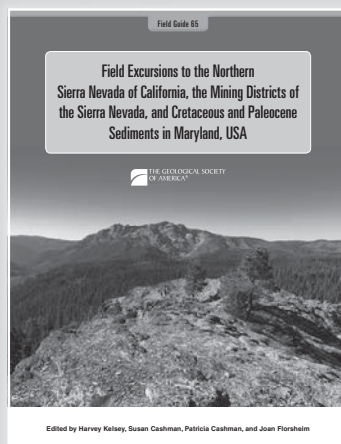
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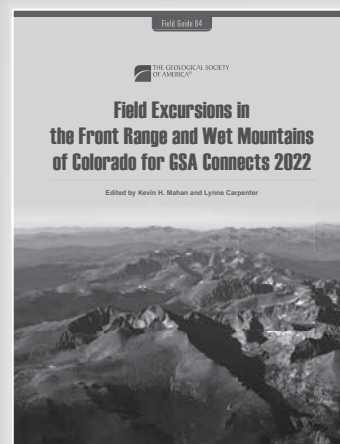
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