

**TOBACCO ROOT GEOLOGICAL SOCIETY 49th ANNUAL FIELD CONFERENCE,
COLUMBUS, MT, JULY 25 – 28, 2024**



View to the southeast of the deformed rocks of the Stillwater Complex, Beartooth Mountains, Montana. Photo by USGS

Columbus Area Details, Conference Schedule, and Registration

This year's Annual Tobacco Root Geological Society Field Conference will be held in Columbus, Montana. The conference check-in opens on late Thursday afternoon (July 25) with conference activities beginning Friday morning (July 26) and lasting through Sunday afternoon (July 28).

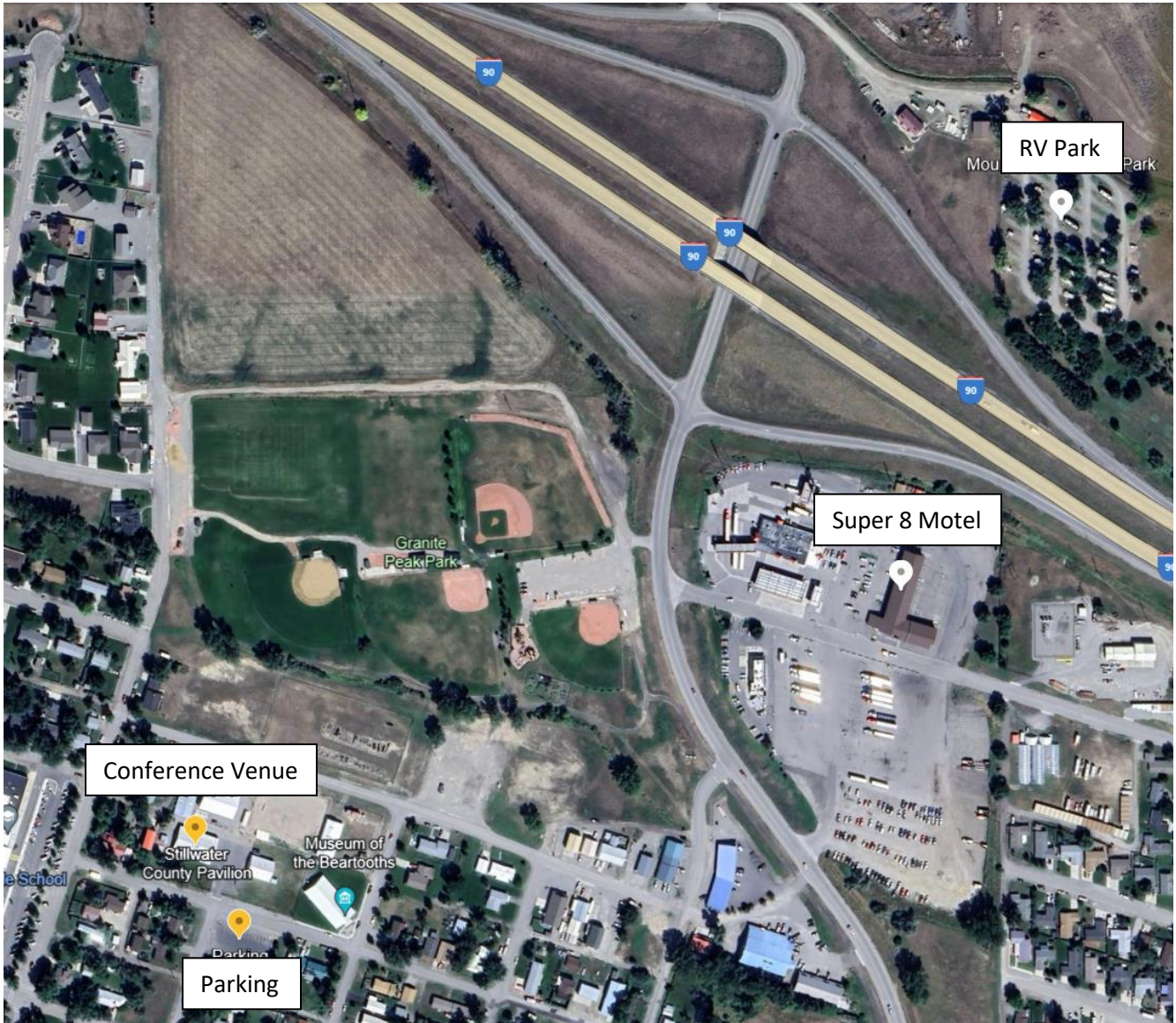
The field trips this year are focused on the spectacular geology of the Beartooth Front. Participants will have the opportunity to investigate the Precambrian rocks of the eastern Beartooth Mountains, hear about the significant petrologic and structural advances of the Stillwater Complex, revisit the complex structure along the east end of the Stillwater Complex, and visit exposed Sappington/Cottonwood Canyon Formation in Clarks Fork Canyon.

This announcement provides information on the meeting schedule and events, lodging, and meals. If you are staying in a hotel, book early (TRGS has a block of rooms available at [Super 8](#)). Numerous restaurants and food trucks are available and you will need to make or obtain your own breakfast and dinners during the conference (with the exception of the Saturday night BBQ available for purchase). Camping is available at [Itch-Kep-Pe Park](#) and RV Accommodations at [Mountain Range RV Park](#). If you plan to stay elsewhere, give yourself plenty of time to reach the Little Metra to catch your field trip group.

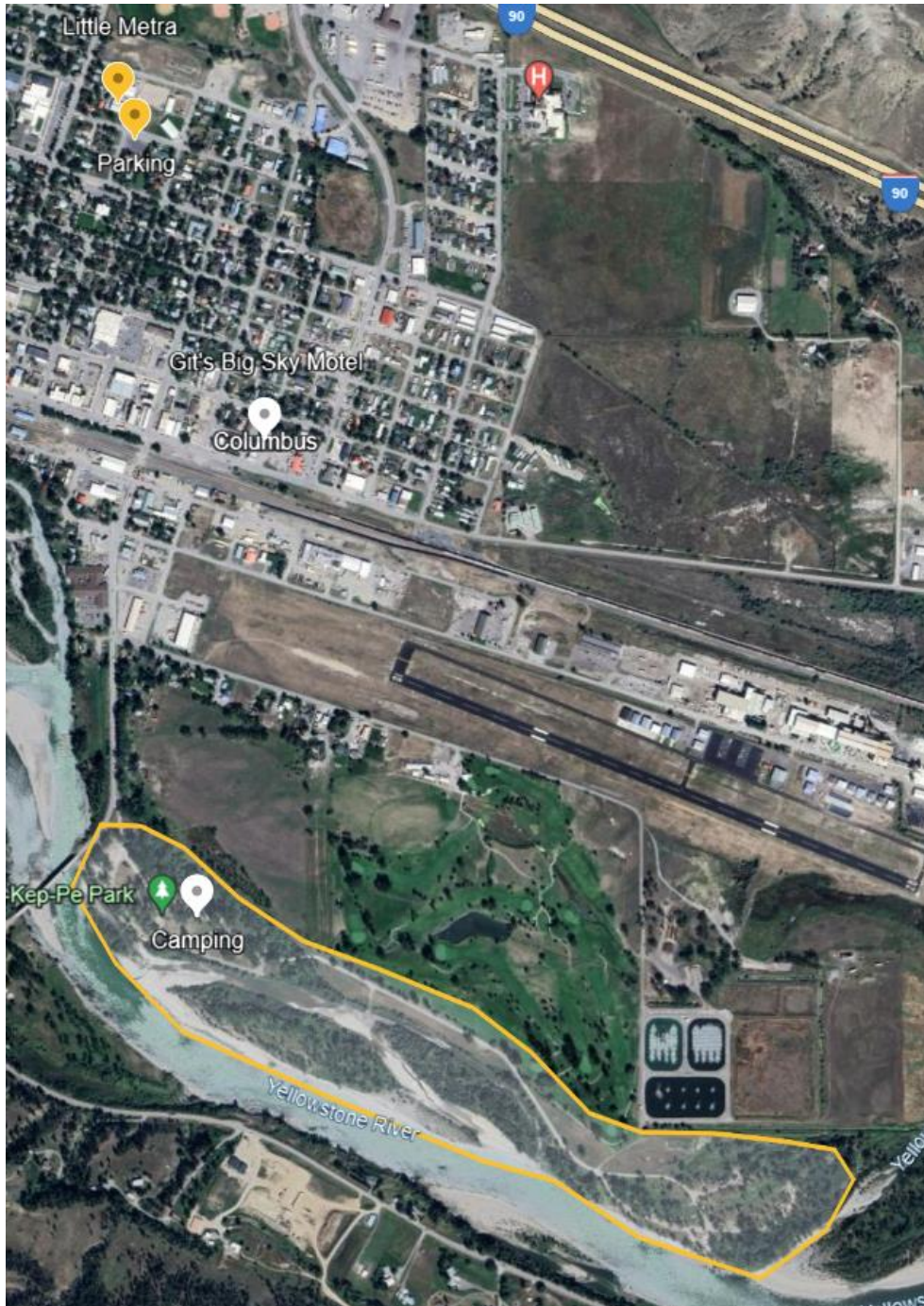
On-site meeting registration and conference venue

Our primary venue is the Stillwater County Pavilion (AKA Little Metra) located just south of Interstate-90 on the north side of Columbus (328 E 5th Ave N, Columbus, MT 59019).

Conference activities will be at the Stillwater County Pavilion. Park in the lot across the street from the conference venue (indicated by the yellow placemarks on the Google Earth image below). The entrance to the building is on the east side and will be open Thursday afternoon for conference registration and check-in. Poster presenters are encouraged to check-in and display their posters in advance of the session scheduled for Friday morning.



Camping and Lodging



[Itch-Kep-Pe Park](#)

located about a mile south of the conference venue offers 30 free campsites along the Yellowstone River and with access to restrooms and drinking water. Sites are first come, first serve.

You can get a sense for the campsites in this [YouTube video](#). Access to the park is off MT-78/Pratten St. You'll turn into the park just before crossing the bridge over the Yellowstone River. The park location relative to the conference venue is shown in the Google Earth image (left)

Other RV sites can be found closer to I-90 at Mountain Range RV Park.

Hotel accommodations in Columbus:

- Super 8 Motel (Block of rooms reserved for TRGS)
 - **Address:** 602 E 8th Ave North, Columbus, MT 59019
 - **Phone:** (406) 298-3744
- Git's Big Sky Motel
 - **Address:** 740 E Pike Ave, Columbus, MT 59019
 - **Phone:** (406) 322-4111

2024 COLUMBUS CONFERENCE SCHEDULE

THURSDAY EVENING (July 25) – Stillwater County Pavilion

Conference check-in, hang posters 4 – 7 PM

FRIDAY (July 26) – Poster session* and Beartooth Highway Trip

7:00 TRGS check-in / registration

8:00 Intro, TRGS stuff

8:30-10 Poster Session

Igneous textures in Line Creek Plateau porphyry outcrops (Beartooth Mountains) and Frontier Formation porphyry cobbles (Bighorn basin), Montana and Wyoming

Nicholas A. Brailer, Jacob O. Thacker (Department of Biological and Physical Sciences, Montana State University Billings), Gary S. Michelfelder (Department of Geography, Geology and Planning, Missouri State University)

Preliminary results of 1:24,000 scale geologic mapping of mid-Cretaceous porphyry on the Line Creek Plateau, southeastern Beartooth Mountains, Montana-Wyoming

Eddy Cunningham, Dylan C. Forquer, Jacob O. Thacker (Biological and Physical Sciences Department, Montana State University Billings, Billings, MT), Rebecca A. VanderLeest (Department of Life, Earth, and Environmental Science, West Texas A&M University, Canyon, TX)

Testing Models of Yellowstone Landscape Evolution Through Chronostratigraphy of Shoshone River Terraces

Emma Tombaugh (Department of Geosciences, Utah State University)

The occurrence and differentiation of PGE in magmatic sulfide deposits in the Yangliuping area, Emeishan large igneous province, SW China

Qing-Lin Liang, Xie-Yan Song (College of Earth and Planetary Sciences, Chengdu University of Technology)

*Posters will stay up through Saturday night.

10-10:30 Field Trip Prep: Grab sack lunches for field trip, coordinate vehicles, load coolers

10:30 Field trip departure from Pavilion parking lot

Friday Field Trip: Precambrian rocks of the eastern Beartooth Mountains, Montana and Wyoming (Field Trip Lead: Dave Mogk, Montana State University)

This trip will do a north to south traverse along the spectacular Beartooth highway, visiting some of the oldest rocks exposed in the North American tectonic plate. Visits will include excellent outcrops of ancient crust (3.5 to 3.0 Ga granulite-facies gneiss) along with the 2.8 Ga Long Lake granodiorites and tonalites. Historic chrome mining at the Highline deposit will be discussed. The Great Unconformity (Cambrian on Neoproterozoic) and “young” (Cretaceous?) porphyry dikes also are easily accessed along the road. The Beartooth Highway has been internationally recognized and designated one of the IUGS First 100 Geosites in the world.

SATURDAY (July 27) – Stillwater Complex Trip and BBQ

7:30-8:30 Field Trip Prep

8:30 a.m. Field Trip departure from Pavilion parking lot

Saturday Field Trip: Stillwater Complex Traverse (Field Trip Leads: Chris Jenkins (USGS), Mike Zientek (USGS), Ennis Geraghty (retired Sibanye-Stillwater Mine))

Significant petrologic and structural advances on the Stillwater Complex have taken place over the past 15 years. This Lake Camp traverse will visit the Hamslice Ni/Cu deposit, historic Mouat chrome mine, and an outcrop of the currently mined J-M Reef Pt/Pd deposit. Discussions will include new age determinations, results of Lidar surveys, and new interpretations on the origin of the mineralized deposits. **Please note: if you have steel- or composite-toed boots, please bring them. We will need them to visit the J-M Reef on Stillwater Mine property.**

6-8 p.m. BBQ Dinner @ Stillwater County Pavilion

SUNDAY (July 28) – Final Day of Field Trips and Conference Close

7:30-8:30 Field Trip Prep

8:30 a.m. Field Trip departure from Pavilion parking lot

Sunday Field Trip Options

1) East end of the Stillwater Complex Structural Traverse (Field Trip Lead: Ennis Geraghty, retired Sibanye-Stillwater Mine)

Revisit the east end of the Stillwater Complex 16 years after the last Tobacco Root visit. Much significant structural information has come to light with the completion Sibanye-Stillwater's Benbow exploration drilling program, the 6,700-foot Benbow Decline, and 21,100 feet of Tunnel Boring Machine development. Contrast this new information with the original surface outcrop mapping in a most humbling display of ground truthing!

2) Clarks Fork Canyon Sappington/Cottonwood Canyon Formation (Field Trip Lead: Ted Doughty, PTD Geoscience)

This trip will visit the scenic Clarks Fork Canyon along the eastern side of the Bighorn Basin in Wyoming, with an emphasis on visiting one of the best exposures of the Sappington/Cottonwood Canyon Formation in Wyoming. After a 1.5 hr drive from Columbus to the canyon, the trip will do a short overview of the geology of the canyon where the steep overturned limb of the Beartooth thrust is exposed. The trip will then scramble up a steep ravine gaining approximately 2,000 feet of elevation to the spectacularly well exposed outcrop. Attendees should be prepared for a difficult hike, but the outcrop is well worth it. The outcrop contains a thin Three Forks and Bakken-equivalent lower Sappington section that is characteristic of the up-dip part of the basin(s). The overlying black shales of the upper Sappington/Cottonwood Canyon Formations are exceedingly thick and contain potential sandstone reservoirs.

REGISTRATION

Registration for the meeting includes a hard copy of 2024 Northwest Geology, edited by Ennis Geraghty and Emily Geraghty Ward. Questions about the field conference, accommodations, or volunteering should be sent to Emily Ward (emgward@gmail.com). Additional conference information may be posted on the TRGS webpage (<http://trgs.org>) or the TRGS Facebook page.

REGISTER BY MAIL: Complete the enclosed registration form and pay by check (postmark by July 17). Send to: Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118.

REGISTER ONLINE: Online registration opens on June 10 at www.trgs.org. After registration opens, complete the online registration form and send a check for registration fees to Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118 or pay by PayPal. *Please be sure to print your completed registration form before you submit your responses.* Please complete the online registration form no later than July 15 so that we can accurately plan for lunches and food.

Online registration is the preferred method of registration for accurate attendee contact information, trip registration, and meal counts.

Reminder: No breakfasts are offered during this conference!

All field trip participants, including leaders, must register for the conference. Field trip leaders do not need to pay for the field trip(s) they are leading. Friday, Saturday, and Sunday field trip registration comes with lunch.

Please note that there are two places on the form where you can contribute to the scholarship fund of the TRGS – by purchasing a conference T-shirt or by making a direct contribution to scholarships.

MAIL-IN CONFERENCE REGISTRATION FORM

Please send form with check made out to Tobacco Root Geological Society to:

Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118

Attendee Name: _____

Attendee Address: _____

Phone: (____) _____

Email: _____

No. Amt.
 Paid

<p>Conference Registration 1. Professional \$ 75 2. Student \$ 35</p>		\$
<p>Meals Please check here if you need vegetarian meals: Yes <input type="checkbox"/></p>		
<p>Dinner (Brats/Burgers/Veggie options/Salads) Saturday Night \$20.00</p>		
<p>FIELD TRIPS: A = Friday, B = Saturday, C = Sunday. Each Trip Comes with Sack Lunch and Drink (\$15/day)</p>		
<p>Trip A: Precambrian rocks of the eastern Beartooth Mountains, Montana and Wyoming (Field Trip Lead: Dave Mogk, Montana State University)</p>		
<p>Trip B: Stillwater Complex Traverse (Field Trip Leads: Mike Zientek (USGS), Chris Jenkins (USGS), Ennis Geraghty (retired Sibanye-Stillwater Mine))</p>		
<p>Trip C1: East end of the Stillwater Complex Structural Traverse (Field Trip Lead: Ennis Geraghty, retired Sibanye-Stillwater Mine)</p>		
<p>Trip C2: Clarks Fork Canyon Sappington/Cottonwood Canyon Formation (Field Trip Lead: Ted Doughty, PTD Geoscience)</p>		
<p>Field Conference T-shirt, please specify number and size, \$15/each</p>		

TOTAL CONFERENCE FEES \$ _____

DONATIONS (Optional)

Complete this portion of the registration form if you wish to **MAKE A DONATION** to the TRGS Scholarship fund. PLEASE SPECIFY ALLOCATION(S) BELOW.

TRGS Scholarship for field-based projects in the northern Rocky Mountains. Preference given to mapping projects in Montana, Idaho, and northern Wyoming. Based in part on need, the scholarship is expected to be used for field expenses.	\$
Please indicate: to grow the TRGS endowment _____ OR to spendable funds _____	
Belt Association Scholarship (This is not an endowment; all contributions are spendable.) Funds are available to support field-based student projects in the Belt Supergroup or correlative strata.	\$
Harrison Scholarship In memory of Jack Harrison and made possible by a generous endowment from Jack to the TRGS, awards go to students working on any project involving Precambrian rocks. Based in part on need, this award can only be used for field expenses.	\$
Please indicate: to grow the Harrison endowment _____ OR to spendable funds _____	
Foster Scholarship (This is not an endowment; all contributions are spendable.) Given in memory of Michael Thompson Foster, to students, researchers, or explorationists who best exemplify the prospector ethic. Criteria are a demonstrated interest and ability in mineral exploration, field research, or economic pursuits which advance our knowledge of mineral commodities and public commitment to responsible mining. Supported by generous grants from Rob Foster and additional donations.	\$
M. Dean Kleinkopf Scholarship (This is not an endowment; all contributions are spendable.) Given in memory of Dean Kleinkopf, for geophysical and geologic investigations in the northern Rocky Mountains. Supported by an initial grant from Nancy Kleinkopf and additional donations.	\$
The Betty Skipp Research Award for Field Studies in the Rocky Mountains (This is not an endowment; all contributions are spendable). Given in honor of Betty Skipp, to women M.S. or Ph.D. students for research with a significant component of original geological fieldwork in Idaho, Montana, Utah, Colorado, or Wyoming. If funds are sufficient, men may also be supported.	\$
Unrestricted	\$

TOTAL DONATION \$ _____

TOTAL AMOUNT ENCLOSED (Conference + Donation) \$ _____

**** Please submit payment check with this registration form ****