

University of Michigan SEG Student Chapter
Stewart R. Wallace Funds report

Upper Peninsula of Michigan geology SEG field trip

Our University of Michigan Society of Economic Geologists Student Chapter (U-M SEG) received \$1250 from the Round II Stewart R. Wallace Fund in 2020. We requested funding support for a field trip to Sudbury, ON in May of 2021, but due to the ongoing uncertainty and travel restrictions caused by the COVID-19 pandemic, we decided to repurpose the funds for a field trip to the Upper Peninsula of Michigan from Oct. 15 - Oct.19, 2021.

Four graduate students and members of the U-M SEG participated in the field trip. We departed Ann Arbor on Friday Oct. 15 and arrived in Marquette in the evening to attend the meeting of the Society for Secondary Enrichment, led by our U-M SEG chapter industry sponsor Robert Mahin. This was the first in-person meeting in over a year and a half and we were honored to take part in it. The meeting brings together geologists from across Michigan and was a fantastic networking opportunity for U-M students. We talked with employees from the Eagle Mine and other active mining operations, including the head of exploration for Lundin, and talked about roles in consulting and mine geology. Then, Bob led us on a local tour around some astonishing outcrops near downtown Marquette, including some 2.7 Ga pillow basalts exposed on the lakeshore. Bob kindly offered to host us on his property near Marquette that night.

The next day we explored Michigan's Iron Country as we traversed west across the Peninsula. We visited the iconic "Jasper Knob", an outcrop of a spectacularly deformed 1.8 Ga banded iron formation of the Nagaunee Formation, located in Ishpeming, MI. Later in the day, we explored dump piles of specular hematite, left by the Beacon Mine in Champion, MI. While we missed the full sparkle of the hematite-gravel roads due to overcast skies, the rocks were nonetheless impressive. We continued our day driving through Houghton/Handcock and visiting the Seaman Mineral Museum. We ended our day at our campsite near Allouez, MI, on the rocky shore of Lake Superior. After setting up camp, we were drawn to the nearby Prospector's Paradise rock shop where we perused hundreds of specimens of native copper and other Michigan minerals. Despite the overcast skies, the weather was surprisingly fair and we enjoyed a peaceful night eating smoked whitefish by our campfire while listening to the autumn waves crashing against the pebbled shore.

The third day was dedicated to experiencing Michigan's historic copper mining district in the Keweenaw Peninsula. We started our day bright and early by exploring the tailings of the Tamarack Mine on the outskirts of Calumet. We had great success finding small pieces of sheet copper with our metal detector. Copper in this region was hosted in a conglomerate which accumulated in between different flows of the Portage lake basalts associated with the mid-continent rift at around 1.0 Ga. We then worked our way North up Highway 41, exploring a plethora of abandoned tailing piles until we arrived at the apex of our route in Copper Harbor. From an overlook, we admired the fall colors at the tip of the Keweenaw Peninsula, which contrasted beautifully with the bright blue water of Lake Superior. From this spot, we could see

the extent of the Lake Superior syncline, standing on the NW dipping rocks which extended down the spine of the Keweenaw, and seeing the other side of the syncline exposed at Isle Royale National Park in the distance. We were fortunate to have exceptional weather for our collecting and sight-seeing day. From this point, we drove back to Marquette, and were once again graciously offered accommodations from the Mahins.

On our last day, we viewed some of the natural beauty the east side of the Upper Peninsula had to offer. Driving from Marquette, we stopped at Wagner Falls scenic site just outside Munising, which was the first of several stunning waterfalls we would pass this day. The main event of the day was exploring the Pictured Rocks National Lakeshore made up of brightly colored Cambrian aged sandstone impressively jutting out into the turquoise water of Lake Superior. We took a small day hike through the beautiful yellow birch trees near Castle Rock, and enjoyed our lunch on Mosquito Beach. Our last stop en route back to Ann Arbor was at Kitch-iti-Kipi (Palms Brook state park) in Manistique MI. We greatly enjoyed the cable boat ride across the crystal-clear spring, and admired the exceptionally large trout. We concluded our trip by staying in Grayling Michigan, and after a walk through the Hartwick Pines old growth forest, made our way back to Ann Arbor.

| Expense | Amount (USD) |
|----------------------------------|---------------------------------|
| Car rental | Covered by the EARTH department |
| Camping (1 night) | \$25 |
| Meals (4 people, 5 days) | \$482.26 |
| Gas | \$191.06 |
| Tolls | \$8 |
| Museum tickets (\$4 per student) | \$16 |
| Total | \$722.32 |

We used part of the SEG S.R. Wallace funds to cover most of the field trip expenses, including gas, tolls, the tickets to the Mineral Museum, and food. None of the funds were used for alcohol or personal expenses. The Department of Earth & Environmental Sciences provided the rental car. We are very grateful with Bob and Debbie Mahin for hosting us on their property for two nights, we camped one night, and stayed the last night in a cabin from one of the participant's family.

Photos:



The team hard at work collecting copper and interesting gangue minerals at the Cliff Mine dumps near Phoenix, MI



Photo op at Wagner Falls, near Munising, MI.



The team admiring an outcrop of Banded Iron Formation at Jasper Knob, Ishpeming, MI



Chris and Maria examining the boulder field of specular hematite and wishing for a sunny day at the Beacon mine dump in Champion, MI.



Chris, Daniel, and Bob pointing to the preserved Precambrian pillow basalts in Marquette, MI.