MGS Luncheon – 2021 MGS Scholarship Recipients

Wednesday, September 21st from 11:45am to 1:30pm

Location: Billings Public Library – Community Room

RSVP to montanageologicalsociety@gmail.com by latest Monday September 19th!

If you prefer to join us on Zoom, RSVP by Tuesday September 20th to receive the Zoom link

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Speaker: Celine M. Beaucamp (2021 MGS Scholarship Recipient)

Montana Technological University, Butte, MT

A geological and geochemical study of the Philipsburg mining district, Granite County, Montana

The Philipsburg mining district is a polymetallic lode deposit in Granite County, Montana. The district produced interesting amount of silver and battery-grade manganese, with minor zinc, lead, copper and gold in the late 1800 to late 1900. The regional geology is dominated by the 75 Ma Philipsburg Batholith which has intruded into folded and thrusted Mesoproterozoic through Cretaceous sedimentary rocks. A 65 Ma Mo-Cu porphyry stock and associated skarn is poorly exposed in the north-west edge of the district, and its relationship to the polymetallic vein mineralization is unclear. A zonation similar to Butte's Main Stage Vein has been identified with detailed mineralogy and stable S-isotopes. Sphalerite from the central area is a mineral of interest due to its unusual fluorescence and its concentration of critical elements (Ga, Ge, W, In). The Philipsburg district has many similarities to the nearby Butte porphyry-lode district and likely belongs to the same Cordilleran polymetallic lode deposit type. Domestic production of raw materials is increasing as our society transitions to a net-zero carbon economy and improves national security by lowering the country's dependence on global production. The re-evaluation of historic district such as Philipsburg's can contribute to the demand for precious and base metals, especially critical minerals that were not desirable during the mine's activity.

Speaker: Courtenay Duzet (2021 MGS Scholarship Recipient)

University of Montana, Missoula, MT

1D Crustal Seismic Velocity Models for West-Central and Western Montana

In seismically active areas with infrequent, large-magnitude earthquakes, high-quality seismic data are critical for determining high-resolution, accurate seismic velocity models. Here, we present a new local-scale seismic velocity model for the crust in west-central Montana as well as a new regional-scale seismic velocity model for the crust and upper mantle across broader western Montana. The new models are constrained by phase arrivals from several passive seismic networks, including the University of Montana Seismic Network (UMSN), the Montana Regional Seismic Network (MRSN), the Advanced National Seismic System (ANSS), temporary deployments by the United States Geological Survey (USGS), and the USArray Transportable Array (TA). The "local" seismic velocity model is the first model specific to west-central Montana, constrained primarily by P-wave arrivals from aftershocks that followed the 2017 M 5.8 Lincoln, Montana, earthquake. The local model consists of eight distinct layers down to 30 km depth below mean sea level and spans a region of about 40,000 km^2 (200 km by 200 km). Using an expanded dataset across a broader geographical area, we develop a "regional" seismic velocity model that represents spatially averaged velocity structure across western Montana. The regional model consists of thirteen distinct layers down to 45 km depth below sea level and is appropriate to an area of about 160,000 km^2 (400 km by 400 km). The new models are similar to prior velocity models for western Montana and include enhanced depth resolution.

Biography

Celine Beaucamp is studying for her Ph.D. in Earth Science and Engineering at the Technological University of Montana in Butte. She specializes in the geological and geochemical study of ore deposits and their tectonic context. She also teaches Physical Geology, Sedimentary and Petroleum Geology, Structural Geology, and Field Mapping. After obtaining her Masters' degree in Geology from the University of Montreal Quebec, she spent five years in Nevada as an open pit geologist and geotechnical engineer, but eventually came back to academy to teach and do research.

Biography

Courtenay recently completed her M.S in Geosciences at the University of Montana where she researched the derivation of seismic velocity models for west-central and western Montana. Courtenay received a B.S in Environmental Sciences at Oregon State University in 2018 and is currently working for the U.S Geological Survey as a Science Communication Specialist.