MGS Happy Hour

Live in Billings
Streaming in Missoula

Bighorn Resort: 1801 Majestic Lane
Students: *$10* **Members:** *$30* **Guests** *$40*

Imagine Nation Brewing: 1151 W Broadway St.
Donations welcome!

Wednesday May 22nd - 5-8 pm

Social 5-6 pm **Dinner** 6-6:30 **Talk** 6:30-7:30

RSVP to
montanageologicalsociety@gmail.com
by May 20th

MGS Grant Recipients

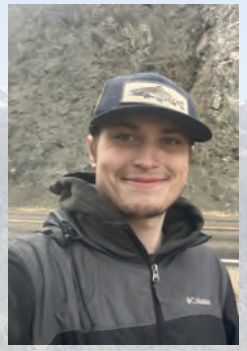
Zack DeLuca

Zack DeLuca is a geomorphologist interested in understanding landscape response to extreme weather events and river processes. Zack completed a B.S. at Western Washington University and an M.S. at the University of Montana. Prior to moving to Missoula, he worked as an engineering geologist in north-central WA.

Hydrogeomorphic response to flooding in northern Yellowstone National Park

Understanding and predicting flood-induced geomorphic change, and the relative influences of fluvial forces and valley-bottom geometry on system response, are persistent quandaries in geomorphic process studies. We combine field surveys, remote sensing, and hydraulic modeling to assess the hydrogeomorphic effects of historic flooding in northern Yellowstone National Park (YNP) in a variety of channel configurations, and we compare impulse, a metric that incorporates a flow duration threshold based on threshold channel theory, grain size, channel-bed slope, and flood depth and stream power estimates with hydrogeomorphic response. Measurements of pre- and post-flood active-channel width change in aerial photos captured geomorphic response associated with deposition related channel migration while a transect based metric of bed elevation change from pre- and post-flood DEMs of difference captured erosion related channel evolution. Hydrogeomorphic response to flooding correlates with fluvial forces in areas that experienced erosion while channel areas of extensive deposition are more closely tied to a decrease in valley-bottom confinement. Bank erosion was greatest in areas immediately downstream of a tributary capable of delivering fine sediment to the channel. Results indicate that the impulse framework may be a useful tool for investigations of geomorphic change resulting from floods and informs understanding of riverscape response to floods.

Dominik Weber



My name is Dominik Weber, a graduating senior Geoscience major at the University of Montana and a third-generation student here. Born in Billings, Montana, I've had a lifelong fascination with rocks and a passion for the outdoors. My studies focus on Sedimentary Geology, and I've spent the last year working on my Senior Thesis, graciously funded by the Montana Geological Society. Outside the lab and the field, I'm an avid fly fisherman, which along with geology, has deepened my connection to the landscapes I grew up in. As I prepare to graduate, I look forward to further exploring and contributing to geology.

Synorogenic Sedimentation and Zircon Provenance in the Cretaceous Golden Spike and Blackleaf Formations, West-Central Montana

This study employs U/Pb zircon geochronology and sandstone petrography to characterize the provenance and detrital zircon age ranges of the Golden Spike Formation and the Flood Member of the Blackleaf Formation in West-Central Montana. The late Cretaceous Golden Spike Formation crops out along a 16 km outcrop near Garrison, Montana. It was deposited between the Sapphire Tectonic Block, uplifting the Garnet, Flint, and Sapphire Ranges in the west and the Elkhorn Mountain Volcanics in the East, representing synorogenic alluvial and fluvial deposition within the actively deforming Sevier fold-thrust belt. This thick unit is marked by the interfingering of non-volcanic sandstones, mudstones, and conglomerates with chaotic mega-breccia lahars and andesitic lava flows. The Albian Blackleaf Formation records the initial transgression of the Cretaceous Interior Seaway into West-Central Montana, capturing depositional environments that range from coastal shallow-marine to marginal marine within the foreland basin. Sandstone Petrography of both Formations indicates orogenic recycling of primarily sedimentary rocks. However, the Golden Spike Formation is significantly more mineralogically and texturally immature. Despite similarities in tectonic settings, differences in depositional environment and catchment areas resulted in detrital zircon age populations that are markedly different. Due to the dominance of Cretaceous age grains in the Golden Spike samples, the maximum depositional age of the formation was constrained to late Santonion, generally agreeing with previous biostratigraphic and dates of time-correlative units. Zircon in the Blackleaf Formation were generally very fine and rounded, producing no near-depositional age dates. Age ranges from the Blackleaf Formation suggest orogenic recycling of primarily Paleozoic age strata. While there is a lack of indication of Paleozoic sources in zircon data for the Golden Spike Formation, identifiable clasts of Mississippian limestone clasts are plentiful within the formation. Overall, provenance and age interpretations in the study align with previous research detrital zircon work on the Blackleaf by Gardner et al., (2022) and sandstone petrology on the Golden Spike by Mackie (1986) and Waddell (1997).