The Crevasse Canyon Formation in west-central New Mexico outcrops along the southeasternmost margin of the Colorado Plateau and is thought to record fluvial-deltaic sedimentation along the Seboyeta embayment during the Late Cretaceous (Coniacian-Santonian time). Although this stratigraphic interval has received a considerable amount of study throughout parts of northwestern New Mexico and the Southwestern U.S., very little is known about the depositional history provenance of these strata in westcentral New Mexico. Throughout much of the New Mexico, the Crevasse Canyon Formation has been documented to represent nonmarine, fluvial sedimentation and marks the stratigraphic transition from marine sedimentation to nonmarine sedimentation in the Cordilleran foreland basin. However, these trends diverge in west-central New Mexico where much of the Crevasse Canyon represent marginal marine to offshore sedimentation which may be explained in part by subsidence in and around the Seboyeta embayment.

The Crevasse Canyon formation is situated stratigraphically within well studied formations of the Western United States (Dakota Sandstone, Mancos Shale, Gallup Sandstone, Tres Hermanos...). However, the CCF itself has sparse literature detailing the small-scale lithographic changes within the formation especially as it changes throughout various regions of
New Mexico. New U-Pb detrital zircon ages will be used to generate sets of age spectra from the base of the Crevasse Canyon where it meets the Dakota Sandstone to the top of the Crevasse Canyon. The detrital zircon approach ensures robust spectra given the durable nature of zircon as a mineral. New ages and provenance data will help constrain the maximum depositional ages for each member of the Crevasse Canyon Formation. As of now the only zircon ages are from exposures of the Crevasse Canyon in southern New Mexico. In addition, the proposed analyses will help constrain provenance and sediment dispersal as well as (1) test whether these strata are derived solely from Sevier Uplift structures to the west or from a range of sediment sources in the surrounding southwestern landscape, and (2) test the nature and timing of deposition and whether or not marginal marine environments of the Cretaceous Interior Seaway are responsible for deposition in the Crevasse Canyon Formation. The goal of this study is to document the depositional history, stratigraphic relationships, and sediment dispersal trends from the Crevasse Canyon. At the largest scale, results from this project will help in deciphering what role regional subsidence (dynamic and/or flexure) may have played in the formation of the Late Cretaceous Seboyeta embayment in west-central New Mexico.

I plan to conduct 15-20 days of field work in the proposed field area in Catron Country of west-central New Mexico. Field work will include detailed measured stratigraphic sections and collection of samples for sandstone modal composition analyses (i.e., point counting) and U-Pb detrital zircon dating. Detailed facies and architectural elements will be documented in measured sections to determine the range of marine/marginal marine depositional environments and aid with regional paleoflow and sediment accumulation rates for the Crevasse Canyon Formation. Point-counting of sandstones and U-Pb detrital geochronology will help constrain the provenance (source) for these strata and aid in reconstructing sediment dispersal trends and the regional paleolandscape along the Late Cretaceous Seboyeta embayment. I plan to collect N=8
samples for detrital zircon geochronology and will analyze n=300 zircon grains from each sample. A total of N=30 samples will be collected for thin sections and sandstone modal composition. Several days of preliminary field work took place in late September, mid-November of 2023 and mid-March of 2024. The 2023 field sessions involved sample collection and site analyses. The 2024 field session predominantly involved detailed stratigraphic section measurements through the sample stratigraphy.

There is a wealth of sedimentologic and provenance data from age-equivalent strata from throughout New Mexico and this project will produce the first data from the Crevasse Canyon Formation in west-central New Mexico. Results from this project will provide a better understanding on why the Crevasse Canyon records a different depositional history (and possibly provenance trends) along the Late Cretaceous Seboyeta embayment.