The Ancestral Rocky Mountains (ARM) represent a poorly understood major tectonic episode in the Phanerozoic geologic history of North America. Conclusive evidence to support any single structural explanation for development of the ARM uplift is still lacking. Although accepted to be Pennsylvanian-Permian in age, the precise timing and orogenic formation mechanism(s) remain elusive due to intraplate location, deformation, and structural overprinting. Several researchers demonstrate wide-ranging hypotheses concerning the structural style and tectonic setting of the ARM system with two prominent models cited. The Ouachita–Marathon Gondwana suturing event from the east and southeast (Kluth,1986), or a possible Andean-style arc from the west affecting the Pacific margin of northern Mexico (Ye et al., 1996). If the major deformation mechanism was either from the E-SE or from the west then a trend should be exhibited amongst the timing of uplift across the region that can be measured and tested. However, systematic detrital radioisotopic dating has not been applied through out the region and few ARM investigations have utilized radioisotopic dating to correlate basins. In a region where a significant portion of ARM uplifts have been eroded or deformed by more recent tectonic events, there is a need for detrital radioisotopic dating in terrestrial rocks without well constrained biostratigraphy to aid in the better understanding of uplift and basin formation. One largely untapped data set that may be useful for unraveling the ARM regional tectonic framework consists of the Pennsylvanian–Permian synorogenic deposits exposed along the margins of ARM basins. Therefore, I propose to use detrital zircon U-Pb Geochronology and (U-Th)/He Thermochronology analysis to test ARM formation hypotheses and to constrain the timing, pattern, scope, and mechanism(s) of uplift and associated basin formation across the ARM region. Initial fieldwork will focus on the central ARM region within the southern Rocky Mountains of Colorado and northern New Mexico in addition to the Paradox Basin of SE Utah (Figure 1). First, key locations to measure ARM synorogenic deposits on opposite sides of major ARM uplifts will be identified and mapped. Then, samples from both upper and lower sections of siliciclastic formations at interpreted intervals of Pennsylvanian-Permian strata will be collected for detrital zircon U-Pb Geochronology and (U-Th)/He Thermochronology analysis. Initial results will test the validity of this method to quantify time constraints on the ARM uplift across the region while providing new data on the structure, dynamics, and history of the enigmatic late Paleozoic tectonics of the North American continent.

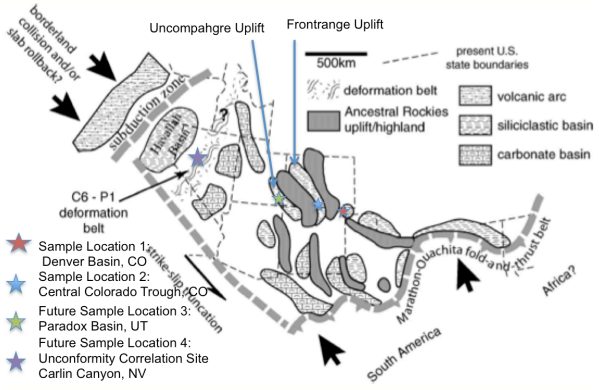

Figure 1. *Major geologic features of the Ancestral Rocky Mountains and suggested proposed and future Sample Locations. Modified from Trexler, 2004.*