

# CONSTRAINING MODELS FOR INTRAPLATE DEFORMATION USING SPATIAL AND TEMPORAL PATTERNS OF EXHUMATION AND BASIN FORMATION IN THE ANCESTRAL ROCKY MOUNTAINS

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Intraplate strain, deformation extending 100s to 1000s of km from active margins, is commonly recognized yet poorly understood in both ancient and modern tectonic settings. The role of intraplate deformation remains unclear and is a gap in the classic plate tectonic paradigm. Consequently, this is an active field of study across many geoscience disciplines. Building of the Ancestral Rocky Mountains (ARM) is a particular enigmatic example of intraplate deformation and is one of the most poorly understood orogenic events in North America (NA). The ARM are characterized by uplift of discrete crustal blocks, erosion of sedimentary cover and igneous basement, and formation of adjacent basins which preserved the shed detritus. I will evaluate the timing and locus of fault-driven erosion and sediment accumulation to reconstruct the ARM with respect to the Paleozoic NA convergent margin. The strategy of this research is to provide geologic context through field observation (measuring section, mapping, paleocurrent analysis, and point counting) and thermochronologic constraint on timing and provenance (zircon (U/Th)-He and U-Pb) to unravel ARM dynamics. The application of these methods applied in key locations, on a regional scale are critical in developing a viable kinematic model for ARM intraplate deformation.

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