



California State University
Northridge



The Department of Geological Sciences Presents:

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**Neogene to Present Landscape Evolution in
the southern Colorado Rockies: Insights
from Geo- and Thermochronology**

Wednesday, Mar. 8th, at 12:30 p.m. in LO1227

Please call (818) 677-3541 or email geology@csun.edu if you have any questions

Abstract:

Colorado is host to a long and complex geologic history from Proterozoic accretion and terrane suturing, rifting in the Neoproterozoic and Cambrian, late-Paleozoic Ancestral Rock Mountain uplifts, to late-Mesozoic through early Cenozoic orogenesis. The region continues to evolve today and much of the landscape we see at present was shaped by relatively recent processes including the eruption of large volume ignimbrites that blanketed the surface from ca. 36-20 Ma. Initiation of the Rio Grande rift extension began ca. 25 Ma with continued fault initiation, growth, linkage, and exhumation progressing in pulses through ca. 5 Ma. The modern landscape is further defined by localized areas of high relief created by paleo and modern fluvial systems of which one of the most dramatic at present is the Arkansas River.

Analysis of low-temperature thermochronometric data in the northern Rio Grande rift (RGR) provides the means to assess the timing of fault initiation, as well as patterns in growth and linkage of rift faults. Apatite (U-Th-Sm)/He (AHe), zircon (U-Th)/He (ZHe) and apatite fission track (AFT) thermochronometric data combined into vertical transects and modelled in the program QTQt, reveal the detailed thermal histories useful for determining timing and rates of faulting in the northern RGR. Furthermore, initial detrital zircon U-Th-Pb data from samples in the Miocene-Pliocene Dry Union formation along with detailed stratigraphic characterization suggest a complex fluvial evolution of the modern and proto-Arkansas River indicating the potential that rift structures also played a role in evolution of the river.