Tertiary Cooling History of a Northern Rio Grande Rift Flank Uplift, Central Colorado

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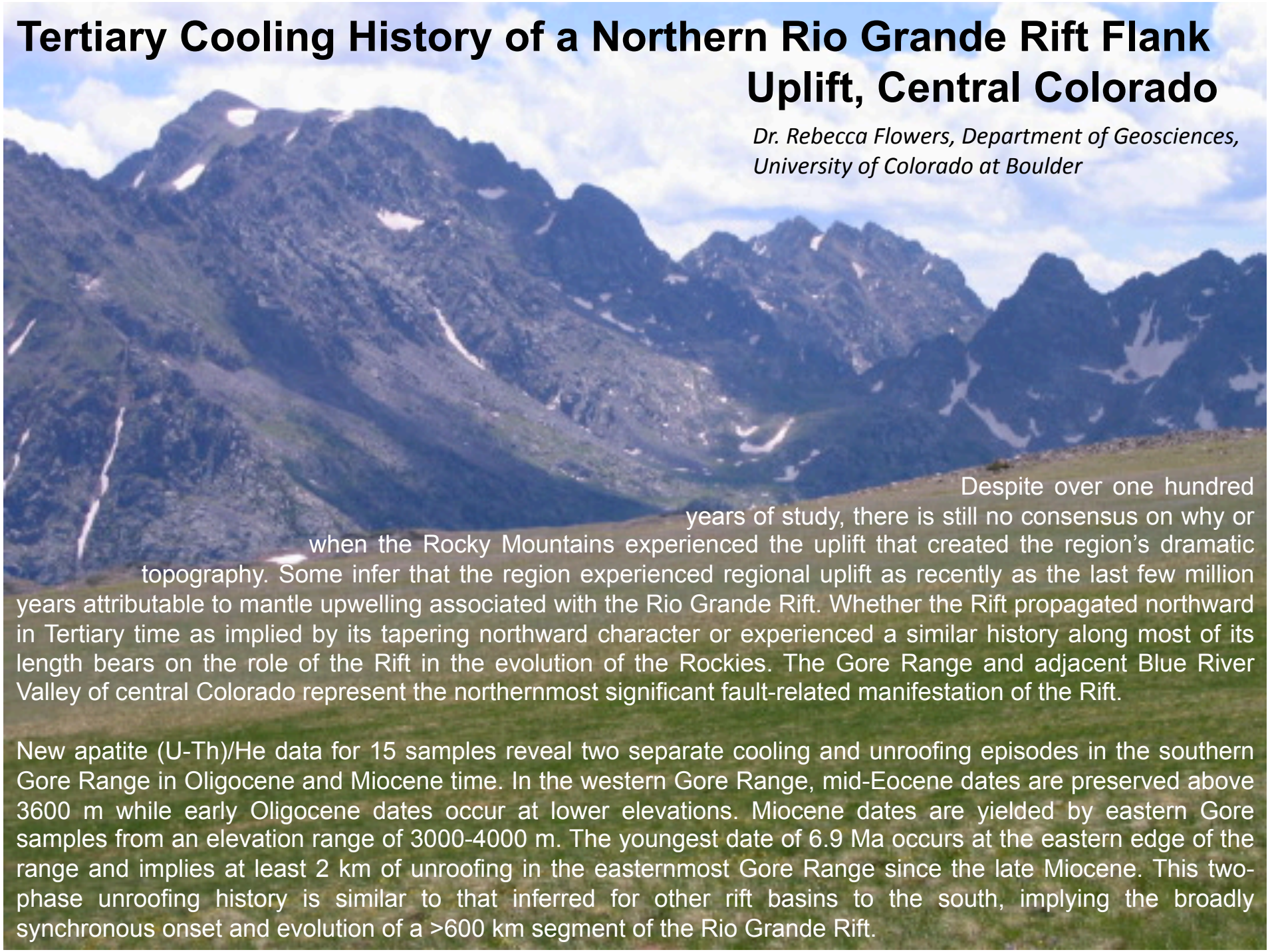

Despite over one hundred years of study, there is still no consensus on why or when the Rocky Mountains experienced the uplift that created the region's dramatic topography. Some infer that the region experienced regional uplift as recently as the last few million years attributable to mantle upwelling associated with the Rio Grande Rift. Whether the Rift propagated northward in Tertiary time as implied by its tapering northward character or experienced a similar history along most of its length bears on the role of the Rift in the evolution of the Rockies. The Gore Range and adjacent Blue River Valley of central Colorado represent the northernmost significant fault-related manifestation of the Rift.

New apatite (U-Th)/He data for 15 samples reveal two separate cooling and unroofing episodes in the southern Gore Range in Oligocene and Miocene time. In the western Gore Range, mid-Eocene dates are preserved above 3600 m while early Oligocene dates occur at lower elevations. Miocene dates are yielded by eastern Gore samples from an elevation range of 3000-4000 m. The youngest date of 6.9 Ma occurs at the eastern edge of the range and implies at least 2 km of unroofing in the easternmost Gore Range since the late Miocene. This two-phase unroofing history is similar to that inferred for other rift basins to the south, implying the broadly synchronous onset and evolution of a >600 km segment of the Rio Grande Rift.