



## Provenance of the Northern Range, Trinidad Using Detrital Zircon U-Pb Geochronology: Implications for Northern South American River System Paleogeography

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The Northern Range of Trinidad is located in a key area for evaluating the Mesozoic-Cenozoic evolution of the Caribbean and South American plates. Here, we present detrital zircon U-Pb geochronology for 2391 grains from ten samples collected from metasedimentary rocks of the Northern Range. These data bracket the maximum depositional age of the fossil-poor metasedimentary rocks from the Northern Range and to investigate the provenance of their sedimentary protoliths. Detrital zircon ages range between  $3136.5 \pm 22.9$  Ma and  $139.0 \pm 5.4$  Ma, reflecting apparent contribution from a variety of crustal affinities; however, since the youngest ages are  $199.5 \pm 7.4$  Ma to  $139.0 \pm 5.4$  Ma, it is unlikely that sediments were sourced from the Caribbean Plate, which is ca. 88 Ma. Samples from the western Northern Range exhibit significant peaks clustering around 1.0 Ga, suggesting a prominent Grenville basement sediment source. In contrast, samples from the eastern Northern Range have bimodal peaks at ca. 1.4 Ga and 1.75 Ga, which overlap with Central Amazonian crustal ages. Central Northern Range rocks exhibit a single, well-constrained peak at ca. 2.0 Ga, which may be associated with Eburnean-West African to Northern-Central Amazonian terranes. While all samples show significant contributions from the South American craton, suggesting this was their primary sedimentological source, potential source area changes were explored because samples were collected from different structural horizons. These results are among the first to quantify the maximum depositional age of the metasedimentary rock and indicate that the youngest Northern Range clastic sediments were deposited in the Early Cretaceous (Valanginian). Based on the high frequency of detrital zircons from the western interior of South America, our data suggest that the proto-Orinoco River may have begun draining to the northeast coast of South America earlier than previous research suggests.