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EPISODIC UPLIFT PATTERNS OF THE SIERRA NEVADA DE SANTA MARTA IN NORTHERN COLOMBIA.

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The Sierra Nevada de Santa Marta (SNSM) is a ~14500-km2 triangular mountain range located adjacent to the Caribbean Sea in northern Colombia. With an average elevation of ~4 km and peaks up to ~5.8 km-high, the SNSM lays only 85 km to the south of a ~3.5 km deep abyssal plain, configuring the world's highest coastal mountain range, with a topographic relief in excess of 9 km. The tectonic development of the SNSM is related to dextral migration of the Caribbean Plate along northwestern South America and the associated episodes of collision, accretion and subduction that have shaped the continental margin since Late Cretaceous. Remarkably, a major positive gravity anomaly occurs beneath the SNSM, which has led researchers to infer either support from a thick, buoyant oceanic lithosphere underthrusting the continent, or a very recent crustal stacking and uplift, so that the prominent topography has not yet been isostatically compensated at depth. Testing these hypotheses requires documenting exhumation patterns in the SNSM on various time scales. New stratigraphic data collected in Cenozoic basins flanking the SNSM to the north and southwest reveal ongoing uplift and unroofing by Oligocene time, and development of fan delta and alluvial fans sourced in the SNSM. New bedrock and detrital apatite fission-track and apatite (U-Th)/He data document spatially variable, episodic exhumation with a major peak in the middle to late-Miocene (25-10 Ma) and decreasing rates southeastwards, away from the collision boundary. On a more recent time scale, present-day denudation rates calculated from suspension- sediment are lower than 0.1 mm, which is unexpected given the large erosive power that is inferred from rivers draining a high relief range in a subtropical climate. In order to bridge present and Cenozoic denudation patterns, we are currently acquiring catchment-wide erosion rates using cosmogenic radionuclides (10Be) in rivers draining the SNSM. Preliminary, we hypothesize that the high topography and relief of the range are the result of a recent (< 2Ma) pulse of rapid uplift whose rates surpasses the rates of erosion, thus precluding the thermochronometric signal associated to rock cooling to have reached the surface, portraying an example of denudational immaturity.