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Early Neogene unroofing of the Sierra Nevada de Santa Marta along the Bucaramanga –Santa Marta Fault

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Plate interaction between Caribbean and Nazca plates with Southamerica gave rise to an intricate pattern of tectonic blocks in the Northandean realm. Among these microblocks the Sierra Nevada de Santa Marta (SNSM) represents a fault-bounded triangular massif composed of a representative crustal section of the Northandean margin, in which a Precambrian to Late Paleozoic metamorphic belt is overlain by a Triassic to Jurassic magmatic arc and collateral volcanic suites. Its western border fault belongs to the composite Bucaramanga - Santa Marta fault with a combined left lateral-normal displacement. SE of Santa Marta it exposes remnants of an Oligocene marginal basin, which attests to a first Cenoizoic activation of this crustal-scale lineament. The basin fill consists of a sequence of coarse-grained cobble-pebble conglomerates > 1000 m thick that unconformably overlay the Triassic-Jurassic magmatic arc. Its lower sequence is composed of interbedded siltstones; topwards the sequence becomes dominated by coarser fractions. These sedimentary sequences yields valuable information about exhumation and coeval sedimentation processes that affected the massif's western border since the Upper Eocene. In order to analyse uplifting processes associated with tectonics during early Neogene we performed detrital zircon U-Pb geochronology, detrital thermochronology of zircon and apatites coupled with the description of a stratigraphic section and its facies composition. We compared samples from the Aracataca basin with analog sequences found at an equivalent basin at the Oca Fault at the northern margin of the SNSM. Our results show that sediments of both basins were sourced from Precambrian gneisses, along with Mesozoic acid to intermediate plutons; sedimentation started in the Upper Eocene-Oligocene according to palynomorphs, subsequently in the Upper Oligocene a completion of Jurassic to Cretaceous sources was followed by an increase of Precambrian input that became the dominant source for sediments, this shift in provenance is related to an increase in exhumation and erosion rates. The instauration of such a highly erosive regime since the Upper Oligocene attests how the Santa Marta massif was subject to uplifting and erosion, our data shows how in the Upper Oligocene an exhaustion of Cretaceous to Permian sources was followed by an increase in Neo-Proterozoic to Meso-Proterozoic input that is related to the unroofing of the basement rocks, this accelerated exhumation is directly related to the reactivation of the Orihueca Fault as a NW verging thrust at the interior of the massif coeval with Bucaramanga-Santa Marta Fault trans-tensional tectonics in response to the fragmentation of the Farallon plate into the Nazca an Cocos Plates.