Andean Mountain Building: A Review of 10 Years Study in Eastern Ecuador

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Our work since ten years in the Eastern Cordillera, Sub- Andean Zone and Andean Amazon Basin of Ecuador aims to quantify periods of vertical movements (denudation or burial) in the frame of the geodynamic of the northern Andes. The Andes are there constituted of five morpho-tectonic domains, from west to east: the coastal blocks, the Western Cordillera, the Inter-Andean Valley, the Eastern Cordillera, the Sub-Andean Zone and finally the Andean Amazon Basin. Different methods were used along and across the chain: these are Fission-Track on apatite and zircon, (U-Th)/He on apatite, Ar/Ar, provenance analysis and tectonic subsidence. Results point toward accelerated periods of denudation in the Early Cretaceous, Eocene, and Late Miocene that can be related to the accretion of allochtone terranes against the Ecuadorian margin to the West but also to the subduction of the buoyant Carnegie ridge. The syn-orogenic basin to the east is the Andean Amazon Basin that partly or totally preserved the record of mountain building through 1) its detrital and thermochronological signatures, 2) sedimentary thicknesses, but also 3) thermal overprint on basement rocks. It is thus the key region to trace past and recent traces of mountain building in the Andes of Ecuador.

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