



Inception of a plate model along northwestern South America

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Given its location between the downgoing Caribbean and Nazca plates, and the Amazonian Craton, northwestern South America is a key region to understand the connection between the Central- Equatorial Atlantic and the Pacific Realms. The geology of NW South America is complicated by wide dispersal over many geographic elements, some with poor accessibility, tropical weathering and/or young volcanic cover and some not well studied yet.

In addition to the geological interests for the Northern continuation of the Andes Cordilleras, the exploration of this region considerably increased in the past few decades regarding its high petroleum potential. Nevertheless, surprisingly the geodynamic processes are not well-captured in any existing plate model reconstruction. This latest point is obvious in the high and varying numbers and geometries of plates involved in various existing geodynamic models.

Prevailing understanding is that the NW South American Plate(s) is composed partly of Pacific accreted Terranes since Mesozoic times and crustal basement rocks of the South American Guyana craton. This western Guyanan pericratonic margin is characterized by pre-Mesozoic inherited strike-slip as well as normal structures inverted in the Cenozoic due to the subduction of the Pacific oceanic plate in the west.

In this work, we compiled available tectonic, sedimentology, geochronology, low-thermal chronology and GPS data from the Western, Central and Eastern Andes Cordillera of Colombia as well as the surrounding areas to: i) distinguish the boundaries of the main structural domains, ii) establish a precise chronology of major fault-block activities and related topography building and finally, iii) suggest an alternative plate reconstruction model for this region for the past 150 My.