

**R178.T001. TECTONIC RECONSTRUCTION OF THE PANAMA-NW COLOMBIA MARGIN:
NEW CONSTRAINTS FROM GEOLOGICAL MAPPING, GEOCHRONOLOGY,
GEOCHEMISTRY AND PALEOMAGNETISM**

MONTES, C. *,**, CARDONA, A. *,**, BAYONA, G. **,*, FARRIS, D. *, STRONG, N. * MORÓN,
S. *, RINCÓN A. *, SILVA, C. *

*Smithsonian Tropical Research Institute, Panamá. montesc@si.edu

** Corporación Geológica Ares, Bogotá, Colombia. gbayona@cgares.org

RESUMEN

New data collected along northern Panamá and northwestern Colombia is integrated into a tectonic model for the Cenozoic history of this margin. This model shows the effects of transpressional deformation driven by the migration of the subduction-related leading and trailing edges of the Caribbean plate along a margin where accretionary wedges, volcanic arcs, obducted oceanic crust and micro continental blocks interacted producing highly contrasting structural styles simultaneously. New data collected along this margin includes geochronology of detrital and magmatic zircons, trace and major element geochemistry of magmatic arcs in northern Panamá, paleomagnetic sites in the Santa Marta massif and central Panamá, geologic mapping in the Perijá range and central Panamá. Paleomagnetic investigations in Panamá (Silva et al., 2008) and the Santa Marta massif (Bayona et al., in review), and spatial distribution of magmatic arcs (Cardona et al., 2008) indicate that the micro-continental and oceanic blocks involved in the evolution of the margin have experienced vertical-axis rotation and large latitudinal translations. The paleomagnetic constrains are compared against new geochemical and geochronologic data in Panamá, the Plato-San Jorge basin in northern Colombia, as well as geologic mapping in the Perijá range and Ranchería basin (Montes et al., in review) and the Panamá Canal zone. This model preliminarily indicates that a moderate amount of vertical-axis clockwise rotation (17.3 ± 12.7 degrees) documented with paleomagnetic analyses in the Santa Marta massif, may explain as much as 105 km of extension (56%) along its trailing edge (Plato-San Jorge basin) and up to 42 km of shortening along its leading edge (Cesar-Ranchería basin). Neogene shortening in the Cesar-Ranchería valley is accommodated by the Cerrejón fault, a northwest-verging, crustal-scale fault that dips $9-12^\circ$ to the southeast, thrusting Mesozoic onto Paleogene rocks, offsetting strata as young as early Eocene. Simultaneous extensional deformation is recorded in the fan-shaped Plato-San Jorge basin by a 2 to 6 km thick, shallowing-upward and almost entirely fine-grained Neogene sedimentary sequence that shows an increased subsidence rate at ca. 12 Ma. Large counterclockwise rotations of small blocks in the Panamá Canal area have been isolated and may record the initial closure of the isthmus and left-lateral deformation and generation of the Panamá orocline. This late shearing may be superimposed on predominantly normal faulting that characterizes the Panamá Canal area with mean NEE directions and dipping to the south. The effects of the ENE translation of the Caribbean plate along this margin are thus integrated, showing a complex interaction of simultaneous right- and left-lateral shearing, extension and contraction and vertical-axis rotation.