

GNSS geodetic networks in Colombia and Ecuador: a tool to understand the North Western corner of South America

H. Mora-Paez¹, P. Mothes²

¹Colombian Geological Survey, GIGE, Bogotá, Colombia

²National Polytechnic School, Geophysical Institute, Quito, Ecuador

The active deformation in both Colombia and Ecuador countries is reflected in the rapid east-northeastward subduction of the Nazca plate beneath South America, which favors the occurrence of major earthquakes. For this reason, Colombia and Ecuador have made great efforts in the installation of instruments of various types, including geodetic instrumentation. Thus, the Colombian Geological Survey through the Space Geodesy Research Group-GeoRED Project (Mora-Páez et al., 2018), of the Geohazards Directorate and the National Polytechnic School of Quito through the Geophysical Institute, (Mothes et al., 2013), have been, for several years, gradually installing GPS permanent stations, in order to study the crustal deformation the North Andean Block. It is presented here an updated velocity field of permanent stations located both in Colombia and Ecuador, expressed in ITRF2014 using HECTOR software (Bos et al., 2012). However, the data obtained by these networks have been also used by several authors to better understand the geodynamics of the region, whose results, exposed in different publications have allowed to answer essential research questions such as the definition of the subduction rate of the Nazca plate beneath South America, estimation of the Euler pole associated with the motion of the North Andean Block, monitoring of the seismic cycle, among others (Mora-Paez et al., 2019; Sagiya and Mora-Páez, 2019; Mothes et al., 2018; Vaca et al., 2018; Nocquet et al., 2017, 2014; Mora-Páez et al., 2016). Also, the two institutions are using geodetic instrumentation for volcanic monitoring in both Colombia and Ecuador.

Bos et al. (2012) J. Geod., 87, 351-360.

Mora-Paez et al. (2019), J. South Am. Earth Sci., 16, 76-91.

Mora-Páez et al., (2018), SRL 89 (2A), 446-451

Mora-Páez et al., (2016), Geophys. Res. Lett., 43, 8407-8416

Mothes et al., (2018), SRL 89 (2A)

Mothes et al., (2013), EOS 94 (26), 229-231

Nocquet et al., (2017), Nature Geoscience 10 (2), 145-149

Nocquet et al., (2014), Nat. Geosci., 7 (4), 287-291

Sagiya and Mora-Páez, The Geology Book, Colombian Geological Survey, accepted to be published in 2019

Vaca et al., (2018), Tectonophysics 724-725, 80-92