



First palaeoseismological data on the Santa Marta Fault System, Northern Colombia

J. Idárraga

Institute of Marine and Coastal Research-INVEMAR, Santa Marta, Colombia (javier_idarraga@invemar.org.co/(+57 5) 4233280)

The Santa Marta Fault System (SMFS) is a NNW-striking major structural feature that controls the western foothills of the Sierra Nevada of Santa Marta (northern Colombia), the world's highest coastal relief. Morphotectonically, the SMFS exhibits an arrangement of parallel to subparallel fault traces. These traces are associated with a set of offset streams indicating a left-lateral component for displacement. NE-trending compressive structures as reverse faults (e.g. the Orihueca and San Pedro faults) and folds (the Fundación Anticline), and NW-trending distensive structures as normal faults are present too. These structures are consistent with a left-lateral shear zone striking NNW. An unlithified ruditic deposit with tectonic deformation crops out at the Riofrío site; this deposit consists of a series of debris slope layers linked to a dejection cone. The documented deformation in this outcrop is characterized by a tilting of the sequence to NE (against the direction of deposition) and by the presence of inverse faulting in which the coseismic displacement could have been distributed across distensive structures (normal faults and opened fractures). A magnitude (M_w) of 6.4 was calculated for the compressive event based on the displacement measured on the outcrop; this value corresponds to a minimum magnitude. Unfortunately, it has not been possible to date the deposits to constrain the tectonic events in time. The results of this research constitute the first data on the palaeoseismology of the SMFS, and are an important basis for future paleoseismic studies that allow calculating the seismic hazard of the region and giving an approximation of the Plio-Quaternary evolution of the South American northwestern corner.