



New observations of the active deformation along the oblique collision/subduction boundary zone between the North American and Caribbean plates (northern Hispaniola offshore margin)

Andrés Carbó-Gorosabel (1), José Luis Granja Bruña (1), Álvaro Rodríguez Zurrunero (1), Laura Gómez de la Peña (4), Alfonso Muñoz-Martín (1,9), María Gómez Ballesteros (2), José Miguel Gorosabel Araus (1), Salvador Espinosa (8), Anatonio Pazos (3), Manuel Catalán (3), Hector Yamil Rodríguez Asilis (5), José Luis Nuñez (5), Santiago Muñoz (6), Uri S. ten Brink (7), Jesús Quijano (3), Pilar Llanes Estrada (1), José Martín Dávila (3), and María Druet (2)

(1) Universidad Complutense de Madrid, Applied Tectonophysics Group, Geodynamics, Madrid, Spain (jlgranja@geo.ucm.es), (2) Instituto Español de Oceanografía, Madrid, Spain, (3) Real Instituto y Observatorio de la Armada, San Fernando, Cádiz, Spain., (4) Barcelona-CSI, Institute of Marine Sciences-CSIC, Barcelona, Spain., (5) Autoridad Nacional de Asuntos Marítimos, Santo Domingo, Dominica Republic., (6) Servicio Geológico Nacional, Santo Domingo, Dominican Republic., (7) U. S. Geological Survey, Woods Hole, MA, USA., (8) Instituto Hidrográfico de la Marina, Cádiz, Spain., (9) Instituto de Geociencias (UCM-CSIC), Madrid, Spain

The Caribbean plate is moving relative to the North American plate at a rate of 20.0 ± 0.4 mm/y towards $074^\circ \pm 1^\circ$. This eastward motion has been taking place during most of the Cenozoic developing a 250 km-wide band of deformation, in which microplate and block tectonics take place. The eastward motion of the Hispaniola block is being impeded relative to the motion of the Caribbean plate's interior due to the collision with the Bahamas banks. This collision has resulted in the development of the Northern Hispaniola deformed belt along the northern Hispaniola offshore margin. A series of large (M6.2–M8.1) thrust earthquakes from 1943–1953, and two significant events in 1994 (M5.6) and 2003 (M6.4) occurred close to the city of Puerto Plata have been attributed to oblique collision/subduction of the North America plate and Bahamas banks beneath the northern Hispaniola.

300 km of 2D multi-channel seismic (MCS) reflection data and approximately 15000 km² of high-resolution, systematic swath bathymetry data were recorded in the northern Hispaniola offshore margin as part of a larger survey carried out in November-December of 2013 aboard the Spanish R/V Sarmiento de Gamboa. MCS profiles were collected shooting a GI gun array (GGUN-II[®]) of 1750 ci. every 37.5 m and the signal recorded in a 3000 m-long streamer with 240 channels (Sentinel Sercel[®]). Differential GPS navigated high-resolution bathymetry data were collected using the hull-mounted Hydrosweep ATLAS DS echo-sounder system.

Using new high-resolution multibeam bathymetry and MCS data, combined with previous 2D seismic data, we have studied the along- and across-strike variations of the geomorphology and shallower structure of the northern Hispaniola offshore margin. Here we present preliminary results focused on the identification and characterization of recent tectonic features in the region and provide well-defined targets to carry out future studies for seismic and tsunamigenic hazard assessment.