



1946 Dominican Republic Tsunami: Field Survey based on Eyewitness Interviews

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On 4 August 1946 an Mw 8.1 earthquake struck off the north-eastern shore of Hispaniola Island resulting in a destructive tsunami with order one hundred fatalities in the Dominican Republic and observed runup in Puerto Rico. In the far field, tsunami waves were recorded on some tide gauges on the Atlantic coast of the United States of America. The earthquake devastated the Dominican Republic, extended into Haiti, and shook many other islands. This was one of the strongest earthquakes reported in the Caribbean since colonial times. The immediate earthquake reconnaissance surveys focused on earthquake damage and were conducted in September 1946 (Lynch and Bodle, 1948; Small, 1948). The 1946 Dominican Republic tsunami eyewitness based field survey took place in three phases from 18 to 21 March 2014, 1 to 3 September 2014 and 9 to 11 May 2016. The International Tsunami Survey Team (ITST) covered more than 400 km of coastline along the northern Dominican Republic from the eastern most tip at Punta Cana to La Isabela some 70 km from the border with Haiti. The survey team documented tsunami runup, flow depth, inundation distances, sea-level drawdown, coastal erosion and co-seismic land level changes based on eyewitnesses interviewed on site using established protocols. The early afternoon earthquake resulted in detailed survival stories with excellent eyewitness observations recounted almost 70 years later with lucidity. The Dominican Republic survey data includes 29 runup and tsunami height measurements at 21 locations. The tsunami impacts peaked with maximum tsunami heights exceeding 5 m at a cluster of locations between Cabrera and El Limon. A maximum tsunami height of 8 m likely associated with splash up was measured in Playa Boca Nueva. Tsunami inundation distances of 600 m or more were measured at Las Terrenas and Playa Rincon on the Samana Peninsula. Some locations were surveyed twice in 2014 and 2016, which allowed to identify current coastal erosion rates. Field data points measured in 2014 and 2016 were corrected for predicted astronomical tide levels at the time of tsunami arrival in 1946 as there were no tide stations operating along the surveyed coastline in 1946. Individual tidal corrections applied to the raw field measurements were less than ± 0.5 m given the relatively small tidal range around Hispaniola Island. At least 10 significant tsunamis have been documented in the northern Caribbean since 1498, six of which are known to have resulted in loss of life (O'Loughlin and Lander, 2003). Rapid population increase in the Caribbean exposes more coastal residents and tourists to future tsunami events.