

# 13th Int. Workshop on Seismic Microzoning and Risk Reduction

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19th century engraving showing the effects of the 1829 catastrophe on a map of Vega Baja, taken from Canales-Martinez et al., 1999, ISBN:94-606-2875-2)

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## Probabilistic Seismic Hazard Assessment in the Enriquillo basin and surrounding Sierras de Neiba and Bahoruco, southwestern Dominican Republic

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### Abstract

This study analyses the seismic hazard in the Enriquillo basin and the adjacent sectors of the Sierras de Neiba and Bahoruco in the southwestern Dominican Republic, where several active faults converge. Following the Cornell-McGuire methodology, the R-CRISIS calculation code builds a probabilistic model that considers both the spatial distribution of seismogenic sources and the occurrence of earthquakes in time and the attenuation characteristics of the strong motion in the ground. The computed seismic hazard estimates the probability of exceeding a peak ground acceleration (PGA) value for a specific site in a given return period (475 years).

The obtained PGA values range between 134 cm/s<sup>2</sup> and 784 cm/s<sup>2</sup>, and PGA zoning defines an elongated pattern sub-parallel to the main WNW to W-trending active fault zones. For this seismotectonic model, the eastern segments of the Matheux-Neiba (E-MAFZ) and Enriquillo-Plaintain Garden (E-EPGFZ) fault zones present locally the highest PGA values (>650 cm/s<sup>2</sup>). However, the seismic hazard decreases to intermediate values towards the eastern sector of the Enriquillo Basin (about 400 cm/s<sup>2</sup>) because the E-EPGFZ is segmented. Located on the northern slope of the Sierra de Bahoruco, the Bahoruco fault zone (BAFZ) presents intermediate hazard values (between 350 and 550 cm/s<sup>2</sup>). However, the seismic hazard increases to high values (>550 cm/s<sup>2</sup>) towards their extremes, because the fault intersects with the E-EPGFZ and the offshore Beata Ridge fault zone (BRFZ).

**Keywords:** probabilistic seismic hazard, active tectonics, fault zone, Dominican Republic, the Caribbean plate

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