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Assessment of tsunami hazard in Central America

Beatriz Brizuela (1), Alberto Armigliato (2), Gianluca Pagnoni (2), Roberto Tonini (2), and Stefano Tinti (2)
(1) Istituto Nazionale di Geofisica e Vulcanologia, INGV, Rome, Italy, (2) Dipartimento di Fisica, Settore di Geofisica, Università di Bologna, Italy

Central America has been struck by at least 49 tsunamis between 1539 and 1996. As many as 37 of these events occurred at the Pacific Coast, and 31 were generated by earthquakes. Some of the events have been destructive, but despite this, tsunamis are an underrated hazard in Central America: people are not aware that they are at risk and even recent tsunami events have been forgotten. Recent studies, following the destructive tsunami occurred in Nicaragua in 1992, have revealed that Central America is a moderately tsunamigenic zone that is mainly affected by tsunamis triggered by earthquakes, especially at the Pacific coast where the Middle American Trench runs parallel to the coast. In this study, a statistical first and then a hybrid probabilistic-deterministic analysis for the Pacific coast of Central America has been carried out. The statistical approach aimed to estimate the Gutenberg-Richter coefficients of the main seismic tsunamigenic regions of the area in order to know the annual rate of occurrence of tsunamigenic earthquakes and their corresponding return period. A hybrid analysis, probabilistic and deterministic was used to compute the run-up distribution along the coast corresponding to a given annual rate of occurrence of a tsunamigenic earthquake. A further scenario-based analysis has been undertaken consisting in the numerical simulations of six historical earthquake-induced tsunamis that were carried out by means of the UBO-TSUFE Model.