



## **Exploring the Uncertainties of the Tsunami Hazard Assessment in Middle America**

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Central America represents a region of high seismicity due to the rapid subduction of the Cocos plate beneath the Caribbean plate. Historical data indicate that almost 50 tsunamis have occurred in both Pacific and Caribbean coasts of Central America since last 500 years. These records indicate that far distance, regional and local tsunamigenic source represent a potential threat to coastal communities along Central America. Over the last years, tsunami threat assessment along Central America has been performed using a deterministic scenario-based method. However, such deterministic scenarios are not accompanied with their probability of occurrence and uncertainty analysis. This information is very important for coastal planning and reliable risk assessment (hazard  $\times$  vulnerability  $\times$  losses) posed by tsunamis. Thus, the aim of the project is to assess probabilistic tsunami hazard in Central America by implementing a modified method based on previous probabilistic seismic hazard assessment methods. The main datasets for this project is the Central American Seismic Catalog (CAT-2011) that covers 500 years of historical and recorded earthquakes and a catalog of focal mechanisms compound from various seismic datasets. We first establish the seismotectonic zonation relevant to the tsunamigenesis, derive earthquake statistical parameters for each zone, and generate a series of synthetic catalogs using Monte Carlo approach. Different catalogs in these series account for statistical data uncertainties and model assumptions. Each of the synthetic catalogs is then used as input data for tsunami modeling and final Probabilistic Tsunami Hazard Assessment PTHA-products (e.g., hazard curves). Additional aleatoric and epistemic uncertainties are determined. Finally we present sensitivity analysis of different parameters that greatly influence the tsunami hazard analysis.