



## **Rapid assessment tool for tropical cyclone waves and storm surge hazards in Mexico**

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Mexico is under the constant threat of tropical cyclones generated in the Atlantic and the Eastern Pacific oceans. While the National Hurricane Center (NHC) in Miami is responsible for the forecast of tropical cyclones in both basins and providing watch and warning areas information for Mexico, Central America and the Caribbean, they are not responsible to issue waves and storm surge hazards. This work presents a quick assessment tool for waves and storm surge hazards developed under conditions that are common to developing countries: tight budget and time constraints, as well as limited numerical modeling capabilities. The system is based on 3100 synthetic tropical cyclones doing landfall in Mexico. Hydrodynamic and wave models were driven by the synthetic events to create a robust database composed of maximum envelopes of wind speed, significant wave height and storm surge for each event. The results were incorporated into a forecast system that uses the NHC advisory to locate the synthetic events passing inside specified radiuses for the present and forecast position of the real event. Using limited computer resources, the system displays the information meeting the search criteria, and the forecaster can select specific events to generate the desired hazard map (i.e. wind, waves, and storm surge) based on the maximum envelop maps. This system was developed in a limited time frame to be operational in 2015 by the Hurricane and Severe Storms Unit of the Mexican National Weather Service, and represents a pilot project for other countries in the region not covered by detailed storm surge and waves forecasts.