

The Puerto Rico Tsunami Program after the 2004 Tsunami: Hazard and Vulnerability Assessment, Public Outreach and the Tsunami-Ready Program for Coastal Towns

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Abstract

Prior to the 2004 Indian Ocean tsunami the Caribbean island of Puerto Rico had implemented the Puerto Rico Tsunami Warning and Mitigation Program, with a grant from the USA's FEMA. This program ended in 2003. For several years we had asked NOAA for Puerto Rico to be included in the in the USA National Tsunami Hazard Mitigation Program, to no avail. But right after the Sumatra tsunami we were asked to join. This resulted in the complete revision of the (local) tsunami flood maps finalized in 2003 by including 300 plus potential sources, now using Lidar-derived, high-resolution grids (30x30 meters), and NOAA's MOST tsunami model. Regional and tele-tsunamis have also been added. And since the island is surrounded by evidence of large underwater landslides, with extremely large slopes, modeling of landslide tsunamis has also been carried out using the coupled models Tsunami-3D and NEOWAVE, both non-hydrostatic. For each potential source, runup and current velocities maps are available in paper and electronic formats, including shapefiles, and KMZ files with color-coded elevation, or current speed, information. We also have color-coded maps for identifying coastal areas where no advisory, or advisory, or warnings can be issued so that in the case of an event emergency managers can make the decision of where to direct scarce resources.

The modeling results have been used to prepare tsunami evacuation maps for coastal municipalities, allowing them to become Tsunami-Ready communities (34 out of 44 municipalities). In addition a tsunami GIS layer describing the Maximum of the Maximum elevations has been created which, with information from the latest (2010) census, allows for demographic studies of all types. We are now working on preparing ocean current maps for in-harbor tsunami hazard maps with the goal of identifying low hazards sites inside our major ports and bays, if any.