

A COUPLED TELESEISMIC OCEAN-GENERAL-CIRCULATION-MODEL SYSTEM FOR GLOBAL TSUNAMI WARNING

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ABSTRACT

The key to a successful tsunami warning for saving lives and property during a tsunami emergency is the early detection of the potential tsunami and the accurate prediction of the tsunami's strength and propagation pattern. Seismometers can detect only earthquake information - but not the tsunami itself, which can be dangerous to many coastal communities, like the December 2004 tsunami that killed about a quarter million of people in countries around the Indian Ocean. Recently, we have successfully demonstrated a prototype tsunami prediction system [Song et al., The 26 December 2004 tsunami source estimated from satellite radar altimetry and seismic waves, *Geophys. Res. Lett.*, Vol (32), doi:10.1029/2005GL023683, 2005] by coupling an earthquake slip-inversion model with an ocean-general-circulation-model that operates in near real-time at many institutions around the world.

Here we propose a global tsunami warning system, based on the prototype system, with state-of-the-art remote-sensing technology. The warning system uses the earliest seismographic information on an earthquake, which is usually available online only a few minutes after the earthquake from the Global Seismographic Network. The ocean circulation model, operating in near real-time at many institutions around the world and with increased resolution in regions of interest to those institutions, will be able to couple the seismically-inverted data for those coastal regions at risk. Furthermore, information from ground-based ocean-bottom-pressure and space-based GPS-reflections and wide-swap altimeters will be used to constrain the model prediction. The model-predicted tsunami's potential will be automatically issued to tsunami warning centers for risk level assessment and early warnings will be issued to regions at risk for hazard mitigation.