DEFINING TSUNAMI SOURCES FOR REAL-TIME TSUNAMI FORECASTING

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Abstract

The NOAA Center for Tsunami Research is developing an operational tool that provides quick and accurate tsunami forecasts known as Short-term Inundation Forecast (SIFT). The SIFT system uses data assimilation and inversion technique to provide offshore forecast and site-specific inundation forecast. A quick tsunami forecast is possible with the aid of the forecast propagation database which is setup by pre-computing earthquake events using base unit sources along the known and potential earthquake zones in the entire Pacific Basin. A total of 804 unit sources (see figure below) have been developed in collaboration with the USGS Tsunami Sources Working Group, and tsunami propagation scenarios have been simulated. Exploiting the linearity of the generation/propagation dynamics, the propagation database can simulate any earthquake scenarios using a combination of base unit sources that can accurately reproduce the actual tsunami time series as validated with two real tsunami events. The sensitivity analysis of this approach is discussed and examples of hindcast and forecast results are presented.