Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11494, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11494
EGU General Assembly 2008

Field survey and detailed numerical modelling of the tsunami from the Bengkulu earthquake of 12 September 2007

J.C. Borrero (1,2), R. Weiss (3), R. Hidayat (4), Suranto (4), C. Bosserelle (1) and E.A. Okal (5)

(1) ASR Ltd., Marine Consulting and Research, Raglan New Zealand, (2) Tsunami Research Center, University of Southern California, Los Angeles, CA USA (3) NOAA/PMEL Tsunami Research, Sand Point Way, Seattle, WA USA (4) Coastal Engineering Laboratory-BPPT, Jl. Grafika 2, Yogyakarta 55281, Indonesia (5) Northwestern, Univ., Evanston, IL 60208, USA

The M_w = 8.4 earthquake on September 12, 2007 offshore of the Bengkulu Province of Sumatra Indonesia generated a tsunami causing runup heights of up to 4 m as measured by Indonesian and international researchers in the days following the earthquake. The tsunami was observed along 280 km of coastline and caused damage at several locations. The largest wave heights and most severe inundation were measured some 80 km to the north of Bengkulu, elsewhere the effects were less severe – with the exception of substantial inundation at Muara Maras, a site 150 km to the south of Bengkulu.

In addition to simply presenting the field data, we conduct a numerical modeling study of this event comparing the relative accuracy of four different seismic deformation models used to initialize the tsunami propagation and inundation model MOST. The model results are compared to measured runup heights as well as water level data recorded by an offshore buoy located near the earthquake source.

The study shows that for this event, estimates of fault parameters available immediately after determination of the earthquake size and location predicted the nearfield runup heights and distribution and farfield wave as accurately as results obtained using detailed descriptions of the surface deformation obtained via inversions of seismic

waves, GPS data and direct observations of ground deformation. The results suggest that while the detailed slip patterns can be important to the nearfield runup distribution, simple fault models can be confidently used to rapidly assess the likely near and farfield tsunami effects of a particular earthquake.