Geophysical Research Abstracts
Vol. 12, EGU2010-6999, 2010
EGU General Assembly 2010

The Samoa tsunami of 29 September 2009: Field survey in Samoa and preliminary modeling

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The Samoa tsunami of 29 September 2009 caused considerable damage and 146 deaths in the country of [ex-Western] Samoa, where the last comparable event took place in 1917.
Following the event, an International Tsunami Survey Team was deployed and surveyed the inundation one week after the tsunami. Our results revealed higher values of run-up and inundation on the Southern shore of Upolu, where run-up reached 14.5 m at Lepa and 11.4 m at Lalomanu, this latter village being eradicated, with a death toll of 61. By contrast, the Northern shore was largely spared. A similar pattern was observed on the island of Savaii, but with lower run-up values, and only 2 deaths. The higher death toll in Samoa, as compared to American Samoa probably results from the combination of terrain morphology (wider coastal plains leading to longer evacuation distances), the absence of a signage project, and an unfortunate reliance on motor vehicles leading to entrapment of victims along roads often parallel to the beach.
A number of numerical simulations were conducted using several models of the seismic source; they correctly predict a concentration of tsunami energy at the Southeastern corner of the island of Upolu, but also at its Southwestern end, where surveyed run-up did not exceed 5 m. All models correctly indicate that the northern coast, with the capital Apia, is spared by the tsunami, even though it had reportedly been emphasized during mitigation exercises prior to the event.