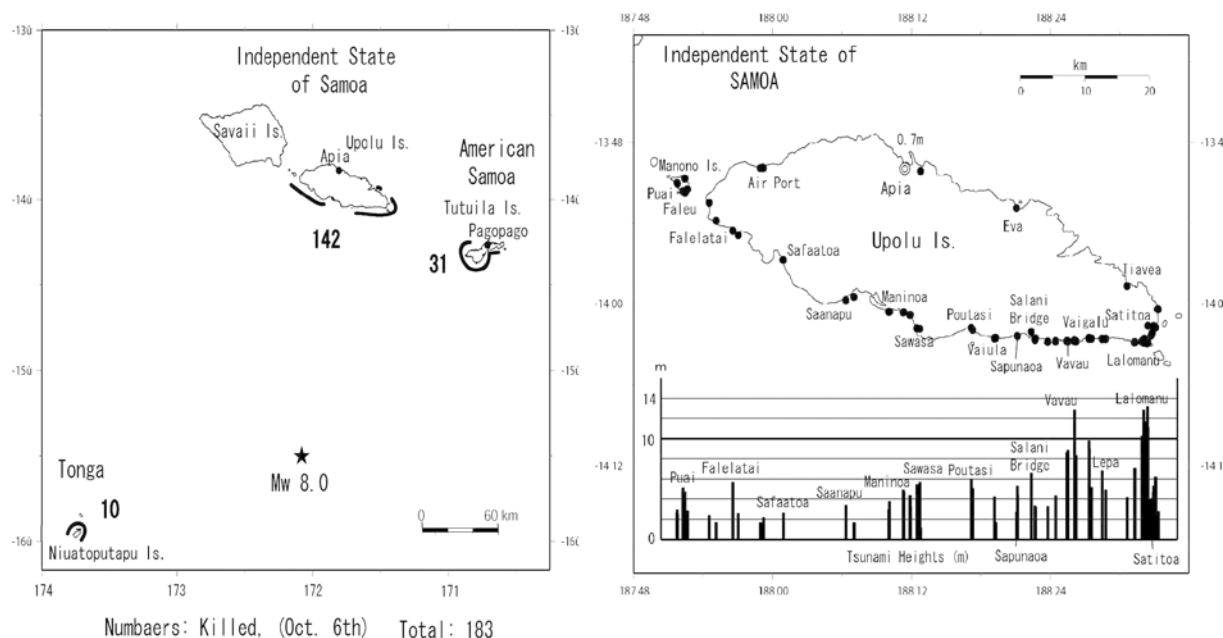


## Damage of the tsunami of the Samoan Earthquake of September 29th, 2009 on the coast of Independent State of Samoa

Yoshinobu Tsuji<sup>1\*</sup>, Koji Fujima<sup>2</sup>, Tsutomu Sakakiyama<sup>3</sup>, Taro Arikawa<sup>4</sup>, Daisuke Tatsumi<sup>4</sup>, Yoshitaka Matsuzaki<sup>4</sup>

<sup>1</sup>Earthq. Res. Inst., Univ. Tokyo, <sup>2</sup>National Defense Academy, <sup>3</sup>CRIEPI, <sup>4</sup>Port and Airport Res. Inst.



In the morning 6:48Am(Samoan local time), 29th September, 2009 a large earthquake (Mw8.0) of a normal fault type occurred in the sea region south-west off Samoa Islands. Accompanied with this earthquake, a huge tsunami was generated and hit the coasts of Upolu Island of the Independent State of Samoa, Islands of American Samoa, and Niuatoputapu Island of Tonga. In total 183 people were killed due to the tsunami, and 142 people of them were habitants on the south coast of Upolu Island, the main island of the Independent State Samoa.

We enter Upolu island on 12th September, and made field survey for ten days. We measured run-up height of sea water and interview to the sufferers. Shaking itself was not so strong; there were falling rocks on the highway road and slope slumping were observed partially. Seismic intensity was estimated at 4 to weaker 5 in JMA scale, about 6 in MMI scale in the eastern part of the island.

Several minutes after the main shock, a huge tsunami hit the south and the east coasts of the island. Most severe damage took place at Lalomanu village, which is located at the eastern end of the southern coast of the island. Almost all houses were swept away and sea water rose up along the slope behind the village to the point with height of 13.2 meters. We saw only the foundations of houses on the ground of this village. A fishing boat was carried at the point at six meters high above mean sea level about one kilometer apart from the shoreline. On Manono island, which is located about 3 kilometers offshore of the western coast of Upolu Island, sea water flooded in the

residential areas.

We asked time interval between the shaking of the main shock and the arrival time of the first wave of the tsunami at several point on the eastern part of the Upolu island. It was 5 minutes at the hospital of Vailoa village, 2 to 3 minutes in the village, 5 minutes at Satitua, 5 to 6 minutes at Vavau on the south coast, 15 minutes at Eva on the north coast. Such short arrival time implies that the initial wave of the tsunami was not generated by the crustal motion of sea bed but it was generated by some secondary reason such as sea bottom slope slumping.

An officer of JICA said that few damage took place on the coast of Savaii Island.

Keywords: the 2009 Samoan Tsunami, normal fault earthquake, run-up height of a tsunami, damage of a tsunami