

Tsunami field survey in Indonesia for the 2004 Sumatra earthquake

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On December 26, 2004, the great Sumatra earthquake (Mw=9.0) generated a giant tsunami which propagated across the Indian Ocean and caused the catastrophic disaster: the casualties over 250,000 mostly in Indonesia, Sri Lanka, Thailand, and India. Among them, the tsunami disaster was the worst in the Ache province of northern Sumatra in Indonesia: the casualties were over 150,000. Our international tsunami survey team began a 10-day long investigation in the Ache province from January 20, 2005.

The team was able to map the detail tsunami heights near Banda Ache city and Lhok Nga, the northern end of the west coast of Sumatra Island. The tsunami heights near Lhok Nga, the west coast, were 16-34 m. The tsunami damages were so catastrophic that the village was completely flattened, except one mosque. The Banda Ache city is located at the northern end of Sumatra Island, and there are several Islands located at the northwest of Banda Ache city. Because those Islands protected the city from the direct attack of the tsunami propagating from west, the tsunami heights in the Banda Ache city are 5-13 m, smaller than those near Lhok Nga. In addition to the tsunami heights, the team sampled sediments deposited by the tsunami, as thick as 70 cm near Lhok Nga. The team also measured the flow direction using direction indicators, estimated the flow velocity, and estimated the coastal subsidence caused by the earthquake.