

Geological evidence of paleotsunami in southern Thailand

Yuki Sawai[1]; Kruawun Jankaew[2]; Montri Choowong[3]; Charoentitirat Thasinee[2]; Maria Martin[2]; Amy Prendergast[2]

[1] Active Fault Research Center, AIST, GSJ; [2] none; [3] Dep. Geol., Fac. Sci., Chula Univ.

Tsunami geology in Thailand revealed precedent of the 2004 Indian Ocean tsunami.

The tsunamis intervals were less than 1000 years and irregular during the Holocene. The 2004 tsunami ended a recurrence interval about 600 years.

Phra Thong Island consists of series of beach ridges. According to eyewitnesses, the 2004 tsunami, of which height was more than 20 m, coated this beach ridge plain as much as 2 km inland with sand sheet. Dr Fujino and his coworkers reported distribution of this 2004 sand sheet and at least one earlier sand sheet underlying the 2004 deposit. In this study, building on Fujino's reconnaissance, we sought pre-2004 sand sheets at the island by digging pits and augering holes into ridges and swales at more than 150 locations.

In a couple of the swales, we observed tsunami deposits and collected samples for radiocarbon dating by excavating pits and a 35-m long trench. We confirmed the 2004 tsunami deposit on the uppermost part of the marshy sediment and also two or three earlier sand sheets underlying the 2004 deposit. Because the underlying sand layers showed a similar sedimentary features to the 2004 deposit, we attributed them to tsunami deposits older than 2004. We dated plant macrofossils (bark) just below the tsunami deposits and estimated that two of the tsunami deposits postdated 550-700 and 2200-2400 years ago, respectively. Assuming these ages, one of the tsunami deposits can be correlated with tsunami deposit in Meulabor of Sumatra Island, Indonesia. The Meulaboh sheet postdates plant detritus dated to AD 1290-1400; Phra Thong sheet B similarly postdates AD 1300-1450. This suggests that the earthquake producing this tsunami was rupturing from Sumatra Island to northern part of the Sunda Trench, not from small local source.

This is the collaboration with Brian Atwater in USGS.