

Turbidite evidence on slope failures and tsunami generation in the off Papua New Guinea area

Ken Ikehara[1], Toshiya Kanamatsu[2], Takeshi Matsumoto[2]

[1] Marine Geol. Dep., Geol. Surv. Japan, [2] JAMSTEC

Larger tsunami occurred at the 1998 Papua New Guinea Earthquake. The tsunami was larger than that estimated from the intensity of the earthquake. Then, influence of submarine slope failure was proposed. Four piston core samples were collected near the epicenter of the earthquake. Many turbidite layers were observed in 3 cores except of PC-2 from mid slope. There is no turbidite at the core tops except of core PC-4, suggested no large submarine slope failures near the piston core sites during the 1998 earthquake. On the other hand, clear downcore change in occurrence, thickness and grain size of turbidite in three cores (PC-1, PC-3 and PC-4) indicated the influence of sea level changes on turbidite deposition.

Larger tsunami occurred at the 1998 Papua New Guinea Earthquake. The tsunami was larger than that estimated from the intensity of the earthquake. Then, influence of submarine slope failure was proposed. Four piston core samples were collected near the epicenter of the earthquake during the survey cruise KR98-13 by R/V Kairei. Many turbidite layers were observed in 3 cores except of PC-2 from mid slope (water depth: 913m). Highest occurrence of turbidite derived from the nearby slopes was found in PC-4 collected from a mid slope basin (water depth: 3253m). Especially in lower part, almost of all section was composed of turbidites. Many turbidite sand layers were recognized in core PC-1 collected from trench floor (water depth: 4161m). A clear submarine canyon from shelf edge opens in the basin. Many benthic foraminifera with calcareous tests and wood fragments in turbidite sands suggested the origin of turbidite sands was located in shallow water zones. Silty turbidites occurred in the upper part of core PC-3 from a mid slope basin (water depth: 2282m) which was thought to be formed in relation to submarine land slide. Sandy turbidites were observed in the lower part. There is no turbidite in the cores except of core PC-4, suggested no large submarine slope failures near the piston core sites. On the other hand, clear downcore change in occurrence, thickness and grain size of turbidite in three cores (PC-1, PC-3 and PC-4) indicated the influence of sea level changes on turbidite deposition.