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Paleotsunamis in Eastern Taiwan

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From the tectonic configurations, historical records of the island, and tsunami records in the surrounding areas, Taiwan is highly susceptible to tsunami hazard. However, there is no record of tsunami hazard in the past one hundred years, therefore study of tsunami was not scarce in Taiwan. Although historical records do show possible tsunami events, the records were too sparse and incomplete to confidently reconstruct the paleotsunami events. In the past few years, simulations based on possible tsunami-genic zones near Taiwan show that the island could be highly affected by the correctly directed tsunami. Nevertheless, there is no detail, scientific research of paleotsunami records yet in Taiwan.

Our investigations in eastern Taiwan indicate that in eastern Taiwan, where the island is facing the Pacific Ocean, stretches of boulders were embedded in the soil horizons, which indicate very high energy events were present in a geologically quiescent time for developing soil horizons. Preliminary C-14 dating indicates the event layers were a bit younger than 280 +/- 30 BP on the 1030 +/- 30 BP wave-cut bench. Although the outcrops are currently on the sea cliff facing the ocean, investigations from aerial photos dating back to 20 years revealed that the sea cliff in the study area is retreating at 0.5~1 m/yr. This implies the event layer seen could be more than 100 m away from the shoreline at the time of event, which increases the likelihood of tsunami-origin event.



Further investigations are needed to further differentiate tsunami or typhoon origin of the event layers in eastern Taiwan. Re-evaluations of the tsunami risk, if the event layers are proven to be tsunami origin, will be needed for the western Pacific Ocean.

Figure 1: Contrast of wave energy shown from the sediments of bimodal grain sizes.

