

Sedimentary process and distribution of terrestrial tsunami deposit: a flume experiment

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Flume experiments were conducted to examine the effects of the magnitude of tsunami and existence of a lake in coastal lowland on sedimentary process and resulting sediment distribution regarding the setting that run-up tsunami transports sediments in coastal zone (e.g. sandy beach or dune) to coastal lowland. We prepared three topographical models of the terrestrial area: flat models with a shallow or deep pool filled with water (9 mm and 45 mm depth, respectively, and 1.0 m long) at their center, and an entirely flat topographical model without a pool. In each run, only one run-up tsunami flow passed through the terrestrial area without generating strong backwash. The tsunami flow was supercritical throughout the terrestrial area in the experimental series without a pool, while it transformed from supercritical into subcritical generating a hydraulic jump in the pool for the runs with a pool. The tsunami magnitude, terrestrial tsunami deposit, and terrestrial topography setting showed the following relationships:

- (i) The total amount of tsunami sediment depended on the magnitude of tsunami.
- (ii) In the experimental series with a pool, most of sediments deposited in the pool, but little sediment was in the area where the hydraulic jump occurred.
- (iii) The amount of the deposit at a given site did not always depend on the magnitude of the tsunami even in the same topography setting.

Although further investigation is needed, the present experiments showed some possible clues for future field surveys to understand tsunami deposits.

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