

# Effects of terrestrial topography on sedimentary processes and distribution of tsunami deposits: two cases of flume experiments

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Recent detailed surveys of onshore tsunami deposits including the 2004 Indian Ocean tsunami and the 2011 Tohoku-oki tsunami have revealed that terrestrial topography causes a variety of their features and distributions. Therefore, to identify and interpret tsunami deposits correctly, a better understanding of the effects of not only tsunami magnitude but also topographic setting is required. In this presentation, we report two cases of flume experiments that were designed to simulate a water body (e.g. coastal lake) on a coastal lowland and a cliff. In both cases, the results suggested relationship between the distribution of tsunami deposits and the hydraulic condition of the tsunami flow associated with the terrestrial topography. In the experimental series with a water body, the run-up tsunami flow transformed from supercritical flow to subcritical flow with a hydraulic jump, which caused characteristic distribution of deposits. Similar flow transformation was also observed in the experimental series with a cliff: it blocked and pooled the run-up tsunami flow, and induced the flow transformation. The flow transformation forced the suspended sediment in the subsequent flow to stall and deposit, and as a consequence, caused a local maximum of deposits near the cliff. These two cases of the experimental series imply significant effects of terrestrial topography on the spatial distribution of tsunami deposits and their features.

Keywords: Tsunami deposit, Flume experiment