

Tsunami and landslide model due to the 1741 Oshima-Oshima eruption in Hokkaido, Japan

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The 1741 tsunami was generated by the Oshima-Oshima sector collapse in the southwestern Hokkaido, Japan. The tsunami caused great damage along the coast of Japan Sea in Oshima and Tsugaru peninsula. By the survey of tsunami deposits, at the coast of Okushiri Island and Hiyama in Hokkaido, tsunami deposits of this tsunami were found. In this study, the landslide and tsunami by the Oshima-Oshima eruption were modeled to explain distribution of debris deposits, tsunami heights by historical records, and distribution of tsunami deposits. First, region of landslide and debris deposits were made out from the bathymetry based on the bathymetry survey data (Satake and Kato, 2001) in the north part of Oshima-Oshima. In addition, topography before the sector collapse and landslide volume were re-estimated. The volume of landslide was estimated at 2.2 km³. Based on those data, the landslide and tsunami were simulated using the integrated model of landslide and tsunami considered soil mass and water mass (Yanagisawa et al., 2014). As the results, soil mass slid slowly submarine slope and stopped after about 15 minutes. On the other hand, the first wave of tsunami were generated during 1 minute that soil mass slide. Distribution of computed debris deposits agree relatively well with region of debris deposits made out from the bathymetry. Calculated tsunami heights match with historical records along the coast of Okushiri and Hiyama in Hokkaido. Calculated inundation area of tsunami cover distribution of tsunami deposits found by tsunami deposits survey in Okushiri and Hiyama coast.

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