

## Earthquakes along the Nankai trough inferred from boulders on Hashigui-iwa dikes in Kushimoto town, Wakayama prefecture

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The largest earthquake along the Nankai trough in historical era is considered the AD 1707 Hoei earthquake. No historical and geological evidences which indicate existences of the larger earthquake are found. We focused on boulders around Hashigui-iwa dikes in Kushimoto town, Wakayama prefecture, and examined whether the earthquake larger than the 1707 earthquake occurred.

Hashigui-iwa dikes are massive rocks linearly arranged in north-south direction. In the westside, wave-cut bench of mudstone is well developed, and more than 1,000 boulders are distributed on the bench. The boulders and dikes consist of dacite, and the boulders are considered to be delivered from the dikes to the present locations due to tsunamis and/or storm surges.

We first examined whether the 1707 earthquake tsunami can move the boulders from the present locations, supposing the locations before moved by the tsunami are closed to the present locations. Tsunami inundation were computed from fault models of the 1707 earthquake (Ando, 1975; Aida, 1981a, 1981b; Annaka et al., 2003; Furumura et al., 2011) and fault models additionally including splay fault (Park et al., 2002). From the computed flow depths and velocities, fluid forces are also calculated, and are compared with the maximum static frictional forces between the boulders and ground. As a result, some boulders do not move from any fault models.

The original locations of the boulders are near Hashigui-iwa dikes, but accurate attribution of the original locations is difficult. The wave-cut bench is divided into 10 sections, and the largest fluid forces close to the dikes in the section which the boulder locates at are calculated. The results show that the fault model of the 1707 earthquake additionally including the splay fault can move the boulders. The distribution of the boulders indicates the existences of the larger earthquakes than the 1707 earthquake.

We also find that the boulders are moved due to storm surges. The largest boulder weighs about 2.6 ton, which is classified into light category of all the boulders. The detail is discussed by Maemoku et al. in this conference.

Keywords: boulders, Hashigui-iwa dikes, Nankai trough, Tsunami