

Tsunami traces of the 1843 tsunami and pre-historical large tsunamis in the lacustrine cores at Tokotan-numa, eastern Hokkaido

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Along the southern Kuril Trench, which faces the Japanese island of Hokkaido, fast subduction generated recurrent earthquakes up to magnitude 8 in two centuries of written history. Along the Pacific coastal zone of Eastern Hokkaido, research tsunami deposits in lake deposits and peat layers in the Holocene, have been increasingly conducted. Here we use deposits of prehistoric tsunamis in the lake bottom to infer the infrequent occurrence of larger earthquakes. The stratigraphic lacustrine cores of Lake Tokotan-numa at Akkeshi provide evidence for unusually pre-historical tsunamis and historical to modern tsunamis during the late Holocene. This lake contains fresh water and it is separated from the Pacific Ocean by 4-m-high beach ridges that the 1952 tsunami crosses. In February 2006, the boring was carried out from frozen lake surface, and 7 cores were collected here. Deposits beneath the lake bottom consist of mottled mud that alternates with coarse grain beds 0.5-30 cm thick. Seven cores contains five such beds. All of these beds show grading upward from gravely sand into fine sand with thick organic mud drapes. Stratigraphic series of these sand sheets, intercalated with volcanic-ash layers such as Tarumai and Komagatake volcanoes, south western Hokkaido, show that unusually large tsunamis occurred every 400-500 years on average in the past 2000 years as same as other study area. On the other hand, we found a historical tsunami deposits between Ko-c1 (1856) from the Komagatake and Ta-a (1739) from the Tarumai. We consider that this historical event can be contrasted with the 1843 Tenpo tsunami, which described in the old document, Nikkanki of the Kokutai-ji temple at the Akkeshi