

Geological features of tsunami deposits associated with the 1983 Nihonkai-chubu earthquake in pine-based windbreak forests of Noshiro City and Happo Town in Akita Prefecture, Japan

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On 26 May 1983, Nihonkai-chubu earthquake occurred off the west coast of Noshiro City in Akita Prefecture, Japan. The tsunami associated with the earthquake caused widespread damage to the north-eastern coastal areas of the Sea of Japan, including Akita Prefecture, depositing sand and mud from the tsunami. These deposits were immediately reported in the 1990s; however, no reports on these deposits have been found since then. In contrast, we conducted geological surveys from December 2019 to January 2020 on soil thinning observed in the pine-based windbreak forests planted along the coastal area of Noshiro City and Happo Town in the period from 1948 to 1970. Thus, sand layers showing inland thinning were found in the soil at a depth of less than 10 cm at both locations. As this sand layer contains fossil brackish marine diatoms, it is highly probable that it was brought from the seaside; the continuity distribution was confirmed from the coast to about 300 m inland only within the windbreak forest. According to historical records, it was considered that this sand layer was a result of the 1983 tsunami because the area was not reachable by means other than the tsunami of the Nihonkai-chubu Earthquake. Since there exist few reports of tsunami sediments with specific ages in Japan, they are an important historical record of past disasters and are geologically significant; the samples can be used to study the magnitudes and inundation processes of tsunamis. It has been noted that tsunami deposits lose their sedimentary structures and constituents with time and changes in weather conditions. In this work, we conducted geological surveys along the coastal areas of Noshiro City and Happo Town to determine the distribution of deposits caused by the tsunami due to the 1983 Nihonkai-chubu earthquake. In this presentation, we will report basic geological features such as the planar distribution of the tsunami deposits as well as changes in their thickness, grain size distributions, and fossil diatom assemblages.

Keywords: The 1983 Nihonkai-chubu earthquake, Tsunami deposit, Diatom