

Geological evidence of historical and prehistoric tsunami at Suijin-numa on the Pacific coast of south Miyagi, Japan

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Four sand or sandy units were found in Suijin-numa, a coastal lake on the Yamamoto Town, on the Pacific coast of northern Honshu, Japan; three of them were originated from tsunami, and the basal sand was deposited between intertidal and subtidal. Stratigraphic evidence for the tsunami consists of thin sand layer in freshwater deposits of the lake. Marine and brackish diatoms were transported with sands and gravels from the beach, associated with the tsunamis. Eight calibrated radiocarbon ages constrain the four events to A.D. 580-770, A.D. 700-910, and A.D. 1320-1430. One of the events correlates with the A.D. 869 Jogan and another was possibly with the A.D. 1611 Keicho tsunami. These three tsunamis were probably unusually larger than the recent tsunami, such as the 1933 Showa-Sanriku tsunami and those generated with 20th-century Miyagi-oki earthquakes.