Historical and paleo-tsunami events based on tsunami deposits during the last 4000 years along the Pacific Coast of Iwate Prefecture

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Iwate Prefecture is advancing examination for future tsunami hazard based on scientific knowledge such as historical records and tsunami deposits. We evaluated the correlations of large tsunami event during last 4,000 years along the Pacific Coast based on the result of tsunami deposit survey and data reported by previous studies.
According to the geological evidence, the event corresponded to 1611 Keicho Oushu (Sanriku) tsunami is recognized along the northern and middle coast of Iwate Prefecture. The event probably correlated with this tsunami is also distributed around the Hirota Peninsula. Because radiocarbon age of this event shows 14th Century to early 17th Century, it is possible to correlate with 1454 earthquake that tsunami might have occurred. We have judged this event is corresponded to 1611 Keicho tsunami because (1)only one event is recognized in this age, (2) 1611 Keicho tsunami were recorded major damages in ancient documents along the Iwate coast. Same event is known in the Sendai and Ishinomaki Plain. Tsunami event that occurred in 17th Century is also recognized along the southeastern coast of Hokkaido.
The event corresponded to 869 Jogan tsunami is recognized throughout the coast of Iwate Prefecture. At Noda lowland and the Hirota Peninsula, an event layer is deposited just below tephra layer that is identified as Baitoushan-Tomakomai tephra (B-Tm) that was deposited in early to middle 10th Century or Towada-a tephra (To-a) of AD915. The horizon of this sand is similar to the Jogan tsunami deposits reported in the Sendai Plane. Geological evidences of the tsunami event that occurred in 9th Century to 10th Century are known along the Pacific Coast from Hokkaido to Fukushima.
Six or seven simultaneous events during last 4,000 years are recognized throughout the coast of Iwate Prefecture, and their intervals are about 500-750 years. However, event ages in 2,000-4,000 yrBP of northern coast show a little difference to southern coast. The boundary of this gap is around the Funakoshi Bay.
On the other hand, several events are correlated only in the limited area. These events might suggest smaller tsunamis or events that generated from factor besides the earthquake (for example landslide of seafloor).
Our evaluation is based on many assumptions. For future tsunami hazard, we need further investigation and have to understand more earthquake phenomena around the Japan Trench and Kuril Trench.

Keywords: tsunami deposit, geochronology, historical tsunami, Jogan tsunami, Keicho Oushu (Sanriku) tsunami, Iwate Prefecture

