

## Two historical tsunami deposits recognized in the core sediments along the Hamana River on the Enshu-nada coast, Central

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The Lake Hamana is located along the Nankai trough, where interplate earthquakes have often occurred repeatedly (Shizuoka Pref., 1996). We analyzed diatom fossil assemblages of samples taken from the Arai No. 1 core (Fujiwara *et al.*, 2010). As the result, two historical tsunami deposits are recognized. Radiocarbon ages indicate that the lower deposited at the AD1498 Meio earthquake and the upper at the AD1707 Hoei earthquake or AD1854 Ansei earthquake.

The Arai No.1 core was excavated in a small flood plain between the Peistocene marine terraces and the Holocene sand dunes in the southern part of the Lake Hamana. This plain is consisted of an abandoned channel of the former Hamana river and back-marshes. According to the core stratigraphy (Fujiwara *et al.*, 2010), this core sediment is composed of channel deposit of the former-Hamana river (lower 3.45 m of the core) and a swamp deposit (upper 2.9 m of the core). The upper 0.9 m part of the channel deposit is sandy sediments with many molluscan fossils. Radiocarbon ages taken from this lowland suggest that the upper part deposited around the Meio earthquake (Fujiwara *et al.*, 2010). We performed diatom analyses about the 33 subsamples taken from the core in interval of 2-41 cm. Subsamples were treated based on Kosugi(1993).

Diatom assemblages enabled to be classified the core sediments into 5 diatom zones. The Zone I (3.54, 3.70 and 3.34 ? 3.52 m depth) is characterized by dominance of brackish-marine species such as *Cocconeis scutellum* and *Achnanthes hauckiana*. In the Zone II (2.53 to 3.32 m depth), however, *C.scutellum* and *A. hauckiana* decrease less than 10 % respectively, and *Staurosira construens* increases up to 20-50% with other fresh water species such as *Synedra tabulate* and *Cocconeis placentula*. The Zone III (1.36 - 2.40 m depth) and the Zone IV (1.16 - 0.96 m depth) is resemble each other with abundance of *S. construens* and *Pinnularia* spp. The Zone V (1.27 - 1.33 m depth) is corresponding to the muddy layer between the swamp deposits (1.25-1.33 m depth) and characterized by the spike of marine species of *Thalassiosira* sp. occupying approximately 10-40 %. This muddy layer is recognized successively in horizontal direction in eastern part of the lowland.

The Zone II shows obvious increasing of fresh-marine diatom species instead of brackish-marine species. This indicates that environmental change from river mouth to fresh-brackish marsh or pond. Stratigraphy and radiocarbon ages show that this environmental change occurred rapidly after the Meio earthquake. On the other hand, the dominance of outerbay diatom species in the Zone V indicates that marine water flowed into the fresh water marsh from the Pacific Ocean due to a tsunami current. Radiocarbon ages around the core indicate that the zone V was formed at the AD1707 Hoei earthquake or AD1854 Ansei earthquake. The Zone V shows similar core faces to the fore-end of the tsunami deposit of the 2011 Tohoku earthquake (Fujiwara *et al.*, 2011). The upper tsunami deposit including the Zone V has 8 cm thickness at least, therefore it suggests that inundation limit of the tsunami flows was further inland than the Arai No.1 core site.

### Reference

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