

Long-term uplift rate of the southernmost Boso Peninsula, northeast Japan, since the late Pleistocene

Heitaro Kaneda^{1*}, Naoko Kataoka², Shu Kawamura³, Daisuke Ishimura¹, Takahiro Miyauchi¹

¹Department of Earth Sciences, Chiba University, ²Otaki Gas, ³Department of Earth Sciences, Chiba University

The southernmost Boso Peninsula is known as one of the fastest uplifting areas in the Japanese islands and elsewhere world-wide. The Holocene uplift rate is estimated at as high as 3 to 4 mm/yr based on raised marine terraces, but the uplift rate before the Holocene has been poorly known because of lack of Pleistocene marine terraces in and around the area. The only study that deals with Pleistocene marine terraces is Sugihara et al. (1978), in which they inferred that a well-preserved terrace surface with an altitude of ~80 m at Ohata (Ohata surface) might be a marine terrace of MIS 5a (~80 ka). If this is the case, the uplift rate of southernmost Boso Peninsula since the late Pleistocene is calculated at ~1 mm/yr, which is less than one-third of the Holocene rate, requiring occurrence of some drastic event that significantly accelerated the Boso uplift after the late Pleistocene.

Our drilling on the Ohata surface and a detailed analysis of the recovered sediments reveal that the surface is undoubtedly a marine terrace, but its abandonment is most likely to have been at the earliest MIS 3 (50-60 ka). The eolian deposits beneath the Ohata surface proved to be 5.0-6.0 m thick, which is further underlain by silt and clay sediments with abrupt subunit contacts and many marine diatoms and sponge spicules. The AT tephra horizon (27-30 ka) was recognized as a clear concentration of volcanic glasses at a depth of ~2.8 m, which allows us to estimate an age of the surface abandonment through extrapolation. On the basis of the above results, along with the sea-level change curve of Chappell et al. (1996), the uplift rate of the southernmost Boso Peninsula since the late Pleistocene is calculated at 2 to 3 mm/yr, which is now comparable to the Holocene rate. The slightly faster Holocene uplift rate may be ascribed to postglacial hydroisostatic effect. We thus conclude that the southernmost Boso Peninsula has been uplifting basically in a steady manner since the late Pleistocene, without any drastic changes in its uplift rate.

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