

Recurrence interval of coastal uplift during the past 2000 years along the Pacific coast of eastern Hokkaido

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At least 3 times of coastal uplift events during the past 2000 years were revealed by contrast of marshy deposits and diatom assemblages along the Pacific coast of eastern Hokkaido.

Along the coastline of eastern Hokkaido, a series of Pleistocene marine terraces records net uplift trend of about 0.03 - 0.05 cm/yr (Okumura, 1996). These terraces are correlated by marker tephra and their chronology to middle and late Pleistocene. By contrast, tide gage data from the past 100 years shows that this area is subsiding at fast rate of about 1.0 cm/yr. This fast subsidence of southeastern Hokkaido cannot persist, if the uplifted Pleistocene terraces along the Pacific coast represent the net tendency of vertical movement. If future seismic events were able to solve this contradiction, such cycles might have recorded relative sea-level changes beneath salt marshes along the Pacific coast of eastern Hokkaido.

Diatom assemblages in peat and mud beneath salt marshes in Akkeshi Hichirippu, Mochirippu, and Onnetoh sites record sudden emergence at least three times in the past 2000 years. Each of these emergence events is shown by alternation of sand, inorganic mud, peaty mud, and peat, and by diatom assemblages in these deposits. Suddenness is shown by a sharp contact between inorganic mud or peaty mud and overlying peat. Diatom assemblages and plant macro fossils in the sediments provide the amount of the change. Brackish-marine diatoms and salt-tolerant vascular plants are commonly seen in muddy layers, by contrast, peaty layers are dominated by a wide variety of freshwater diatoms and freshwater vascular plants. This sequential change means that the relative sea-level shifted drastically from position of salt marsh to upland. Radiocarbon ages and tephra shows that these changes occurred about 2000, 1200, 600, and 300 cal yr B.P.

Judging from stratigraphy, fossil diatoms, and degree of synchronicity of each emergence, the events are probably related to subduction along the southern Kuril-Kamchatka Trench.