

Changes in water mass structure associated with sea-level change in Antarctic lake

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Further understanding of the mechanism of Antarctic Ice Sheet (AIS) changes requires the reconstruction of AIS variability with various timescales. To reconstruct changes on over hundreds of years, geological archives such as sediment and rocks, and model simulations are useful approaches. In particular, lake sediments provide the history of sea-level and ice sheet changes. However, there have been few studies of detailed paleoenvironmental reconstructions of a single Antarctic lake from multiple lake sediment cores, and detailed studies of the differences in response within a lake to external factors such as sea-level change are required. Lake Nurume, located at Langhovde in Lützow-Holm Bay, East Antarctica, is a saline and marine relict lake. Four lake sediment core samples were collected at different depths during the 61st Japanese Antarctic Research Expedition. One core was collected at the deepest depth of 16 m, while the others were collected at shallower depths (5-8 m). We aim to reconstruct how the water mass structure changes with sea-level changes using these sediment cores. Sedimentary observation, XRF core scanner analysis, and diatom analysis were used to reconstruct the sedimentary environment. Age-depth models are established by radiocarbon datings. The results indicate that the water mass structure in the lake has changed due to the surrounding topographic changes associated with sea-level change during the Holocene. This will provide new knowledge on accurate paleoenvironmental reconstructions using lake sediment samples in Antarctica.

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