

High-resolution elemental and mineralogical analysis of the Lake Baikal sediments during the last 25,000 years

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Many evidences for largely and abrupt climate changes are found from Greenland ice cores and North Atlantic deep sea sediments spanning from the last glacial to postglacial period. 6 layers of high density and high Ca (dolomite) content, which are deposited eventually, were found by the high resolution paleo-proxy records VER99, G–12 from the Selenga Delta area of Lake Baikal. The high-resolution proxy records of X-ray linear absorption coefficient (XLAC) and X-ray fluorescence (XRF) intensity of elements were obtained by the nondestructive analysis of the sediments with the scanning X-ray analytical microscope. Timings of 5 event layers are corresponded well with those of Heinrich 2 and 1, Oldest Dryas, Younger Dryas and 8,200-yr cooling event from delta oxygen-18 of Greenland Ice Sheet Project 2 (GISP2), suggesting the cold period. The Heinrich 1 and the 8,200 yr-cooling event are detected for the first time from Lake Baikal area. The existence of these abrupt climate changes suggests the strong linkage of climate systems between the continental interior of Southeast Siberia and the North Atlantic region. The remnant 1 layer is associated with the climate oscillation of about 5,500-yr ago reported from the Lake Hovsgol in Mongolia, where is located in the catchment basin of Lake Baikal. This may suggest the evidence that the climate in the continental interior has independently oscillated only for about 5,500-yr ago.