

Lake-level change history estimated by acoustic record and their factors during the last 45,000 years in lake Nojiri

NAKAMURA, Yuki^{1*}, INOUCHI, Yoshio¹, KUMON, Fujio², INOUE, Takahiko³, KONDO, Yoichi⁴

¹Human Sciences, Waseda University, ²Department of Environmental Sciences, Faculty of Science, Shinshu University, ³National Institute of Advanced Industrial Science and Technology, ⁴Nojiri-ko Museum

Acoustic stratigraphic analysis of acoustic records obtained by Uniboom revealed that lake-level change repeated eight times in lake Nojiri, central Japan, during the past 45,000 years. Comparison of the lake-level record with a profile of pollen composition, TOC concentration changes both in lake Nojiri, oxygen isotope record of NGRIP and those of Sanbao/Hulu caves, show the lake level rose during cold stages and the lake level fell during warm stages. Especially, high lake levels correspond with the global cooling events such as Younger Dryas, Heinrich events and Bond events. The factors for the lake-level rise during cold stages are, decreased evaporation due to cooling and increased snowfall due to enhanced winter monsoon. The factors for the lake-level fall during warm stages are, increased evaporation due to warming and decreased snowfall due to weakened winter monsoon. Grain-size profile of loesses from Loess Plateau corresponds well with that of intensity of winter monsoon deduced from lake-level record.

Keywords: Lake Nojiri, lake-level fluctuation, acoustic record, cold event, snowfall, winter monsoon