

Holocene synchronous fluctuations of the river beds flowing into Balkhash Lake and their relation to climate change

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Sedimentology and geomorphology team of Ili project organized by Research Institute for Humanity and Nature has reported Balkhash Lake level changes (e.g., Endo et al, 2009; Chiba et al, 2010, Sugai et al, 2010) and fluvial geomorphology of the rivers running into Balkhash Lake (e.g., Shimizu et al, 2010; Sugai et al, 2010; Kondo et al, 2011) based on field survey and integrated sediment analyses. This paper reports Holocene riverbed fluctuations of the Kurty River, a tributary of Ili River, and correlates with those of other rivers flowing into Balkhash Lake. Then, it discusses climate control on riverbed fluctuations along with the Balkhash Lake level changes. Holocene terrace levels along Kurty River can be classified into three of KH 1, 2 and 3 whose relative altitude to the present riverbed are about 6-7, 4-5, and 2 m, respectively. KH 1 was formed during early to middle Holocene (before ca. 5 ka: stage 1), while KH 2 and 3 late Holocene (from ca.2 ka to LIA: stage 3). Between ca. 5 ka and ca. 2 ka (stage 2), fluvial processes became inactive and aeolian processes were dominant.

KH 1, 2 and 3 can be correlated with LRT 2a, 2b and 3 terrace levels formed by Lepsy River, respectively. Both stages 1 and 3 can be correlated with the periods of high water level of Balkhash Lake, while stage 2 with low water level. In between the late 13th c and early 15th c of stage 3 peat or peaty silt deposited in wide areas inc. Kurty River valley, paleo Ili river channel system preserved on Bakanas delta, and Lepsy River valley, while Balkhash Lake level recorded highest during the last 2 ka. These suggest cold and wet climate conditions appeared in wide areas, central Asia. This probably reflects the increase of precipitation supplied from North Atlantic Ocean by the westerlies under negative NAO phase.

Endo et al,2009; Shimizu and Sugai, 2010; Sugai et al,2010;Chiba et al,2010: Project report on an Oasis-region vols.,7 and 8/ Endo et al,2011,Shimizu et al,2011: abstracts JpGU 2011 meeting/ Sugai et al, 2010; Kondo et al,2011: abstracts, Japan association for Quaternary research scientific meeting

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