



## **Paleohydrological and paleoclimatic oscillations during MIS3 revealed by multi-proxies from Balikun Lake, NW China**

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Multi-disciplinary analyses (sedimental, geochemical) of a sedimental core (BLK11A) recovered from the centre of the Balikun Lake, eastern Tianshan Mts., provide evidence of paleohydrology and its climatic indications in the arid western China during MIS3. The results suggested fairly high-frequency MIS3 interstadial oscillations and alternate change patterns among nearly fresh water and brackish water and hypersaline water during the ~30 ka. We also found that: 1) the evolutionary process of the lake responds indicatively and quickly to the climate change on sub-orbital and millennial timescales, the onset of MIS3 interstadial is featured by abrupt increases in both bioproductivity and chemical weathering; 2) the appearance of the halite lithofacies indicates gradually cooling and drying trends during the middle to late MIS3, this deteriorated environment shrunk the lake area and weakened the vegetation cover as well as watershed chemical weathering; 3) Our new interpretations differ from the assumption that highest lake level and wettest conditions occurred during the late MIS3 from Tibetan Plateau and Inner Mongolia, while suggest that the climate in the Balikun region, even most of arid western China areas would have undergone a progressive aridification. The evolution of the paleohydrology and climate change of Balikun Basin may have a strong correlation with the high latitude summer insolation and the climate in North Atlantic.