

## Paleoenvironment during the last 2000 years based on cores in Central Asia -special relation to moisture transport and NAO -

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Balkhash Lake in Kazakhstan is located at the center of Eurasia, where is a important place to investigate environmental changes in arid inland continent. Since 2007, field surveys in Ili delta and Balkhash Lake areas and environmental analyses have been continued. Recently, environmental studies in Aral Sea area are conducted mainly using lake core analysis in detail. Lake level changes in both lakes show similar pattern.

In the studies of Aral Sea, it is proposed that activation of Mediterranean Low had transported moisture toward east and contributed to increasing of precipitation (Sorrel et al, 2007). This is also related to North Atlantic Oscillation (NAO).

Environmental changes, especially lake level changes in both lakes are discussed including such issues.

Lake survey in Balkhash: Seismic profiler survey clarified buried valleys and erosional terraces, suggesting lowering stages in lake level. Topographical survey along coastal area supported by high-resolution satellite analyses found out the former lake level evidence. The Balkhash 2007 core, taken from the western Balkhash Lake, is composed of homogeneous greenish gray silty clay with a thickness of 6 meters. Diatom flora analysis suggests salinity and lake level changes.

Lake level changes in Aral and Balkhash: In Aral Sea, lowered lake level was found around 0-425AD, 920-1230AD, 1500AD, 1600-1650AD, 1800AD and after 1960, mainly based on dinoflagellate cyst (Sorrel et al., 2006). Among these, earlier two are very clear also in Balkhash Lake, based on diatom analysis. After the second low level, corresponding to Medieval Warm Period, salinity in both lakes lowered and after that lake level rose rapidly during 1300 to 1400AD. Around 1500AD, lake level went down again with the beginning of Little Ice Age.

Moisture transport and NAO: Based on pollen analysis, rapid lake level rising in 1300 -1400AD was caused by moisture transport of Mediterranean Low activity (Sorrel et al., 2007), which is in general activated in negative phase of NAO. Balkhash Lake was also in similar condition. It is necessary to consider the environmental change in both lakes and surrounding desert in relation to moisture transport and NAO, and also the shift of Siberian High.