

Chapter 5

Geological History and Present Conditions of Lake Balkhash



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Abstract Lake Balkhash is a large endorheic water body, the third largest by size in Eurasia and the second largest salt lake of the world. With its half-moon elongated morphology and 78% of inflows provided by the Ili River from the West, the lake has a freshwater basin in the West and saline water basin in the East, separated by the 4-km narrow and 6-m deep Uzunaral Strait. The average bathymetry is shallow, with a maximum water depth of 11 m in the West and 26 m in the East. According to investigations of the geological history of the lake in Soviet times and in international projects during the last 15 years, a large lake was formed by the Ili River in the Balkhash region encompassing the present area of the Kapchagai Reservoir during the Middle Pleistocene. The large lake basin was subsequently transformed by a series of tectonic deformations. Around 300 kiloyears before present (ka BP) the Ili River was diverted to the North where it formed a large megalake, the Ancient Balkhash, in the Balkhash-Alakol Depression. Around 110 ka BP, the lake became divided into two basins forming the Alakol Lake in the East and the modern Lake Balkhash in the West. Hydrological conditions mostly controlled by precipitation, evaporation and meltwater discharge caused three different lake-level stages in the Late Pleistocene and Holocene: lake levels between 349 and 355 m above sea level (asl) prevailed during glacial periods, between 341 and 348 m asl during the pluvial early and middle Holocene, and between 335 and 348 m asl during the arid late

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