

Effect of human activity on salinization of the Lake Bosten in Xinjiang, China

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Summary

The lake Bosten is located in Yanji Basin, Xinjiang, China. It is the biggest lake inland China now, with about 1,000km² in area, 8m in depth in average and provides water resource for Kurla city. However, with the increase of upstream irrigation lands, lake water decreased and became salty from the later 1970s to 1980s. Moreover, The big project taking water from the lake to supply it to Tarim River started in 2000. We analyzed already the water budgets in the Yanji basin based on the historical meteorological and hydrological data and succeeded to simulate the effect of the human impacts on the storage of the lake water.

In this fiscal year, a salt balance of the lake is investigated. The input of salt to the lake is mainly from the river, the eastern branch of Kaidu River, flowing into the lake.

The annual salt supply to the lake can be estimated from the observed data of inflow volume and salt concentration of the river. Another input is from the drainage system that covers large area of the eastern coast of the lake. As the drainage system is too complicate and there is not enough data to estimate annual salt supply through the system. However, in the intensive observation period from 1983 to 1985, it was found that the salinity of the drainage water was 7 to 8 times higher than the river water. Thus the salt supply from the drainage system became comparable to that of inflow river. Aeolian dust and precipitation also supply salt on the surface of the lake, but the amount of salt is smaller in one or two order of magnitude than those of river and drainage. The salt output from the lake is almost due to the river, Kongque River, flowing out of the lake. Using these available data, we estimated salt budgets in the lake and found that the total amount of salt in the lake varies from $947 \times 10^4 \sim 1,268 \times 10^4$ ton during 1980 to 1999 and had a peak value in 1983, then decreased. This is because they have pumped up high salinity lake water at the pump station settled in 1983 near the exit of the lake to Kongque River. The salinity concentration at the pump station is strongly affected by the lake water circulation.