

## Accepted Manuscript

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PII: S0921-8181(17)30458-7  
DOI: doi:[10.1016/j.gloplacha.2018.03.012](https://doi.org/10.1016/j.gloplacha.2018.03.012)  
Reference: GLOBAL 2757  
To appear in: *Global and Planetary Change*  
Received date: 4 September 2017  
Revised date: 28 February 2018  
Accepted date: 21 March 2018

Please cite this article as: Pei Guo, Chiyang Liu, Lei Huang, Mengli Yu, Peng Wang, Guoqing Zhang , Palaeohydrological evolution of the late Cenozoic saline lake in the Qaidam Basin, NE Tibetan Plateau: Tectonic vs. climatic control. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Global(2018), doi:[10.1016/j.gloplacha.2018.03.012](https://doi.org/10.1016/j.gloplacha.2018.03.012)

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# Palaeohydrological evolution of the late Cenozoic saline lake in the Qaidam Basin, NE Tibetan Plateau: tectonic vs. climatic control

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## Abstract

As the largest Cenozoic terrestrial intermountain basin on the Tibetan Plateau, the Qaidam Basin is an ideal setting to understand the coupled controls of tectonics and climate on hydrological evolution. In this study, we used 47,846 data of carbonate and chloride contents from 146 boreholes to reconstruct the Neogene-Quaternary basin-wide hydrological evolution of the Qaidam Basin. Our results show that during the early Miocene (22-15 Ma), the palaeolake in the Qaidam Basin was mainly situated in the southwestern part of the basin, and its water was mostly brackish. From then on, this palaeolake progressively migrated southeastward, and its salinity increased from late Miocene saline water to Quaternary brines. This generally increasing trend of the water palaeosalinity during the late Cenozoic corresponded with regional and global climate changes at that time, suggesting the dominance of climatic control. However, the paces of the salinity increase from sediments in front of the three basin-bounding ranges were not the same, indicating that extra tectonic controls occurred. Sediments in front of the

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