



Monitoring and Simulation Changes of Typical Lake Basin in Tibetan Plateau Using Remote Sensing Data (1980-2010)

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The environmental factors including snow cover, vegetation and hydrologic regime of lake are all sensitive factors and can reflect ecosystem responses to changing climate. A series of satellite-based environmental data archives including variation of snow cover, vegetation phenology and lake level, together with the in situ observation data were used to monitor and simulate the variation of typical lake basins in Tibetan Plateau for the period 1980-2009. Nam Co is the largest lake in Tibet as well as the highest big lake in the world. It is located in the central part of the Tibetan Plateau, on the north foot of the Nyainqentanglha range, with the geographical position of $90^{\circ}16'$ to $91^{\circ}03'E$ and $30^{\circ}30'$ to $30^{\circ}55'N$. Its elevation is 4718m. Nam Co Lake is the highest lake in the central Tibetan Plateau and there was no any meteorological observation station or hydrological station in the basin before 2005. We chose Nam Co Lake as a typical study region and our results are including:

- (1) We provides a method for estimating the lake water storage based on historical meteorological records from 1980 to 2009, remote sensing images scattered in this period, in situ bathymetric survey, and GIS techniques, and presents a comprehensive 34-year analysis of intra-annual and inter-annual variations of Nam Co Lake water storage.
- (2) A series of satellite imagery-based environmental data archives including variation of snow cover, vegetation phenology and lake level in Nam Co Lake Basin, were mapped.
- (3) Simulation of lake level variation (1980-2009) has been conducted through modeling at a monthly time step for the first time and the contemporaneous water storage series was acquired, based on the satellite altimetric data, meteorological data and the in-situ bathymetric survey data.