

## ***Interactive comment on* “What are the key drivers of regional differences in the water balance on the Tibetan Plateau?” by S. Biskop et al.**

### **Anonymous Referee #3**

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General comments: The Tibetan Plateau keeps the water resources under control for South-East Asia, so as called the Asian Water Towers. In general, hydrologic processes in the Tibetan Plateau conform to the water cycle. Accordingly, the water storage of the Tibetan Plateau is determined by precipitation, surface runoff, evaporation and infiltration. Due to the vastness, high relief and the complicated climate, it is difficult to quantify this water storage. However, the net annual water storage of a lake or river basin, considered as a simple water balance model, is one component of the total water storage of the Tibetan Plateau. Here the authors used the hydrologic modelling J2000g to estimate water-balance components for four closed lake catchments in the south-central part of the Tibetan Plateau. The results contributed to improve the understanding of water mass changes at these four lake catchments during the period

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2001-2010, but the manuscript should be improved with specific comments below.

Specific comments: 1. Four closed lake catchments in the south-central part of Tibet cannot be representative for the whole Tibetan Plateau. As reported in (Zhisheng et al, 2001; Tao et al., 2004; Yao et al., 2012), temperature, humidity and precipitation differently occur at different parts of the Tibetan Plateau. This makes it likely that different patterns of glacial changes and water level changes occur at different parts of the Tibetan Plateau. Maybe these four lake catchments could belong to the same pattern because of their locations. 2. Analyzing spatiotemporal patterns of water-balance components seem to have been forgotten to describe in this manuscript. Four lake catchments are not enough to analyze a spatial statistics problem to determine a correlation of the water-balance components in different parts of the Tibetan Plateau. Furthermore, the water mass change of one or two lake catchments is not representative for a regional pattern. 3. Quantifying single water-balance components and their contribution to the water balance of a closed lake catchment was estimated by using the water mass balance modelling J2000g. In this paper, the authors applied it to four lake catchments, including the Nam Co catchment (Krause et al., 2010). What factors are improved in methodology? Here, the topic focuses on the water mass balance of a closed catchment, so the authors should represent a temporal relation of water-balance components rather than that of climatic parameters during the observed period.

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