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Hydrology and Earth System Sciences Discussions

Interactive comment on "Responses of snowmelt runoff to climatic change in an inland river basin, Northwestern China, over the past 50a" *by* J. Wang et al.

Anonymous Referee #2

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The hydrological response to climate change using SRM has already been assessed in numerous climatic zones all over the world. The paper is technically correct but not well written. The authors attempt to analyze the responses of snowmelt runoff to climate change over the past 50a in Northwestern China. But unfortunately they didn't put the focus on in this work, although they listed lots of work they have done, including improving snow cover mapping method through incorporating CIVCO model for DEM correction and an improved NDSI threshold. Specifically, CIVCO model for the terrain elimination was not one of the main works developed by authors in this work. And they didn't evaluate the CIVCO model in this study. Furthermore, when the authors improve

NDSI threshold in this study area, the range of NDSI is set 0.3∼0.4, which didn't give the explanation for the range selection. In another words, why did we try 0.4∼0.5? In addition, there are still many other specific points in the following, 1) What's the representative of three weather stations used in the manuscript to the whole inland river basin in Northwest China? The authors should give more details here. 2) This paper contained some ambiguity, such as "Annual average air temperature of three different weather station located in the basin has increased 2.1, 2.5 and 2.9deg, respectively", here authors should add the span time, such as from 1959a to present. Also in ehe conclusion part, "discharges become larger as the responses of snowmelt runoff to air temperature increasing ". The author should specify the discharge. 3) P500, line20-21, "The new snow cover algorithm considered the effect of atmospheric and topographic conditions. . .", how to consider the atmospheric effect in estimating snow cover, the authors didn't mention here? Only a flow chart in Figure 2. 4) P501, how to calculate the Recession coefficient for QiLian station and YinLuoXia station? How many data was used for the calculation? And how's coefficient of the third station? 5) P503, in the analysis of air temperature and precipitation change, the authors used Qilian and YeNiuGou and Tuole Station, which were different from for the snowmelt runoff analysis. 6) The difference between maximum and minimum air temperature over the past 50 year, is about 2.1 deg at Qilian Sation, 2.6 at YeNiuGou Station and 2.9 at Tuole Station", that seemed not reliable. 7) P510, in Table 1, a spelling error happened in Longitude of YeNiuGiou Station. What's the dark line in Figure 4? 8) Figure 9, why the maximum runoff (discharge) happened in Aug in 00s? 9) A spelling error on the 9th line in Page 500, 'MODSI' should be 'MODIS'.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 493, 2010.