

Interactive comment on “Physically-based distributed hydrological model calibration based on a short period of streamflow data: case studies in two Chinese basins” by W. Sun et al.

Anonymous Referee #1

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The paper shows interesting results on distributed hydrological model calibration, in which the authors demonstrate that the SWAT model can be satisfactorily calibrated using 1-6 month daily discharge observation, that is much shorter than normally used for calibration. It can be a large contribution to hydrological modeling for ungauged or poorly gauged basins where long term observation is not available.

There are two comments and recommendations:

1. The major point of this paper is that a hydrological model can be successfully calibrated even based on a short term observation and wet conditions for both period and basin are preferable for effective calibration. It may be true but I wonder if it happens by chance. The authors discuss meteorological conditions of calibration years (2005-2007

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for Jinjiang basin and 2003-2005 for Heihe basin) but do not discuss the conditions of validation years. If the study basins were wet in validation years, it is quite reasonable that short observation for wet period can provide successful calibration, while it is truly surprising if it can provide a good result even for the case that validation years are dry. I would like to recommend the authors to add plots for validation years to cumulative distribution shown in Figs 5 and 6 and discuss more about the conditions of validation years in relation to the conditions of calibration periods.

2. I assume that the wet period of the Heihe basin is from April till September and expected that the calibration based on the six months from Apr. 2004 till Sep. 2004 was capable of giving a good result, but Table 5 shows that no behavioral parameter sets were obtained in this period although many behavioral sets were obtained for the two dry periods from 2003 to 2004 and from 2004 to 2005. This is different from the tendency that is found from other calibrations. It would lead to deeper understanding if the authors could give clear explanations for this exceptional case.

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