

Interactive comment on “Integrated hydrological modelling of small- and medium-sized water storages with application to the upper Fengman Reservoir Basin of China” by C. Zhang et al.

Anonymous Referee #2

Received and published: 16 May 2012

Review for the Manuscript hess-2012-37, entitled "Integrated hydrological modelling of small- and medium-sized water storages with application to the upper Fengman Reservoir Basin of China" by C. Zhang et al.

General Comments:

This study has improved the SWAT2005 by representing small and medium-sized water storages in river basins, and then tested it for streamflow simulations in the upper Fengman basin of China. The major contributions of this manuscript are: (1) a realistic representation of the relationships between the water surface area and volume of water

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storages with satellite data (Landsat); and (2) water balance and transport through a network combining both sequential and parallel streams and storage links. The topic of this manuscript is quite important, since the human interference always exists in river basins but usually over-simplified or even neglected in hydrological modeling.

However, the calibration of physical parameters by using monthly streamflows (before 1960; Fig.5) should be further improved. According to my experience, a calibrated monthly hydrograph should have a NSE (Nash-Sutcliffe efficiency) greater than 0.85 or even better. Only if the physical parameters are well calibrated, the comparisons of model performance with different scenarios (Figs.6-9) can be more convincing.

In general, this manuscript is well written and organized. Based on my review, I would like to recommend this manuscript be accepted for publication in HESS after revision.

Specific comments:

- 1) Fig.4 What do you mean by noting “9”, “11”, “12”, “14” in rectangles? The figure should be better self-explained, by improving the figure caption.
- 2) Page 4008, line 16 Suggest revising “simulate large catchments” to “describe the hydrological processes in large catchments”.
- 3) Page 4024, lines 4-6 I am confusing with the sentence “the years before 1998 and 2004 are drier and wetter, respectively, than average”. Please clarify this. And, why don't you mention the large floods before 1996 (e.g., the 1995 floods for both Yangzishao and Wudaogou)?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 4001, 2012.

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