**Hydrology and
Earth System
Sciences
Discussions**

Interactive
Comment

Interactive comment on "Distributed modeling of land surface water and energy budgets in the inland Heihe river basin of China" *by* Y. Jia et al.

Anonymous Referee #2

Received and published: 16 April 2009

This paper presented an improvement of a sophisticated distributed model and its application to the Heihe river basin, an inland basin of China characterized by significant spatial variations of topography, climate, land use and water use within the basin. I evaluated this paper is worthy of publication as the usefulness of this model was demonstrated well and the hydrological cycle in such a data-scarce basin with variable hydro-meteorological and surface conditions was quantified in detail. However, I suggest authors to elaborate the application results while keeping the model description as brief as possible. Nevertheless, information on the special treatments or model modifications specific to this application will be especially helpful for readers. Also it is better to elaborate the background related to the scenarios in this paper, i.e. construction of conservation forest and animal husbandry. I also suggest directly showing the hydrological impacts due to increasing irrigation water consumption.

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Specific comments:

P2196 L18: How did you formulate the wetness function beta? Please describe the function in this part.

P2202 L2: It seems an equation is missing between "⋯ the second soil layer or" and "if hu ⋯".

P2202 L17: It seems that hydraulic conduction coefficient is not a commonly used terminology. Please consider to revise this.

P2202 L17: The value of Kf becomes larger than Ko when Ta is smaller than Tc. Is this formulation reasonable?

P2205 L20: Antropogenic → Anthropogenic

P.2207: It is better to provide the general information of the basin such as location, the topographical condition (the range of elevation) and climatic conditions.

P2209 L26: Please check the unit of irrigation quota. m3/ha → m3/ha/10days?

P2210 L17: In your model, do soil thermal properties depend on humidity, not on soil moisture?

P2213 L15: Fig.8 instead of Fig.5.

P2215 L9: I could not find names of some areas or locations on any figures, such as the Shandan-Minle Plain and the Minle-Shandan irrigation areas. So, please clearly include the names of basin, plain or any other geographic locations that are important to follow this paper into one figure.

P.2218 L2: Why are the hydrological changes so small in Table 4, although the construction of conservation forest changes the entire basin areas to forests?

In figures 14 through 20: please include units.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 2189, 2009.

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