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Hydrology and Earth System Sciences Discussions

Interactive comment on "Quantifying the effect of land use and land cover change on green water and blue water in northern part of China" *by* X. Liu et al.

Anonymous Referee #1

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General Comments: This paper mainly discusses the impacts of land use/land cover change on river runoff. A distributed hydrological model was employed for simulating the hydrological processes in a catchment based on the land cover scenarios and observed climate forcing. The simulated difference based on the land cover scenarios was assumed to be the impacts of land cover change on runoff and evaporation. There lacks of some important discussions on the simulation uncertainty and the reason for the changes.

1)Table 1: The model was calibrated and validated for the 4 periods in corresponding to

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the land cover scenarios. The physical meanings of these parameters and the reason for their changes due to the different land cover should be explained in detail. 2)Table 4: This is the major results from hydrological simulation. The potential evaporation can be different due to the different definition; however the actual evaporation should have only one true value. How to validate the simulated actual evaporation? Can the actual evaporation be estimated directly by long-term water balance equation? If so, it is necessary to estimate the actual evaporation by water balance and compare with the model simulation. 3)Figure 7: It is better to have the spatial distribution of actual evaporation too. 4)Table 6: Changes in runoff ratio in the study catchment is significant during 1964-2005. Discussion on the reason for this change is non-sufficient. 5)Table 4: Based on the same climate data, the simulated actual evaporation (Ea) using different land cover scenario had little change. This means that the hydrological model was unable to simulate the land cover impact. How to explain the results using the same climate but different land cover in Table 4?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2425, 2008.