

Interactive comment on “Impacts of forest changes on hydrology: a case study of large watersheds in the upper reach of Yangtze River Basin” by X. Cui et al.

Anonymous Referee #2

Received and published: 29 August 2012

General comments: The paper “Impacts of forest changes on hydrology: a case study of large watersheds in the upper reach of Yangtze River Basin” is a good paper. Firstly, it tried to evaluate the forest change impact on water yield in large watershed, which is more relevant to the policy making of land-use management and forestry development but was less studied in the past. Secondly, this paper tried to sum up the recently obtained research achievements at both forest stand scale and large watershed scale, expecting to interpret the findings in large watershed scale by the findings obtained at stand scale. Thirdly, the watershed of Mingjiang studied in this paper represents an important eco-zone, and the conclusion of this paper that future reforestation and

C4036

climate change would likely affect the runoff in the same direction and consequently reduce the water yield, a different situation from past that the water yield decrease caused by climate change was counteracted by the water yield increase caused by deforestation. This is very important for the policy making in this region.

Specific comments: 1. One of the main issues that should be addressed in large watershed studies is the hydrological effect of spatial heterogeneity. However, probably limited by the available research achievements from current studies in the Minjiang watershed, the effect of spatial heterogeneity of forest cover and other land surface characters on the water yield was not analyzed in the large watershed scale in this paper; meanwhile, the influence of vegetation structure and vegetation change on the water balance and water balance components was not systematically analyzed in stand scale. Thus, the linkage between the large scale and small scale is still loose. 2. The review in this paper should not be limited within the studies carried out in the Minjiang watershed; other studies in the surrounding regions with similar natural condition can also be included in this paper to discuss the scientific issue, rather than just to summarize the studies in the watershed of Minjiang. 3. It should be better, that the detailed water budget and its relation with forest structure parameters can be given and compared with other non-forest vegetation. Then the process-based linkage of findings and understandings between different scales can be improved through revising the current manuscript, or this paper should point out how to strength the process-based linkage between different scales in the discussion section. 4. P6513L0-8: Here it needs a detailed description of forest change dynamics, with a table or figure. 5. P6514L5-14: Is the canopy interception based on rainfall event or annual precipitation? Here it should be clarified and uniformed for the data cited from different literature. I prefer it is based on annual precipitation, since the main topic of this paper is the annual water yield change. 6. P6515: The review of isotope studies looks not closely related with the main topic of this paper. You may delete or rewrite this part.

Technical corrections: 1. P6512L27: “After the foundation of China (1949),” changed

C4037

to “After the foundation of P.R. China (1949)”, 2. P6513L16-17: The description of temperature was already given in the P6510L26-27. Delete one of them. 3. P6516L15-19: The order of ET amount of different forest types described in the paper is not the same as shown in Fig. 3, i.e., the order of DB (deciduous broadleaved forest) and MF (Mixed broadleaved with coniferous forests) should be changed. 4. P6530: Figure 3 is not complete, since one part of the water yield of SP was lost. Make it again.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 6507, 2012.