

Interactive comment on “Changes of evapotranspiration and water yield in China’s terrestrial ecosystems during the period from 2000 to 2010” by Y. Liu et al.

Anonymous Referee #3

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General comments:

This study presents BEPS model simulations of evapotranspiration (ET) and water yield over terrestrial ecosystems of China between 2000 and 2010. The BEPS model is a remote sensing based model or approach for quantifying the terrestrial water and carbon cycles. This study is significant since ET is important for understanding water and carbon cycles of terrestrial ecosystems. The authors used eddy covariance ET estimates from 5 China Flux towers to validate the BEPS model simulations and compared the BEPS model simulations with ET inferred using statistical hydrological data in 10 basins across China. In addition the authors attempted to address the spatial and

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temporal variations of ET and water yield in China’s terrestrial ecosystems and evaluated the roles of temperature, precipitation, and LAI in regulating ET. Overall I found the study was important and I commend the effort shown by the authors’ in analysing huge data sets in this study.

However, the study does not provide new information on the spatial and temporal variations of ET and water yield except for the finer spatial resolution (500 m). The authors reported that the results from this study are comparable to other studies but they did not show what is new and what improvements were made to the previous studies to increase our understanding of ET and water yield in China.

I have the following suggestions for the authors:

1)The paper needs editing, proof reading, and check all typographical errors. The grammar needs to be improved, some sections are not easy to read and follow. Specific comments are listed in the supplement file attached.

2)Include other international and local references related to this study. For example (Li, X., Liang, S., Yuan, W., Yu, G., Cheng, X., Chen, Y., Zhao, T., Feng, J., Ma, Z., Ma, M., Liu, S., Chen, J., Shao, C., Li, S., Zhang, X., Zhang, Z., Sun, G., Chen, S., Ohta, T., Varlagin, A., Miyata, A., Takagi, K., Saiqusa, N. and Kato, T. (2012), Estimation of evapotranspiration over the terrestrial ecosystems in China. *Ecohydrol.* doi: 10.1002/eco.1341)

3)The ET inferred from statistical hydrological data in 10 basins (section 3.1.2) cannot be used for BEPS model validation. This is model inter-comparison not validation. For some regions precipitation is interpolated and irrigation is not included in the BEPS model. This section brings a lot of uncertainties and is one of the drawbacks in this study.

4)The spatial patterns of simulated annual ET (page 5415), the authors stated that “the mean of ET in the terrestrial ecosystems of China simulated in this study is somewhat

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lower than the global value due to the vast semiarid and arid regions in northwestern and northern China and the vast frigid Tibetan Plateau, in which ET is very low". It is not clear whether these areas were included in the previous studies or not? This needs to be clarified.

5) On the influence of land cover change on ET (page 5423), it is not clear whether the national total ET of cropland increased or decreased. The authors have to rewrite the section and clearly state a decrease or increase in the national cropland ET in China.

Specific comments:

Specific comments are listed in the supplement file attached.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/10/C2477/2013/hessd-10-C2477-2013-supplement.pdf>

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