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Discussions

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Interactive comment on "Assessing Green and Blue Water: Understanding Interactions and Making Balance between Human and Nature" *by* Ganquan Mao et al.

Anonymous Referee #2

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This paper analyses results of a previously applied hydrological model (gsflow) to assess green and blue water partitioning in the Heine basin in China. The paper is well written however unclear in his contribution and as a result it is difficult to judge if methods are tailored to the objectives or the objectives are a tailored to available results from previous studies. More specific comments follow:

1 The objectives of the paper state: "(1) How integrated hydrological modeling could efficiently and effectively simulate green and blue water dynamics while emphasizing the interlinkages between them; (2) How the implication of such green and blue water assessment could support basin-scale water resources management to address

human-nature water conflicts." Both objectives are too generic. First, surely there are studies that have addressed these problems. The objectives of the paper need to reflect what this study does in addition. Second, this paper does not address these objectives in general. It is limited to a specific application in the Heine catchment. This needs to be reflected.

2 Title is too generic. It could be a good title for a book or for a conference session. It would be appropriate if the paper was so comprehensive to address a problem that was never addressed and to a level that the problem is definitely solved. It is not the case of an application of a model on the Heihe basin.

3 The introduction speaks about geological eras and problems of mankind but should be tailored to the specific advances that the paper wants to make.

4 The model selection is a crucial methodological choice. A fully distributed hydrological model is selected for the following reasons: "(1) This study aims to assess the water resources by investigating the interlink between green water and blue water. The selected model is capable to simulate all the necessary hydrological elements for this analysis due to the capacity of the model for detailed depiction of interactions between groundwater and surface water. (2) Gridded hydrological simulations from distributed model are essential for spatial investigation on green and blue water." Both arguments are not convincing. Re argument 1, what are all the necessary hydrological elements needed to assess green and blue water components? I struggle to see why one would need to model everything if interested only in such partitioning. Re argument 2, why gridded simulations are essential? Can one go with a couple of HRUs?

5 The calibration and validation of the model is deferred to another study. This limits the relative contribution of this paper to an analysis of already available results, and complicates the assessment of the appropriateness of methods.

6 There is no uncertainty analysis in this paper and no comparison with alternative models. Considering that green and blue water are derived quantities form a calibration

on other type of data (ie streamflow), I suspect that there is large uncertainty in the analysis. Perhaps something that is difficult to do with such a complex model, but perhaps also something that would speak in favour of different methodological choices? It would be also good to see how different would results be if applying a much simpler model, and if there are arguments to prefer the results of one model over the other.

7 The treatment of the interception process is unclear. It appears that intercepted water has been incorporated in green water, but as already noted by other reviewers, this may be inappropriate. This comes back to clarifying what are the necessary processes to estimate green and blue water components (see point 4).

8 Most conclusions are not related to the paper objectives

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