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Hydrology and Earth System Sciences Discussions

Interactive comment on "Modelling global water stress of the recent past: on the relative importance of trends in water demand and climate variability" *by* Y. Wada et al.

Anonymous Referee #3

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The article provides very interesting and new results for the global water stress. It extends the understanding of the water stress to the recent past, being the first article systematically doing that. There are, however, various issues that authors should be addressed prior the publication, as commented below.

Comments

(1) The study is very well done and combines very well different kind of global datasets. I feel, however, that authors are covering too many issues in the article. Thus, I would suggest that particularly the methods section could be shortened and partly moved to

online supplement. Further, there are at the moment many tables and figures that are not necessary in the main text and could be removed or moved to online supplement. This would make the article more readable and better highlight the key findings.

(2) Authors could think of separating the discussion and conclusions from each other. The discussion part is rather short compared to other parts of the paper. This could be expanded to cover, for example, some of the below mentioned issues.

(2) Authors are doing the analysis in 0.5° grid scale. I would argue, however, that water resources are not always managed with that scale. Sometimes water is transported from far distances to large cities, for example. Other examples are long irrigation channels, when water for irrigation is coming from distance of tens of kilometres. Further, the actual size of the analysis scale (in km2) is varying depending on the latitude. Impact on the selected scale on the results should be discussed.

(3) In globalised world the virtual water flows are playing more and more important role in the water resources management. The role of virtual water trade has changed dramatically during the last 50 years. Thus, I feel that this should be discussed in some extent within the article.

(4) Definition and names of key terms: Authors should clearly define the key terms of water scarcity. According to for example (Falkenmark et al., 2007): - water stress refers to use-to-availability ratio (the one used in this study) - water shortage refers to water availability per person - water scarcity is normally used as a meta-term for both, water stress and water shortage Authors should not mix these terms and definition of the thresholds (page 7404; lines 10-14) should be written open more explicitly.

(5) It is fine to compare the results between water stress and water shortage results. Those do not, however, always reflect the same issues. This could be better addressed in the article.

(6) When referring to existing literature, a present tense is normally used. While then

referring to own results, a passive tense should be used. In some parts of the article these are mixed and thus, should be corrected.

(7) The article is written in general with good English. There are, however, parts that are not flowing that well. Thus, I would recommend a proof reading of a native speaker before publishing.

References

Falkenmark M, Berntell A, Jägerskog A, Lundqvist J, Matz M and Tropp H 2007 On the Verge of a New Water Scarcity: A Call for Good Governance and Human Ingenuity. In: SIWI Policy Brief, (Stockholm: Stockholm International Water Institute (SIWI))

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7399, 2011.