

Interactive comment on “Why increased extreme precipitation under climate change negatively affects water security” by J. P. C. Eekhout et al.

Anonymous Referee #1

Received and published: 10 July 2018

The paper “Why increased extreme precipitation under climate change negatively affects water security” explores the redistribution of surface water (blue water) and soil water (green water) under future climate scenarios. The primary result is that increasing precipitation intensity will reduce green water and thus increase plant water stress.

Overall I think that the central questions and technical work in this paper seem to be fine. The primary area in need of improvement is the presentation and discussion of the results. In particular, I feel that: a) some of the conclusions are overstated (or rather not properly qualified), b) the implications of the key results are not discussed in a precise way, and c) there is unnecessary repetition in some sections. Having said this, the paper is generally well written from a grammatical perspective.

I have two broad comments (listed below), and several minor comments (in the at-

[Printer-friendly version](#)

[Discussion paper](#)



tached .pdf) for the authors to address.

1. I find the title/abstract and the results of the paper to be somewhat incongruous. I think that the authors should include more discussion of how the magnitude of the trends that they find impact water security issues in a more precise way. The basic causal narrative that comes across in the abstract is very clear, but the supporting evidence for this narrative is not clear. For example, it is hard to assess whether the impacts on reservoir storage via changing soil erosion are of substantial enough magnitude to significantly change the prospects of irrigation in the study region.

2. I think that the paper would benefit from a more thorough literature review. There is previous literature that discusses the implications of decreasing precipitation frequency and increasing precipitation intensity on runoff and water stress (e.g. Fay et al. 2003, and Knapp et al. 2008).

If the authors can address these comments, along with the minor comments that are highlighted in the marked-up pdf, then I think that this paper could be reconsidered for publication in HESS.

Lastly, I want to qualify this review by stating that my primary expertise is not in hydrological modeling. Thus, I think that at least one additional reviewer that focuses in this area should review this paper.

References: Fay, P. A., Carlisle, J. D., Knapp, A. K., Blair, J. M., & Collins, S. L. (2003). Productivity responses to altered rainfall patterns in a C4-dominated grassland. *Oecologia*, 137(2), 245-51. doi:http://dx.doi.org/10.1007/s00442-003-1331-3

Alan K. Knapp, Claus Beier, David D. Briske, Aimée T. Classen, Yiqi Luo, Markus Reichstein, Melinda D. Smith, Stanley D. Smith, Jesse E. Bell, Philip A. Fay, Jana L. Heisler, Steven W. Leavitt, Rebecca Sherry, Benjamin Smith, Ensheng Weng; Consequences of More Extreme Precipitation Regimes for Terrestrial Ecosystems, *BioScience*, Volume 58, Issue 9, 1 October 2008, Pages 811–

821,Â€https://doi.org/10.1641/B580908

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-161/hess-2018-161-RC1-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-161>, 2018.

HESSD

Interactive
comment

Printer-friendly version

Discussion paper

