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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Comparison of different evaporation estimates over the African continent" *by* P. Trambauer et al.

Anonymous Referee #1

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General comments:

A comparison of eight evapotranspiration products is made over Africa, for the 2000-2010 period. Among these, three are satellite-based and five consist of model simulations. The differences from one product to another can be very large. The differences are analyzed for various African ecosystems. Two model products are close to the mean of all the products: ERA-Land and PCR-GLOBWB. The latter model is used to assess the impact of irrigation and of changes in precipitation or potential evaporation estimates. The paper presents existing products and shows the difficulty in estimating land surface fluxes. However, the results are not very new and it is difficult to see to what extent this work is useful. While the objective is to focus on a region of the globe, there is no direct validation of the products (e.g. independent in situ flux observations

are not used), and the analysis of the differences between model simulations is quite superficial. In particular, a given flux may result from contrasting individual values of the components of this flux. Model simulations should be able to differentiate the three main components of evapotranspiration: soil evaporation, plant transpiration, rain interception. Is the fraction of these components similar across models ? A Table showing the mean total precipitation and evapotranspiration value for the six regions of Fig. 2 and for the whole continent, together with the three main components of evapotranspiration, would be useful. The quality of key Figures is poor and the results cannot be properly interpreted. The Conclusion section is lacking recommendation/prospects for future research.

Recommendation: Major revisions.

Particular comments:

- P. 8424, L. 28: "This understanding can lead to improved evaporation estimates" ; this objective is a bit vague. The real objectives of this work (e.g. indirect validation of operational tools ?) should be clearly stated.

- P. 8425, L. 21: why was the PCR-GLOBWB model set up for the African continent ? Is this model used at a global scale ? For what purpose/application ?

- P. 8426, L. 3: LAI presents a marked seasonal and interannual variability. Where does LAI come from in PCR-GLOBWB ? Same question for ERA-I and ERA-Land.

- P. 8426, L. 28: GPCP ends in 2009 while the 2000-2010 period is considered (?)

- P. 8431, L. 5 and L. 13: LAI was defined already.

- P. 8432, L. 15: LPRM is not a product nor a satellite. Do you mean AMSR-E ?

- P. 8437, L. 17 (Fig. 6): why showing the Saharan region while it "was left out of this analysis" ?

- P. 8438: Figures 8-9-10 (especially Fig. 10) are not readable. Too much information is

shown in a single Figure. In Fig. 8, I suggest to show the EM, only. The individual model simulations should be shown only for those regions and/or products where noticeable features have to be discussed. The Taylor diagrams of Fig. 10 are particularly useless as they cannot be read nor interpreted. Rather, in order to characterize the spread for each region, adequate metrics could be illustrated in a Table.

- P. 8439, L. 14-24: should be moved to the Methods Section.

- P. 8445 (top): Also, for vegetated areas, less intense precipitation tends to increase the direct evaporation as the rain is more easily intercepted by the vegetation, and thus to reduce the infiltration. Is the interception simulated by the considered models ?

- P. 8462 (caption of Fig. 8): "Interannual" or "Seasonal" variation ?

- P. 8447, L. 3: do you mean "by the analysis of soil moisture" ? What is the explanation of this behaviour of the data assimilation in ERA-I ?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 8421, 2013.