Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2017-705-SC1, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Using satellite observations of precipitation and soil moisture to constrain the water budget of a land surface model" *by* Ewan Pinnington et al.

I. Dharssi

i.dharssi@bom.gov.au

Received and published: 3 January 2018

Dear Authors

Please can you confirm whether the ESA CCI combined soil moisture product used in this study has the same Cumulative Distribution Function (CDF) as the GLDAS-NOAH model? If so, will the ESA-CCI product have the same biases as the GLDAS-NOAH model? Therefore, does it make sense to use bias and Root Mean Square Error (RMSE) as your verification metrics? Your Table 1 does suggest that the parameter optimisation is helping to reduce the random errors in your experiment. Therefore, would it be much better to use verification metrics such as temporal correlation and

Printer-friendly version

Discussion paper

unbiased Root-Mean-Squared-Difference (ubRMSD)?

The reasons why the ESA CCI combined product is matched to have the same CDF as the GLDAS-NOAH model are given in Dorigo et al 2017 and references therein.

It would be highly desirable to repeat your parameter optimisation experiment over data rich areas such as portions of the continental United States and Australia. This would allow the use of ground based soil moisture observation for verification. You may wish to consult with Dharssi and Vinodkumar (2017) for availability of Australian ground based soil moisture observations and validation. Also the STATSGO (Miller and White, 1998) soil map could be used to evaluate your optimised sand/silt/clay soil fractions for the US.

For figures 2 and 3, please can you clarify whether the “observations” are the ESA-CCI product. If so, please label accordingly.

Dorigo, W., Wagner, W., Albergel, C., Albrecht, F., Balsamo, G., Brocca, L., ... & Haas, E. (2017). ESA CCI Soil Moisture for improved Earth system understanding: state-of-the art and future directions. Remote Sensing of Environment, 203, 185-215.

Miller, D. A., & White, R. A. (1998). A conterminous United States multilayer soil characteristics dataset for regional climate and hydrology modeling. Earth interactions, 2(2), 1-26.

Dharssi, I and Vinodkumar. (2017). JASMIN: A prototype high resolution soil moisture analysis system for Australia. Bureau Research Report No. 026. Melbourne, Australia. http://www.bom.gov.au/research/publications/researchreports/BRR-026.pdf

Sincerely

Imtiaz Dharssi

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2017-705, 2017.