Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-434-RC2, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Assessment of Precipitation Error Propagation in Multi-Model Global Water Resources Reanalysis" *by* Md Abul Ehsan Bhuiyan et al.

Anonymous Referee #2

Received and published: 12 November 2018

The manuscript examines propagation of uncertainties in precipitation forcing (from satellite âĂŐand reanalysis) and in land surface models into simulation of hydrological variables, specifically, âĂŐsurface runoff, subsurface runoff, and evapotranspiration. The study was conducted in the âĂŐIberian Peninsula.âĂŐ The importance of this study is in presenting the large uncertainties exist in both precipitation âĂŐand models, which induce substantial uncertainties in hydrological simulation. In accordance to âĂŐprevious studies, it is shown in this work that precipitation uncertainties have the largest role âĂŐin prediction uncertainties, but the authors also show that there is a substantial uncertainties âĂŐoriginate from the model itself. This finding is important to be emphasized and to take into âĂŐaccount in hydrological simulations.âĂŐ

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I have few suggestions for improvement:âĂŐ

âĂŐ1) I suggest adding a table comparing the different precipitation and reanalysis products, as âĂŐwas done for the land surface models. Such a table should include information about the âĂŐresolution, and what data sets were used.âĂŐ

âĂŐ2) Sensitivity to product resolution: the different forcing products have different resolution, âĂŐwhich one could expect to affect the simulation results. It would be good to separate between âĂŐthe uncertainty related to the product itself and the one related to its resolution, which may âĂŐtoo coarse for example for representing a given process. I suggest the authors to refer to this âĂŐaspect. âĂŐ

âĂŐ3) There is almost no discussion of the role of the specific conditions in the Iberian Peninsula âĂŐand their relations with the findings. For example, it can be expected that surface runoff âĂŐsensitivity to precipitation uncertainties would be different in arid/semi-arid region compared âĂŐto mode humid areas. Since the study area includes a gradient of conditions, it would be good âĂŐto compare the different indexes among regions and possibly discuss this issue in Section 5.âĂŐ

âĂŐ4) What are the sources for additional data required for the models such as soil types, âĂŐgroundwater table, others? âĂŐ

Technical comments (typo errors and other):âĂŐ P. 6 L. 4: “land” and “Land”âĂŐ P. 6 L. 10: “from” instead of “form”âĂŐ P. 7 L. 11: “3-hourly”âĂŐ P. 8 L. 11-12: “. . . the water flux reaching the surface exceeds the maximum infiltration rate of âĂŐthe soil”. I believe the authors mean here the “final” infiltration, which is actually a minimum, âĂŐbut not the maximal infiltration.âĂŐ P. 9 L. 11: Please explain “Dunne runoff”âĂŐ P. 10 L. 6: “a” is missing P. 13 Eq. 7: index i seems to be missing; why representing range by max – min and not std? âĂŐwhy not using “y” for reference?âĂŐ P. 13 L. 10: please check, it is not clear

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