

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

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

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I have few suggestions for improvement:

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

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

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

4) What are the sources for additional data required for the models such as soil types, groundwater table, others?

Technical comments (typo errors and other):
P. 6 L. 4: “land” and “Land”
P. 6 L. 10: “from” instead of “form”
P. 7 L. 11: “3-hourly”
P. 8 L. 11-12: “. . . the water flux reaching the surface exceeds the maximum infiltration rate of the soil”. I believe the authors mean here the “final” infiltration, which is actually a minimum, but not the maximal infiltration.
P. 9 L. 11: Please explain “Dunne runoff”
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? why not using “ y ” for reference?
P. 13 L. 10: please check, it is not clear

