**HESSD**

Interactive
comment

# *Interactive comment on* "An evaluation of daily precipitation from atmospheric reanalyses over Australia" *by* Suwash Chandra Acharya et al.

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Dear authors,

The present article deals with the evaluation of a new reanalysis dataset called BARRA with other gridded datasets (ERA-Interim and AWAP) and rain gauge observations, for Australia. This is a well written paper, which easy to read. At this stage I think however that some improvements are needed for the publication in HESS.

1. I wonder if the results of the mean precipitation (Figure 1 and related text in the results section) could be presented in a different way – besides the four maps that are useful for sure – to better capture the changes in spatial variability. Maybe the authors have a good idea for a plot. Also, I wonder if cutting off the over-sea precipitation

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[Discussion paper]

for BARRA and ERA-Interim would help to better read the map, meaning taking the over-land precipitation as the lowest common denominator.

2. I think it would be good to look into spatial correlations. As far as I can see you have not looked into them, although they are relevant. Is there a particular reason for not taking them into account?

3. I do not fully understand the purpose of the BARRA dataset, at least not in the context of the article, which is focusing on daily values. Considering that the AWAP dataset is superior to BARRA (superior at daily timescale), why would I use BARRA (when sub-daily is not the topic)?

4. What exactly is the added value of comparing the gridded data among each other, without the point rainfall? I would like to try to understand the motivation behind it, isn't the comparison with the point rainfall sufficient enough?

5. In that context (point 4), it would be good to see what has already been done in terms of evaluations of gridded rainfall vs. point rainfall (and also grid rainfall to other grid rainfall), as conducted in this study, means I would like to see a more comprehensive literature review. A brief review of such evaluations helps the reader to better understand the implications of the present study. For example, what are the pros and cons of ERA-Interim according to other studies, and what has been concluded in this article? Again, I miss a bit the ability to generalize from the results from this article.

6. I would appreciate a final overview that summarizes the results, ideally in the format of a table. The table could contain for example (i) general information for each dataset (time period, spatial resolution, URL to obtain data), (ii) metrics for evaluation, (iii) performance of each metric etc. The table would make it much easier to get a good overview of the results. And, even better, another column could add some information on each dataset or similar datasets (similar in terms of how they were processed) and some results from other studies if applicable (see comment above).

7. Reviewer #1 asked for innovation. This is not my main concern as long as I can draw general conclusions from this paper as a reader for my own studies (also outside Australia), but at this stage I miss it a bit. The article tries to explain the results to a certain degree, but I think the discussion should be more detailed, and pros and cons of each dataset should be better explained considering how the datasets were generated, considering seasons, resolution etc. I find statements such as "AWAP estimates of point rainfall are higher than the gauged observations" or "ERA-Interim generally performs better in the central arid region, whereas BARRA exhibits better scores in the temperate region", but I miss good explanations why. The table overview I addressed may help to make this generalization easier. Also, I must admit, looking into more re-analysis data (ideally popular datasets) as suggested by Reviewer #1 may make the paper stronger – at least one more prominent dataset maybe?

8. Figure 6. I would add x-axis labels to the upper plots

9. Optional: The code (R, MATLAB etc.) to analyse the rainfall data could be published with the paper. I always encourage to do so, but this is up to the authors of course.

Sincerely, Korbinian Breinl, TU Vienna, Austria

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