Hydrology and
Earth System
Sciences

Discussions

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

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We do appreciate the detailed review by Anonymous Referee 1 and her/his overall positive impression of our work. Here we briefly clarify some comments in order to stimulate further discussion.

The reviewer's main comment (point 1) is that the comparison of the performance against multiple datasets (global reanalysis, satellite product, or corrected satellite products) would strengthen the impact of the research. While we agree that a comparative analysis covering more datasets is instructive, this study focuses on an evaluation of the new regional reanalysis dataset BARRA and does not aim to instruct users on which of the wide-ranging precipitation products should be used over Australia. The

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choice of AWAP and ERA-Interim datasets are well-suited to addressing the study objectives as AWAP is a daily, high-resolution gridded dataset which is widely accepted as being the best synthesis of gauged observations, and ERA-Interim is known to perform well when compared to other rainfall products in the Australian region (Peña-Arancibia et al., 2013). Assessing the skill of BARRA to estimate precipitation is of most interest as precipitation observations are not assimilated in BARRA analysis.

Furthermore, the reviewer questions, in point 2, the evaluation of BARRA at a daily timescale given the potential utility of its sub-daily estimates. We do agree that the sub-daily estimates have the potential to provide great value to users, though there are two points that underscore the importance of first looking at its ability to represent daily performance. First, the accuracy of AWAP suffers greatly from the uneven distribution of gauge networks (see Fig 1b), and the potential advantage of BARRA lies in its ability to complement the existing dataset at the regions where gauged observations are sparse (especially in the semi-arid regions). Second, any reliance on sub-daily estimates is necessarily dependent on its ability to correctly represent daily rainfalls, so this is seen as a necessary first step towards examining sub-daily behaviour (information which is not available from the AWAP product). This will inform our future work of conducting sub-daily evaluation, which requires more sophisticated methods and involves more complicated results.

We would be pleased to address the Reviewer's concerns more comprehensively once the discussion period has closed.

Reference

Peña-Arancibia, J. L., van Dijk, A. I. J. M., Renzullo, L. J. and Mulligan, M.: Evaluation of Precipitation Estimation Accuracy in Reanalyses, Satellite Products, and an Ensemble Method for Regions in Australia and South and East Asia, J. Hydrometeorol., 14(4), 1323–1333, doi:10.1175/JHM-D-12-0132.1, 2013.

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