

## ***Interactive comment on “How does bias correction of RCM precipitation affect modelled runoff?” by J. Teng et al.***

**Anonymous Referee #2**

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The focus of this paper is on the correction to precipitation estimates from RCMs. While this is important, there is the underlying question about the need to correct potential evaporation estimates used to predict future water resources. In this study, the authors have used the same PET dataset derived from the observed climate variables, so there is still an underlying question about the need to consider bias correction of PET. Are RCM precipitation estimates independent of PET? If not, then what impact might this have on the predictions of future water resources?

That said, the work is thorough. While it is not surprising that the conclusion is that a correction based on quantile matching or double gamma distribution would work well, it is good to see this confirmed by a thorough analysis. There is the question about the use of daily data. The use of a daily timestep is common in applications

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to the study of water resources in many areas (including Australia) because of the limited availability of high temporal resolution data. In calibrating a model on a daily time step, the parameter values are optimised to capture the catchment behaviour, including the unseen behaviour at a sub-daily timestep that can influence the daily observed discharge. This means that any estimation of future water resources requires the same effect from sampling to a daily timescale.

While these points go beyond the scope of the existing paper, it would be worth pointing out to the reader that this paper does not give the definitive answer on how RCMs can be used, and only looks at the question of bias correction (in the broader sense of bias given the correction to the PDF). The remaining issues that need to be addressed should be pointed out to reinforce the a reader that they should use even a good bias correction method with care.

In general, the paper is well written, with a few grammatical errors (see comments by reviewer #1). The font is a little small on most of the figures. While the display can be zoomed to look at each figure, this does make it more difficult to read the paper. I suggest the authors think about reformatting the figures to make it easier for the reader.

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