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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Comparison of occurrence-bias-adjusting methods for hydrological impact modelling" *by* Jorn Van de Velde et al.

Anonymous Referee #2

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This paper compares different bias adjustment (BA) schemes for climate data as used in hydrological impact studies. With respect to precipitation, the originality resides in the fact that intensity and occurrence BA methods are used. Also, univariate and multivariate schemes are compared. The analysis is based on a high quality climate data set, yet only a 20 year window is used to make the comparisons. For the comparison, precipitation amount, precipitation occurrence and discharge are evaluated. The results suggest that for the randomness inducing BA methods, performs worse than traditional methods. The results also show that the multi-variate methods lack robustness with respect to the modelling of precipitation occurrence and change the intrinsic structure of the time series in an unexplained way. The results suggest also that the

performance of the current analysis is case specific and lacks generalization (the analysis should be repeated for climate series of other climate regions, and in the case of the multivariate method probably also with other climate variables). The paper is very detailed and uses state-of-the-art methods for implementing BA and for comparing novel BA approaches. The paper is also novel and original as it compares different BA methods for a specific climate region using a high quality data set. Yet the paper lacks focus and is difficult to read. For instance, the BA is on climate data but the authors report also on the impact of climate data on modelled discharge. While this may be interesting to evaluate the impact of BA on final hydrological impact assessments, it does not add value to the comparison of the climate data in-se and only results in less focus of the manuscript. The final conclusions are also somehow disappointing: the addition of complexity in the BA did not result in better results. It is regretted that the reasons for these poor performances of more complex approaches are not explained. The reader is left with a feeling of : "So what? Why do the simple BA approaches outperform as compared to the more complex approaches". No real answers on this question has been offered by the authors.

Small editorials: - Title: The title could be reformulated to focus on the climate data. - It is suggested to create a clear "material and methods" section. - Line 80 – 103. This section should be moved to a "material and methods" section. - Line 105 – 109 is not needed. - Line 310 -314. This section can be removed. - Table 1. Index 2 & 3 could be removed. - Line 321-328 could be removed. - Line 338-357. This section could be moved to a "material and methods section". - Fig.5, Fig. 8. The quality of the symbols should be revised.

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