

Interactive comment on “Satellite-driven downscaling of global reanalysis precipitation products for hydrological applications” by H. Seyyedi et al.

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We would like to thank Anonymous Referee #2 for his/her helpful comments and suggestions. Herein we provide answers to his/her comments to facilitate further interaction on the points listed in the review.

Major: 1- We randomly selected 60% of the dataset in the 2002-2011 period for model calibration and the remaining 40% for validation. Due to the random selection we believe this makes the two datasets independent to each other. If we separated the data period in two parts (e.g. 2002 to 2008 and 2009 to 2011) and take first part for

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calibration and second part for validation we could potentially lose some of the strong precipitation events given the annual variability. Instead our criterion was to divide the data 60/40 on the entire period with the only criterion that they have similar probability distributions. 2- The GLDAS data are available globally and given its long record (50 years) is a dataset typically used for flood frequency applications particularly over areas lacking long records of in situ observational data. In this study we argue that applying GLDAS reanalysis products without a proper error correction and downscaling would significantly bias the basin rainfall and streamflow simulations and consequently the flood frequency analyses. Applying the satellite rainfall based correction makes the data compare favorably with independent reference rainfall and streamflows, which is shown in figures 5, 10 and the statistics of figure 8. More importantly it is shown that the quantiles of the corrected GLDAS compare well with the reference rainfall and streamflow quantiles, which indicates that the technique can now apply globally to derive adjustments on the GLDAS-driven simulations prior to using these data for flood frequency studies.

Minor: 1- It has been changed to “above sea level” 2- Thank you for the comment. It was a typo and has been corrected as following: “The summer events exhibit the highest values whereas fall and spring have lower POD values.” 3- We will provide a higher quality figure in the final stage. 4- We will provide a higher quality figure in the final stage.

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