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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Intensification characteristics of hydroclimatic extremes in the Asia monsoon region under 1.5 and 2.0 °C of global warming" *by* Jeong-Bae Kim and Deg-Hyo Bae

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This manuscript highlights the projection of hydroclimatic extremes in the Asia monsoon region under global warming. The authors have comprehensively examined seventeen indices using the best five GCMs over different climatic zones in Asia. However, I feel substantial work to be done to improve the paper. Hence, I request an editor to give more time for the revision of the article. I would love to review the revised draft, and the authors can find my major and minor comments/suggestions below:

Major:

1. No robust finding is coming out from the abstract. It contains a few lines of introduction, method, and overall results. The abstract has to be crisp, short, and quantitative with results.

2. What are the major scientific questions of study?

3. How the selection of GCMs varies for the different climatic zone? And what are RMSE and SSC range to assign a score from -1, 0, 1? Why is the score given based on MME not against observed? MME comparison may induce bias, and I recommend to re-calculate GCMs performance (calculate Pbias) against observed data for each climatic zone. To see selections of GCMs remain the same for all climatic zone or not? Also, I would like to see selected five GCMs performance against observed data from the 2006-2019 period.

4. Why is bias correction applied after the selection of reference period for individual GCMs? How bias corrections affect the 1.5 and 2 °C central years for reference?

5. How APHRODITE and University of Washington data could perform against CERA-20C reanalysis?

6. Make a similar plot (Figure 2) using observed and MME data for temperature and simulated runoff. You can keep those in the supplemental material.

7. The figure's quality is poor.

Minor:

Line 25: "increased the frequency and intensity of natural disasters" Give citations.

Line 71-77: I recommend to keep these in data and method sectionsâĂŤno need to brief in the introduction.

Line 81: "As far as we know, relatively few studies" Give citations.

Line 120-123: How to relate 1.5-2.0 °C global warming with the RCP4.5 scenario? The small description of this will help the reader to understand the process.

Line 136: What is a central year for reference for MME at 0.48, 1.5, and 2 °C?

Line 137-138: How come the central year of PI is 1895? When your PI period is 1861-1890? Please check.

Line: 155: provide the full name of VIC.

Keep observational datasets section after section 2.1

Line 197: what are the reference period and two future periods? Is it for individual GCM or MME? Please clear to avoid confusion.

Table 4: Also, provide a source of indices (e.g., minimum temperature, maximum temperature, precipitation, and runoff) in another column.

Section 3.1: Is climatic zone classification is based on observed data? And which year? Also, mention which observation reanalysis or APHRODITE and University Washington data?

Line 219: “the bias-corrected GCMs are validated” Justify this result for temperature as well.

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