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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Evaluating climate change impacts on streamflow variability based on a multisite multivariate GCM downscaling method" *by* Zhi Li and Jiming Jin

Anonymous Referee #2

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The manuscript titled "Evaluating climate change impacts on streamflow variability based on multisite multivariate GCM downscaling method" applies a multivariate downscaling approach to the Jing River Basin. Overall I found the manuscript to be of sound technical quality and does suggests a novel approach of GCM downscaling as inputs to a hydrologic model to investigate hydrologic variability. However, I believe that this manuscript requires additional work to clarify the text to best present this work. Please see my general and specific comments for additional guidance. I found the title to be accurate for the manuscript's content, but would suggest the addition of the words "in the Jing River Basin" or something equivalent.

General Comments: - As mentioned, I find the manuscript to be of good technical quality and appears to use industry standard model techniques to explore the effects of this novel downscaling approach.

- The figures seem appropriate for the manuscript topic and seem to support the findings stated in the body of the manuscript.

- The first paragraph of the introduction seems to be the weakest of the introduction. The english/grammar should be improved for clarity. My opinion is that the first paragraph should be reworked. The syntax/grammar of the remainder of the manuscript should also be refined before publication, but there are no specific sections to highlight other than the first paragraph of the introduction.

- Because this work is based on techniques that the author has already published, I found it difficult in to decipher the contributions of this paper from the previous downscaling work. I highly suggest that the authors clearly present the objectives of the manuscript at the end of the manuscript and how this is differentiated from previous work. What are the primary hypotheses of the work? Whether or not these hypotheses are supported should be contained within the discussion section.

- As it stands, I found the results/discussion section to read like a results section with a very brief discussion at the end of this section. Normally a results/discussion section is needed only when it is difficult to present the results of the paper apart from the greater context of how the results relate to other bodies of work. In this result/discussion section, I found only one location where references are presented, which I found to be insufficient. The most important contribution of this paper will lie on how these results relate to a vast collection of other work completed before this one and what we learned in this paper that can help inform future papers. The core of this manuscript seems to be the attempt to investigate the characterization of hydrologic variability, which has a very long history and should shown in the context of such. It is my opinion that the results/discussion section should be split into separate results and discussion sec-

tions, and therefore the authors should provide an indepth discussion section currently absent from the manuscript.

- The conclusion section should never present new information, however it seems that the authors merged part of a would be discussion section into the conclusions. Based on how the discussion section is written, I might also recommend revising the conclusions section to make sure that new information is not first presented there.

Specific Comments: Page 5 Line 7: This sentence is a bit confusing. The phrase "spatially downscaled GCM outputs from the monthly scale to a daily scale" is a bit clumsily worded. I suggest revising for clarity.

Page 5 Line 10: The first step is to spatially downscale and the second is the temporally downscale. However, you seem to combine them both here to speak specifically about single site GCM downscaling. But then in the same sentence, you only mention the temporal downscaling. Please revise this sentence for clarification.

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