

< REPLY TO REVIEWER 2 >

- **Title: Streamflow estimation at partially gaged sites using multiple dependence conditions via vine copulas**
- **Authors: Kuk-Hyun Ahn**

((Acknowledgement)) The authors sincerely thank the reviewer for their helpful and constructive comments.

((Comment #1))

Could the author add a few lines on the computational aspects of the newly introduced method?

((Reply #1))

This is a good point. I admit that the proposed method is computationally expensive. Thus, this study adopts the multicore processing to reduce the computational burden. The limitation could be problematic particularly for a larger, complex streamflow gaging network. However, the computational burden will be excused since many local water managers may not need to build the model repeatedly whenever they meet missing values. Instead, they can use the model for a while once the proposed model is calibrated for a specific site. The argument will be raised in the conclusion section.

((Comment #2))

Perhaps a neglected aspect of the analysis is the robustness of the results under misspecifications of the chosen pair-wise copulas with the same pair-wise Kendall's tau assumptions. I would appreciate it if the author could elaborate on this point.

((Reply #2))

You are correct that the FDC-highestrho and DVine approaches seem to be very close in terms of their performance, although the DVine performs slightly better than the FDC-highestrho (e.g., median RMSEs: 1.598 (DVine) and 1.603 (FDC-highestrho) for the "sufficient record" case). I was not aware of the simplifying assumptions while developing this paper, and I am grateful to the reviewer for pointing this out. I will include this assumption in the conclusion section as a part of the areas that need to be considered for future work to improve the proposed model.

((Minor comment #1))

Line 101: I do not understand the meaning of the word “efficient” in this context.

((Reply))

The word will be altered to “effective”.

((Minor comment #2))

Line 118: Citing the most recent book by Joe “Dependence modeling with copulas” (2014) would be more appropriate.

((Reply))

The recent book will be cited.

((Minor comment #3))

Line 246: “Penalized” instead of “panelized”.

((Reply))

The word will be corrected.

((Minor comment #4))

Line 905: Improve the readability of the figure (the plot labels cover the matrix).

((Reply))

The readability of the figure will be improved following the reviewer’s comment.

((Minor comment #5))

Line 929: Specify how to interpret the scores in the figure caption (i.e., the higher the score, the better). The same comment applies to the other figures.

((Reply))

The interpretation for the scores will be suggested in Figures 4, 5 and 8.

((Minor comment #6))

Line 990: Improve the readability of the figure (there is some text outside the circles).

((Reply))

The readability of the figure will be improved based on the reviewer’s request.