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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Heterogeneity measures in hydrological studies: review and new developments" *by* A. I. Requena et al.

Anonymous Referee #3

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The manuscript titled 'Heterogeneity measures in hydrological studies: review and new developments' presents a summary of the state current state of Regional Hydrologic Frequency Analysis (RHFA). Generally, I found the manuscript to be a very interesting and information dense product that I enjoyed reading. However, I think that there are missing components that limited my understanding of the implications of this study. This manuscript has a lot of ground to cover to get to it's results, and I encourage the authors to include key information and reorganize some of the sections as per my general comments below.

I was not able to find the data source in which the study was applied. It seems as though the data might be synthetic and generated as a hypothetical, but that is not clear. Please include at lease a small section specifically about how the data was used (if measured from real data) or synthesized (if it was generated by the authors). Please

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include this data, or summary of data, either in the manuscript itself or as supplemental material.

The Gini Index is a very popular index to determine economic equality as the authors mention, but there should be additional descriptions about why the Gini Index was applied in the way that it was. Many of the other methods have been used in the past and are presented as benchmarks. However, the Gini Index is fairly new in hydrologic studies, and extra explanation of implementation should be added.

I would consider changing the title to the manuscript to something more reflective of the end goals of the paper. While a review of past heterogeneity measures is vital to introducing new methods, I am confused as to why " in hydrologic studies" is used. The connotation seems to be that you are applying new methods to the results of past studies, which is not the case. Consider "New developments of heterogeneity measures for synthetic distributions of extreme hydrologic events."

Specific comments: Line 8 Page 1 - I found the first sentence "Regional frequency analysis is needed to..." to be misleading. While this statement is certainly true, I did not find this to be a major part of this study. This statement should be in the introduction as background instead.

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