

Interactive comment on “Indicators of Necessary Storages for Flood and Drought Management: Towards Global Maps” by Kuniyoshi Takeuchi and Muhammad Masood

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The authors have been well-served by the comments from 5 reviewers, who have offered very constructive comments and criticisms on the paper. I am also glad that the authors have responded positively to these comments.

The following is a summary of the outcomes of the public discussion on the paper so far:

1. There has been a misunderstanding in the minds of most (all) reviewers about the main aim of the paper, and the authors have partially clarified these. Really, the main of the paper is to characterize the global patterns of variation of long-term hydrologic

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variability (in time), of droughts and floods. For this purpose the authors have decided to use a composite measure, which is the reservoir storage needed to meet an average demand (or something similar to this). This paper is a paper on hydrologic variability and not on reservoir design, as some of the reviewers misunderstood. It is important that the authors take particular care to present these clear aims at the beginning so this misunderstanding does not arise.

2. In the same spirit, the paper will become clearer and will have high impact if the authors can simplify the paper and reorganize it so that the main message comes out more clearly in the rest of the paper and does not veer off beyond the main message.

3. Also in this respect, all reviewers agree that the analysis of climate change impacts does not add much to the paper, and only distracts from the main message. I am glad the authors have already agreed to remove it from the paper, which I encourage. Depending on subsequent reaction to this paper, the authors may decide to look at a subsequent paper looking at how climate change affects the global-regional patterns long-term, temporal variability (as measured in terms of reservoir storage). I am not sure if it will make any contribution to climate change research.

4. There was some discussion about the appropriateness of the FDC approach to reservoir size estimation. The authors defended it, and I support their argument. The FDC approach was indeed used for reservoir sizing more than 50 years ago, and has now been forgotten, and superseded by more modern methods like range analysis etc. However, as a simple rule of thumb it is quite useful since one can easily see the connection between hydrologic variability and reservoir size. I don't mind the authors reviving the approach here - but they should explain its meaning for the average reader, and how good a measure it is about hydrologic variability.

In conclusion, this is an unconventional paper, and I am so glad that the reviewers did not dismiss it out of hand. If one takes a higher level and long-term historical perspective, and look at understanding the world as it is and finding ways to characterize

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hydrological variability globally, this may be a very interesting approach and I applaud the authors for introducing it. It is entirely appropriate for a special issue in honor of Professor Eric Wood. It draws a connection between modern hydroclimatology as seen in the many other papers submitted to the special issue to approaches used more than 50 years ago when Professors Wood and Takeuchi started their careers, and learn how much has changed and how much has not. The rest of the hydrologic community can benefit from this broader perspective.

For this reason I encourage the authors to resubmit a substantially revised paper (along the lines suggested by the reviewers and the authors themselves), which I will consider for further (non-public) review by some of the critical reviewers before final consideration for publication in HESS.

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