Hydrology and Earth System Sciences Discussions

Interactive comment on "The role of catchment classification in rainfall-runoff modeling" *by* Y. He et al.

Y. He et al.

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D: This is a contribution from an author not usually associated with the regionalisation discussion in contemporary hydrology. It is good to know interest in the topic of regionalisation, in general, is growing.

- The number of regionalisation studies has been on a rise, this review paper made an attempt to collate and gauge various work of regional analysis. The paper aims to provide material and assess the status of regional studies in hydrology and the steps forward.

D: Coming from a relatively young female scientist, it is in the humble opinion of this

reviewer, ought to be encouraged and supported.

- Authors wish to thank the encouragement.

D: The paper presents a comprehensive review of regionalisation techniques in a rather unorthodox style. This makes reading of the manuscript laborious and sometimes boring.

- It is true that the paper is missing figures, tables or illustrative charts to convey message in a succinct and clear manner. Authors will address this problem in the revision.

D: Having said this, the work definitely contains many important and interesting points that are clearly contributions beyond the state-of-the-art. The exploration of regionalisation in other fields is particularly interesting and dare I say this part of the document could have been even more useful had the authors made additional efforts to make links between the outcome of their investigative exploration and the theory and application of hydrological modelling. The segregation of classification into, for example, Linnaean and numerical types is especially interesting. This reviewer found the attempt noteworthy and deserving of further investigation (for example in the development of systematic nomenclatures for similar catchments in hydrology).

- It may be better to remove LCC completely from the paper as it attracts argument on whether the division of LCC and SCC is sensible. The division is only from the author's perspective and may be disputable. In "Concluding remarks", it states "two categories have considerably different bases and serve different purposes. The two might potentially compensate each other and formulate a hybrid catchment classification scheme." The difference between LCC and SCC may be described with an analogy of physically-based and conceptual rainfall-runoff model. The latter rely more on calibration and validation as many model parameters don't have explicit physical meaning. But the latter also contains to a large extent understanding of physical processes although using coefficients/parameters to explore the physical processes indirectly. SCC is a collection of methods for exploratory analysis of multivariate data. The authors wish to focus

more on SCC and expand it a bit more with some more current publications.

D: In terms of recommendations I would suggest or rather propose the following: 1. Restructuring of the content to make the document more coherent; 2. The length of the manuscript could shorten and the entire document made more efficient. Not only would this improve readability it would help get the import of the article across to a wider audience, improving impact tremendously; 3. The manuscript is in urgent need of an illustration or diagram to present some of the points made in writing. The latter would also help get rid of superfluous text. This paper should definitely be accepted albeit with important revisions. Implementing the points enumerated in points 1 to 3 above would convert a brave attempt into a significant achievement that will serve current scientists and engineers and be a useful resource for posterity.

-points all taken and will be reflected in the revised manuscript.

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