**HESSD**

Interactive
comment

# *Interactive comment on* "Coherence of Global Hydroclimate Classification Systems" *by* Kathryn L. McCurley Pisarello and James W. Jawitz

**Anonymous Referee #3**

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The authors highlight the absence of a proper ET-derived classification system. It is a such that they propose a "series of ET-based global classifications that should yield comparatively higher ET coherence than other systems", by assessing coherence and shape complexity within the classifications. I find that the study is well carried out, very nicely written and illustrated. Methods are also well explained. I think that the study would be a great contribution to HESS, enabling researchers to choose the best system of classification suited to their purposes, specially regarding ET. However, I have some clarifications that need to be added to the former version of the manuscript.

1. Existing so many proxies for landscape connectivity assessments the authors need

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[Discussion paper]

to support the use of "zone area" and "zone fragmentation". Why are these the best ones? Also, I did not see any formula, or explanation. This is needed wince these classification schemes are not that well known in the field of water resources, and rather in the field of ecology. A figure would be useful. 2. ET is dependent on many local parameters related to land cover and land use (See for example Sterling et al., 2013). Human activities such as agriculture, urbanization, deforestation, heavily affect these parameters and then would imprint less coherence, more variability and patchiness into the classification system. The authors should comment/adjust on this. 3. Furthermore, I would have done the analysis with a more "large-scale climatic parameter" that involves less spatial variability (and more spatial coherence-less CV) at the local scale, such as the aridity index (PET/P) or evaporative ratio (ET/P). Have the authors considered this? 4. I was expecting a more concrete recommendation on the best system for ET. Which one is it if you have to choose one? 5. Conclusions are missing, and should be independent from the Discussion.

References: Sterling, S.M., Ducharne, A., Polcher, J., 2013. The impact of global land-cover change on the terrestrial water cycle. Nature Climate Change 3, 385–390. https://doi.org/10.1038/nclimate1690

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