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Hydrology and Earth System Sciences Discussions

Interactive comment on "Data-driven catchment classification: application to the PUB problem" *by* M. Di Prinzio et al.

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Editor's comments

I agree with the two reviewers that this is a very interesting paper that is very relevant for the Special Issue on Catchment Classification and PUB. The study uses data from ∼300 Italian catchments to address the question of whether unsupervised objective classification based on landscape and climate characteristics can reduce uncertainty in predicting specific hydrologic characteristics, such as mean runoff coefficient or annual average flood. They find that self-organizing maps (neural networks) in combination with multivariate analysis to reduce dimensionality are indeed powerful tools to address the PUB challenge. The paper is well written and technically sound. The figures are generally clear, with the exception of Figure 6 which readability can be enhanced by

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increasing font size of axis labels.

The authors have adequately responded to the comments of the two reviewers, and are encouraged to upload a revised manuscript for further consideration of publication in HESS.

Nevertheless I want to encourage the authors to address the main comment of Reviewer #2 in more detail (his/her comment about discussing the classification results in a hydrologic context). I agree with reviewer #2 that the paper's impact can be improved if the authors would spend some time interpreting their results. After all, this is a hydrology journal and the reader expects to learn about hydrologic similarity and its cause when studying papers in this special issue. In particular, maps such as the ones shown in Figure 5 intrigue me. The three different classification methods lead to visibly different grouping of the catchments, but also a high level of consistency exists across the three maps, suggesting that groups of landscape/climate similarity are largely independent of the method of classification used (good news!) But why do we see these groups emerging? Can we interpret the patterns that emerge from this study? Is there something different in the Sardinian catchments that make them standing out compared to mainland catchments? Is it only climate on Sardinia that can explain this separation, or are there specific landscape characteristics from the database that can further help explaining their similarity within and dissimilarity outside the island? Same observations can be made throughout the region. I think the reader wants to see such a discussion and I again encourage the authors to add this to the paper.

Peter Troch

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 391, 2011.