

Interactive comment on “A comparison of regionalisation methods for catchment model parameters” by J. Parajka et al.

J. Parajka et al.

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Author response to review 1

We would like to thank the reviewer, Dr. Pfaundler, for his very helpful comments on the manuscript and his suggestions for future research. We have addressed his comments as follows:

Specific comments:

1. Local georegression comment (p. 520). We have added information on the georegression and the use of residuals as follows: “... where we interpolated the residuals of the local multiple regression by ordinary kriging using an exponential semivariogram with 50 km range.”
2. Perfect similarity comment (p. 523). We prefer not to skip the “perfect case” as we think it provides significant insight into the potential of this type of regionalisation

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method. We have therefore expanded the explanation in section 4 (p. 521, end of first paragraph): “This is a diagnostic case which probes the potential of the catchment model performance that can be achieved with an ideal donor catchment selection. In this study it helps assess the criteria for selecting the catchment attributes used for finding the donor catchment. In a practical application this is not a viable method as the model parameters are of course unknown at the ungauged site of interest.” In section 5 we have changed the relevant wording (second paragraph, p. 523) to: “The case of the “perfect” similarity index illustrates the model performance when a donor catchment with the most similar model parameters is applied in the water balance simulations.”

3. Spatial loss for smaller catchments (p. 524). We agree with the reviewer and have added a sentence at the end of the second paragraph on p.524:” This indicates that in small catchments the peculiarities in runoff forming conditions are more difficult to capture than in larger catchments where always some sort of averaging takes place.”

4. Conclusion (p. 525). We, again, agree with this comment and have added a sentence and reworded the relevant sentence in the text: “For a number of catchments the regionalisation does perform poorly with efficiencies one would not use in practical applications. This is particularly the case in the high alpine areas where the spatial hydrologic variability is particularly large. Also, in some low land catchments the runoff model does not seem to represent the runoff dynamics very well.”

5. We agree with the reviewer that the performance of regionalisation methods depends mainly on how representative is the original information. We also concur with the reviewer’s note that he does not consider this issue to be directly relevant to the objectives of the paper and have therefore not modified the paper in response to this comment.

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Technical corrections:

We have made the technical corrections as suggested by the reviewer:

1. We have used a consistent spelling of “homogeneous” in the entire manuscript.
2. We have changed part of the first paragraph on p. 512 to: “..., while in the regression case, ...”
3. We have corrected the last sentence (first paragraph, p. 512): “...physiographic catchment attributes.”
4. We have used lower case for west, eastern, etc... throughout the paper.
5. We have changed the sentence (first paragraph, p. 521) to: “...that can be achieved with an ideal donor catchment selection.”
6. We have added ‘geographical’ as suggested (p. 523, second paragraph).
7. We have changed the preposition to ‘in’ (p. 523, second paragraph): “...and was in the order of 10 km.”

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