

## **This document is the response of the authors to the editor's comments**

We would like to thank the Prof. Jan Seibert for his comments.

**Comment 1:** “The good performance of SHETRAN is interesting and also the decrease of performance when going to a coarser resolution. Given that even the finer resolution is rather coarse from a process point of view, the reasons for this are not obvious to me. Overall, there are some questions and possible tests regarding the model performance, which I would find interesting. However, I realize that the SHETRAN performance itself is not the focus of this study, but this could perhaps be worthwhile to explore more in another study. “

**Authors Response:** We agree that this is very interesting and should be explored in another study

**Comment 2:** “Be consistent with the capitals when writing SHETRAN (or Shetran)”

**Authors Response:** Shetran is now used throughout

**Comment 3:** “There are some other places where you used capitals and I would rather not (e.g., River in the beginning of the intro) and Snow water equivalent in the figure captions)”

**Authors Response:** These changes have been made

**Comment 4:** “It should be Thiessen (instead of Theissen)”

**Authors Response:** These errors have been corrected

**Comment 5:** “the Thiessen polygon method is a method to compute weights for the different stations, not necessarily to produce maps of spatial variations (such maps with the large jumps look a bit strange, for a map, interpolation methods would be more appropriate). However, this does not influence the results of the study.”

**Authors Response:** I have discussed this point with my co-authors. We agree that the maps in Figure 3 look a bit strange and interpolation methods would be better to show the spatial variations in precipitation and temperature. However, we have decided that Thiessen polygons were used to produce the inputs for Shetran and therefore the maps should reflect that. We have changed the caption to make this clear.

Steve Birkinshaw (on behalf of the co-authors)