Rereview of „ Using hydro-climatic and edaphic similarity to enhance soil moisture prediction " by E. J. Coopersmith, B. S. Minsker, and M. Sivapalan

The authors have extensively reworked their manuscript and considered most of my comments. I have listed some minor remaining issues which should be considered. Therefore I can recommend the publication of this work after minor revision.

We appreciate the reviewer's feedback initially and are pleased that our efforts have been largely satisfactory. We have addressed the reviewer's subsequent comments to the best of our ability and hope the manuscript will be fit for publication at this point.

General comment:

One of my former comments was related to the negative effects of the machine learning code, which was responded by the authors as follows: "Any corrective algorithm will, over thousands of validation points, push the estimate away from the observed value in some cases."

This, however, somewhat extenuates the situation. For instance it leaves out the fact that especially during dry periods the model systematically overestimates soil moisture (see Figure 5). Although the performance analysis demonstrates the overall increase in model performance, the authors should be more critically with the application of MLC. The authors have to be objective and not to sell MLC like a panacea (I am sorry for being so persistent).

Fair point. The following will be added to further clarify the efficacy and limitations of the approach, following the sentence to which the reviewer has drawn attention:

> "Moreover, it is possible, if the training data are largely wetter or drier than the validation samples, that machine learning's corrective power will consistently over or underestimate moisture content. An example occurs in Figure 3, where soil moisture values in New Mexico are still overestimated, even after machine learning corrections."

Specific comments:

While screening the MS I found several typos (see below), and sure that I have overlooked many more. I have also indicated some additional specific comments:

L83-85: Please delete "ionic chemistry, CO_2 concentrations, solute transport data". This information is not meant to attempt to improve predictions of water fluxes in HYDRUS.

The change has been made.

L93: Change into "Pan et al. (2003) and Pan (2012)"

The change has been made.

L116: Change into "used"

The sentence now reads:

> "To calibrate and validate the model, we use data from the U.S. Department of Agriculture's (USDA) Soil Climate Analysis Network (SCAN) were used."

L176: Citation year is missing

The change has been made, the correct year (2003) now appears.

L386: Change "to" into "do"

Unfortunately, we cannot determine the correction noted here. Can the reviewer kindly provide the full sentence to which he refers? The offending paragraph has been re-read and seems to scan appropriately.

L534: The benefit of this work for SMAP Cal/Val activities is still too vague. Clearly, the results of this study are not "measurements" but model outputs and therefore represent the real soil moisture to a lesser degree than in-situ measurements. Unless the benefit of this study for SMAP Cal/Val cannot be clearly demonstrated, this chapter must to be omitted.

Section 4.3 has been removed. The study can be discussed in subsequent publications.

Figures

Figure 3-6: Axis labels are much too small.

They have now been enlarged by 80%.

Figure 7-9: x-axis labels should be always at the bottom

The changes have been made.