Hydrology and
Earth System
Sciences

Discussions

Open Access

HESSD

Interactive
comment

Interactive comment on "Blending SMAP, Noah and In Situ Soil Moisture Using Multiple Methods" *by* Ning Zhang et al.

Anonymous Referee #2

Received and published: 10 January 2020

Main comments: 1. The title says different blending methods were to be used. However, in the manuscript, only LSW and AVE were used to blend SM data. This needs to be made consistent. 2. In the abstract "The in situ-based product 23 performs better when the sample density is high, while the simple-averaged product performs 24 better when the station density is low, or measurement sites are less representative." This sentence is misleading. It seems encouraging a sparse SM network. The author should specify what level of accuracy this sentence is referring to. 3. In terms of the four knowledge gaps: "1) of the lack of in-situ soil moisture inclusion in product blending" 3.1) If the high resolution in-situ based soil moisture product is available, then why bother blending it with coarser SM products? Please the author clarify what is the information gain/loss on this point.

[Printer-friendly version]

[Discussion paper]

3.2) The RK was used to derive gridded SM utilizing API, relying on precipitation as the main predictor of soil moisture variations. Nevertheless, plenty of studies show the control of LST and vegetation on SM, together with topographic variables and soil textures. This reviewer is wondering why the authors neglect these perspectives.

3.3) The API uses a fixed k, as in equation (1). However, this reviewer expect the k value will be a function of different climates, vegetation covers, topography and soil textures. Please the author clarify.

"2) There 139 is no comprehensive evaluation of different data blending methods" 3.4) From the title, it seems the author would like to use multiple blending methods. On the other hand, it turns out only LSW and AVE used. This reviewer does not agree with this knowledge gap.

"(3) The impact of measurement units (e.g., volumetric water content, 144 soil moisture anomalies, and percentiles) is unknown" This is to me physically nonsense. They are not all measurement units even. Volumetric water content is a unit, but anomalies? percentiles?

4) A simple and operational methodology is still needed for accurate daily soil moisture mapping with high spatial resolution.

This is not a knowledge gap, but rather improving the current technology. For example, people are using UAV to derive SM for precision agriculture.