Review: Soil moisture products consistency for operational drought monitoring in Europe

October 2, 2024

1 Overall summary of the main contribution of the paper

The paper is interesting and gives an insight into different soil moisture products leaned towards remote sensing products (2 HSAF versions and ESA CCI passive). They are complemented with one model dataset from Lisflood (EDO). All data are evaluated using in situ data from ISMN and the triple collocation method. The aforementioned products are then merged into 2 combined products and evaluated against ISMN. Finally. the authors make a trend analysis with the dataset mentioned.

The conclusions of this study are mainly well informed by the analysis and plots

2 Appropriateness for the journal and relevancy

The study is in the scope of HESS and fits in very well. The topic of soil moisture assessment and monitoring highly relevant.

3 Major items should be addressed in revision

- The authors should make clearer what is the novelty and the research gap addressed by their study.

- I suggest to change the title by removing the term drought as the paper is not reffering to droughts at all.

- How are quality assurance scores (ESA CCI, ISMN) treated within this study?

- L212 How do the datasets used fulfil these assumptions?

- L297ff The low scores of EDO in Northern Europe may arise from low performance but good agrrement of the other 2 RS products. As you mention before they are known to worse in forested and icy regions. Please elaborate a little in the discussion and add in situ observations as reference to get a better picture.

- L361 Please check the time period of XMS-CAT to underpin your analysis.

- L228I couldn't find the mentioned method in Braocca 2010b

- L3956 In the rest, ... - Compared to EDO the spread of B and C type climates seems not to be reduced in the combined products.

4   Minor corrections

- L76 please rephrase numerical model into process based or conceptual model.

- Fig. 1 Labels a and b missing.

- L171 Web address of ISMN is outdated. Please update with https://ismn.earth.

- Fig. 2 A distinction into further classes like forest, urban etc would be useful.

- L190 Please rephrase (The daily values ...)

- L197 I guess SM_{sat} shall be m_s

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- I suggest to add a table detailing the different spatial and temporal representation/resolution of the data source.

- Please review the use of hyphens instead of a comma when you refer to two panels in a figure, e.g, L260 (Fig. 3b-3e), L261...

- L229 R_TCA$_{HSAF}$ should be SM_{HSAF}

- L270 caption of Figure 3: Map of temporal R-Pearson correlation instead of spatial.

- L318 English grammar, please rephrase (Hence, ...).

- Fig. 7: Please add an axis label to all x axes.

- L372 Please rephrase, sentence is hard to understand.

- L399 I am not quite sure about which dashed lines you are talking about.

- L400 Dfb instead Db

- L 414 Please rephrase, sentence not understandable (While the products ...)