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Discussions

Interactive comment on "Gap-Free Global Annual Soil Moisture: 15 km Grids for 1991–2018" *by* Mario Guevara et al.

Anonymous Referee #1

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OVERVIEW The study presented a gap-filled global soil moisture dataset based on the ESA CCI satellite soil moisture product. The dataset is characterized by a spatial resolution of 15 km. The new filled and downscaled dataset has been validated against in situ soil moisture and precipitation data through annual comparision as well as in terms of long-term trends during the period 1991-2018. GENERAL COMMENTS The paper is well written and clear and I found the topic of interest for the readership of Earth System Science Data. However, I have some comments and doubts that should be clarify before considering the paper for publication. My comments are listed below.

1) Please, add some details about the ESA CCI SM product. Did you use the combined dataset? I think version 4.5 (or 4.9, please check out throughout the manuscript) is the latest one; 2) It is unclear to me how you have selected the data gaps in the original CCI

dataset. The ESA CCI SM product is a daily dataset, so the gaps should be present during the entire period? Did you estimate an annual mean of original CCI data? Did you find a reduction of gaps during the analysis period; 3) Bioclimatic features are not described at all; 4) It is unclear to me how the comparion with ISMN has been carried out. You extracted the original and the downscaled ESA CCI SM products over the stations locations and then? Did you estimate an annual mean of observed SM and compared to the satellite data? Are the couples drawn in Figure 8 the resulst for each year (so, 28 points)? How these couples have been estimated?; 5) The link to the downscaled product reported at line 907 is referred to the previous version of the dataset, please change it

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-264, 2020.