



## ***Interactive comment on “A fine-resolution soil moisture dataset for China in 2002–2018” by Xiangjin Meng et al.***

### **Anonymous Referee #1**

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Soil moisture is an important indicator for a wide range of applications, especially those related to agriculture and the ecosystem. Measuring soil moisture is expensive with ground stations and difficult to cover the spatial variation of soil moisture. Satellite observation is able to cover a large area and has the potential for deriving soil moisture for a country or even the globe; however, the coarse resolution of the satellite-derived datasets limits wide use of these data, especially for soil moisture derived from passive microwave observations. The paper presents a soil moisture dataset for China with monthly and 0.05 degree resolutions, which could be helpful to many applications.

The paper claims that the 0.05-degree spatial resolution is a breakthrough for soil moisture; however, datasets with the same resolutions have been published for even the

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globe, for example:

Chen, Yongzhe, Xiaoming Feng, and Bojie Fu. “An Improved Global Remote-Sensing-Based Surface Soil Moisture (RSSM) Dataset Covering 2003–2018.” *Earth System Science Data* 13, no. 1 (January 5, 2021): 1–31. <https://doi.org/10.5194/essd-13-1-2021>.

Jing, Wenlong, Pengyan Zhang, and Xiaodan Zhao. “Reconstructing Monthly ECV Global Soil Moisture with an Improved Spatial Resolution.” *Water Resources Management* 32, no. 7 (May 2018): 2523–37. <https://doi.org/10.1007/s11269-018-1944-2>.

The paper needs to compare to the existing dataset to investigate the accuracy and improvements of this dataset over others, to provide a subjective review of the dataset accuracy for users. Meanwhile, recent studies have suggested advantage of down-scaling soil moisture using machine learning methods, for example:

Liu, Yangxiaoyue, Wenlong Jing, Qi Wang, and Xiaolin Xia. “Generating High-Resolution Daily Soil Moisture by Using Spatial Downscaling Techniques: A Comparison of Six Machine Learning Algorithms.” *Advances in Water Resources* 141 (July 2020): 103601. <https://doi.org/10.1016/j.advwatres.2020.103601>.

The dataset was produced using aged algorithms with little methodology innovation by the authors, making it difficult to justify the value of this manuscript.

Many of the sentences make little sense, and the writing needs improvement before publication.

It appears that the authors have been misusing terms in the paper, such as “verify”. Please replace it with “validation” or “evaluation”.

The authors interpreted the changes of derived soil moisture in China, and explain the changes due to climate changes. I wonder if the authors have compared the results to climate datasets to justify these statements?

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Line 80, please add a citation at the end of the sentence.

Line 89, replace “verified” with “validated”.

Line 103, why “most of the areas in China”? What happened to the rest of China?

Line 136, replace “finite working life” with “limited lifespan”.

Line 225, please clarify “different absolute values”.

Line 227-228. Please clarify how the average was calculated from the one and half month’s data.

Line 378, what “consistent” is referring to? Similar trend or similar values?

Line 386, I am not sure what “sensitive” refers to.

Line 388, “most significant change” please clarify.

Line 520, is there evidence to support the statement regarding the effects of urbanization?

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-292>, 2020.

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