



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

### **Anonymous Referee #2**

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Soil moisture is very crucial in exploring the response of vegetation dynamics to the climate change in ecohydrological processes. Having professed my general enthusiasm for the topic and its importance, I have some concerns that require substantive effort, a large part should be recalculated and rewrote. The paper should be suitable for publication following the recommend major revisions below: 1. There are several similar studies on the reference. What are new findings on this study? 2. Line 111-114: The authors should explain more about how to divide into these six regions (NEM, NCM, SCM, etc.) by climate and topography, and add these in Fig 1. What does the different color mean is Fig 1 (the patch not the points). 3. Eqs4: Why do you need to correct the surface temperature? Did these data already include the elevation effects? 4. Eqs8: These letters (i, j, a and b) seem to be four different pixels. Please explain clearly about

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how to get the new soil moisture data from the previous soil moisture and TVDI in different location. 5. Line 327-328: Can you explain why for this: 'the downscaled SM data underestimated the ground observations at all three temporal scales, especially the monthly scale.' 6. Lin 343: 'possibly attributable to ice and snow cover in winter' If it is true, why the RMSE in April was higher than that in November. 7. There are five elements including station, vegetation types, R, SDV and RMSE in Fig 5. It is difficult for the reader to get information easily and it did not show the highlight (SM associated with higher vegetation is more variable) well. 8. Line 378-379: Would it be affected by the soil types either? The soil types could also affect the soil moisture. Please include the effect of soil types in this part. 9. Fig6: I found large interannual variability along with the declined trend in each panel. Please explain the variability in the main text. Is it caused by low quality of the data or climate change? 10. Please mark the 'Changbai Mountains', 'Liaodong Peninsula', 'Sichuan Basin', etc. in relevant figures. 11. Fig8: why did the soil moisture increase in Northeast China in autumn? 12. The authors actually did 'results and discussion' in 'results' session. The 'Discussion and conclusions' part did not show much discussion. Please modify the session name.

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