

Earth Syst. Sci. Data Discuss., referee comment RC3
<https://doi.org/10.5194/essd-2022-21-RC3>, 2022
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Comment on essd-2022-21

Anonymous Referee #3

Referee comment on "An in situ observation dataset of soil hydraulic properties and soil moisture in a high and cold mountainous area on the northeastern Qinghai-Tibet Plateau" by Jie Tian et al., Earth Syst. Sci. Data Discuss.,
<https://doi.org/10.5194/essd-2022-21-RC3>, 2022

Dear Editor,

**Thank you so much for proving this opportunity for me to review this paper.
Please see my comments below.**

Review of "An in situ observation dataset of soil hydraulic properties and soil moisture in a high and cold mountainous area on the northeastern Qinghai-Tibet Plateau"

This paper provides potentially a very useful and important dataset. Substantial effort to collect soil samples and build up a long-term SM monitoring network in the high and cold mountainous region. Potentially a good candidate for ESSD. However, the important first-hand measured data cannot be accessible, for instance, SMST at the half-hourly scale on 32 LULC-Soil-DEM zones and measured SWRCs and possible soil heat conductivity curves, which hampers its potential to become a useful dataset in the hydrology, RS and soil research conducted on the high and cold mountainous region. The reviewer suggests the author uploading all raw data and completing the description data. Moreover, provide a brief description of the loaded data (in the data availability) that is consistent with the description in the manuscript. For detailed comments please see below. Some comments are labeled in the .pdf.

- In Line 69 about 'a long-term SM dataset for the Qilian Mountains', the reviewer knows

the focus of this dataset is more about SM, while soil temperature information measured by ECH2O 5TE device should also be released for a comprehensive soil physical property information, which is more helpful in the use of soil water and heat transport (in LSM) research conducted on the high and cold mountainous region, as well as microwave signal simulation and the corresponding SM retrieval validation.

In line 114-115, it is mentioned that SM at different soil depths with a time interval of 30 min. The reviewer does notice this half-hourly data cannot be accessible. The reviewer suggests publishing SMST at the measured time scale rather than at the processed scale. Moreover, the reviewer does not think evaluating SM at the monthly scale is a routine, at least at the daily scale is more convincing.

- In the sheet 'station information' of the uploaded file 'soil moisture data_NE_QTP.xlsx', there is no information of land use/type data, elevation, soil type and soil texture. In line 123, 'Environmental factors such as the position, slope, aspect, root depth, and land cover were measured at each station', please complete all these related information. In Figure 1, please also add the meaning of 32 main LULC (Land Use/Cover)-90 soil-DEM types, which is not clear for the reviewer who does not concern with LULC research.
- In the file of 'SoilProfile_NE_QTP.nc', there are 250 lat and 501 lon, please clarify how do these two correspond to the number of samples the author described in the paper.
- In line 140, please consider making the measured soil water retention curve (SWRC) data accessible. Peers are more interested in the raw data, which they can use to obtain parameters in other soil hydraulic models that they are interested.
- In Line 270, the author used Kriging method in ArcGIS to interpolate the spatial SHPs, please specify the Kriging method (e.g., what kind of method, any covariates and spatial resolution) and describe the uncertainty of this method and the interpolated data.
- Please explain Figure 7b.
- The reviewer thinks that the 'dry bulk density' is measured. Please refer to this soil property as dry bulk density in the manuscript and figures.
- Please make the symbols of and consistently used in the manuscript but also in the legend in Figures, e.g., In Figure 6, θ_s and θ_r .

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2022-21/essd-2022-21-RC3-supplement.pdf>