Comment on essd-2020-368
Anonymous Referee #1

Referee comment on "A 1 km resolution soil organic carbon dataset for frozen ground in the Third Pole" by Dong Wang et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-368-RC1, 2021

The authors created high spatial resolution data of organic carbon distribution in the Third pole by compiling all the field data and using machine learning methods. The dataset can be very useful to help the scientific community to understand the carbon cycle. I found the paper is well organized. My major concern is that the authors should clearly explained what are the new findings in comparison with several previous reports on the plateau, e.g., Ding et al. 2016, Wang et al. 2020.

Specific comments:

Figure 1, 2 and 4 are never mentioned in the manuscript, please add reference mark in right place.

Many SOC data were collected in this study, however, the data of China’s national soil survey were not included in this manuscript, why?

Please add the accuracy assessment in manuscript between your dataset and other global or regional SOC datasets, such as: SoilGrids and HWSD.

L 62-64, Permafrost degradation will not only cause serious geological disasters and affect engineering construction in cold areas...” needs citations here.

L.87-90. “Furthermore, the large-scale maps of vegetation and soil types...” needs
what is SOCSs?

“in the area of” into “in the areas of”

“Fig. A1” to “Fig. S1” Also in L.323.

“To test the predictive effects of the two machine learning methods...”, two or three?

“The estimated SOC storage at a depth interval of 0–300 cm in forest, shrub, cropland, grassland, and desert areas was 3.30 Pg, 0.85 Pg, 31.67 Pg, 9.77 Pg, and 0.59 Pg, thus accounting for 7.15%, 1.84%, 68.58%, 21.57%, and 1.28% of the total, respectively”. Mismatching in different vegetation types and SOC storage values.

“lithosols” Inconsistent font.

“QTP” into “Third pole region”

Hence, most terrestrial SOCS studies have focused on the shallow soil layer within 100 cm ...especially that of permafrost zones (Ding et al., 2016; Mu et al., 2015; Wang et al., 2020; Zhao et al., 2018). Wrong citations. The soil depth is deeper down to 100cm in those articles

Change “In” into “in”.