

## Comment on **essd-2021-83** - in English

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Referee comment on "New high-resolution estimates of the permafrost thermal state and hydrothermal conditions over the Northern Hemisphere" by Youhua Ran et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-83-RC2>, 2021

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### Comments:

The authors of the manuscript have done a lot of work on mapping the thermal state of the permafrost in the Northern Hemisphere: the average annual soil temperature (MAGT) at a depth of zero annual amplitude (ZAA) and the thickness of the active layer (ALT), zoning of permafrost based on hydrothermal conditions with a resolution of 1 km per period 2000-2016. The results obtained undoubtedly enrich the previously obtained data of previous researchers and have been successfully mapped on a global scale (the entire northern hemisphere), they can also be mapped at the local (regional) level, as the most demanded in practice.

### Technical Notes (Corrections):

- In fig. 2 contours of the "lake" are missing.? They are present in the following figures. This error should be eliminated;

- In Fig. 3, the MAGT (oC) color selection is unsuccessful (-15 - -14; -14 - -13 and -2 - -1; -1 - 0). They almost do not differ in color. Also, the color of the "lake" repeats the color "-10...-9; -9 - -8". You should choose a different color for the "lake";

- In fig. 4 remark is similar as in fig. 3. Choose a different shade for the color of the "lake".

In my opinion, the gradations of average annual temperatures should be chosen according to generally accepted classifications of types of seasonal freezing and thawing of rocks: transitional (-1 - 0), semi-transitional (-2 - -1), long-term stable (-5 - -2), stable (-10 - 5), arctic (-15 - -10) and polar (-20 - -15). I do not insist on following my advice, leaving the choice to the authors of the manuscript.