

Earth Syst. Sci. Data Discuss., referee comment RC1
<https://doi.org/10.5194/essd-2021-268-RC1>, 2021
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Comment on **essd-2021-268**

Anonymous Referee #1

Referee comment on "An hourly ground temperature dataset for 16 high-elevation sites (3493–4377 m a.s.l.) in the Bale Mountains, Ethiopia (2017–2020)" by Alexander R. Groos et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-268-RC1>, 2021

The manuscript of Groos et al. presents a dataset on ground temperature data: At 5 + 14 locations in the Ethiopian highlands, ground temperature was monitored at three depths (5) or near the surface (14 stations) for nearly three years. The manuscript contains a first analysis of the data with focus on the occurrence of frost, annual and seasonal temperature variations.

I am not an expert in the area of ground temperature dynamics. Thus, my comments are mostly restricted to the overall content of the paper, its structure and technical details. That being said, the authors convincingly lay out the potential use of the data set. Moreover, the logistic and technical challenges of the respective measurements in this remote area underline its uniqueness.

However, with effectively only three station providing true temperature profiles (albeit 3 depths only), and timespan of just 3 years and many data gaps (although reasonably-well filled), the data set is not excessively rich. Therefore, I strongly suggest to include the concomittant measurements at the meteorological stations into the dataset. The paper often relates to them (e.g. II), and even includes their analysis (p. 12)., as they greatly enhance its value or seems even mandatory (as stated in the Discussion) for its analysis. I was even somewhat surprised not to find them. As for meteo-data of secondary provider that cannot be included, at least the respective reference would of great help to the potential user.

The core data of the publication are available from a Zenodo repository. However, they seem incomplete in some aspects, while redundant in others. I recommend some restructuring:

- Naming the folders "raw data" (i.e. log files) and "processed data" would seem more intuitive to me.
- Some files (e.g. Hourly_Ground_Temperatures_Corrected.csv) have a deviating formatting of the date column. Highly impractical for automatic use / scripts
- Information_Sheet_Data_Correction.ods: For each logger, add a column "flag" with indicator(combinations) for "interpolated to full hour", "missing/filtered", "interpolated/gap"

filled based on logger nn"

This potentially makes the other files (except, perhaps, Information_Sheet_Data_Interpolation) obsolete.

- The duplication of *.txt and *.ods seems unnecessary. I suggest using txt for the actual data, ods for the meta-data
- Please add a GIS file (or at least table with the station coordinates), the information of Table 1 plus further site attributes (vegetation, etc.)
- Please add some reference to the ESSD-manuscript (e.g. with an overall readme.txt and/or in the Zenodo description field)

The overview data analysis in the paper provide an adequate first insight into the data. As this is not the core of a data publication, I recommend not extending them. Please consider shortening by excluding the analysis of the effect of slope and orientation. However, I made some suggestions how to improve some points, if these are considered essential. Some conclusions drawn should probably be formulated more carefully, as they do not seem to be fully backed up by the analysis. The formal quality of the paper is high, with logical structure, adequate style and (mostly) helpful figures. As a technical suggestion I strongly urge to decrease the file size of the resulting PDF - 20 MB for a text document is unacceptable. I assume this comes from photos with excessively high resolution .

The dataset and paper merits publication, especially when supplemented with the meteorological data. However, I recommend moderate revision before.

Further details in the annotated PDF.

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2021-268/essd-2021-268-RC1-supplement.pdf>