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Earth System Science Data Discussions

Interactive comment on "NORPERM, the Norwegian Permafrost Database – a TSP NORWAY IPY legacy" *by* H. Juliussen et al.

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AUTHOR RESPONSE TO COMMENTS BY REFEREE 1 (J. Noetzli)

Section 1 Where can the CALM data be found in the database? Is it included? This is not clear for me from the text. AUTHOR COMMENTS: NORPERM contains temperature data only (some also from CALM sites), and no active layer depths, as CALM data go directly into the CALM database, which does contain all data, as opposed to the GTN-P which is only a metadatabase. We will make this clearer in the final revised paper.

Section 2 Section two basically gives rather technical information on measurement locations and installations, but not on the data itself. As I understand ESSD, the main

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purpose it to present/publish the data. Therefore the data sets should be better described. AUTHOR COMMENTS: The main purpose of the present paper is to describe the data infrastructure and database design, to foster similar initiatives on free and open data sharing in the permafrost scientific community. The actual data are presented and discussed in a Nordic perspective in Christiansen et al (2010), and will also be presented in more detail in local manuscripts under final preparation.

If the observatory design is described, two fundamental aspects need to be addressed, but are lacking in the manuscript: What parameter is measured in order to obtain or deduce which information? AUTHOR COMMENTS: Temperature is the only measured parameter (cf the heading of section 2 and p.32 line 10, and that permafrost is thermally defined). Indirectly, snow cover depth is deduced from vertical arrays of snow temperature measurements by evaluating the signal damping when the sensors are snow-covered, but the focus is solely on the permafrost temperature data infrastructure within the permafrost observatories.

And what are the criteria for the selection of the sites where these parameters are measured (climate conditions is the only criteria mentioned, but factors such as (sub)surface conditions or snow cover distribution are as important for permafrost temperatures)? The observatory design depends of course on the main aim of the TSP Norway project but it is very clear from the text (long-term monitoring? Snapshot? Process studies? Best spatial coverage? All together?). AUTHOR COMMENTS: The overall criteria for study area selection are presented in Christiansen et al 2010, and will in addition be presented in detail in manuscripts under final preparation and are also mentioned in p. 32 l. 14-17. The main aims of the TSP Norway permafrost observatories are to provide an IPY snapshot of permafrost temperatures from these areas as a baseline for future changes (i.e. next IPY) but also to develop long-term permafrost temperature monitoring networks in different climatic and microclimatic settings.

Section 3 In my opinion, the authors must include a discussion on the data quality and the limitations of the data, which is listed as one of the main requirements of ESSD.

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There are two short paragraphs (p. 38 and 39), but they do not sufficiently describe how the data has been processed and quality checked between the logger and the output of the database. This information is not accessible in the metadata, either, but it is crucial to know when dealing with permafrost temperature data. Are there standard routines and quality criteria that are given to the data providers? Is any available data stored? Are gaps filled, errors corrected, or zero-curtain calibrations performed? And if yes, how? How does the NORPERM administrator make sure, data is complete and of high quality? Is there any intention to store raw data as well or to do a versioning to be able to trace back previous versions of the data sets (when NORPERM will be a tool for long-term monitoring, this may become very important)? If it cannot be described comprehensively for the NORPERM dataset, it may be demonstrated and discussed using one or two examples. AUTHOR COMMENTS: We agree this is a topic of major concern and will elaborate further on the data quality aspect in a final revised version of the paper. We are aiming to work further on this as a key future development of NORPERM. The present data in NORPERM is the raw data, corrected for obvious errors only by the data provider and/or by the database administrator. Presently we will keep it this way, encouraging the data users to correct the data before use, as this is more transparent for the end users. Ice-bath calibration was made at the borehole sites before installation and will be repeated regularly to ensure high-quality data. Calibrations are and will be provided in the metadata fact sheets. Zero-curtain calibration provides a possibility for data quality evaluation between the ice-bath calibrations.

It is often not clear if the author speak of the data, the database or the graphical user interface with GIS-functionality and the term NORPERM seems to stand for all three. It should be clearly distinguished between these three terms, because they have different meanings and different implications. E.g., the structural design presented in Section 3.1. mainly relates to spatial scales and map view changes and therefore to the GUI. If the authors relate to the data and database (as stated in the first sentence) they should use e.g., terms of relational data base modeling. AUTHOR COMMENTS: As NORPERM is the name of the database it by definition also covers the data within it

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and contains also a graphical user interface. Thus to us this is all an entity, but we make sure to distinguish between the modules were appropriate in a final revised version of the paper.

The last paragraph of Section 3 on the different map layers used in the GUI is too long. It is sufficient to describe the data type and source. AUTHOR COMMENTS: We argue it is necessary to provide the necessary background for these map layers and their scientific use with the data, but will shorten the text slightly for the final paper.

Metadata The metadata should obligatory include information on the last calibration of the measurement sensors (this is mentioned in the text on p.38, but I did not find the information in the actual metadata sheets). Also a contact name or institution (including a contact address) should be given for all data, in order that data users can obtain more detail on the data acquisition, processing, and quality, or give feedback. AUTHOR COMMENTS: For mainland Norway no calibration data is yet made available in NORPERM, but will be included as soon as possible by the data providers. For Svalbard the calibration data can be found in the individual borehole metadata fact sheets. Calibration data is not yet included for all the boreholes, as we did not save all the calibration data in the beginning, but just checked against the accuracy given by the manufacturer (2 holes). A new ice-bath calibration should soon be made for the installations with the coarser 0.2°C accuracy, and these will all be provided in NORPERM. For the high-accuracy Campbell-systems, an ice-bath calibration was performed by the manufacturer and the data is automatically corrected in the datalogger following this calibration. For the older installations no ice-bath calibrations are available. At present the administrator is contact person for all the datasets and can guide any requests to the relevant data provider. As the data were collected in a joint project with several scientists participating and collaborating on the data collection, and with a funded database administrator position, we have so far not seen the need to provide personal contact information for individual datasets.

Minor Comments p.31, l. 6 and elsewhere: The reference Christiansen et al. (2010) is

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in review and should therefore not be used as a single reference, because publication is not assured. AUTHOR COMMENTS: The reference is now published.

p.33, l. 14-17: I do not understand the meaning of this paragraph. It can be deleted, except for the first sentence. AUTHOR COMMENTS: This is simply an overview of the entire length of boreholes drilled and instrumented during the IPY campaign, so we like to include this information in a rewritten form: In total 570 m of boreholes were drilled and instrumented in Norway (281 m) and Svalbard (289 m) during the IPY TSP Norway campaign.

p.34, l. 23 The term near-ground surface temperatures is generally used for temperatures measured only little below the surface. It should not be used to describe air or snow temperatures. AUTHOR COMMENTS: We agree and will rewrite this to 'Temperature is monitored in the air, snow cover, at the ground surface and/or in the upper layer of the ground. . .' in a final revised paper.

Figures 1 and 2: It would help the reader' orientation to include a smaller map showing the location of the two regions on a continental scale. AUTHOR COMMENTS: We agree and will update the figure with an inset map showing the position of both two observatories.

Figures 3 and 4: The text is sometimes very small and could be magnified. AUTHOR COMMENTS: We agree and will improve this in a final version of the paper. Figure 3 will become full text width.

Interactive comment on Earth Syst. Sci. Data Discuss., 3, 27, 2010.