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Geoscientific Instrumentation Methods and Data Systems Discussions

Interactive comment on "Sodankylä manual snow survey program" *by* L. Leppänen et al.

Anonymous Referee #2

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Sodankylä manual snow survey program

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The authors present an overview of snow measurements in Sodankyla, Finland, providing a useful reference to high quality, often long term, data sets of conditions at a European Arctic location. Greater exposure of these data to the wider scientific community is of value and should provide a valuable baseline data resource. In its current form, the manuscript lies between a metadata document describing what data are (or may be) available and a descriptive paper of changes in measured snowpack properties. To increase the scientific impact of the manuscript I strongly recommend the authors increase the descriptive presentation of data and consider the following com-

ments before publication.

Major comments: 1. Within the remit of this journal, a descriptive article presenting data and their temporal patterns and trends without analyses would be highly acceptable. However, too often methods and durations of data collection are presented without presentation of the data sets themselves. Presenting data is, in my view, is essential to this 'data paper' and would significantly add value to the reader who could then directly reference basic statistical summaries, as well as temporal trends. Figure 3 and Table 2 are good examples of this, but they represent a fraction of data listed in Table 1. A non-exhaustive list of ideas would be: Non-pit measurements of SWE and density would be useful. Spatial comparison between data (e.g. snow depth) at different sites (e.g. IOA, bog, course etc.) in the same years (i.e. an idea of spread of snowpack properties). SSA changes over annual cycles would be very interesting, especially if broken down into major layers (e.g. depth hoar, wind slab, rest of snowpack).

2. The current structure of the manuscript could be improved. Site and history should clearly show all sites that will be discussed (e.g. Fig 1 does not show locations of the snow course or the lake). Better figures could combine relative locations as well as detail about spatial variability of local vegetation. History is not all that relevant to the reader, rather concentrate on what data exist, for what duration and where they can be accessed. Linking Fig 1 & 2 explicitly would add value. Detailed information about each site (substrate, surface, vegetation) would be very useful.

3. Structure of section three is confusing. Currently it starts by data type, then location (3.3), then grouped data due to the measurement style (i.e. pits in 3.4), then measurement methods (3.4.1) then spatial changes (3.4.2), then uses example data (3.4.3), rather than a comprehensive presentation of available data. I suggest a methods section covering all sites, all measurements, and all techniques. Then present data by snowpack property (grouping physical properties where appropriate) and include description of spatial variability of data when data are temporally coincident at different locations. Where temporal patterns don't show much change (e.g. Fig 6) could the

data be summarized more succinctly in a table?

4. While Fig 4 is visually appealing it is not necessary and could be removed to free up space for presentation of data. The snapshot of Fig 5 doesn't add much, rather can you find a way of summarizing temporal change in some of the variables (see point 1 above)?

5. Where you do not show data (e.g. brightness temperatures of microwave radiometers, broadband albedo), remove descriptions from the text. However, I would rather see these data included AND presented, which would make it a much stronger paper.

6. Where multiple methods are used to measure the same property (either when they have changed over time or more than one method is used at the same time) please can you indicate these durations in a table (e.g. Table 1 or a version of Table 1 if it becomes too big to fit in a single table). Where appropriate, can the time windows when data are available electronically or just paper records be indicated in Table 1? Can the ownership (or institute granting access) of each data set also be indicated (e.g. FMI, SKYE etc.)?

7. The use of personal emails rather than a form of online data repository (e.g. a DAAC) as the main (only?) access point is a weak link due to potential movement of scientific personnel. With the backing of FMI / SYKE can a more long term approach be formulated to allow data access well into the future?

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