

Comment on **essd-2021-68**

Anonymous Referee #4

Referee comment on "Operational and experimental snow observation systems in the upper Rofental: data from 2017–2020" by Michael Warscher et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-68-RC4>, 2021

General comments:

The manuscript 'Operational and experimental snow observation systems in the upper Rofental: data from 2017–2020' by Warscher et al. provides a description of different types of continuously recorded snow and meteorological datasets - using standard as well as experimental sensors - collected at three sites in the Rofental in the European Alps. The manuscript is an extension of the ESSD paper 'The Rofental: a high Alpine research basin (1890–3770ma.s.l.) in the Oetztal Alps (Austria) with over 150 years of hydrometeorological and glaciological observations' by Strasser et al. 2018.

Although the title and the abstract imply that all data has been available since 2017, a closer look reveals that some datasets do not start before 2019 or even 2020. In addition, data gaps are an issue that has not been discussed in detail. I agree with Reviewer 2 that the covered time period for some recordings (especially for the unique experimental snow measurement setups) is too short for publication at current state. Therefore, I also recommend waiting some more years and collecting a longer time period of data before publication. In general, I agree with the general and specific issues raised by Reviewer 1 and 2 as well as the specific/technical comments raised by Reviewer 3 and will not repeat them here again. In particular, information on assessment data quality should be included.

However, I see good potential for publication in a few years (i.e. after extending the dataset for approx. two more years: 1) There is a great need for standard and experimental continuous snow monitoring datasets that cover longer periods in high-alpine regions, as such datasets are still very sparse. 2) The Rofental research catchment seems to be an ideal site for glacier, snowpack and hydrological model applications and developments, especially since the basin is not influenced by hydropower structures.

As the authors are focusing on datasets for snow observation, it would be wise to include

and describe also the other snow measurement sites in the Rofental research basin (stations Hintereisferner and Vernagtbach) in this manuscript, although they were already introduced in Strasser et al. 2018. Adding these two sites in the manuscript would make the multi-station dataset even more valuable. I agree with Reviewer 3 that the data provided on the PANGEA platform was easily accessible and, except for the data gaps, was complete as described in the manuscript.

Specific comments:

- L. 2: The altitude of the research basin might be of interest for the reader; however, as you describe the data sets of specific measurement sites, the altitude of these sites would be at least as interesting to mention.
- 3: The expression 'original' (which is written twice in this line) seems strange in this context and implicates your work is somehow not original. Better change to: 'The dataset of our first study published in 2018 (<https://doi.org/10.5194/essd-10-151-2018>) contains... The time series presented here...'
- Section 1: Please add some information on similar sites and studies (i.e. Ménard et al. 2019, <https://essd.copernicus.org/articles/11/865/2019/>).
- 58-60: As you are describing snow drift measurements in detail (Section 4.2.4), I would recommend to introduce this point already here, i.e. extending point I to : I) Improved process understanding of snow drift, accumulation and melt dynamics in high mountain regions.
- 92-93: Information on topography and meteorological conditions of the research site should be moved to Section 2.
- Section 3.1 and 3.2: Several statements (especially the site descriptions, coordinates) are repetitive. I would suggest merging these two subsections and describing each site individually introducing their meteorological and snow sensors together in one subsection.
- Section 4.2.4: This section is very long compared to the other subsections of 4.2. I would suggest to describe the snow drift measurements in general in this section and move the explicit case study to a new section (i.e. Section 5: Case study - Application of the dataset for an improved assessment of avalanche-critical blowing snow situations).