

## **Review of DebDab: A database of supraglacial debris thickness and physical properties**

### **General comments:**

The manuscript presents an extensive dataset of supraglacial debris properties, compiled into a database. The database is an important and valuable contribution to the research area of debris covered glaciers, as nothing on this scale has existed previously. It will be an excellent resource to which data going forward can be added to.

Generally, the manuscript is largely well written and presented clearly and logically, with useful figures and tables. There are a few minor issues, detailed below, which are provided to enhance the flow of the paper and to clarify some aspects.

The data files are easily accessible, well presented, clearly organised and sufficiently explained for publication. I think it is great that templates for submitting data are provided, as combining data into a database is often time consuming due to variations in their presentation.

I do suggest the title 'DebDab' is replaced with 'DebDB' as DB is the common acronym for database, and thus makes more sense.

In conclusion, I think this manuscript is publishable following minor corrections.

### **Specific comments:**

Line 4: Suggest 'supraglacial debris' is changed to 'supraglacial debris layer' to be more specific, as the properties collated into the database are debris layer properties rather than individual clasts.

Line 6: Suggest 'has not been published before' is changed to 'are previously unpublished'.

Line 10: Suggest replacing 'for the' with 'to'

Line 11: Suggest replacing 'DebDab' can be used' to 'The data within DebDab can be used'

Line 17: Suggest replacing 'the entire manifestations of debris across elevations' with 'debris properties for all elevations'.

Line 18: Suggest replacing 'DebDab is an openly available dataset that aims at evolving and being updated with' with 'The aim of DebDab, as an openly available dataset, is that it evolves over time and is updated and added to through'.

Line 25: Suggest that '(1-2 centimetres)' is updated to '(less than around 2 cm)' or '(less than a few centimetres)', as a thin debris layer can be less than 1 cm thick, and the threshold varies from the glacier to glacier, so is not as specific as currently stated.

Line 26: Suggest replacing 'and thicker debris reducing it by' with ', whilst thicker debris reduces melt by'.

Line 36: Suggest replacing 'insufficient' with 'limited' so the former is only used once in the sentence.

Line 45: Suggest replacing 'as measurements' with 'as collecting such/these measurements'.

Line 46: Suggest replacing 'often involve' with 'are often'.

Line 48: Suggest replacing 'may be' with 'is'.

Line 54: Suggest adding 'into one database' after 'properties'.

Line 56: Suggest replacing 'for the scientific community for their modelling' with 'for use by the science community to support and enhance numerical modelling'.

Line 62: The use of 'the debris' is somewhat vague here and throughout the manuscript. I suggest replacing with 'the debris layer' or 'the bulk debris layer' throughout to show you are considering properties of the bulk debris layer.

Line 71: Suggest replacing 'due to its' with 'through'.

Line 73: Suggest removal of 'the' before 'melt'.

Line 80: Suggest replacing 'or' with 'which is'.

Line 93: Suggest rewording 'can range from 20% to 60%' to 'has been found to range from 20% to 60%' or including '~' before each value. It is unlikely these values are absolute thresholds.

Line 94: Suggest including '~' before the values in 'from 40% at the surface to 20%'. It is unlikely these values are absolute thresholds.

Line 101: Suggest replacing 'with increasing debris cover area' to 'as the proportion of the debris covered glacier surface increases'.

Line 103: Suggest replacing 'above' with 'Section 2'.

Line 106: Suggest removal of 'a compilation of'.

Line 109: Suggest removal of 'over' before hundreds'.

Line 110: Suggest addition of 'provides a' before 'citation'.

Line 142: Suggest replacing 'debris thickness values are provided in metres, surface roughness length in metres' to 'debris thickness values and surface roughness length are provided in metres'.

Line 144: Suggest replacing 'As detailed data descriptions as possible are included in the database' with 'The data descriptions provided in the database are as detailed as possible'.

Line 147: Suggest replacing 'The dates of the measurements' with 'Dates on which measurements were collected'.

Figure 1: Figure 1 should be placed under the text in which it is introduced (Section 4.1.).

Line 165: Suggest replacing the second 'information' with 'provided'.

Line 169: Suggest replacing 'show a high variability' with 'highlight the variability'.

Line 175-176: Suggest capitalising 'region' in all cases.

Figures 2 and 3: These plots could be combined into one figure, so they are easier to view together.

Line 189: Suggest 'very similar' is replaced with 'near to'.

Line 190: Suggest replacing 'that (Brock et al., 2010) provide and that' with 'that Brock et al. (2010) calculated, which'.

Line 192: Suggest adding 'which is apparent' before 'despite'.

Line 205-210, Figure A2: I do not think this analysis is particularly useful, and the paper would not lose anything if it was removed. Variability in debris properties can be big over the chosen arbitrary distance of 10m, and will vary between glaciers and at different locations on a glacier. I suggest removal of this analysis.

Line 215: Suggest replacing 'properties in' with 'property values within'.

Line 215: Suggest including 'constraining' before 'energy'.

Line 227: Suggest replacing 'around  $\pm 10\%$ ' with 'varying values by up to'.

Line 228: Suggest addition of 'available' before 'in DebDab'.

Line 233: Suggest adding 'and compared to existing data' before 'to understand'.

Line 239: Suggest replacing 'provided by' with 'available in'.

Line 243: Suggest replacing 'once more data' with 'as more data become'.

Line 25: Suggest addition of 'Consequently,'

Line 264: Suggest replacing 'This shows that for the middle segment of the glacier in particular debris thickness measurements are undersampled' with 'Consequently, these results highlight that there is a lack of data available for the middle segments of glaciers'.

Line 265: Suggest 'These are' with 'The middle glacier area'.

Line 280: Suggests removal of comma.

Line 281: Suggest replacing 'despite the strong efforts in collecting as much data as possible, and as detailed as possible' with 'despite the effort to collate as much detailed data as possible'.

Line 282: Suggest replacing 'have escaped the data collection of' with 'were not available for inclusion in'.

Line 285: Suggest including 'for it; between 'is' and 'to'.

Line 285: Suggest replacing 'updating' with 'being updated'.

Line 288: Suggest replacing 'These data can then on a yearly basis be included into an updated version of DebDab.' with 'These data can then be included in future updated versions of DebDab'. This change is suggested so the authors are not tied to a specific schedule of updating!

Line 295: Typographic error in 'gran'.

Line 307: A comma is suggested before and after 'r such as North America and South America'.

Line 308: Suggest replacing 's from the upper reaches' with 'from the middle and upper reaches'.

Line 332-333: Suggest commas are adding in the following places for this sentence: 'Some regions, such as South Asia East and West, show consistently thicker debris than other regions, such as Central Europe or Alaska.'.

Line 333: Suggest the addition of 'the production of' between 'enables' and 'an'.

Line 337: Suggest replacing 'for any use of the dataset' with 'when using the dataset'.