

General Comments:

This manuscript integrates a wide range of published and unpublished datasets (of different vintage and source) to build an impression of bathymetry off the Coat's Land margin on the eastern side of the Weddell Sea embayment, Antarctica. The data derive from multibeam echo sounder measurements obtained during several different cruises, regional bathymetry from the International Bathymetric Chart of the Southern Ocean, and a new 500 m regional grid of bathymetry near the Brunt Ice Shelf and Stancomb-Wills Glacier Tongue. The latter was derived from a range of datasets that measured sea floor depth, including seismic soundings, historical ship tracks inland of the present ice-shelf front, and single-beam echo sounding measurements. A geomorphological investigation of the new bathymetry data, supplemented by data from sub bottom profilers, seismic reflection surveys and radiocarbon dated sediment cores, is then used to build an understanding of the process and timing of ice retreat off the Coat's Land margin following the last glacial maximum. The authors find the Coat's Land glaciers merged with the palaeo-Filchner Ice Stream at the LGM, after ~24 cal kyr BP. They also suggest four phases of ice retreat that include the establishment of ice shelves. The data provide new insight on the evolution of this margin of the Antarctic Ice Sheet following the LGM, and insight on the future stability of ice along this coast. This is an impressive amount of diverse data coming together to shed new light on ice history along the Coat's Land margin. In my view the conclusions are reasonable and are based on sensible interpretations of the data. Therefore, I recommend it be published with only minor changes.

Specific comments:

Methods: There is significant discussion about the multibeam data collected from the James Clark Ross cruises (L12-18) but no discussion about data from the Polarstern. Presumably this information is available and could be incorporated into the manuscript. Also, there is no sense of the proportion of data deriving from the different sources. Some further discussion and/or a figure would help to clarify this. It would be nice to see some discussion on the reliability of the 35-40 m grid cell size (presumably some of the data derive from larger grid cells?).

Figures: There are a number of issues regarding figures being mislabelled in the text, in the figures themselves, etc. Please do a thorough check that all figures are correctly labelled in the final version. I'll point to some of the mistakes below.

Technical corrections:

L38: remove comma after future

L21: spelling of Nunatak

P5L2: perhaps report the average slope for "moderate" and "steep" : or at least report the length of the survey line.

P5L22: Confusing: a direct glacial deposit that contains dropstones? Perhaps on top, or beneath, but not in the till. Clarify.

P6L19: Fig 7a

P6L20: Figs. 4c, 7d

P6L25: reference after floatation

P6L36: add “a” before 100-400

P6L38: I don’t follow the argument on the orientation of the feature – a profile might help?

P7L37: It’s interesting to consider how glaciers have eroded such deep troughs, in this case 450-900 m deep, without removing the pre-existing marine sediment, in this case the MIS 3 open-water marine sediments. Does this say something about the age of the eroded troughs? The spatial variability in erosion rates?

P8L18: Fig. 7d

P8L24: reference?

P8L28: add comma to 9,555. It may also read better if you put cal yr BP after each age.

P9L2: include the evidence for the grounding line halts at trough narrowings, etc...”as evidenced by...”

P9L7: remove “nearly”

P9L19: remove “rises”

Figure 1: The Legend in panel c describes features observed in panel b. Either move legend, or better, add the features to panel c too.

Note inset boxes are labelled wrong: 6a, 6c, 6d should be 7a, 7c, 7d

Figure 3: a) Label the cross section displayed in Figure 8a (note: 8c is labelled WRONG – it is actually 8b), but 8a is not labelled at all [ok, it has the s116, but easier if you give figure number too])

Note also in this figure and others, that the white dotted lines indicate the cores, AND the number next to that dot is the core number.

Figure 4: explain that this is a bathymetric map.

Figure 5: In b) perhaps differentiate the data sources by colour

Figure 6: It is very difficult to taken anything from this figure. I’d suggest changing the colour of different units.

Figure 8: In caption: Define TWT and VE, and explain what the y-axis scale refers to (ideally in the figure too). In caption: Note that Dawson-Lambton Trough and Albert Trough are backwards. Profile B is Albert, and C is DLT.

Figure 10: caption: add “of” after photograph