Dear prof. Stokes! Tromsø, June 24, 2020

First of all we would like to thank the reviewers for providing us a thorough and constructive review of our manuscript "Last Glacial ice-sheet dynamics offshore NE Greenland – a case study from Store Koldewey Trough". Their critical and constructive comments have been very helpful in improving the manuscript.

In the file *Revision Store Koldewey Trough – changes marked*, added and re-written paragraphs, as well as corrections of misspellings are marked with track changes.

In the following, we would like to give some feedback on the referees' comments and on some changes that we carried out as a consequence of the reviews.

Both reviewers commented on our use of the geophysical data previously published by Laberg et al. (2017), arguing we should be more explicit in differentiating what is published and what is new, as well as pointing out our re-interpretations. We agree that this should be stated more clearly and have, therefore, provided this information in chapter '4.2 Submarine landforms: glacial – deglacial ice-sheet dynamics' in the revised manuscript.

In the first version of the manuscript, we had included XRF core scanner data, shear strength, magnetic susceptibility and wet bulk density data in the result chapter. Both reviewers found our use of this data unsatisfying, suggesting we either remove it from the manuscript or discuss it further. We agree with the referees and have, therefore, removed the XRF core scanner and shear strength data from the manuscript, thus, focusing on the data that is absolutely relevant to determine the different lithofacies.

The reviewers questioned the landforms interpreted as crevasse-squeeze ridges and multi-keel iceberg ploughmarks in the first version of the manuscript. Therefore, we have re-visited the data set and examined existing literature once more. The result is that we changed the interpretations of these landforms to be saw-tooth moraines. As a consequence, the discussion regarding possible surging during the deglaciation has been removed. Both reviewers were unconvinced by our interpretation of the mega-scale glacial lineations on the middle shelf. However, we wish to keep our interpretation and have provided justifications for this in the comments to reviewers.

We have restructured and rewritten the discussion chapter. This includes reorganization of existing paragraphs, as well as incorporation of new paragraphs focusing on possible drivers of retreat, the role local trough topography may have had on the retreating ice front, as well as calculations on GZW volumes and the relative length of time of grounding line stabilization.

We removed figure 10, a schematic landform-assemblage model for Store Koldewey Trough, as suggested by the referees.

Both the abstract and conclusions have been adjusted according to the changes in the revised manuscript.

With the support of the co-authors of the manuscript, the author list has been rearranged, now listed by relative contribution.

We hope that the responses to the referees and the adjustments of the manuscript are satisfactory, and that the manuscript has a level to be accepted for publication in The Cryosphere.

Please to not hesitate to contact us in case of any further questions and/or the need of additional clarifications!

Kind regards on behalf of the authors,
Ingrid Leirvik Olsen