

Interactive comment on “Glacial sedimentation, fluxes and erosion rates associated with ice retreat in Petermann Fjord and Nares Strait, NW Greenland” by Kelly A. Hogan et al.

Anonymous Referee #2

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The manuscript of Hogan et al. present new knowledge from the Petermann Fjord, and is based on seismic profiles. The study gives important information from a fjord environment that rarely are surveyed due to ice conditions and its remote location. The paper is suitable for publishing in the journal, but only after a moderate to major revision. The main comment to the paper is that it must be better structured and that the discussion has also to implement a depositional history of the fjord system.

Comments:

1) Chapter 1. Introduction: The paper should better explain why this study is of regional interest. As it is in the present paper the focus is quite local (Greenland). Why should

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we read this paper?

2) Chapter 1. Introduction: In the listing of the objectives (lines 70-75) a more overall objective should also be included, e.g. compare erosion rates in this fjord environment with fjords elsewhere, global outlook, regional considerations. The objectives as they are now is quite “local”.

3) Some more references to Figures 1 and 2 should be included in Chapter 1

4) In the heading of Chapter 2 delete “(geology, physiography, oceanography)”

5) Chapter 3 should be renamed to “Data and Methods” as you also describe the data used in the study

6) Chapter 3 does not include information about the cores you have used in the study. Information about these cores (and which now partly are in Supplementary Material) should be mentioned.

7) All information provided in Supplementary Material should instead be implemented in the main text as I think the information in Supplementary Material is essential for the paper.

8) The methods used in the papers (how to calculate drainage area, erosion rates etc) are as I read it spread a bit around in the paper. Please structure the paper in such a way that all your methods are included in Chapter 3

9) The Result chapter should be restructured. As it is now it is some repetition of the text. I suggest that you in 4.1 included information (text and figures) from the Supplementary Material in defining your facies. Furthermore, I suggest that Chapters 4.2 and 4.3 are merged to get a better overall view of the study area. You do not need to repeat the definition of the facies in chapters 4.2 and 4.3 (or what these facies are composed of) since you have already defined this in Chapter 4.1.

10) Why do the manuscript have an own chapter on GZWs (Chapter 4.4). This chapter

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could also be merged into the merged 4.2-4.3 chapter. I also find that there is some repetition of text in this chapter (Chapter 4.4) from previous part of the text.

11) Chapter 5 is also a result and should be part of Chapter 4. I do not think it is necessary to subdivide the sediment volume chapter into sub-chapters.

12) Chapter 6.1 is partly a review (e.g. lines 355-370) and partly a result/discussion text about how to calculate volumes (lines 383 - 400). Thus, part of the Chapter 6.1 text should be included in the result chapter and the entire Chapter 6.1 should instead include a text about the development of the fjord system; telling the reader what have happened in the fjord during LGM and the last deglaciation (based on your data)

13) Chapter 6.2 also includes methods (e.g. calculation of erosion rates in lines 435-450) which should be included in Chapter 3 and results (the erosion rates itself, e.g. lines 450-470) which should be in the result chapter. Chapter 6.2 should focus on comparison with other fjord systems (regarding erosion rates, volumes etc).

14) Some more references to fjord papers from UK, Norway and Svalbard should be implemented. The last few years numerous papers have been published, and which are relevant for the present manuscript.

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