

## ***Interactive comment on “Submarine melt as a potential trigger of the NEGIS margin retreat during MIS-3” by Ilaria Tabone et al.***

### **Anonymous Referee #2**

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The objective of the study is to test whether submarine melt (ocean warming) could be the primary cause of the ice margin retreat of NEGIS during MIS3 and MIS1 that was recently documented by Larsen et al 2018 using radiocarbon dating of reworked shells in historical (LIA) moraines. It uses the GRISLI-UCM 3D ice-sheet-shelf model to simulate the influence of submarine melt using a variable amount of melt rates.

I am not an expert in ice sheet modelling and cannot evaluate if the model set-up is state-of-the-art, but the description of the model set-up is easy to follow and understandable. It also seems to be realistic melt-rates that have been used to force the model. The manuscript is generally well-written, and the model-data comparison provides new and interesting knowledge about the potential effect of ocean warming and submarine melt on the evolution of NEGIS. However, there are a few places where

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minor revision is warranted. These are listed below.

Page 1 Title: I am not aware of the TC politics on using abbreviations in the title, but I would avoid using them. The title could be changed to: Submarine melt as a potential trigger of ice margin retreat of the Northeast Greenland Ice Stream during Marine Isotope Stage 3

L1: remove “area”

L5: Why is this a conundrum? – this should be explained in more detail.

L9: MIS3 = Marine Isotope Stage 3

Page 2 L11-: change to.. . . .even retreating 70 km behind its present-day position from 7.8-1.2 ka during most of the mid- and late Holocene and 20-40 km from 41-26 ka during Marine Isotope Stage 3 (MIS-3, c. 60-25 ka).

L12: Stage NOT state

L20: change to (LIG, c. 128-116 ka)

Page 5 L15: change to (c. 116 ka)

Page 6 L20 and L24: I guess it should be the last 45 ka?

L34: change to mid- and late Holocene

Figure 1: I would make the inset map bigger and outline NEGIS – maybe as a panel next to the diagram. It would also be useful if the LIG, MIS3, LGM, Holocene time periods are as shown as vertical bars.

Figure 3: I would suggest making the figure bigger as it is difficult to see the details in the maps. Maybe an outline of NEGIS could be placed on top of the velocity fields? It would also be valuable for the discussion if the LGM reconstruction of Funder et al and the minimum reconstructions (MIS-3 and MIS1) of Larsen et al could be shown on the maps.

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-228>, 2018.

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