

Interactive comment on “Modelling the fate of surface melt on the Larsen C Ice Shelf” by Sammie Buzzard et al.

Anonymous Referee #2

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Review of “Modelling the fate of surface melt on the Larsen C Ice Shelf” by S. Buzzard, D. Feltham and D. Flocco

This manuscript presents the application of a melt pond model to the Larsen C Ice Shelf, explores sensitivities to changes in precipitation and temperature, and estimates implication for ice shelf stability of available meltwater on surface crevassing. It is an interesting and timely study and fits well into the scope of The Cryosphere. However, I would like to raise some points which should be addressed before publication. Details on this can be found in the commented pdf included as a supplement.

1. Structure: The overall structure of this manuscript is not very clear. Methods should be introduced in more detail and not mixed up with results and interpretation. This makes it hard to follow. In many places the text could be more concise.

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2. Model introduction: The mathematical model used has been introduced in a separate paper, but here it is first applied to a real-life setting. In my opinion there is not enough information about the model included in this manuscript. It's general concept, the required input data, the chosen parameter settings (e.g. the catchment area estimation), all this is not very well explained. The manuscript would benefit from including a “Methods” chapter where this is all summarized.

3. Model validation: As I understand this model, the evolution of melt lakes is mainly based on high resolution (in time) weather station data for one location on the ice shelf. In terms of validation it would have been desirable to also use data from a different area on the ice shelf where no lakes are observed and look at the model performance there (hopefully no lakes?). It also is not clear from the description whether the weather station actually is in the area where the lakes are formed. The limitations of the model are not really discussed.

Please also note the supplement to this comment:

<https://www.the-cryosphere-discuss.net/tc-2018-84/tc-2018-84-RC2-supplement.pdf>

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-84>, 2018.

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