

Interactive comment on “Stopping the Flood: Could We Use Targeted Geoengineering to Mitigate Sea Level Rise?” by Michael J. Wolovick and John C. Moore

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I first read the article Moore et al. 2018 in Nature and this sparked my interest in this proposal. This manuscript is focused on the proposal to build an artificial sill to protect the ice from melting caused by the warmer incoming water. The authors used a simplified model to investigate a time period of 1000 years based on different scenarios, which included sills with different blockage rates. Costs and feasibility are discussed and also lighter constrictions are mentioned. It is obvious a paper to use as a starting point and think/discuss the proposal further.

I have to notify that I'm not an expert in this research field but hope that my suggestions/questions further strengthen the understandability for a bigger audience.

C1

- Abstract and page(P) 13 line(L) 15: The 30% probability of success is an estimate based on which calculation or boundary conditions?

- The water level is fixed for the calculation time because it is comparable small to the ice sheet. I couldn't find a comment on this in the discussion part.

- As above mentioned, I'm not an expert in this particular research field. Consequently, in my opinion it would be very useful if in the section Methods (or alternatively in the supporting information) the simplifications are summarised, which gives the reader a previous overview of the used model and its assumptions.

- P6 L10: The construction time of 10 years seems to be a very conservative approach but it's reasonable keeping the difficult boundary conditions as well as the length in mind. The fixed beginning of the work in 100 years should be questioned; especially, when looking at the animations. Except of the animation 5 all other scenarios would suggest that the sill is built under the floating ice shelf, which would lead to a dramatic increase of the difficulty and cost of the intervention. Maybe a flexible starting point of the work based on an ice-free sea on top of the potential cross section would be a good starting point.

- P9 L7: How did the authors define the collapse of the ice sheet? Which criteria was used? Please clarify this.

- Figure 5: It would be good to have a clear connection the individual subfigures and the added animations.

- The discussion starts with a general comment and some further (research) questions and ends with the geoengineering. In the middle part the used approach is discussed and ranked as a first step. I would suggest to split this into two different subsections. One with a general discussion and an additional part, in which all assumptions are summarised.

C2

- The animation 1 and 2 only cover 120 years of the total investigated 1000 years. It would be nice to see the full period to compare it to those with the intervention. All animations show the similar first 100 years and in consequence the novelty of these videos are only 20 years.

- If I understand it correctly, the animation 1 and 2 show the same result hence the build structure has 0% blockage. It would be very useful, if in the section Movies in the supplement documents the choice of the presented movies would be explained and also the main findings summarised.

I would like to thank the authors for their very interesting paper and I'm looking forward to the final version. Thank you!

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-95>, 2018.

C3