

Interactive comment on “Repeat UAV photogrammetry to assess calving front dynamics at a large outlet glacier draining the Greenland Ice Sheet” by J. C. Ryan et al.

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We would like to thank the reviewers of this paper for their helpful and insightful comments. The suggestions will be incorporated as best they can and we will think about how some of the broader points apply to our paper. We also apologize for the delay in replying. The first author was away on fieldwork just after the paper was uploaded onto Cryosphere Discussions.

The error sources raised by M Nolan are important and we will clarify these where possible. We will include the parameters used in Photoscan and a more thorough description of the steps taken in processing. Without manually shifting the DEMs using

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‘software’ GCPs, the horizontal difference between DEMs were tens of metres. A large part of this difference is likely to be caused by not knowing when the picture was actually taken after the camera was triggered. This probably causes a systematic error in the geo-referencing of the pictures, which will present problems for any similar studies. We aim to remove this error using the methods outlined by Welty et al. (2013) in further studies. The glaciological point raised by M Nolan has sparked interesting discussion and, is again, something that will be considered in the future.

We will aim to tone-down the discussion where D Benn suggests but believe that there are some useful analysis worth keeping and which will be refined. The discussion regarding dynamic thinning and acceleration will be clarified with reference to the Ahlstrom et al., (2013) paper noted by M Pelto. However, the GPS referred to in that study were placed a few kilometres upstream and we have reason to believe that the frontal zone (within 1km of the calving front) behaves relatively independently of up-stream dynamics. We think that highlighting this could provide interesting points of research for future studies. A better analysis of ablation will be carried out using the degree-day model approach suggested by M Pelto.

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