

Interactive comment on “Generating synthetic fjord bathymetry for coastal Greenland” by Christopher N. Williams et al.

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General Comments: Overall this is a good paper worthy of publication with just minor revisions. The methodology described here should find some important uses in glacier modeling studies by greatly improving the predicted local bathymetry within fjords compared to the regional interpolations. The text is clear, well written, well organized, and the figures are very good. I do have a few suggestions for improvements.

Specific Comments: 1) Page 2, line 16: the term “physically based” is too vague.

2) Page 3, Line 19: Goff et al. (2014) should be referenced with regard to statistical modeling and interpolation.

3) Page 5, line 30: It is stated that “to the best of our knowledge, there are no studies

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that have considered spectral analysis of fjord bathymetry.” That is technically true, but Goff et al. (2014) certainly investigated the statistical characteristics of subglacial channel geometry in great detail, and that has to be considered highly relevant to this study.

4) Page 7: This description of the methodology for centerline picking includes a number of seemingly arbitrary values: an unknown “predefined distance interval”, parent edge $< \pi/6$, angle between any pair of new edges no less than $\pi/24$, $|x-x_i|$, $|y-y_i| < 16$ km, $|a-a_k| < \pi/8$. The authors should endeavor to provide rationales for these values.

5) Pages 7,8: I think that the demonstration of centerline picking would greatly benefit from using a path that was not a perfect straight line. This part is a bit hard to follow, and I think a curved path would give the reader a more intuitive sense about how it really works. I would suggest in particular that the geometry used for Figure 6 be the same as used for Figure 5. I also wonder: in looking at Figure 4b, wouldn't it be a lot simpler to just follow the path of maximum distance?

6) Page 14, line 26: It is inaccurate to say that this is the first time such a methodology has been applied to fjords since subglacial channels are geometrically identical to fjords.

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