

**We would like to thank the referees for the time they devoted to this second revision of the manuscript. We respond (in blue) to each of the reviewers' comments (in black) below and propose a revised manuscript, hoping to meet the expectations.**

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### **Authors response to Anonymous Referee #1**

I am pleased with the modifications made to the manuscript,  
The authors have addressed all the points raised during the first round of reviewing.  
I would therefore recommend the manuscript for publication.

One minor point concerns the conclusion; a sentence should be added that relates to the questions raised in the introduction on the role of freshwater in the local to general circulation, and the suitability of satellite derived surface current product to help answering this question.

We are pleased that the revised manuscript has addressed the points raised in the first round of revisions. Regarding the point relating to the conclusion, we have added the following paragraph at the end of the conclusion (l. 450-453) to explain how these results will help to answer the questions raised in the introduction.

“The results of this assessment pave the way for a long-term study of currents around the southern tip of Greenland based on satellite observations. They have the potential to improve our understanding of freshwater exchange between the shelf and the ocean basin by adding 30 years of observations to the results of modeling work, and possibly eliminating some model disagreements.”

### **Authors response to Anonymous Referee #2**

The revised manuscript now has a clearer focus, which makes it easier to read and more informative. Many of the reviewer's comments were addresses. There are a few minor comments left. Some of the figure panels are very small and details are not visible (see comments below). Also, despite both reviewers requests, a qualification of the skill score is still missing. This should be easy enough to add in the text and it would add to the interpretation of the results to have this information.

Lines 135-144: There are three subsequent uses of 1), 2) and 3)> is not clear if the second two uses refers to the items described in the first enumeration or whether they are separate new enumerations.

The subsequent uses of numbers refer to the same three steps. For greater clarity, we have added the word "step" before the numbers (e.g. step #1).

Line 231: it stated that a skill score of 1 is nearly impossible to get, but it would help to have more information on what is considered a good or acceptable skill score. Further on the authors state that Lui et al found skill scores of such and such, but they do not say what qualification Lui et all gave these (bad, acceptable, good?). The general qualification could also be given around line 170, where the skillscore is introduced.

Liu et al does not define bad, acceptable, or good skill scores – they simply compare different models/products to their skill score by suggesting that models with higher skill scores better represent the flow. The skill scores are a useful tool to assess where and when the simulated particles are doing better and worse relative to one another, as well as relative to previous results. Here we use the same idea, in assessing where and when the simulated particles simulate the drifter trajectories well, as well as compare our results with those reported in Liu et al.

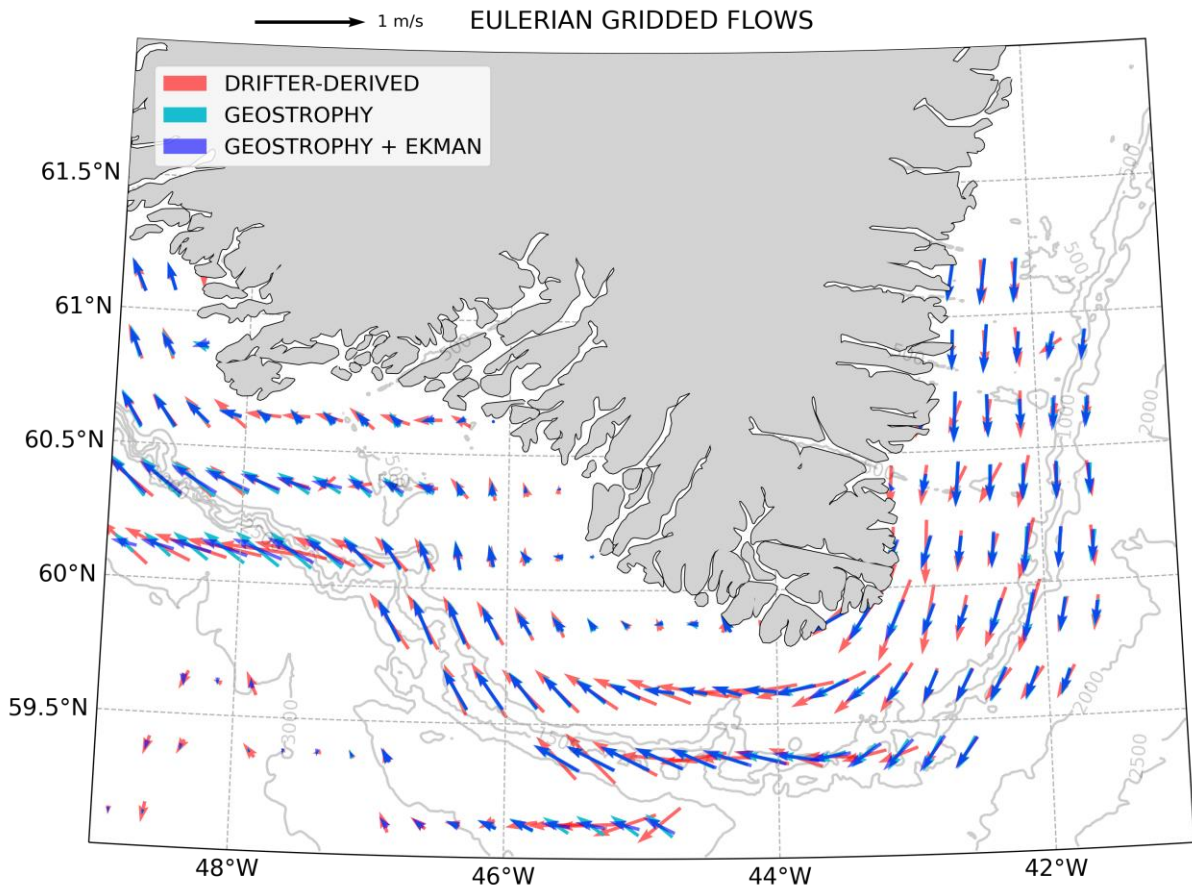
Line 273 “lower RMSE could be explained by the smaller magnitude of the across-shelf velocities which make the lower RMSE worse relatively to the magnitude of the velocity component” This sentence is hard to read and not very clear. Especially “make the lower RMSW worse” is vague, as low errors are generally good.

We agreed that our message was not clear in this formulation. The expression "signal/error ratio" explains more clearly what we meant here. We reworded the sentence as follows:

“this lower RMSE could be explained by the smaller magnitude of the across-shelf velocities, which imply a lower signal-to-error ratio” (l.273-274).

Fig 6. It is not possible to see the yellow arrows, or maybe they are hidden underneath other arrows. Similar comment for S3. Some colors do not show and the two blue colors that are used are not very distinct. If the differences are so small, maybe it is clearer to plot anomalies.

As the colors are not easy to distinguish, we have used another set of colors (avoiding yellow) that seems easier to see. Here, we have consciously chosen to present the magnitude rather than the anomalies, even though the superimposed arrow may be difficult to see. Indeed, in this case, it means that the vectors are almost identical, which is the main aim of this figure, to show the coherence between the vector fields.



Figures 8 and 9. The panels are very small and hard to see features and read the label text. Could these be made bigger?

We agree with this comment and have reorganized the sub-figures to increase their size.