

Interactive comment on “Multi-year particle fluxes in Kongsfjorden, Svalbard” by Alessandra D’Angelo et al.

Anonymous Referee #1

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This is a very good manuscript on an important topic in Arctic climate change research - congratulations. The authors used a unique dataset from Kongsfjord and analysed it on a high level and to an impressive depth. The ms is well written even though quite long. See my recommendations on this below. I highly recommend to publish this paper because it is not only important with respect to biogeochemical issues but also to many other disciplines in Arctic coastal research.

My specific answers to the review questions.

1. Does the paper address relevant scientific questions within the scope of BG? Yes, the ms gives a deep insight in some major biogeochemical issues with respect to temporal and spatial matter fluxes in an Arctic fjord system located almost in the center of global change, in Svalbard.

C1

2. Does the paper present novel concepts, ideas, tools, or data? Yes, the ms presents data from a 6 year study of mooring data which are new and most important for a better understanding of the effects of glacier melting and changes in the overall hydrography due to increasing air and water temperatures.

3. Are substantial conclusions reached? Yes, the ms provides sound and substantial conclusions.

4. Are the scientific methods and assumptions valid and clearly outlined? Yes, all methods and assumptions are clearly outlined and explained. This is most important because the results are also of importance for other disciplines than biogeochemistry.

5. Are the results sufficient to support the interpretations and conclusions? Yes, the results are sufficient and all interpretations and conclusions are well supported by the data presented.

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes.

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes. There are some newer articles about the inner Kongsfjord system which however mainly focus on the very shallow areas, where we see very similar results. These articles may be cited but the ms is well enough also without.

8. Does the title clearly reflect the contents of the paper? Yes

9. Does the abstract provide a concise and complete summary? Yes

10. Is the overall presentation well structured and clear? Yes

11. Is the language fluent and precise? Yes

12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes

C2

13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? The introduction, material and methods and result section are quite good written, not too long and quite clear. The discussion section is a little bit long even though well written. I recommend to go over the discussion section again and try to shorten it here and there without losing substance. The same with the graphs. The ms has a total of 12 graphs. I've read the ms without the graphs at all and understood most of the parts. I therefore recommend e.g. to summarize some information's in the graphs which do not really provide absolutely important information. My favorites in this point are e.g. graph 4 and 5 which show wind and current in the different years. I think that nobody will try to extract data from this graphs from the different year so the years might be averaged to one graph because the necessary patterns among the years are provided also in the text.

14. Are the number and quality of references appropriate? Yes

15. Is the amount and quality of supplementary material appropriate? Yes

Further very specific comments on the ms are: Page 4, line 6: I do not understand 5°C as unit for direction measurement? Page 4, line 17: A dot is missing after (Karl and Knauer, 1989) Page 7, line 1: This wind conditions however have completely different effects on the surface waters because the effective area where the wind is able to affect the water surface is much larger. Therefore, intense wave formation happen only during these wind conditions while even much stronger wind coming from the south have less effects on the surface waters.

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