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Interactive comment on “Bio-optical characterization and light availability parametrization in two glacial melt water influenced estuary systems (West-Greenland)” by L. Holinde and O. Zielinski

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The paper is a very much needed study of the optical conditions in areas influenced by glacial meltwater and the effects of increased melt water discharges related to global changes. The paper address specifically two transect located on the west coast of Greenland with CTD, water sampling and optical measurements. The goal of the study is to develop a bio-optical model to predict the 1 percent light depth based on concentrations of chl-a, organic and inorganic suspended matter, and CDOM absorption in the water. This goal is achieved though it is unclear why the authors selected photic depth

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as the modelling goal? I did not see anything about photosynthesis and primary production even though 1 % light is actually the photic depth where there is a production +/- respiration. The paper is well organized and the language is okay even though English is not my first language but there are many flaws – statements with no references - and redundant information as “Greenland’s estuary system . . . boundaries”. Yes, but I need some references. I know they are there, both from the west and east coast of Greenland. Find the references! In the introduction we are told that the authors obtained data from several fjord of Wes Greenland and Iceland. It might well be, but focus on the data that you present here. Anyway, the scientific level in the paper is low and the authors misunderstand the concept of estuaries. The authors claim that they studied estuaries but there only one or two stations located in estuaries. The rest are placed out the fjord/estuaries on the shelf etc. The paper applies a dynamic concept of estuaries looking at the effects of melt water/fresh water influence and according to this an estuary “Is a semi-enclosed area with an open connection to the ocean and with a measurable dilution of the saltwater”. The authors mention part of this definition in the abstract but their stations are not located in semi-enclosed areas. Thus, the areas studied are not estuaries. Looking closely at the CTD-profiles there only a few stations with reduced salinity in the surface. The CTD-plots should only show the upper 100 m of the water column to make the plots more detailed to depths of interest regarding the optics (0-100 m) and not 0-500 m. Nevertheless, that it is not estuaries that authors studied makes reading and understanding of the paper misleading, as all interpretation of data are framed by the estuary concept but which is clearly not the right concept.

I suggest that the authors rewrite the whole paper and frame the data and interpretations in the right context as “Bio-optical properties of the Disko Bay and Umanaq Fjord” or similar. The authors can model 1 percent light depth. Yes, but how does that model react towards a larger input of suspended matter? Run some model scenarios with variable chl-a and SPM concentrations. That would be interesting and scientifically relevant to answer which they do not in the present version.

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