



EGUsphere, referee comment RC1
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Comment on egusphere-2022-916

Anonymous Referee #1

Referee comment on "The sensitivity of primary productivity in Disko Bay, a coastal Arctic ecosystem, to changes in freshwater discharge and sea ice cover" by Eva Friis Møller et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-916-RC1>, 2022

The authors present with this paper a modelling approach to study the separate and cumulative effects of melt water runoff and sea ice cover on the net primary production in the Disko Bay area (West Greenland). This study highlights that sea ice reduction leads to changes in phytoplankton phenology as well as in an increase of the magnitude of primary production. It also showed that vertical mixing and tides have important role in nutrient replenishment in the area

I believe that the paper can be published as it is. It is a simple and clear modelling experiment. The study design is clear and well justified. Authors accurately discussed every limitation of their approach in terms of forcing, model parametrisation and spatial scale. I only have few comments for the authors:

- L535 to L537, I think that the importance of the drivers is related to the spatial scale we are looking at. The region of the study is quite large and the glacier discharges only influence a small area of the studied domain so it seems normal that the sea ice cover plays a stronger role in the control of the primary production.
- I noticed in the manuscript different spelling for 'sea ice', with and without hyphen. Strictly speaking, it should be spelled without hyphenation when it's a noun, and hyphenated when it is an adjective. In most in this manuscript sea ice is spelled without hyphen and I will suggest to keep it like that everywhere else. L182, L194, L910, L930.