

General Comments:

I would like to commend the authors on their revision. It is clearly demonstrated that they sincerely considered the reviewers' comments, in particular with regard to unsubstantiated statements about the future of small phytoplankton in the Amundsen Sea. I would be excited to see this manuscript published in Biogeosciences. I recommend that it be accepted, but only after subjected to minor revisions. As discussed below, there are important technical and content-related issues that still need to be addressed.

Specific Comments:

There are still numerous typos throughout the manuscript. I have highlighted a few below, but by no means is this a comprehensive list. I strongly encourage the authors to carefully check the text. Please pay special attention to using consistent terminology.

Results section: This section is still a difficult read. It seems the goal is to describe the same information for each measurement. I would recommend making a template for the first measurement (chlorophyll-a), and then using it for each subsequent one (e.g POC, PON, etc.). Having the information for all measurements described identically will assist the reader.

Lines 18-19: "recently changing ocean condition" – please be more specific re. the changes to which you are referring.

Line 64: "a shift" – indicate that this shift is recurrent.

Line 65-66: As currently written this statement implies that the meltwater effect driving the association with cryptophytes is the lower salinity (as opposed to a meltwater constituent, light, etc.). I don't believe Moline et al. (2004) speculate on the specific meltwater effect. Consider removing "and reduced surface water salinity".

Line 75: Water samples were collected for chlorophyll-a too, right (see also line 86)?

Lines 75-87: This paragraph appears to be a general description of the water collection for all the measurements. Move information specific to the carbon/nitrogen uptake rates to Section 2.3. Consolidate these lines into a single paragraph.

Line 106: Please justify why small-sized phytoplankton were defined as less than 5 μm (as opposed to the canonical 20 μm , for example). Additionally, why were chlorophyll-a samples size-fractionated through 20 μm filters if the cutoff between large and small cells was 5 μm ?

Lines: 272-273: A relatively lower carbon uptake rate of small-sized cells makes sense. However, citing a paper on Arctic phytoplankton doesn't seem justified. Is there a more general source that could be cited? Are there other explanations for the demonstrated relationship that should be considered?

Lines 269-284: This passage appears to be operating under the assumption that there will be a shift to smaller cells in the Amundsen Sea. However, the data presented in this paper do not support that prediction. Please make that clear. If you would like to include information on the carbon uptake rates and food quality of small phytoplankton, do so explicitly within the framework of a hypothetical community shift (and give examples of where this has occurred elsewhere).

Technical Corrections:

Lines 52-55: Run-on sentence.

Line 60: “drives” – consider changing to “has driven”.

Lines 69-71: This thesis statement has numerous grammatical errors.

Line 76: “1 to15” – change to “1 to 15”.

Lines 83-84: add “the” to “non-polynya region” and “polynya region”.

Line 90: “at six” – change to “at the six”.

Line 101: “bottle” should be plural; change “matches” to “matched”; remove “with”.

Line 102: Remove “material”.

Lines 103-104: Please be more clear re. how the bottles were inoculated. As currently written it seems bottles were inoculated with carbon, as well as with a nitrogen isotope. Was that the case?

Line 107: “24 mm” – should that be “25 mm”?

Line 109: “GF/F (24 mm)” – should that be “pre-combusted GF/F filters (25 mm)”?

Line 115: “small phytoplankton” – until this point the term “small-sized” has been used. See also Line 116. See also the Results section. Use one or the other.

Lines 123, 133: “depth-integrated total” vs. “total integral” – make consistent.

Line 126: Use either “to” or “-“ consistently to indicate ranges. Fix elsewhere.

Lines 134-135: Where is the mean +/- SD?

Lines 137-140: List statistics for non-polynya and polynya regions in the same order for all measurements.

Line 140: Why is there no comment regarding the statistical difference between non-polynya and polynya regions as with the other measurements?