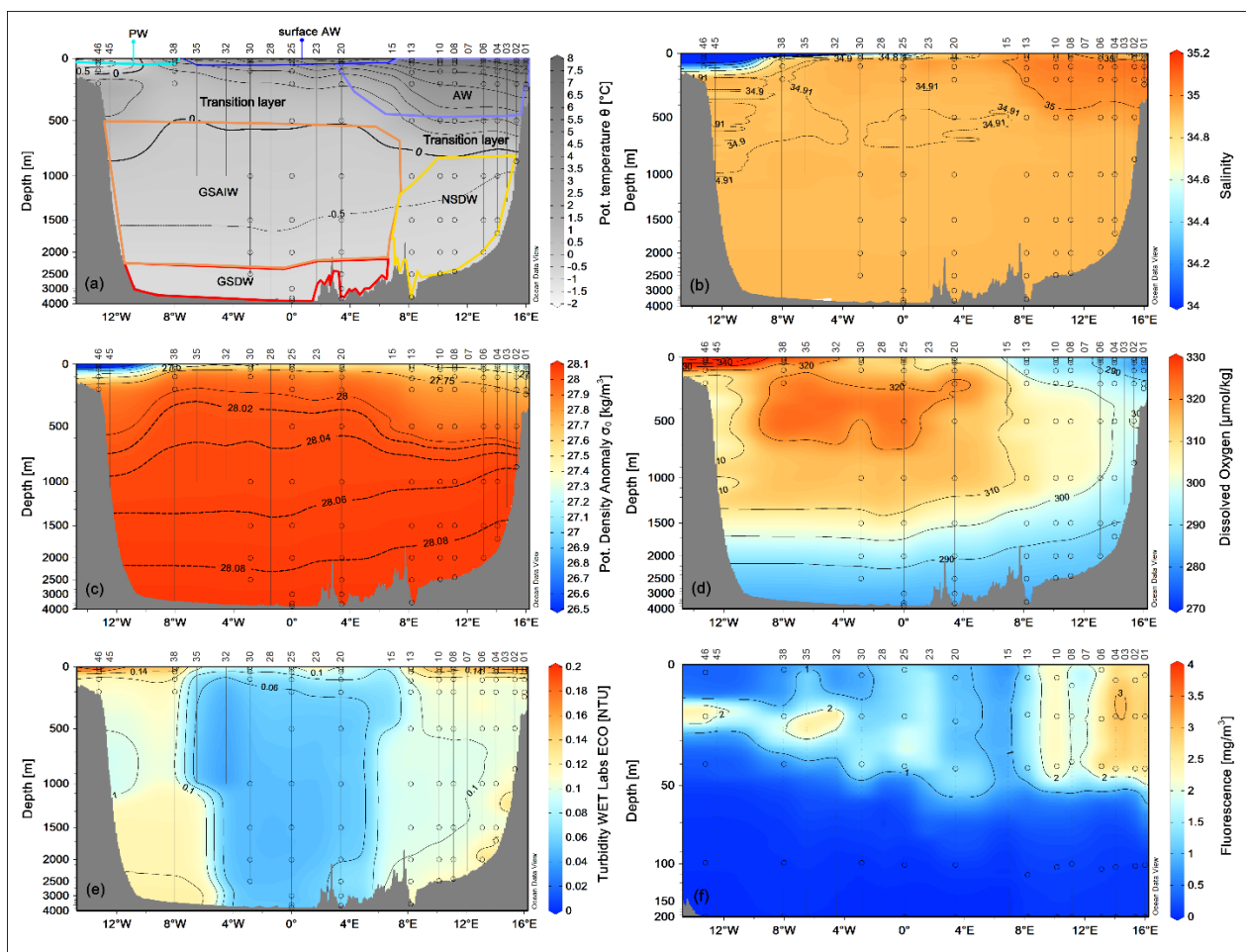
Answer to comments raised by Reviewer #1

Dear Reviewer,

Thank you for the comments, which help us to improve our manuscript. We have carefully considered all your comments, and we modified figures and text accordingly. Please see below the answers to each comment.

This MS is a very nice description of the field data and analyses of the collected samples.

It is a pity though that data of water turbidly and fluorescence collected by WET Labs ECO-AFL/FL are not analyzed and described. I believe reported increase of the DOC/POC values at the depth could be nicely connected to the turbidity profiles.

Thanks for the comment, we have now included data from turbidity and fluorescence sensors. Figure 3 (see below) now shows two additional panels (e, f) and the text was updated accordingly.

I believe this MS can be published after minor revision after fixing a few remarks below.

Ln 374: should it be 'easternmost'?

Yes, corrected

Fig. 5: I would suggest to use non-linear depth axis (as in Fig. 3) to better illustrate the upper photic layer.

Done, Figure 5 is now updated with non-linear depth axis (see below)

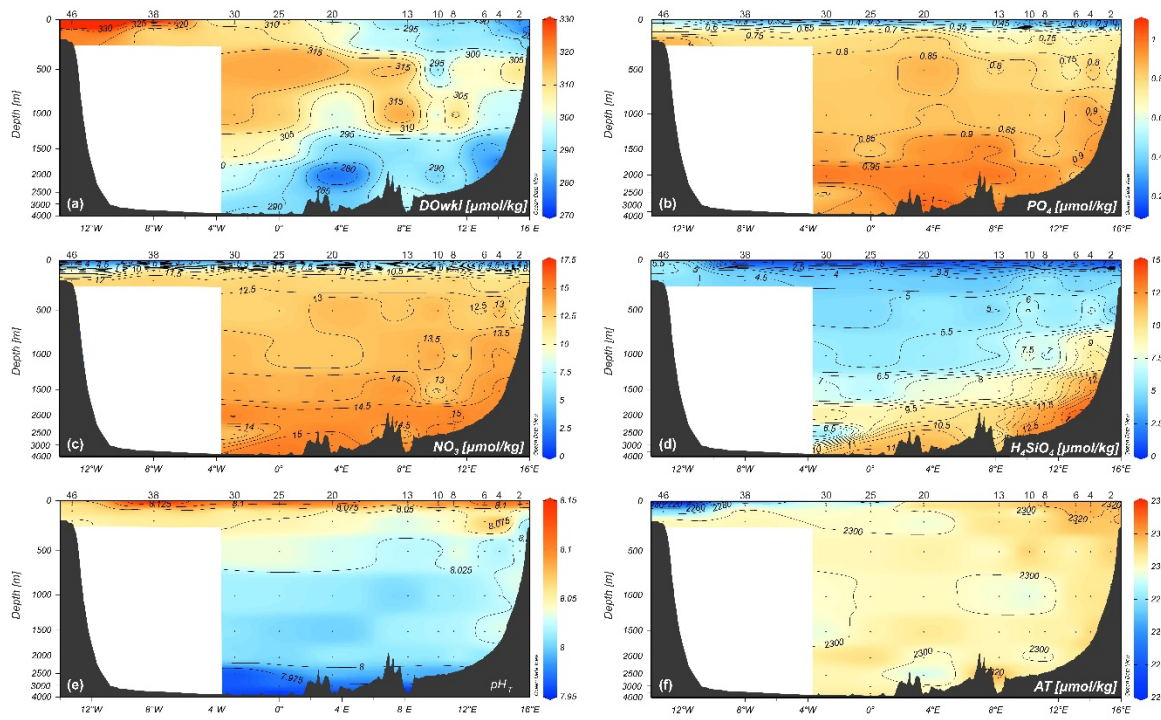
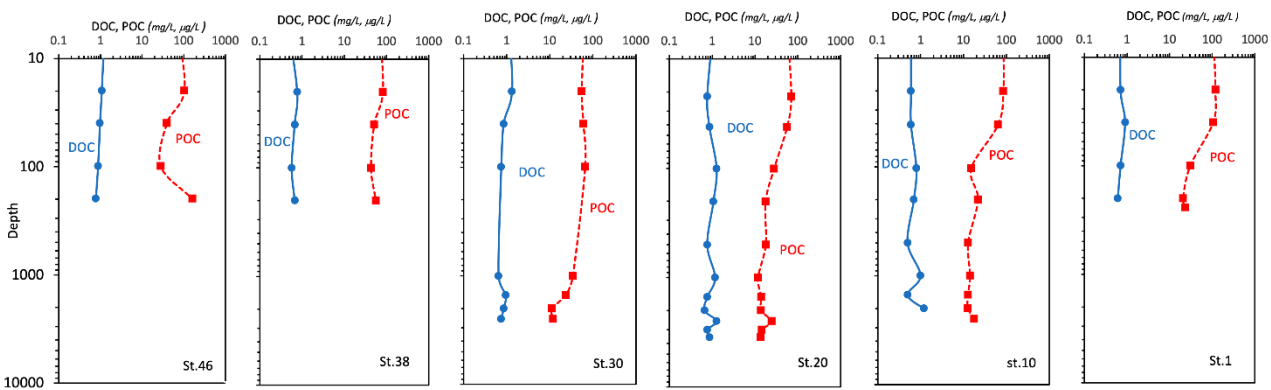



Fig.6: Edit units notation in the caption (i.e. L⁻¹, not L-1)

Corrected, and Figure 6 is now updated with new colors (see below)

Ln 421-422: Cold be that increase of DOC & POC be related to the bottom nepheloid layer? Are there any comparison with the turbidity records?

Having included turbidity in Fig. 3, we have now compared the data in Figure 6 to see if DOC/POC have a relationship with turbidity values. The data show that slightly higher values for POC are found near the seafloor at station 46 (westernmost station), but not at station 1. Hence, we do not see a clear relationship between DOC/POC and turbidity values, which are slightly higher both at surface and along the two continental slopes (westside and eastside).

Ln 441: Looks lie St. 46 is located at the westernmost end of the transect (as mentioned in Ln 447). Please check and correct.

Checked and corrected

Ln 465-466: I would say that Sts 20 and 30 are central (as it is referred to in Ln 481), not easternmost. Please check and correct.

Checked and corrected

Ln 602: Consider replace 'during' with 'along'

Corrected

Ln 606: consider replace 'lighter' with 'lower'

Corrected

Answer to comments raised by Reviewer #2

Dear Reviewer,

Thank you for the comments, which help us to improve our manuscript. We have now carefully considered all your comments. Please see below the answers to each of them.

The authors present a very comprehensive hydrographic biogeochemical and biological dataset from a cross-section at 75°N from the East Greenland Shelf to the Barents Sea shelf in late summer 2021. The data set is very extensive with the various parameters that were investigated and allows an insight into the interrelationships of the biological ecosystem during this time phase. I think the manuscript can be accepted after a view minor change as following:

Line 42/43: Sentence unclear please rephrase

Answer: The sentence has now been revised as follows: *"Phytoplankton biomass, expressed as chlorophyll-a, varies across the transect, with higher values at the westernmost and easternmost stations. The micro-phytoplankton fraction dominates in PW, while the nano-phytoplankton fraction predominates in AW, even at the interface between the two water masses"*

Line 212: How many replicates were taken? How was the spatial variability of the POC on the filter handled?

Answer: At least two replicates were analysed for each sample. Spatial variability was within ±2.5 % on the filter.

Line 222 Could you comment on using (HDPE) bottles, I thought DOC should be in pe-combusted glass vails?

Answer: As reported in Halewood et al. 2022 (https://doi.org/10.3389/fmars.2022.1061646) if glass is logistically challenging, DOC samples can also be collected into acid washed high-density polyethylene (HDPE) or polycarbonate (PC) bottles. Tests have shown that DOC concentration measured from glass, PC and HDPE bottles are comparable at the $\mu mol\ L^{-1}$ resolution.

Line 247 Please give μm units for polycarbonate membranes

Answer: μm units are now indicated

Figure 5: Please use same y-scale as for Fig 3 for better visibility of the biological relevant surface data.

Answer: Figure 5 was updated using the same y-scale as for Fig. 3. Here the new figure:

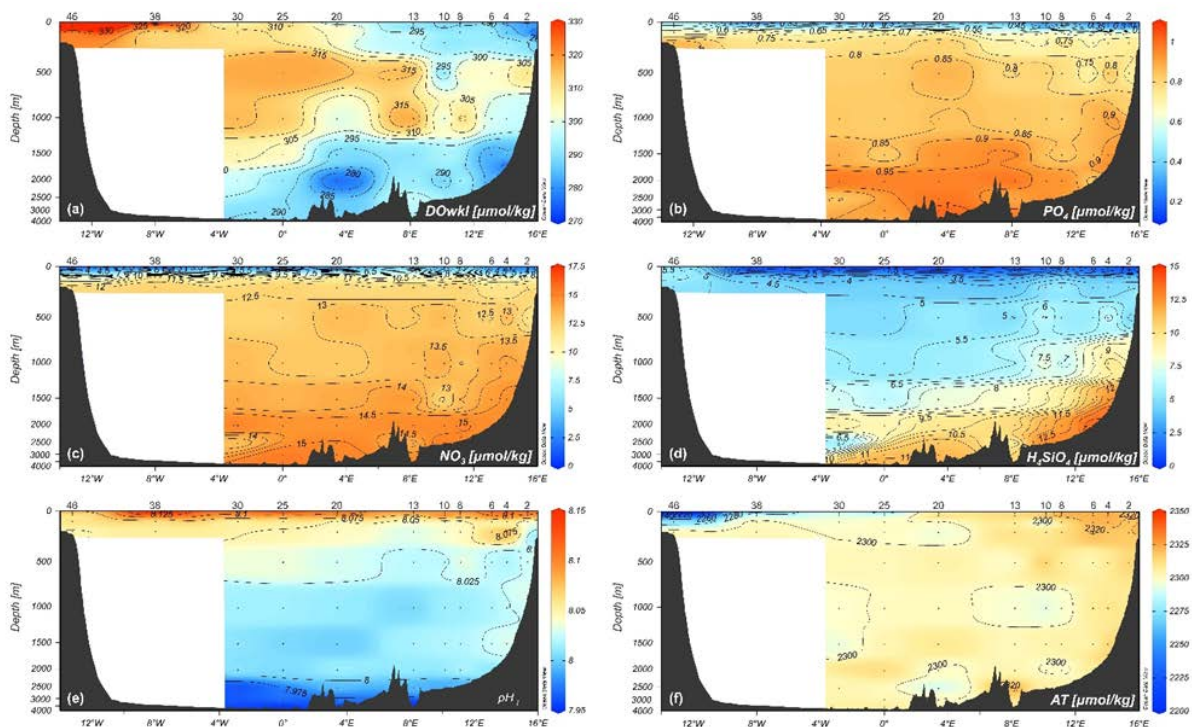



Figure 6 & 14: Please improve the quality of the figures and hange the order in West - East, as done for all other figures

Answer: Figures 6 and 14 have been improved as suggested

Figure 9: Integrated contribution again 0-100m?

Answer: The Figure 9 caption has been modified, the phytoplankton values were integrated 0-100 m.

Figure 10: Integrated values again 0-100m?

Answer: The Figure 10 caption has been modified, the microzooplankton values were integrated 0-200 m.

Figure 14: change unit notation to: μL O₂ h-₁ L-₁

Answer: We think the reviewer is referring to FIG 15 and not 14, Hence, "μl" has been changed to "μL" in figure 15