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***Interactive comment on* “Phytoplankton distribution in the Western Arctic Ocean during a summer of exceptional ice retreat” by P. Coupel et al.**

Anonymous Referee #3

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Title: Phytoplankton distribution in the Western Arctic Ocean during a summer of exceptional ice retreat

Overall Comments: This manuscript contains a large dataset on chlorophyll a, phytoplankton accessory pigments and carbon uptake linked to hydrographic data across the Chukchi shelf and into the Canada Basin. The data contained in this manuscript are of utmost importance to our study of this region. However, there are several barriers to the publication of this manuscript as it stands at the moment. The first is the

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poor language used throughout the text, while it is obvious that the authors do not speak English as a first language they should enlist the help of someone in correcting the mistakes. Secondly, the paper gives much space over the description of CHEMTAX results and little to the actual microscopy. Overall the paper is long and filled with the description of accessory pigments, this makes it tiring to read. The authors should endeavor to tighten the main points of the paper.

Major Questions Strong reliance on CHEMTAX to give phytoplankton assemblage. This program must be initialized with pigment ratios that are regionally specific, these ratios then influence the outcome of the program. Given that the authors have the microscopy, I am unsure why they are using CHEMTAX. Describing the accessory pigments and linking that analysis with the microscopy would provide a much more robust result and serve the same purpose as CHEMTAX. If the authors have HPLC data from other years, then I suggest they write a separate paper on using CHEMTAX in this region and validate the model with their data from other years.

Major Corrections

Figure 2,b,c&d: Using the same scale for each figure would help in comparing the different ice concentration metrics. Figure 5 b & e: By using the same depth scale for the depth of the nutricline and the SCM would allow for an easier comparison between the two. Figure 9: Axis should be labeled with units in all cases. Figure 9 b & c: If a regression between two variables does not turn a statistically significant regression as in these figures, there is no point in displaying the regression line. Simply state in the text that the regression was not significant. Table 2: It would be helpful to the reader to be able to see the chl a and PP profiles in a figure. This would help with understanding the discussion about chl a and PP maximums.

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