The manuscript reports on a 2008 cruise to the Western Arctic and compares pigment data from HPLC with microscopy. The HPLC is used to estimate concentrations of pigments that are identified using the Chemtax program and the microscopy data is based on epi-fluorescence microscopy, which provides some taxonomic and biomass information. There seems to be little or no agreement between the two methods. Another theme of the report is the difference between surface and subsurface chlorophyll maximum layers in different Arctic oceanographic regions. The regions include Chuckchi Shelf, Chuckchi borderland, Medeleev Abyssal plain, Canada Abyssal plain. The whole area then is binned as Shelf, Ice free basins, marginal ice zone and heavy ice basins. These are then compared. Overall 8 of the 9 figures seem to present the same data but summed and graphed for the multiple comparisons. The phytoplankton pigment record is interesting, but I think over interpreted.

The written manuscript should have been read and edited by a native English speaker with knowledge of the techniques.

We have corrected grammatical mistakes and have asked an English native speaker to edit the manuscript.

The abstract does not represent the content of the paper.

The abstract have been reworked to fit better with the content of the paper.

The comparison with earlier work using similar techniques is over emphasized given the limitations of the techniques.

The comparison with previous work has been moderated given the limitations and disparencies of the techniques as mentioned by the referees 1. In the comparison, the terms “differences” have replaced “changes” to evoke a comparison between two snapshots of the Arctic Ocean and not over-interpreted the impact of global change. The differences in the techniques used (lines 376-385) and the sampling strategies (lines 343-350) between 1994 and 2008 have been indicated and took into account for the comparison between the two years.

The introduction has missed several important papers eg. Comeau et al 2011 PloS One, where 8 or 9 years in one region were compared.

Reference to the paper Comeau et al 2011 PloS One has been added in the introduction to inform on the phytoplankton changes underlined in Arctic Ocean (lines 62-64).

The methods section on introducing the complex hydrography of the region should have been in the discussion and would be a good way to integrate some of the data into a larger story.

The description of the hydrography has been removed from the sections methods and results and was used to explain the phytoplankton distributions observed in 2008 and 1994. We focus on the physical parameters describing the environmental conditions susceptible to influence phytoplankton as the salinity, temperature, and stratification, light and freshening (see section 4.3.).

Key methods such as how physical oceanographic data were collected and how the photic zone and stratification depths were arrived at are not included. I did find some of this information in the legends of the figures, I do not know if this is a question of journal style.

The physical oceanographic data used in the discussion and their methods of acquisition are now presented and explained in the section methods (lines 84 to 97).

Results No statistics or correlative analyses are given for any of the comparisons.

Student's test has been added in this new version to compare statistically the pigments distribution in the different areas (Table 1 in suppl. mat.). Pearson's correlations were calculated and used to compare the information given by the two methods, HPLC and taxonomy (Table 2 in suppl. mat., section 4.1.). To compare the distribution of the main phytoplankton groups obtained through pigments and cells count, simple correlations have been presented (Figure 1 in suppl. mat.) and discussed (line 259-277).

The reader should not have to go to a supplemental file to find out what the acronyms for pigments indicate.

The table with pigments acronyms and significance has been displaced from the supplementary material to the main text (Table 1).

On p2071 integrated results are compared but there is no indication of how these were arrived at. Was it to the bottom of the water column, mixed layer, or photic zone? How many depths were considered.

Most of the numbers have been removed from the discussion and listed in Table 2, which allow reducing details and highlighting the main findings. Two depth were considered, surface and SCM. In table 2, averaged cells number, carbon biomass and relative contribution for main phytoplankton groups has been calculated for different provinces according to bathymetry and ice cover. No vertical integrations were calculated because of insufficient vertical resolution of the phytoplankton data.

Discussion. The attribution of every result to the ice melting is bothersome.
In section 4.3 the suggestion that there is a causal effect cannot be supported without before and after data with appropriate statistical analysis or some experimental evidence. This is a serious shortcoming of the entire manuscript, none of the conclusions are supported.

Efforts have been made to support most of the hypothesis with statistical analysis as suggested by the referee 1. The discussion was greatly improved and we are grateful to referee 1 for that meaningful suggestion. Numerous parameters, others than ice cover, have been discussed to explain the 2008 results and the difference with the 1994 cruises (see section 4.3.). The influence of physical (salinity, stratification, freshening, light…) and chemical (nutrients) on the biological observations are now supported by Student's test (Table 3).

Specific comments: The language is poor and confusing throughout, I do not have the time to list these errors. Starting with the abstract, which suggests that ice has been melting for 2,008 years and the puzzle of the word hinospitable.

Sorry for these mistakes which have been corrected. The entire manuscript has been edited by a native English speaker to avoid others confusions and errors.