

Author's response to referee #3

We are grateful to your comments and useful suggestions that improved our manuscript greatly. As described below, we have revised our manuscript. Please note that the expression in black colored letters are the comments provided by you whereas those in red are our replies.

Specific comment:

Abstract: Last sentence: I don't see that the diatom community shifted from a centric to a pennate dominated community. Rather it shifted from centric dominated to one where centrics/pennates are more equal in abundance.

→Yes, we corrected as you suggested (p8790, Line 25).

1 Introduction

pg 8791

line 5: "Then, the microplankton" Remove "Then"

→We corrected (p8791, Line 5).

line 11: change "in the shelf" to "on the shelf"

→We corrected (p8791, Line 11).

line 12: add comma after Sea

→We added (p8791, Line 12).

pg 8792

line 11: change "and and not quantified" to "and did not quantify"

→We changed (p8792, Line 11).

2. Materials and Methods

pg 8792

2.1 Field sampling: It seems that more than 1L was collected from each depth every day as 2L were filtered for chlorophyll and 1L preserved for abundance and some amount for nutrients.

→We collected 12-L water from each depth. We provided information on exact size for each sampling and sample (p8792, Line 19, 22, 24).

2.2 Microplankton analysis: Please explain why calcofluor was used to stain the diatoms. Was it used to distinguish between thecate and non-thecate forms or for some other reason?

→We clearly mentioned that calcofluor staining was used for distinguish between athecate and thecate forms in the revised manuscript (p8793, Line 8).

2.3 Statistical analysis: pg 8793, line 22: change “an SWE” to “a SWE”

→We corrected, thank you (p8793, Line 22).

3 Results More information on the wind event is needed. A plot of wind velocity and direction for the entire sampling period would be very useful

→Concerning description of strong wind event, we added more information in the revised manuscript (p8793, Line 23).

3.1 Hydrography

pg 8794 change “nutrientcline” to “nutricline”

High chlorophyll. It appears that high chlorophyll was present at 30 m before the SWE and was mixed into the surface waters by the SWE. And so maybe there wasn't much of a growth response in chlorophyll because of the SWE?

→We changed term “nutrientcline” to “nutricline”. For the cause of high chlorophyll around 25 m depth, we think that nutrient depletion at surface layer was a possible cause (see p8798, Line 12-18).

3.4 Dinoflagellates: Did you distinguish between heterotrophic and autotrophic forms? It would be interesting to know if they responded differently to the SWE.

→We did not distinguish between heterotrophic and autotrophic forms for dinoflagellates in this study. In the revised manuscript, we added short note on this subject in 2.2 Microplankton analysis (p8793, Line 13).

3.5 Ciliates

pg 8795 line 22: change “ciliate” to “ciliates”

→Yes, we corrected (p8795, Line 22).

pg 8796, line 2: change “SEW” to “SWE”

→We apologize mistake. We corrected (p8796, Line 2).

3.6 Temporal: pg 8797, line 3: change “throughout the study period” to “throughout most of the study period”

→We changed (p8797, Line 3).

4.1 Characteristics:

Why would you expect the groups to be consistent between the Matsuno et al. 2014 study and this one? I would think the groupings reflect several factors including water mass origins, stage of bloom, seasonal succession, among others. Any evidence that these groupings would be consistent between years and seasons?

→ Since the study region and season were comparable with those of Matsuno et al. (2014), we made comparison to clarify the characteristics of microplankton community in this study. In the revised manuscript, we mentioned these notes in limited extent (p 8797, Line 8).

pg 8797, line 18: change “Compared with values” to “Comparing the values”

→ Yes, we changed (p8797, Line18).

pg 8798, line19: change “1 cells mL⁻¹” to “1 cell mL⁻¹”

→ Yes, we corrected (p8798, Line 19).

4.2 Short-term changes: : :

pg 8799 You don't discuss advection, patchiness, and sampling variability anywhere. How do you know you weren't sampling different water masses with different communities? How do you explain the sudden increase in chloro- phyll concentration at 30 m prior to the wind event?

→ Detailed ocean physics at this station during sampling period were published recently (Kawaguchi et al. 2015). In the revised manuscript, we added description of water-mass formation, advection and mixing based on Kawaguchi et al. (2015) with limited extent (p8793, Line 22).

Line 21: change “were low are possibly” to “were low, possibly”

→ We corrected (p8799, Line 21).

Line 22: change “amount of centric diatom” to “abundance of centric diatoms”

→ Yes, we changed (p8799, Line 22).

Pg 8800, line 11: It looks like in figure 8 that chlorophyll increased in phase 2, the day prior to the SWE. I assume this is because of the increase at depth. The abundance of some microplankton increased the day before as well. How do you explain this? Did the wind event actually start a little earlier? Maybe a bar that shows the extent of the SWE instead of a point showing what I assume is the middle point of the SWE might be better to show in the figures.

→ According to Kawaguchi et al. (2015), SWE was observed on approximately 19 to 22 September. So, as the reviewer pointed out, the increase in chlorophyll *a* was slightly faster than the SWE.

This increase in chl. *a* was started around 30 m (Fig. 2F). Concerning such deep-chl. *a* maximum in this region, we made discussion from viewpoint of nutrient depletion (p8798, Line 12).

Lines 25, 26 change “ciliate” to “ciliates”

→We corrected (p8800, Line 25, 26).

Pg 8800, last sentence is vague. The ciliates may respond more quickly than what?

→We revised to that response of ciliates may faster than dinoflagellates (p8800, Line 25).

Pg 8801, line10: change “depletion after bloom” to “depletion after the bloom”

→We corrected (p8801, Line 10).

Line 20 and 24: change “an SWE” to “a SWE”

→Yes, we corrected (p8801, Line 20, 24).

Perhaps more important than accelerating the seasonal succession of the microplankton community, the SWE may enhance the fall productivity providing food for zooplankton and extending their growing season, and thus perhaps enhancing overwintering survival. Any thoughts on this?

→Recently, the relevant study on copepod gut pigment during the same period was published (Matsuno et al. 2015). In th revised manuscript, we cited this study, and mentioned the consequence of the small bloom (p8801, Line 25).

Figure 2. How many days did the wind event last? Perhaps a bar showing the duration would be better than a triangle showing the midpoint. Why did silicate mix into the surface, but not DIN? Was vertical sampling too coarse to see it? Was it immediately taken up? Any thoughts?

→Concerning period of SWE, we modified to show by bar for 19-22 Sep. instead of showing the midpoint. Since the nutrient depletion in the upper layer (Fig. 2d), nitrate limitation seems to be more severe than silicate (Fig. 2e). Concerning nutrient dynamics during study period, detailed studies were made by Nishino et al. (2015). In the revised manuscript, we cited this study and described in limited extent (p8799, Line 12, 15, 27).

Figure 3. It appears that centric diatoms were already decreasing before the wind event. Should put the centrics and pennates on same color scheme. It makes it appear that the pennates are much more abundant than centrics after the SWE when they are not. I think that you would still see the large increase in pennates but it wouldn't be so misleading.

→Since we presented cell densities of each species, and made comparison between before and after

of SWE in Table 1, it may be easily recognized that what species showed increase or decrease with SWE in Table 1 rather than Fig. 3.

Figure 8. Chlorophyll appears to increase before SWE, likewise for the dinoflagellates and ciliates? Any explanation?

→Since this increase started around 30 m (Fig. 2f), we think that nutrient supply from deep layer to the nutrient depleted surface layer would be caused this increase. In the revised manuscript, we mentioned it clearly (p8799, Line 12-15).