

Interactive comment on “Short-term changes in a microplankton community in the Chukchi Sea during autumn: consequences of a strong wind event” by N. Yokoi et al.

Anonymous Referee #3

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Review for Biogeosciences Discussions:

Short-term changes in a microplankton community in the Chukchi Sea during autumn: consequences of a strong wind event

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This paper describes the response of the surface microplankton community in the Chukchi Sea to a brief strong wind event during the fall. To do this, the abundance of microplankton in the surface waters was followed daily for about 2 weeks. During this period a short, 2-day, strong wind event was encountered. The wind event appeared

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to trigger a phytoplankton bloom, with increased chlorophyll and higher microplankton abundances shortly following the event. There appeared to be some mixing up of deeper waters with waters of higher salinity, lower temperature, higher silicate, and possibly higher chlorophyll brought into the surface. They also observed a shift in the diatom community from one clearly dominated by centrics to a community where pennates were relatively more important.

I found their observations to be very interesting. However, there were some things that changed prior to the SWE that need to be discussed more thoroughly. For example, chlorophyll appeared to increase prior to the SWE due to high concentrations at depth. Also, some dinoflagellates and ciliates did as well. I assume this is simply due to patchiness, advection and sampling variability, yet there was no discussion on how these might have affected the interpretation of the results. I think there were some really interesting changes that occurred due to the SWE, but I think some discussion on the complicating factors mentioned above should be discussed.

Specific Comments:

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.

1. Introduction pg 8791 line 5: "Then, the microplankton" Remove "Then" line 11: change "in the shelf" to "on the shelf" line 12: add comma after Sea

pg 8792 line 11: change "and and not quantified" to "and did not quantify"

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.

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

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other reason?

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

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

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?

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

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

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

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

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?

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

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

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-

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phyll concentration at 30 m prior to the wind event?

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

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

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.

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

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

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

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

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?

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?

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

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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.

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

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