

General comments

In most cases, replies to comments satisfactorily treated the general issues raised. However the discussion requires revision in the form. In some cases the changes in the manuscript discussion made it even more confusing (some examples are: P16 L42-45; P18 L14-19). Because of this lack of clarity in the discussion I believe the manuscript is not ready to be published.

According to the MS title, species composition and calcite content are the key parameters under study, but the largest part of the discussion goes to *Emiliania huxleyi* biometry (already in the introduction is *E. huxleyi* biometry and not calcite content the main parameters). The discussion of this section (4.4) goes back and forth around the same ideas and should be rewritten so it gets more concise.

Regarding the figures, I think the changes improved the MS.

In general, I believe the data set, calculations and statistical work do deserve publication but the discussion has to be improved. Readability should still be improved.

English is not my mother language so I did not focus on it, but a revision of grammar will be useful.

Specific comments

Abstract:

L15. Perhaps some words on how eddies regulated the coccolithophore community?

Introduction: I agree with the changes.

Methods:

P11, L22 and 23: Not necessary here.

L28: "In addition to" instead of "Apart from" or just starting the sentence in "Coccolith length"

P12, L34: Similarity matrix was constructed with biomass data? It was not explained how biomass was estimated.

Results:

P13, L35: "these features may indicate lateral transport" instead of "these features may be characteristics of either lateral transport". Perhaps the whole sentence should go to the discussion.

P14, L9: Italics for species name

Discussion:

P15, L15: I do agree it was probably related to the higher temperatures in the sampled area; but insist that this is not proved with the data of this study.

L38: Sentence needs to be re-written, I suggest: [Results from nMDS, HCA and eddy settings in the 18°N section clearly showed that.....](#)

P16, L29-31: thus, community composition did not change with environmental factors? In the previous section the differences between the results in cyclonic eddies, anti-cyclonic eddies, and adjacent stations were suggested to be driven by nutrients.

Same lines: It would be nice to elaborate more on the fact that *E. huxleyi* and *F. profunda* contributed more to water column calcite in cyclonic eddies than in anti-cyclonic eddies. This is not mentioned in the results section.

L42-45: I don't understand "in anti-cyclonic eddies,... coccolithophore maximum layers were in group 3" does that mean that some stations in these eddies had a "coccolithophore maximum layer" while other stations did not? And that the first clustered together? Perhaps it refers to abundance instead of layer?

L45: "This transition" it should be clearer stated in the text

P16, L7: "coccolithophore community locations are similar with those in anti-cyclonic eddies" I don't understand; does it mean: environmental conditions or coccolithophores community composition/structure in those stations (I6 and I7) resembled those of AC eddies?.

L16-18: The last sentence of the paragraph is maybe not necessary as it was mentioned just before that POC fluxes are higher in the border of AC eddies.

L45: "coccolith calcite species" I understand what is meant but the term is confusing. It may be better stated as in the comment of the review and the response to this comment (P6, L26-28 in the Reply to referee #2)

P17, L1: please delete "totally"

P17, L9: I believe the whole section 4.4 should be re-written. The changes done so far did not help the MS. In this section, the argument that is proposed to explain the results stresses the importance of light limitation because nutrient limitation does not explain their results.

However: 1) It is very difficult to follow the ideas that cut, come back, are exposed using confusing terms. 2) It goes back and forth around the same ideas: trying to explain why under P-limiting conditions cellular PIC generally has increased in culture experiments, although this is not "the core" of their arguments and could just be developed in one short paragraph. 3) PIC was not determined in this study but rather coccolith-coccosphere sizes and, although these parameters are obviously related, the author passes from PIC to coccolith size and to coccosphere size as equal without warning the reader.

L12: "coccoliths size has been show to change under low phosphate. ..." how? Also, Engel et al. (2005) has been cited here and again in L2 of page 18 with the same purpose, can these paragraphs be synthesized into one?

L15: *E. huxleyi* calcite quota did not differ between the 6 strains tested in that experiment. The calcification rate did. Meaning growth rate changed in a strain specific fashion.

L16-17: This is not a novelty and it was not "revealed" by Aloisi's model.

L17: "Phosphorus deficiency" instead of "phosphorus deficient". However, the whole sentence should be reconsider because Aloisi (2015) himself referred to Müller et al. (2008) (and others, please see page 4676). The same issue is raised again in page 18, the newly inserted L14-19. None of the two paragraphs (in page 17 or in page 18) are clearly written.

P18, L5: Müller et al. (2008), and Aloisi (2015) did not say that Engel's et al. results meant that P limitation regulated growth rate.... This is the authors' interpretation.

L14 -19: It would be better to focus on PIC only and not to mention POC, since the whole discussion should go around coccolith biometry. Thus, parentheses are not necessary.

L19: "different perspective from coccolith calcification (rate)"?

L30: "possible" instead of "necessary"

L32-35: that in the North Sea *E. huxleyi* type A was dominant is stated twice

L46: "were of valley values" higher or lower?

Conclusions:

P19, L16: "...assemblages in cyclonic eddies were slightly productive." Productive in terms of what? This statement was not discussed.

Figures:

Figure 4. Please insert “percentage” after 40.

It was good to combine Figures 5 and 6 into Figure 6.

Can the new Fig. 7 show the different contributions of these species between Cyclonic and Anti-Cyclonic eddies?
