Biogeosciences Discuss., 7, C2976–C2978, 2010
www.biogeosciences-discuss.net/7/C2976/2010/

Biogeosciences Discussions

Interactive comment on "

Carbon fluxes in natural plankton communities under elevated CO_2 levels: a stable isotope labeling study" *by* A. de Kluijver et al.

A. de Kluijver et al.

a.dekluijver@nioo.knaw.nl

Received and published: 22 September 2010

The authors thank the referee for the positive evaluation of the manuscript. The referee commented on three main issues, which are addressed below.

Referee comment 1: Given the accidental resuspension of settled material during a storm, I feel the authors have overstated their confidence in the lack of increase in depositional loss rates under increased CO2. This is an important finding, but has the least confidence of any of their conclusions. Although this is clearly covered in the

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

Discussion, the line in the Abstract “There was no indication of enhanced settling based on isotope mixing models during the phytoplankton bloom” seems to overstate it. The following sentence (final sentence of Abstract), on the other hand, nicely captures the main finding.

Authors’ response: The sentence will be toned down, by adding that settling in the post-bloom phase could not be estimated.

Referee comment 2: Why were the treatment levels 2x and 3x current CO2 levels used? I could find no justification? It is crucial that these treatment levels be put in the context of realistic predictions for CO2 levels; the work otherwise risks being seen as irrelevant.

Authors’ response: The doubling and tripling of sea-surface pCO2 values are levels that are expected to happen during the first half and towards the end of this century under a business-as-usual CO2 emission scenario. The motivation will be added in the revised manuscript.

Referee comment 3. Presumably the 2 different increased treatments (2x and 3x CO2 levels) were used for a reason. It is thus important to know not only whether the effects of these increases differed from the current level CO2 (control), but also whether they differed from each other. That is, are the conclusions the same for both increased treatments? Is there a threshold in the effect of increased CO2? To my eye (from Tables and Figures), the effects on phytoplankton growth look linear (i.e. magnitude of different between 1x and 2x and same as between 2x and 3x). But, because the wrong statistical model was used for the posthoc text (after ANOVA), this important point could not be established. The authors should re-analyse so that the comparison between 2x and 3x treatments is also tested. And then report that difference more clearly (no change to Figures, but will add a column to Table).

Authors’ response: In fact we had done the proper statistical post-hoc tests. In the revised version we will present the statistics for the difference between 2x and 3x CO2

BGD

7, C2976–C2978, 2010

as well.

Minor comments RC: P 3259, l 19. Change to “fixation does not always result” AC: This part will be removed, because the introduction will be rewritten.

RC: P 3263, l 23. A symbol is missing from the text immediately after the equation (presume it is 13C(control)). AC: If this is the correct line, then no symbol is missing and the equations are correct.

RC: P 3264, l 17-21. Explain why these 2 species of zooplankton (only) were selected? AC: The zooplankton part will be removed, because the data were very limited.

RC: P 3273, l 11. Delete “Based on the available data” at beginning of sentence. AC: done

RC: P 3288. Table 1. For p values, standardise to 3 decimal places. Also, in caption, insert “in” before “the post-bloom phase”. AC: done

---

Interactive comment on Biogeosciences Discuss., 7, 3257, 2010.