

## ***Interactive comment on “Technical Note: A mobile sea-going mesocosm system – new opportunities for ocean change research” by U. Riebesell et al.***

### **Anonymous Referee #1**

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The manuscript from Riebesell and co-authors reports on the use of a novel experimental platform allowing the study of ocean change (among which ocean acidification) on planktonic communities in open-sea conditions. Although I do believe reporting such improvements in our way to study climate change effects is highly beneficial for the biogeosciences community and therefore deserves publication in the Biogeosciences journal, I strongly encourage the authors to revise their manuscript according to the following suggestions:

- First of all and most importantly, this manuscript lies between science and engineering. The science part is minimal and, in my idea, should not even be included in this manuscript, the important list of papers submitted to the special issue should be sufficient no? This implies significantly modifying the results section and removing the

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section 4.1 of the discussion. Instead of this, after reading the material and methods, I was waiting for some results and some answers for: 1) were the starting conditions (right after the closing of the bags), in terms of nutrients, organic matter, phytoplankton, zooplankton etc. . . identical between the 9 mesocosms?, 2) were the CO<sub>2</sub> conditions close to the targeted values, would it be possible to see the evolutions over the 4 days during which you injected saturated CO<sub>2</sub> water in the 7 mesocosms?, 3) the same for nutrient additions, 4) what is finally necessary to clean the walls? What was the importance of the biofilms as compared to “water-column” chlorophyll, POC etc., 5) sampling: any problems of contamination? If so, you have to report it, if not you should also report it. How did you clean the integrated samplers actually?

- Second, the authors should first present their protocol for the Svalbard experiment, second report on the results and highlights the problems, and 3) expose the subsequent improvements as operated during the following experiments as well as, potentially, insisting on the, if any, unresolved issues. This whole sequence should be much clearer in this manuscript, and is totally mixed in the present version of the manuscript.

- It is a pity that the techniques used to measure the mesocosm volumes and those used to estimate gas exchange not included in the present manuscript. I do believe one single “technical” paper would have been much better.

- Maps in Figs. 8 and 9 are not necessary. Instead I would present a scheme of the moorings and of the free-floating mesocosms and perhaps a picture.

Very very minor issues:

- please always mention the pH scale (pHT etc..) - was it necessary to bubble for so long (24h), my understanding is that CO<sub>2</sub> has a very high solubility in seawater, equilibration and therefore saturation should be done in few minutes no?

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Interactive comment on Biogeosciences Discuss., 9, 12985, 2012.

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