

Interactive comment on “Technical Note: Artificial coral reef mesocosms for ocean acidification investigations” by J. Leblud et al.

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REPLY TO EDITOR'S COMMENTS

Dear Professor Gattuso,

We are grateful for all comments as they helped us improving this manuscript. Please find below an answer to each comment and the reference to the altered text in the manuscript. Transcriptions of your comments are in bold and our response in roman font. We hope to have provided a clear answer to all your questions/remarks and that the manuscript will be now suitable for publication.

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Please find all the changes in the attached pdf.

Yours sincerely,

Julien Leblud, Laure Moulin and Philippe Grosjean

- The title must start with: "Technical note: Artificial..."

The title was corrected.

- To me, the largest changes in total alkalinity are a flaw in your design. I suggest that you carefully think about it and be prepared to have a rough time in review.

The total alkalinity variations, due to the important calcification together with the closed system design, are now discussed in the text at p13:l-390-396. The paired design allows, at least, for parallel and identical changes in both acidified and control conditions, which is a good point. We claim that such changes occur in many other closed systems with lots of calcifiers... but they are simply not enough documented in many cases. Yet, it is a weak point where much effort is still required to obtain more stabilization of this parameter over time.

- Another weakness is the comparison with field data. It is useless in my view considering the fact that, unless I am mistaken, Clavier et al. looked at sediments. In any case, what key information do you get from this comparison?

In Clavier et al. (2008), oxygen data in the water column are provided too (see fig. 3 in this paper), and it is the information we used. The key aspect is that the amplitude of oxygen variation in our mesocosms during a day is comparable to field measurements. It is not so trivial to obtain in closed systems because of the small volume.

- Your definitions are very opaque, even for someone who is relatively familiar with mesocosms. First "artificial" is a useless qualifier because all mesocosms are artificial. Second, what does "(semi)-closed "cosms"" mean? Please rewrite.

The definitions of each term were clarified in the text and artificial mesocosm was

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changed into minicosm, in order to avoid such a misinterpretation.

- There is a large body of literature which used mesocosms

Yes. And a large part of this literature does not define/redefine/point to a source that defines the term. It is perhaps useful to clarify the definition and use of this term that almost becomes a buzzword otherwise.

- 15: Doney et al (2009) is surely not the best reference to cite. Use the relevant chapter of IPCC 2013.

Agreed Doney et al. (2009) was replaced by IPCC (2013).

- 20: "species" rather than "ecosystemic"

Agreed "Ecosystemic" was replaced by "species"

- I find that the benefits of the system that you describe compared to previous coral mesocosms are not clear.

Benefits of our system are more clearly exposed at lines p17:l-522-535 in the new version of the manuscript.

- You did not measure light intensity but irradiance

Agreed "light intensity" was replaced by "PAR" (flux unit, what we actually measured), thanks

- 145: how were the plots made available on the Internet? They are not available publicly on the internet. They are shared among minicosm users thanks to the internet. A Dropbox folder is regularly updated with new graphs, and automatically synced with the online version of Dropbox folder shared by the users. However, there are irrelevant technical details, since there are many ways to share image through the internet today.

- How was O2 measured?

The method used in order to measure O2 is described at lines p11:l-324-327:
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"Oxygen was monitored every two months by using Clark electrodes connected to the IKS system. At the end of the experiment, a more detailed analysis of oxygen fluxes was performed by recording the data continuously over a five-day period using oxygen probes in each experimental aquarium, in the sumps and in the main tanks."

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/11/C8879/2015/bgd-11-C8879-2015-supplement.pdf>

Interactive comment on Biogeosciences Discuss., 11, 15463, 2014.