

Interactive comment on “Technical Note: A minimally-invasive experimental system for pCO₂ manipulation in plankton cultures using passive gas exchange (Atmospheric Carbon Control Simulator)” by Brooke A. Love et al.

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We thank the reviewer for the thoughtful suggestions. We agree that the main comments that the reviewer makes would all improve the manuscript and will be happy to make those changes. In particular:

1) Add a more detailed description of the system, in particular the environmental chambers. We were attempting to keep everything as concise as possible, in the interest of complying with the short communication/technical note format. We can certainly expand the description somewhat and it is good to have the reviewers comments to guide

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which areas most need a more detailed description. If other readers or reviewers have additional points in the system description that could be presented more clearly, please let us know.

2) Statistical treatment/pseudoreplication discussion can be more complete. The suggestions here are also very cogent and achievable. More details on statistical approach to minimize the limitations of the experimental design can be added. While we have been aware of these issues from the start, tools and consensus on how to address these concerns have been emerging over the time we have been building and refining the system. The suggestion of including the chamber as a random effect is more clear way of expressing the treatment that we were suggesting with the nested design. We will incorporate that into our protocols for data analysis in this section.

3) The reviewer would like us to include a more complete suite of carbonate chemistry parameters. We chose not to do this initially because we were attempting to compare the system to the performance of other approaches and pH was the parameter that was universally available to make that comparison. Again, in the interest of keeping it short, we did not include additional parameters. We do, of course, have those data, and would be glad to add them to the manuscript.

We find that there are several different ways to present these kind of data, which tell different stories about the system. In our existing data presentation, we highlight the diurnal differences in pH in the system. Perhaps a data table showing means with variability over the course of several entire experiments for the whole suite of carbonate parameters would be the best approach for further data summary. Time series plots of these parameters over time can also be useful, but again, we don't wish to unduly expand the manuscript beyond the modest footprint of this format. If readers and reviewers have a preference for time series plots versus summary data tables, we would welcome that feedback as well.