

Please find replies to the comments of reviewer 1 below in red.

Section 2.1.1: The paper begins with a useful, if brief, review of the acid-base equilibrium chemistry of the carbonate system in seawater. While these definitions are not new, and the descriptions not exhaustive, I found these sections useful.

Section 2.1.2: I found the description of Figure 1 (Deffeyes diagrams) confusing. The figures themselves would benefit from revision that makes the different sources of alkalinity (NaOH, NaHCO₃, etc) more clear (coloured and not grey lines, perhaps)? The subsection would also benefit from a worked example using the figure, in addition to the rather vague statement that it is 'straightforward to assess the potential of 1 kg of a particular modified seawater to remove CO₂ from the atmosphere'. Since it is straightforward, please add it, for 1 kg of each of the chosen sources of TA.

We agree and have updated the Deffeyes diagrams to include colour. Also, we now explain that assessing the CO₂ removal potential involves horizontally moving from the arrow tip that represents a certain alkaline agent addition to the initial fCO₂.

Section 2.1.3: while this section is called 'OAE impacts on seawater' it was dominated by descriptions of CaCO₃ precipitation, and a disproportionate amount of detail is given to inorganic precipitation relative to the other sections.

We have added the potential for secondary CaCO₃ precipitation to the section title to better reflect the content. Some details on the three modes of CaCO₃ precipitation were deemed necessary as all three modes will have different saturation state thresholds.

Section 2.1.4: would remove the (strangely casual) 'So, how much TA can be added, then?', and rather refocus on recommendations, though this seems to be a bit out of context with the goals of the chapter (as stated in the abstract).

As suggested, we rephrased the respective sentence. Recommendations are difficult in this section as it is providing a basic understanding on the impacts of OAE on seawater carbonate chemistry and how much of atmospheric CO₂ can be taken up.

Section 2.1.4: the focus of this section on the global (or latitudinal) distributions of salinity, temperature and various CO₂ system parameters seems rather detailed compared to other sections, including those about sample collection, preservation, and analysis, which were listed as key to the chapter. This doesn't lead to recommendations about where to do the TA additions, but rather ends with a statement about how the uptake factor is minor, and the potential is driven by the amount of added TA (keeping away from critical thresholds in Omega)....

We believe that a key recommendation in this section is that the uptake factor is most likely of minor influence and should not guide decisions where to do OAE and where not. It is rather the two step assessment by how much alkalinity can be increased without triggering secondary CaCO₃ precipitation and how much of CO₂ is then actually taken up.

Section 2.2: it is a pity that there are no references given for any of the suggested modifications to the SOPs for sampling, storage and analysis – very nice to see recommendations for dealing with elevated concentrations.

Unfortunately, experimental OAE is still in its infancy, hence there are no published articles on testing the various modifications suggested here.

The manuscript seems to be missing a (short) conclusion section. In general, while relatively well-written, the text leaves the impression that it was done in a rush, and not with as much care as you might expect from the team of authors.

We agree and have added a paragraph with key recommendations to the end and to the abstract. The guide was indeed on a tight timeline. Nevertheless, we went over the entire manuscript again for refinement.