

Interactive comment on “Assessing Carbon Dioxide Removal Through Global and Regional Ocean Alkalinization under High and Low Emission Pathways” by Andrew Lenton et al.

Anonymous Referee #3

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The Lenton et al., study investigates the impacts from adding artificial alkalinity to the oceans using the model CSIRO under 2 different emission pathways - RCP2.6 and RCP8.5. It was a really well done and interesting study to read technically, however my main comment is that the way the paper is currently structured makes it confusing to read. For example, each paragraph jumps back and forth between RCP2.6 and RCP8.5 making the story line hard to follow. I suggest setting up the story for one of the emissions pathways and then comparing to that one for the other pathway. It would also be useful to set up the chemistry in a little more detail or reiterate the paragraph in the intro. This would be useful when explaining why adding alk under a 2.6 scenario is more effective.

C1

Lastly, section 3.1 was confusing (you may want to expand on the methods section to make this section clearer). For each run you added 0.25Pmol/yr of alkalinity but then I read in ln216 that the magnitude of the increase in alkalinity is dependent on where it was added. Is the 0.25Pmol/yr added to all the boxes? or is it divided up between the boxes for a total of 0.25Pmol/yr? Can you put everything in the same units to be constant?

Minor comments: ln50: "including through coral bleaching" - not clear what this means

ln79-80: This sentence seems out of place.

ln149: what do you mean by impact?

ln158: extra period between feedbacks and references

ln230: the first sentence does not make sense.

ln250: why is there a difference in export?

Section 3.1.2: I don't understand how soil-moisture feedbacks are influencing temperature in this case. Temperature is more variable on land than over the ocean, could it be simply that?

Table4: relative to what?

Figures: relative to what?

Figures: There are a lot of figures which I'm not sure add much to main text. You could simply the story in the text and only look at a few and toss the rest into the supplement. Or could you combine the 2.6 and 8.5 figures into 1? Could you do a difference between them? That would visually show the reader where the differences between scenarios lie....

Section 3.2.5: I think the figures referenced are not the correct figures. Plus I think a description of figures 11 and 12 are missing.

C2

I see that the previous reviewers picked up a bunch of typos, missing words, and grammar mistakes so I won't repeat them here.

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2017-92>, 2017.