

While the latest revisions in response to reviewer comments have helped to clarify the manuscript, further clarifications in some instances would be helpful (see specific comments attached). I recommend that the authors re-read the manuscript carefully with particular attention to clarity to make it as easy as possible to the reader to follow.

I. 41: A reference to this recent study is missing:

Nzotungicimpaye et al., 2023, Delaying methane mitigation increases the risk of breaching the 2°C warming limit. *Communications Earth and Environment* 4, 250, <https://doi.org/10.1038/s43247-023-00898-z>

I. 58-60: Nzotungicimpaye et al., 2023 also discusses the effect of methane mitigation on the carbon cycle.

I. 69 “nonlinearity in the system”: cite Schwinger et al., 2014; Zickfeld et al., 2011 again here.

I. 157 “Three ensemble members...”: Clarify whether three ensemble members are run for each experiment.

I. 175-176: “The beta feedback reflects the strengthening...”: This is only true for rising atmospheric CO₂ concentrations. I suggest to word this in a neutral way that applies to both increasing and decreasing atmospheric CO₂.

I. 176 “positive response”: Avoid value judgements in this context as there is a risk of confusion with the sign of the feedback.

I.180-181: “The gamma feedback reflects the weakening...”: This is only true for rising temperature. As for beta, I suggest to word this in a neutral way that applies to both warming and cooling.

I. 267-268: This sentence is confusing. Why not say “Radiative forcing alone ([CO₂rad] experiment) leads to a slightly higher global temperature increase compared to the coupled [CO₂] experiment, which includes the combined effect of CO₂ physiology and radiative forcing”.

I. 314: Fig. 3 caption: Point out that vertical axes differ between panels e, g and i, j.

I. 322: “... ocean carbon sink”. I think this should read “ocean carbon source”.

I.323-324: “It is nearly equivalent ...”. I wonder if the difference between land and ocean is merely due to the different vertical scales used in Fig. 3 panels e, g?

I.324: Should refer to panels e, g (not f, g).

l. 334-335 “greater reduction in the climate-driven carbon sink”: In my mind this should read “greater reduction in the CO₂-driven sink”. Climate (warming) drives a source, whereas rising atmospheric CO₂ drives a sink.

l. 350-352. Clarify which experiment you are referring to. I suppose it’s [CO₂-BGC] and [non-CO₂]?

Edits/typos:

l. 64 and elsewhere: “over the ocean” should read “in the ocean”.

l. 100: “runup for” → “runup to”

l. 278: delete extra “in”.

l. 335: delete extra “driven”.

l. 413: “priority to” → priority over”.

l. 413: insert “they” before “provide”.