

## Responses to the Topic Editor's comments

Dear Sebastiaan,

We sincerely appreciate the detailed comments, which helped improve the manuscript. Our detailed responses are provided below:

Kia ora,

The feedback of both reviewers was positive, and you have addressed their suggestions well.

I have a few more technical corrections and consistencies that should be addressed (as outlined below), after which I will be happy to accept this manuscript for publication.

ngā mihi

Sebastiaan

L106:  $1 \text{ Gt CO}_2 = 3.667 \text{ Gt C}$  -> that does not seem to be correct, CO<sub>2</sub> is heavier than C, so  $1 \text{ Gt CO}_2 = 0.27 \text{ Gt C}$

**Response:** Changes have been made. The updated phrases in parentheses are shown below:

"(1 Gt =  $10^{15}$ g, 1 Gt CO<sub>2</sub> = 0.273 Gt Carbon, or Gt C)"

L115: The update global carbon budget is out in ESSD discussions:  
<https://essd.copernicus.org/preprints/essd-2025-659/>

**Response:** The old citation has been replaced with this one.

L143: remove point before citation

**Response:** Done. See Line 142 of the revised document.

L243: comma is inside the quotation mark "v2023,"

**Response:** The extra comma has been removed. See Line 239 of the revised document.

L329: 'using the CO2SYS ...' - is a bit redundant, as there are a few other programs you could use, and this is not part of the data product itself (unless I am mistaken?). Maybe omit this part, or rephrase so it is clear that this is part of the data product.

**Response:** The phrase “using the CO2SYS program modified for Python (<https://github.com/mvdh7/PyCO2SYS/tree/v1.2.1>, last access: 8 January 2023; Humphreys et al., 2022)” has been removed.

L362: repeated three times "A synthesis paper is available at <https://doi.org/10.5194/essd-12-2647-2020> (Padin et al., 2020), and the"

**Response:** The sentence below has been removed. Since Padin et al. (2020) is already cited above, readers can readily recognize that it is a synthesis paper for this product.

"A synthesis paper is available at <https://doi.org/10.5194/essd-12-2647-2020> (Padin et al., 2020), and the"

L 392: repetition 'Data is available at NCEI:  
<https://www.ncei.noaa.gov/access/metadata/landing->'

**Response:** The phrase has been replaced with the below:

"Data is available at <https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:NCRMP-CO3-Atlantic> (Manzello et al., 2018)."

L483: repetition 'The program is based on shipboard observations and experiments conducted on ~10 expeditions per annum'

**Response:** 'Per annum' has been replaced with 'per year'.

L548: repetition 'Data are available at OCADS:  
<https://www.ncei.noaa.gov/data/oceans/ncei/ocads/metadata/0173932.htm>"

**Response:** 'OCADS:' has been removed in all cases.

Table 2: might as well add 'ocean' to the last two rows

**Response:** Changes have been made correspondingly.

Table 3: same, add 'ocean' to the 'Open + Coastal' cells

**Response:** All cases have been changed.

L874: suddenly you give a high degree of detail for the calculations (which dissociation constants were used) - if you choose to do it here, you should do the same for the other products were variables were derived.

Also check citation, suddenly you are using square brackets

**Response:** The sentence below has been removed.

“Calculations of  $\Omega_{\text{arag}}$  utilized a MATLAB version of the CO2SYS program (Orr et al., 2015), with the dissociation constants for carbonic acid of Lueker et al. [2000], potassium bisulfate ( $\text{KHSO}_4^-$ ) of Dickson [1990], hydrofluoric acid (HF) of Perez and Fraga (1987), and the total borate concentration equations of Lee et al. [2010].”

Table 4: add 'ocean' to the last row

**Response:** Done. See Row 57 of the new Table 4.

L1047: maybe worth mentioning that the last GCB is currently under review?

**Response:** Done. See Line 997 in the revised document.

Table 5: add 'ocean' to be consistent

**Response:** Done

Table 6: same as for other tables

**Response:** Done.