

1 **Response letter**

2 We thank the editor for handling and carefully inspecting our manuscript. In the following sections, editor comments are
3 written in bold italics, our answers are kept in plain font.

4

5 *Thank you for submitting this revised version to Biogeosciences. I have read it with pleasure and I am happy to inform you*
6 *that your paper is now accepted for publication. However, while reading, I identified a few technical corrections.*

7

8 *Line 110-111: Clarify that you report particulate nitrogen (PN), particulate organic carbon (PC). I guess your PC data and*
9 *C/N ratio only refer to the organic carbon fraction.*

10 Unfortunately, this is not the case. For multiple cruises, we also have organic carbon data. However, for some cruises only
11 total particulate carbon measurements are available. Therefore, we decided to present and use only total particulate carbon
12 fractions for C/N ratios. We clarified this in the manuscript.

Lines	Change
L110-111	Added: “[...] and subsequently analyzed for suspended particulate matter (SPM), particulate nitrogen (PN), total particulate carbon (PC) and C/N ratios (Fig. S1).”

13

14 *Line 443: I guess the range is 25 to 7 % rather than -25 %.*

15 We checked the reference to validate -25%.

16 In Wells et al. (2018), p. 888, L:49-50: “Although 1% of DIN entering the estuaries is expected to be released as N₂O (Kroeze
17 et al., 2005), here N₂O_{total} accounted for anywhere from -25% (Moolooah dry season) to +7% (Nerang dry season) of N_{in}
18 [...]”

19 They found N₂O under saturation in estuaries with low land-use intensity leading to a negative relation between N₂O_{total} and
20 nitrogen input.

- 21 **Line 474: Rewrie et al. reference as submitted. If you can update it to accepted/in press then include it, otherwise I suggest**
 22 **deleting because it is not essential for the point you make (it is a reference in a list of 4).**
 23 The research article is now published and accessible as online version before being included in an issue
 24 (<https://doi.org/10.1002/Ino.12395>). We updated the reference in the main text and in the reference list.

Lines	Change
L455-456	Changed citation to: “(Kerner, 2000; Amann et al., 2012; Hillebrand et al., 2018; Rewrie et al., 2023)“
L474	Changed citation to: “(Kerner, 2000; Amann et al., 2012; Hillebrand et al., 2018; Rewrie et al., 2023)“
L734-736	Changed reference: “Rewrie, L. C. V., Voynova, Y. G., van Beusekom, J. E. E., Sanders, T., Körtzinger, A., Brix, H., Ollesch, G., and Baschek, B.: Significant shifts in inorganic carbon and ecosystem state in a temperate estuary (1985–2018), <i>Limnol. Oceanogr.</i> , in press, https://doi.org/10.1002/Ino.12395 , 2023.”

25 **References**

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 27 of improving water quality, *Estuar. Coast. Shelf Sci.*, 107, 112–121, <https://doi.org/10.1016/j.ecss.2012.05.012>, 2012.
- 28 Hillebrand, G., Hardenbicker, P., Fischer, H., Otto, W., and Vollmer, S.: Dynamics of total suspended matter and
 29 phytoplankton loads in the river Elbe, *J. Soils Sediments*, 18, 3104–3113, <https://doi.org/10.1007/s11368-018-1943-1>, 2018.
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 31 *Limnologica*, 30, 137–143, [https://doi.org/10.1016/S0075-9511\(00\)80008-0](https://doi.org/10.1016/S0075-9511(00)80008-0), 2000.
- 32 Rewrie, L. C. V., Voynova, Y. G., van Beusekom, J. E. E., Sanders, T., Körtzinger, A., Brix, H., Ollesch, G., and Baschek, B.:
 33 Significant shifts in inorganic carbon and ecosystem state in a temperate estuary (1985–2018), *Limnol. Oceanogr.*, in press,
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- 35 Wells, N. S., Maher, D. T., Erler, D. V., Hipsey, M., Rosentreter, J. A., and Eyre, B. D.: Estuaries as Sources and Sinks of
 36 N₂O Across a Land Use Gradient in Subtropical Australia, *Glob. Biogeochem. Cycles*, 32, 877–894,
 37 <https://doi.org/10.1029/2017GB005826>, 2018.