

**Review** of the manuscript *Depositional controls and budget of organic carbon burial in fine-grained sediments of the North Sea – the Helgoland Mud Area as a natural laboratory*, by Müller et al, submitted to **Biogeosciences** (egusphere-2024-1632).

## Manuscript overview

Given before, this is the second review round for this particular reviewer

## Review overview

Following the initial presented manuscript (which had been reviewed before) the authors have made textual changes, as suggested. Some of my comments were in direct opposition to previous comments by other reviewers, so I accept the choices made by the authors to keep all/most reviewers happy. I do have some comments on the revised version though:

I know the sedimentation rates do not include seasonality, but my point was more on interannual variability. As the sedimentation rate estimates are based on longer timescales I would expect a shift in values as long term trends in e.g. SPM or DOC loads from the Elbe become visible. This hinders comparison to values obtained decades ago, for instance, if the trends are significant (which was my point for the comparison to de Haas et al (1997), this is nearly 30 years ago). This caveat should be included here, as marine trends have become stronger due to climate change in this region. Not necessarily for SPM, DIC or DOC loads from the Elbe (there is no obvious trend yet in the data from Patsch (2024), which is worth mentioning), but in general I think this point is worth including in the text. The authors have not addressed this point in the revised text.

8. I also understand the focus is not on biology here, yet a few references to relevant work such as Neumann et al (2013), Shojaei et al (2016), Shojaei et al (2021) and particularly Thatje & Gerdes (1997) and Wrede et al (2017, already referenced elsewhere) would not be amiss given the speculation later of benthic activity differences. True, the spatial scale is not the same, but Thatje & Gerdes do classify a large part of the HMA as 1 ecosystem type, which is relevant for the presented work when bioturbation is discussed, and Wrede et al (2017) have quantified bioturbation potential in the area. So mentioning this in the site description seems worthwhile to me.

27. A reference to Callies et al (2017) would not be amiss here, just for readers who wish to have a better overview of local residual current patterns.

Purely textual:

- Line 91: remove “as a natural laboratory”, as the sentence is grammatically wrong this way and it is repetitive with regard to line 95.
- Line 553: “this is *likely* a result of”, as you cannot be sure of the cause.
- Line 651: “sites *are* exceptionally” or replace while with “with” in the line above.

## Recommendation

Accept after minor revision

## References

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