

Responses to minor corrections on

“Deep-water inflow event increases sedimentary phosphorus release on a multi-year scale”

Dear professor Middelburg,

Thank you for the feedback on the manuscript. Please see our responses (in blue) below.

I. 39: water-column stratification

This has been corrected.

“The central parts of the Baltic Sea have been naturally oxygen-depleted for thousands of years due to a strong water water-column stratification, a long water residence time and limited deep-water renewal (Zillén et al., 2008).”

I. 192-194: you use the argument that standard deviations do not overlap and then the phrase ... which suggests that the fluxes were indeed elevated after the inflow. Your arguments would be much stronger if you would use a proper analysis of variance (ANOVA) to test whether fluxes are different/higher. Such a ANOVA based difference would strengthen the conclusiveness.

We agree. In the original version of the manuscript, we excluded “non-significant” fluxes which occasionally resulting in few replicates per station and year and made the data set unsuitable for an ANOVA test. Since all fluxes are now included in the data set, it is possible to conduct a proper statistical analysis. We have conducted an ANOVA followed by Student-Newman-Keuls tests, which indeed show that the fluxes vary with time, that they were highest in 2016 and that the fluxes were highest at station F. We have added a paragraph to the methods section describing the statistical tests; the results are described in supplementary tables A2 and A3 as well as throughout *Results and Discussion*.

I.236: perhaps rephrase in consistency with to consistent with to avoid misreading as inconsistency.

We have made the suggested change.

“The excess inventory of P_{ex} and P_{Fe} suggest that the net P retention at station F by the sampling occasion in 2016 was $4.6 - 6.4 \text{ mmol P m}^{-2}$ (Fig. 3b), consistent with a study from the eastern part of the EGB where 12 mmol P m^{-2} was estimated to have been retained due to the MBI (Hermans et al., 2019b).”

I. 258: Try to avoid on the other hand if there is no on the one hand prior.

We have made the suggested change.

“The 2017 inflow had a smaller effect on the sediment geochemistry at station D...”

I. 293: do you mean were missed or were missing? Just to check.

We do mean missed, since we believe that this could be an issue with the method.

Section 3.3.2: I believe you could have utilized the increase in DSi fluxes to argue for enhanced deposition of diatoms material. (No action on your side required; just an observation).

We agree, we have modified a sentence in section 3.3.3 to make this point.

“The elevated DSi fluxes observed here could also indicate that an increased input of organic matter (with which biogenic silica is associated, such as diatom material), rather than the presence of oxygen, was causing the change in fluxes.”