

Comments on manuscript

This paper, by Nishant et al., describes sedimentary OC stocks and microbial turnover rates in shallow coastal areas of the Baltic Sea. Stocks were highest in sheltered areas with low wave exposure and decreased with increasing wave exposure, suggesting that exposed environments retain less fine sediment and organic matter. Carbon-rich sediments exhibited the highest rates of remineralisation, indicating more active carbon turnover. Overall, sheltered nearshore sediments function as important carbon storage hotspots, while simultaneously supporting active microbial decomposition. The study is relevant and the motivation, aim and “story” of the manuscript is clear. I appreciate the opportunity to review this paper, and my comments are of minor nature.

Abstract

Line 12-15: The first two sentences sound contradicting, consider rephrasing.

Intro

Line 71: The authors should somewhere in the introduction, perhaps here, highlight more clearly that this study was conducted in unvegetated sediments.

Field sampling and methods

Line 130: I suggest to move the first two sentences to the “study area” section and start this section with: “Based on geographical location...”.

Calculations

Line 180-190: Just as a comment; DBD is not needed to calculate OC stocks. It is possible to instead calculate it based on the cumulated sum of g C, which according to my understanding, is more correct and limits possible errors derived from estimating DBD. Example: $\text{Sum } \%OC/100 * \text{dry weight to the desired depth (g OC)}$ and divide it with the area of the core (g OC/m²).

Table 1: This table should be moved to the results section. Salinity has no unit.

Result

Figure 2. I would suggest showing significant differences in the figure. Figure 2b and 2c is not mentioned in the text in the result, please add.

Figure 4 and 7: Figures that combine different types of plots within the same figure are, in my opinion, hard to interpret. I would suggest instead show this in a scatterplot where the different sites/exposure levels are shown in different colors/shapes.

Discussion

Section 400: Please clarify the relationship with seafloor topography and wave energy more clearly in the first statement.

Line 459: space missing after reference and “are”

Line 486-488: Move this to the methods section: “To assess the extent to which variable sources of sediment OM might influence overall reactivity, we tested the significance of the relationship between bulk C/N ratio and median fractional turnover.”

Figure 8: This figure should be moved to the result section.