

## Review #3 Comments

### Accept with Minor Revisions

The authors have thoroughly addressed the comments and concerns raised in the first review. The manuscript has improved markedly and provides a valuable contribution to the field of carbon storage in vegetated ecosystems, particularly in coastal reed ecosystems. However, I still have some comments regarding the LOI and TOC data. Therefore, I recommend the publication of this publication after some minor revisions.

Thank you for your helpful comments. Please see our responses below in green.

### Specific comments

- Lines 113-116: Please add a sentence here, why it is interesting to look also at carbon stocks from deeper soil depths.
  - A sentence on why it is interesting to look at C stocks from deeper soil depths has been added to **Lines 116-119**: “While many earlier studies focus only on the uppermost 10cm for sediment C stock data, Yost & Hartemink (2020) emphasize the importance of generating data from deeper soil horizons as over half of the organic C in the soil column in some settings can be found below 30 cm and the potential for long-term C sequestration increases with depth.”
- Lines 137-142: If carbon stocks are defined in terms of TOC, it would be more appropriate to present the measured and calculated TOC data in the main text (Figure 4), while moving the LOI results to the Supplementary Materials. Moreover, loss on ignition is not equivalent to TOC, as mass loss during ignition includes contributions from components other than organic carbon, such as bound water, the combustion of total organic matter (not only carbon), and, depending on temperature, carbonates. LOI should therefore be described as a proxy for organic matter content rather than a direct measure, as it does not represent organic matter quantitatively.
  - We have now clarified LOI’s use as a proxy for organic matter content rather than a direct measure and included a new citation on the use of LOI as a method for estimating organic and carbonate content in sediments (Heiri et al. 2001). Most samples had both LOI and TOC measurements but LOI was used as a proxy for organic matter content when there were not TOC measurements as well. I have added a visualization of the regression that was used to generate the conversion factor of 1/2.1 to the supplement

(Figure S2) to show the strong relationship between these parameters and kept Fig. 4 as our LOI data.

- Wording has been added to **lines 144-146**: “For samples with no direct TOC measurement, a LOI% to TOC% conversion factor of 1/2.1 was applied, as calculated in R from the slope of the linear regression line for all samples with both LOI and TOC data (Figure S2).”
  - Citation has been added to **line 136** and the **References** (Heiri et al. 2001)
  - A visualization of the regression used to generate the conversion factor of 1/2.1 has been added to supplementary materials (**Figure S2**). Figures pre-existing in the Supplementary materials section have been re-numbered accordingly and their references updated throughout the manuscript (**Lines 146, 190, 301**).
- Lines 139-140: Please add how exactly you have calculated the sediment carbon stocks.
    - The sediment C stocks were calculated in R using several different formulas. I agree that including more details about how we calculated the sediment C stocks is useful.
      - I have tried to summarize this efficiently and **lines 142-144** now read: “Sediment C stocks were calculated for a given sediment thickness (either *0 cm to 10 cm*, or *0 cm to bottom of core*) by multiplying the TOC content (%) by the DBD ( $\text{g cm}^{-3}$ ) and the sample volume ( $\text{cm}^3$ ) in a hypothetical sediment column of surface area  $1 \text{ cm}^2$ . Data were then converted to  $\text{g C m}^{-2}$  for the given thickness of the layer (Table S4).”
      - Sediment increment has been added to **Figure 5, Table 1, and Table 2**: (0 cm to bottom of core)
      - 0 cm to 10 cm sediment stock columns have been added to **supplemental table S4**.
  - Lines 141-142: Please also add the formula for the LOI conversion factor.
    - **Line 144-146** now says: “For samples with no direct TOC measurement, a LOI% to TOC% conversion factor of 1/2.1 was applied, as calculated in R from the slope of the linear regression line for all samples with both LOI and TOC data (Figure S2).”
  - Line 209 and 219: Please add the definition of aboveground and belowground biomass not only in the figure captions, but also in the main text.

- I have now added aboveground and belowground biomass definitions in the main text on the following lines: **line 28, line 29, and line 65-66**.
- Figure 2: This may be a matter of personal preference, but the use of color in this figure could enhance readability.
  - I have replaced **Figure 2** with a color version. Please let me know if you prefer this one to the black and white version.

#### Technical corrections

- Lines 38-39: The terms carbon (C) and blue carbon (BC) still had not be defined in the main text. The same is true for loss on ignition (LOI) in line 112.
  - Thank you for catching this. The terms are now defined on the following lines: C is now defined on **line 39**, BC is now defined on **line 40**, and LOI is now defined on **line 114**.
- Line 40: Please replace “Muller” by “Müller“.
  - Thank you. “Muller” has now been replaced with “Müller” on **line 41**.
- Lines 278-280: Please replace “correspond with” by “correspond to”.
  - Thank you. **Line 283** now says “correspond to”.
- Lines 283-284: Please modify as follows: Our sediment C stocks averaged between approximately 6 and 16 C kg m<sup>-2</sup> across the different sites, compared to the values of 17.4 C kg m<sup>-2</sup> reported by Buczko et al. (2022).
  - Sounds good. **Lines 287-289** now read: “Our sediment C stocks averaged between approximately 6 and 16 C kg m<sup>-2</sup> across the different sites, compared to the values of 17.4 C kg m<sup>-2</sup> reported by Buczko et al. (2022).”
- Lines 288-295: The parentheses around the publication year are missing in the references to Buczko et al. (2022).
  - Thank you. Parentheses have been added around the publication year for Buczko et al. (2022) on **lines 289, 292, 296, and 297**.
- Line 296: Since the previous Figure 5 is now in the Supplementary Material, the reference here is incorrect.

- Thank you. The reference has been corrected to read Figure S3. **Line 301** now says “(Figure S3 and Tables 1 and 2)”