Dr. Miyajima,

We thank you for your valuable comments on this manuscript, which we generally agree with and believe will improve the manuscript. We address these comments below.

Isotope Mixing Models

To the authors knowledge, both C/N ratios and $\delta^{15}N$ are suitable for use in mixing models. Some research suggests that while diagenesis can modify the C/N of organic content in sediment, it may not severely alter the ratio, although we acknowledge this evidence may not be definitive. For example, Craven et al. (2017) writes "*In saltmarshes, while d13C is considered relatively conservative and not susceptible to large diagenetic fractionation in sediment, d15N is rapidly altered during early diagenesis (e.g. Benner et al. 1991) and is not an appropriate SIAR system tracer unless diagenetic fractionation is quantified. In its place, the absolute ratio of C/N can be used (e.g. Goñi et al. 2003; Gordon & Goñi 2003; Liu & Kao 2007), as this is more resistant to diagenetic changes (Lamb et al. 2006).*" For this reason, we choose to use C/N ratios as a tracer in our model, although it is likely that either C/N or $\delta^{15}N$ would be feasible.

More significantly, we agree with the comments regarding the four sources, which were echoed by the Reviewer 1. To address this, we believe it may be more appropriate to re-run the mixing models, pooling C3 and diatom sources given their overlap. This idea was tested (we re-ran models) and the results seems consistent with what reviewers suggest. This 3-source, 2-tracer model will be used to explicitly account for the fact that in reality, we mean sediment contributions from diatoms "AND/OR" C3 plants. To further address this, language will be changed to acknowledge other possibilities in sediment contributions.

Grain Size

We agree with comments here and will include the reference provided (Miyajima et al. 2017). This 36% value cited in the manuscript is a product of the way analysis was done, showing statistical significance of the trendline when all possible values of TOM are included (Figure 4). Based on the comments and references, by altering the regression analysis, we can produce a more realistic estimate of the threshold at which the correlation between % mud and % total organic material is no longer significant. Specifically, by analyzing the data by selectively filtering out sediments with high levels of % mud, we find a threshold value of 82% mud – a value close to what is suggested by the reviewer and also by Figure 4. This change will be added in text throughout the manuscript (methods, results, and discussion).

We will also add a brief discussion of the possible differences between salt marsh and seagrass meadow sediments in terms of the fraction of OC present as independent particles versus mineral associated-OC, particularly in light of the differences in grain size between habitat types. Although we do not explicitly assess this, it is likely a contributor to what we observe.

Core depths & comparison to other studies

This same general comment was echoed by Reviewer 1, and a full response to this matter can be viewed in our response to Reviewer 1. In short, we plan to explicitly report the core depth over which cores were collected in Table 3 for clarity and add details in text on the variation in core depths and resulting stock estimates.

Minor questions and suggestions

We thank you for your attention to detail here. All suggestions and corrections will be accepted.

Thank you again for your contribution to this work,

Melissa Ward on behalf of all co-authors

References

Craven, K. F., Edwards, R. J. and Flood, R. P.: Source organic matter analysis of saltmarsh sediments using SIAR and its application in relative sea-level studies in regions of C_4 plant invasion, Boreas, 46(4), 642–654, doi:10.1111/bor.12245, 2017.

Miyajima, T., Hori, M., Hamaguchi, M., Shimabukuro, H., and Yoshida, G.: Geophysical constraints for organic carbon sequestration capacity of Zostera marina seagrass meadows and surrounding habitats, 62, 954–972, https://doi.org/10.1002/lno.10478, 2017.