

Referee #1

Referee comment: The main issue is the calculation of the organic carbon stocks. The authors report a total stock of 203 million tonnes in an area covering 223 km² of seafloor according to their most refined upscaling approach (scenario 3). Compare this with results in Diesing et al. (2021), who estimated 231 million tonnes of organic carbon in the North Sea and Skagerrak (558,000 km²) or Smeaton et al. (2021), who estimated 524 million tonnes in the United Kingdom's Exclusive Economic Zone (744,000 km²). The stock estimate in the study of Brennan et al. is on the same order of magnitude as the other two studies despite an area three orders of magnitude smaller. It would therefore appear that the estimate is too high and that there is an error in the calculations. The error can be found in equation 4, where arcsine transformed organic carbon contents are used to calculate stocks. Stock calculations should instead be done with untransformed organic carbon contents. Transformation of the data can be advisable when spatially interpolating or predicting organic carbon content. However, the results need to be back-transformed prior to stock calculations (equation 2 in Diesing et al., 2017 or equation 8 in Smeaton et al., 2021). Recalculating organic carbon stocks based on the data provided in the supplement, I got 80,901 t for scenario 1 and 16,437 t for scenario 2. I would advise the authors to calculate stocks using the untransformed organic carbon data and then assess whether a transformation is necessary for spatial prediction. They could then run the spatial predictions with transformed data and back-transform the results to get organic carbon stocks.

Response to Referee comment: Thank you for picking up on the error in the calculations, we have corrected the estimates by removing the arcsine transformation advised by the referee.

Referee comment: I find the choice of scenarios (upscaling methods) a bit artificial. Given the progress we have seen in recent years, I think (or at least hope) nobody would simply upscale the mean stock values based on measurements to a whole site (scenario 1). I suggest linking the scenarios to the methods discussed in the introduction, i.e., kriging without regression or external drift (as a new scenario 1) and upscaling based on average stocks per sediment class (similar to scenario 2). In my opinion, this would be more informative and better link up with the introduction which, among other things, summarises the evolution of the mapping methods.

Response to Referee comment: We agree with the referee that the upscaling method for scenario 1 may be somewhat bit artificial – but we wanted to demonstrate the challenges of spatial estimates of seafloor carbon in the absence of high-resolution seafloor mapping data. In order to demonstrate the variability in estimates in the absence of high-resolution seafloor substrate maps – we will incorporate an additional scenario into the paper where the carbon stocks are interpolated between the sampling locations using Empirical Bayesian kriging. This is now included as Figure 9 and estimates of OC based on this method in Table 7.

Referee comment: The discussion is very short, which in itself is not necessary a bad thing, but I think that it leaves out opportunities. For example, the authors could discuss the impact of coarse-grained sediments on OC stock calculations more generally. All marine studies published so far calculate stocks by multiplying organic carbon content with dry bulk density and the sediment depth interval that is considered. In this study, organic carbon stocks are only calculated for soft substrates (sand, silt, and clay), while it is assumed that hard substrates do not contain organic carbon (in scenarios 2 and 3). It might be worth comparing these two contrasting

approaches with the approach taken in terrestrial soil mapping, which accounts for the content of coarse fragments (>2 mm grain diameter) when calculating stocks (Hengl et al., 2014; Poeplau et al., 2017). Is this an aspect that the marine community has so far overlooked?

Response to Referee comment: We agree with the referee's comment on adding more to the discussion. However, we decided to not include a section on comparing between marine and terrestrial soil mapping since we have added a limitations section and a comparison in OC stock section.

Referee comment: The first paragraph of the introduction sets out to define Blue Carbon. However, I find this section not particularly clear. In fact, there are two definitions of Blue Carbon given. The first one is extremely wide including all inorganic and organic carbon stored in the ocean. Conversely, the second definition of the IPCC is much narrower and aligned with the 'classical' definition of Blue Carbon, which only considers vegetated coastal ecosystems that are actionable. I strongly suggest revising this first chapter, so that it becomes clear what is considered Blue Carbon in the context of this study. Some suggested literature: Lovelock and Duarte (2019); Howard et al. (2017, 2023)

Response to Referee comment: Thank you for addressing your concerns about the definition of blue carbon. We examined the suggested literature and removed the initial definition and only kept the second definition (Line 33).

Referee comment: The sampling design could be explained in more detail. In particular, it is unclear to me how a stratified sampling design, which requires some form of segmentation of the area into more or less homogeneous areas can be based on the backscatter mosaic, which is continuous. Was the backscatter data categorised and if so, how?

Response to Referee comment:

Referee comment: The methods section could benefit from a short paragraph that summarises the research strategy incl. a flow diagram. This would provide the reader with a better overview of the methodology right from the start.

Response to Referee comment: We added a flow diagram and summary of the methods at the beginning of the to the materials and methods section to provide a better overview of the methodology (line 151 to 163).

Referee comment: Figures 1, 2 and 8 use a rainbow style colour palette. The use of such a colour scheme is generally discouraged. Please see Crameri et al. (2020) for advice on choosing a suitable colour scheme.

Response to Referee comment: We reviewed the suggested paper and found that we disagree with the referee and will keep the rainbow style colour scheme for Figures 1, 2 and 8.

Referee #2

Title

Referee comment: The title of the manuscript should be changed to reflect the local-regional scale of the study rather than implying the results could be applicable at the scale of continental shelves.

Response to Referee comment: We have changed the title to better reflect the focus of the paper. The new title is: “Seafloor sediment characterization improves estimates of organic carbon standing stocks: an example from the Eastern Shore Islands, Nova Scotia, Canada”.

Introduction

Referee comment: The paper would benefit from restructuring the introduction to provide better flow and linkages between the paragraphs, including a stronger link between MBES, sediment type and organic carbon.

The introduction sets the scene for the requirements of the research generally; however, it needs to provide a clearer rationale for how it is novel in comparison to other mapping studies for sedimentary organic carbon and what specific contribution it is making. The paragraphs do not link together particularly well and the authors are encouraged to consider the flow between sections. Crucially, the link between sediment type and organic carbon has not been made, which is essential supporting information to explain why seabed sediment mapping using MBES can yield carbon stock results. The section on marine carbon is chaotic, for instance, it jumps from marine carbon straight into different definitions for blue carbon to benthic carbon. References that are more appropriate are needed to support statements.

Response to Referee comment: We have edited the introduction to improve the flow, inserting linking sentences between paragraphs where needed. We have also added to the section by describing the relationship between sediment type and organic carbon (line 53 to 55). We have also added more appropriate references and kept the second blue carbon definition that specifically discusses organic carbon and not inorganic carbon to avoid confusion (line 33).

- Line 32 – Blue carbon is specifically about organic carbon – if this is not explicit, there is the potential for confusion with inorganic carbon too.

Response to Referee comment: We specified biological carbon to avoid confusion (line 33).

- Line 33 – The term disproportionate needs to reflect per unit area. Rather than the global ocean, it is about specific habitats that can store disproportionate amounts of carbon on an area-by-area basis.

Response to Referee comment: Thank you for your comment, we altered the definition to reflect per unit area and highlight that it is specific habitats that can store disproportionate amounts of carbon (line 32).

- Line 36 – A more appropriate to reference McLeod *et al.*, 2011, who was part of coining the term Blue Carbon.
- Line 38 – A more appropriate reference would be Lovelock et al., 2019 as this paper discusses how the BC term is evolving in the science and literature.
- Line 40 – A more appropriate reference is required to highlight times of accumulation and burial of sediment over 1000s of years (See papers by Berner, 2003, or Burdige, 2007 to get a longer-term overview). The currently referenced papers investigate surface sediments, which are not where the long-terms stores of carbon are found.

Response to Referee comment: Thank you for your insight we added all these references to the paper (line 35, 37 and line 38).

- Line 41 – What is the scale for this estimate? Is that one trawl or all trawls everywhere?

Response to Referee comment: That is a good question, we added to the sentence by stating that the study is combining all trawls everywhere on a global scale (line 43).

- Line 42 – Only one reference provided, although next sentence refers to more than one study.

Response to Referee comment: We have retained reference to more than one reference here – as it is a general statement following on from the (several) previous cited studies on this topic in the proceeding sentences. We have therefore inserted the word “Combined…” at the start of the sentence to emphasize that reference is to the early papers that are cited (line 46).

- Line 45 – Could be more specific about which anthropogenic activities. Can they be characterised?

Response to Referee comment: We have edited this to clarify that we are referring to bottom trawling and dredging (line 47).

- Line 48 – MPAs have traditionally been designated for biodiversity – designation for carbon would be a novel approach?

Response to Referee comment: Yes, we emphasized in the paper that mapping carbon could expand the definition of MPA’s to become areas that need to be protected due to high amount of CO₂ sequestration (line 50).

- Line 56 – Sampling systems – do you mean physical samples or other?

Response to Referee comment: Yes, we made sure to specify that it is physical sampling (line 64).

- Line 57 – Can expand on the relevance of the different sediment names – i.e. increasing grain size. What classification is this?

Response to Referee comment: We expanded on the relevance of different sediment names and specify that in this study we utilized the Wentworth scale (line 65).

- Line 66 – Are these early studies based on terrestrial or marine carbon?

Response to Referee comment: These studies are marine carbon-based studies, so we clarified this in line 75.

- Line 73 – Was MBES data used in all the referenced studies?

Response to Referee comment: When examining the referenced studies Smeaton et al. 2019 was the only study that examined MBES data, which emphasizes how novel our approach is in marine carbon mapping research. We made sure to elaborate on that in line 88.

- Line 80 - There has been no mention yet about the relationship between sediment type and organic carbon so it is not clear why the extent of bedrock would make a difference to calculations.

Response to Referee comment: Thank you for addressing that point, we made sure to add this information into the paper to make it clearer for the reader (line 54 to 56).

- Line 86 – The Hunt et al., 2021 study results were not output at 6 m resolution. Check references used are accurate representations of the points you are making.

Response to Referee comment: That is a great point, we specified that the Hunt et al., 2021 performed one calculation of organic carbon stock using predictions from the linear mixed model with backscatter at 48 m resolution (line 96).

- Lines 91-92 – Could be more explicit in why the two studies mentioned found differences. The studies were apparently in very different geographical settings as one possibility.

Response to Referee comment: Yes, we agree with your point and added to that paragraph discussing why the estimates in these studies are different emphasizing that one reason is due to the different locations and approaches (line 104 and 106).

- Lines 96-99 – This sentence is too long and vague - lots of challenges with global estimates and is it a realistic scale for management?

Response to Referee comment: We shortened this sentence and added more detailed (line 110 to 112)

- Line 100 – Further detail about why it is an Area of Interest?

Response to Referee comment: We added more detail about the significance of the site and why it is an area of interest (line 125 to 130).

- Line 101 – Question about the relevance of the setting - I understand that this location is a good setting to test the hypothesis that different sediment types have different carbon densities? Would that be true?

Response to Referee comment: Yes, previous studies have explored carbon mapping in a homogenous seabed, therefore our study is novel since we are exploring carbon within a heterogenous seabed (line 115).

Study Area

This section could be strengthened by including a description/ characteristic of the Study Area that might be more relevant to sedimentary carbon. There is no description of what is known about seabed sediment type for instance.

Response to Referee comment: We agree and included a description of the study site that includes seabed sediment type (line 135 to 139).

- What is the relevance of temperature and nutrients to potential carbon stocks?

Response to Referee comment: We wanted to provide general information about the location since temperature and nutrients all have a relationship with carbon and could provide insight on why there is substantial organic carbon in certain areas on the map. This section has therefore been retained.

- Why is it an Area of Interest to the Canadian Government?

Response to Referee comment: We added the information to the paper (line 125 to 130).

- Figure 1 - Would appreciate the location within a more generalised map of Canada somewhere as well to get the wider geographical context.

Response to Referee comment: We added a more generalised map of Canada to the figure.

Methods

The method chapter is currently too vague and requires further development to include specific details for clarity (it is a little unclear what has been done and in what order) and for repeatability. Some areas for improvement include:

- Line 154 - Explain more about what focal statistics is and how it was applied.

Response to Referee comment: We agree with the referee and added more detail about how focal statistics works and how we applied it to our research (line 189 to 191)

- Line 166 - How many grab samples were taken overall?

Response to Referee comment: 17 grab samples were taken overall. We specified that in the paper (line 204).

- Line 167 - A stratified random sampling technique was used based on the backscatter; however, no information has been given about what classification method was used for this.

Response to Referee comment: The wording here has been changed to provide more clarity and detail on the sampling approach (lines 198 to 200).

- Line 169 - How large were the subsamples? How big was the Van Veen grab?

Response to Referee comment: The size and dimensions of the sampler have been added. The subsamples were the 0.907 kg plastic containers. We rephrased that sentence to make sure that is clear (line 206).

- Predictor variables – I don't see that sediment type has been explicitly mentioned. E.g., Line 150 mentioned additional predictor variables but it is not clear what they are additional to.

Response to Referee comment: Sediment type is not a predictor variable - it is the response variable. Also, we were trying to explain that from the primary bathymetric dataset additional predictor variables like slope, bathymetric position index (BPI) and vector ruggedness measure (VRM) were derived. We will make sure to make that clearer.

- Line 168 – Backscatter is not always a good proxy – Could you caveat this by saying backscatter can be a good proxy for sediment grain size and perhaps add some more references for studies where this is the case?

Response to Referee comment: Thank you for this insight, we altered the wording here and added additional references to prove our case (line 200)

- Line 172 - Only soft substrates have been sampled – what was used to ascertain what substrates were and were not suitable prior to sampling?

Response to Referee comment: Substrate were suitable based on the backscatter mosaic we added this to the paper (line 198 and line 200).

- Line 178 - Were the sediments sorted for grain size before being prepared for OC analysis? How were the sediments above 2 mm separated? Was bulk density of the sediment measured?

Response to Referee comment: Sedimentary OC analysis was the first measurement and a section of the grab samples (five grams was used (line 213). The sediments above 2 mm were separated using a mesh sieve (line 222). Bulk density was not measured and only calculated (Line 227).

- Line 180 - Were samples dried from frozen?

Response to Referee comment: Samples were stored in a freezer to reduce biological activity that could impact OC and then it was dried (line 210).

- Line 183 – How was the coarse fraction estimated and removed? Did this result in any loss of integrity of the sample?

Response to Referee comment: The coarse fraction was estimated using the mesh sieves; therefore, we knew the % weight of the coarse fraction within the sample. When examining figure 7, only two samples had a coarse fraction (gravel) and we state that this in line 214: *Two samples (ES-31, ES-35) had notable amounts of course-grained sediments (around 30% of sample). The coarse fraction was removed from these samples, and the % OC adjusted accordingly.* We modified this sentence by describing further how we altered the calculations to accommodate for the loss in sample (lines 215 to 216).

- Line 192 - How was it determined that the sediments had relatively low organic content?

Response to Referee comment: Before the grain size analysis was performed on the fine sediment organic carbon content was measured and it was relatively low for all the samples, indicating that the samples did not need to be treated with acid or hydrogen peroxide.

- Line 192 - Were the coarse and fine fractions measured as % of mass or volume of the total? Was the full particle size distribution used to classify sediment type at all?

Response to Referee comment: The coarse and fine fractions were measured as % mass of the total. We made sure that it is clear in the paper (line 226). The sediment classification was determined using imagery; therefore, the particle size distribution was not used to classify the sediment type.

- Line 206 - Was the camera stationary for 3 minutes or was it taking a video transect?

Response to Referee comment: The camera was not stationary and instead moved for 3 minutes. We added this information to this section to make it clear for the reader (line 236).

- Line 213 – Two classifications is quite rudimentary, and it should be acknowledged somewhere when interpreting the results as a potential limitation. Mixed sediment can exist which contain proportions of mud, sand and gravel, e.g., a gravel veneer on a muddy substrate, which will have a different OC content than a sandy or pure gravel.

Response to Referee comment: Thank you for noting this limitation. We originally tried to add more sediment classification types, but the random forest model had high error suggesting that the sediment type was too complex and challenging for the model. We described this further in the discussion (line 478 to 482).

- Line 223 – It is not clear what is being modelled - is it carbon content within the sediment? The title of the section is confusing.

Response to Referee comment: Section 3.5 is only modelling sediment type and no examination of carbon content. The sediment model provides insight of where the soft substrate is located to provide the area for interpolation of the carbon content. We altered the title and added a sentence to make that clearer for the reader (line 254).

- Line 253 – Are there any limitations of assuming the same single grain density value across the area? For instance, could it artificially over-inflate carbon stock estimates for muddier sediments?

Response to Referee comment: Yes, and we discuss the difficulty in estimating OC stocks in complex substrate in lines 478 to 482.

- Line 254 – Check that the references are correct to support the method used.

Response to Referee comment: We double checked the reference in this sentence. Thank you for noticing this error.

- Line 261 - Did this step of modelling the OC content at unknown locations happen before or after the OC stocks were estimated in the previous section?

Response to Referee comment: The modelling of OC density at unknown locations happened before determining the OC stocks estimations for scenario 3 and 4. We made that clearer in line 299.

- Line 273 – What does a small RMSE value indicate?

Response to Referee comment: A small root mean square error (RMSE) indicates that the model has performed well and can predict the data accurately. We added this information in lines 324 to 325.

- Figure 2 – In the map legends, the values of the parameters could be rounded up.
- Table 1 – formatting – centre the table headings

Response to Referee comment: Thank you for both these insights, we rounded up the values and centered the table headings.

Results

The main issue here is that the calculated stock estimates do not appear correct when compared against other studies that have also used OC Content and Dry Bulk Density (e.g., Diesing et al., 2017, Smeaton et al., 2021, Hunt et al., 2020) - they are at least an order of magnitude higher, and the calculations should be revisited.

Response to Referee comment: Thank you for picking up on the error in the calculations, we corrected the estimates by removing the arcsine transformation (line 280).

- Line 275 – Is this a measurement of organic carbon content or concentration? See Flemming and Delafontaine, 2000.

Response to Referee comment: We measured organic carbon content (%) and its relationship to the grain size composition of mud. We made sure that is clearer in the paper (line 339).

- Line 277 - What framework is used for silt + clay = mud? Reference needed.

Response to Referee comment: We added a reference here to explain why silt+ clay= mud (line 334).

- Line 284 – Clarity needed – The results from Figure 4 suggests to me that % mud is a good proxy for OC - not sediment type. Sediment type is a classification based on the total composition of grain sizes.

Response to Referee comment: Thank you for picking up on that distinction. We altered our language to state that it is % mud that is a good proxy not necessarily sediment classification (line 341).

- Line 309 – Are these statistics for across the whole area? Or for the grab samples? What useful information does this general distribution provide?

Response to Referee comment: These statistics are just for the grab samples which were measured for OC content and sediment grain size. This figure helps explain the distribution of grainsize within the grab samples and demonstrate that the areas with the highest OC content have high quantities of mud (silt and clay).

- Line 325 – Can you expand on the significance of the accuracy of the interpolation?

Response to Referee comment: Yes, we expanded on the accuracy of the interpolation to provide further understanding for the reader (line 375 and 376).

- Line 338 – Over what area is the assumption of a homogenous seafloor made – hard and soft substrate? It is not clear what 'average' sediment type and carbon content was used here to scale across the 'whole' area?

Response to Referee comment: The first scenario is assuming that the entire study area (hard and soft) is homogenous since in this situation there would be no sediment classification map. The 'average' moc is the organic carbon stock per pixel and then we multiplied by the number of pixels in the entire study area. We made sure to clarify this is from lines 153 to 165.

- Line 342 - Is this the same as assuming no OC present, as in scenarios 2 and 3? Needs some clarity.

Response to Referee comment: Scenario 1 is assuming we have no understanding of the seabed and cannot differentiate between hard and soft substrate therefore the averaged OC stock from the grab samples is multiplied to the entire study site. We delved deeper into each scenario at the beginning of the methods section (line 153 to 165).

Tables 3 & 4 – further detail needed in the caption to explain what is being shown.

Response to Referee comment: We added more detail in the caption for both these figures thank you for that suggestion.

- Table 6 - The table format is difficult to follow. Please consider how to improve the layout. Is the average across the grab samples?

Response to Referee comment: We altered the table to make it easier for the reader to follow. The average density of OC per grid cell is across the grab samples for scenario 1 and 3, but the average OC density is the interpolated average for scenario 2 and 4.

- Column 6 – Is this supposed to be density rather than stock?

Response to Referee comment: Yes, we changed that in the table, thank you for the comment.

- Figures 6 & 7s – The colour key (orange and purple) in the caption is the wrong way round.

Response to Referee comment: We altered that, thank you for noticing the error.

- Figure 8 – Is the spatial map showing organic carbon density? The text in the results section suggests that it is OC concentration (content?). Also are the units kg/m³ correct?

Response to Referee comment: The spatial map is showing organic carbon density and we changed the lines 373 to make that clear.

I am interested in the results map in Figure 8, which generally shows very high OC densities associated with locations further offshore and within sandy sediments. It would be interesting to discuss why this might be the case – is the spatial model biased by the sample location or are there local circulation patterns occurring which may be transporting material offshore?

Discussion

Overall, this section needs developing and the results discussed further. The discussion has not acknowledged the limitations of the study - I would expect some discussion around the implications of only two sediment classes (and no sampling of the harder substrate), no direct measurement of DBD, what physical processes might be driving the spatial distributions of sediment types and/or carbon hotspots. There should be some acknowledgement of the difference between surface and deeper sediments and how this relates to OC burial if the rationale for the study is being linked to climate. Specific comments include:

Response to Referee comment: We agree with the referee and added a limitations section in the discussion (lines 477 to 483). We also added insight on what physical processes are causing the spatial distribution (line 469 to 475).

- There should be further development of Paragraph 1 – it's not clear why improved spatial modelling should always result in decreased OC stock estimates – is that what is meant?

Response to Referee comment: Thank you for your comment we expanded more in paragraph one. The goal of mapping is to provide more accurate representations on OC stocks and variability in OC within a small study area. In this case it decreased the OC stocks as we increased the detail, which makes sense since without examining the spatial variability within an area it will be assumed that the estimate is even throughout. We emphasized the improvement in accuracy in line 406.

- Line 380 – Might be appropriate to discuss that one limitation of your study was only classifying into two sediment types. For instance, how would gravelly mud be defined – as hard or soft substrate - given the binary classification?

Response to Referee comment: Yes, we added the two-sediment classification as a limitation and express the challenges with modelling sediment type (lines 479 to 490).

- Line 382 – What empirical relationship is being referred to here?

Response to Referee comment: The empirical relationship is that adding more spatial detail can improve organic carbon estimates.

- Line 386 - Why is this reference being used? - As an example of a study saying the same thing or an example of study that has assumed a homogenous seafloor? I disagree with the latter - The Smeaton et al., 2021 study supports the importance of good substrate

mapping (16 Folk classification – if the data support the use of such a high-resolution study) for OC stock estimates. It does not assume a homogenous seafloor.

Response to Referee comment: The reference is being used since this study said the same thing. We will alter that sentence to make that clear (line 420).

- Lines 395 – 405 – Can the challenges with carbon modelling on the seafloor be further elaborated? How much surface POC reaches the seafloor? Is this the only source of POC in the ocean? What might be driving the spatial distribution of carbon in the map in Figure 8?

Response to Referee comment: Yes, we added more to the challenges with carbon modelling and the lack of papers that have tried to analyze this problem. All of these are great questions are added in the lines 491 to 495.

- Line 409 - What is the uncertainty with this estimate?

Response to Referee comment: We added the ranges in Table 7.

- Line 420 - This study looks at stock of carbon, which is not the same as sequestration (see bullet point above). The discussion needs to better reflect the study and not over-promise on the results.

Response to Referee comment: We now only discuss stock of carbon to ensure that we are not providing misleading statements.

Conclusion

There is some mixed messaging in the conclusion. The authors suggest throughout the paper that their dataset is satisfactory to determine robust results however the final paragraph in the discussion and the conclusion mentions limitations in the dataset that are not discussed anywhere else.

Referee comments: We have rewritten the conclusion and moved reference to limitations to previous parts of the paper to ensure that no new information is addressed in the conclusion. The conclusion now links with the revised study goals presented at the end of the introduction.

1. Technical Corrections

The definition of blue carbon in the introduction is confusing – how is it being defined in this study, and why is it something that should be cared about?

Referee comments: Thank you for that insight we altered our definition to make it more clear for the reader.

- Some terms have been used incorrectly. For instance, there are incorrect uses of carbon ‘concentration’ / ‘content’ / ‘stock’ and ‘density’. E.g. Line 258 - Concentration is incorrect here - it represents a mass per volume. This study is measuring content i.e. mass per mass (weight % of organic carbon) (See the paper by Flemming and Delafontaine, 2000).

Referee comments: We reviewed our terminology to ensure we are not using incorrect terms throughout the manuscript.

- There is inconsistent formatting of units; there should be a space between the number and unit. Use either mm or μm .
- There is inconsistent formatting with the references and ‘et al.’ should be italicised.
- Check references used are supporting and accurate representations of the arguments being made.
- Data are plural – check grammar.
- Line 37 – Use of capitals for Blue Carbon – be consistent throughout the paper.
- Language - Lines 417/422 – ‘Anthropocentric’ is not the appropriate adjective here.

Response to referee comments: Thank you for finding these technical errors, we reviewed the document to fix these grammar and formatting mistakes.