

In my opinion, this paper addresses relevant scientific questions within the scope of BG and presents novel ideas and tools. I believe the topics addressed are well represented in the manuscript title and abstract and are important for the field of environmental science as a whole. I suggest accepting this manuscript with some revisions.

**General comments:**

Figures: All of your figures look very different from each other. Similar categories (Natural mangroves, Restored mangroves, Tidal flats or High, Moderate, Low-urbanization) are shown in several different colors or layouts throughout your figures. It might be easier for the reader if you picked a consistent color scheme throughout (example: applying the green, yellow, red scheme you used to depict High, Moderate, and Low-urbanizations in Figure 6 to all of your relevant figures) or consistent layout (like the clearly differentiated column and row headings in Figure 5).

**Specific comments:**

line 28: Do you want to include this image as Figure 1? If so, please add a figure description and adjust figure numbering throughout the manuscript accordingly.

line 72: Both “blue-carbon” and “blue carbon” have been used in the manuscript so far. Please choose one format and apply throughout the whole manuscript.

line 90: Figure 1. Please make some adjustments to Figure 1. Inset C is very clear and easy to understand. Insets B and D are not as clear. It would be helpful to have the first views for Insets B and D zoomed out more so we can tell where we are (as you did with Inset A). It would also be helpful to keep the color scheme consistent throughout all of the maps (water always shown as blue, adjoining land always the same gray or white as they are in Inset A).

lines 91-92: Figure 1 description. I do not see urbanization gradients depicted in your Figure 1. Please either add urbanization gradients to the figure (or make them more obvious if I have missed them) or adjust this figure description.

lines 106-107: Is this soil bulk density dry or wet? Based on information further down in the manuscript, it seems like you looked at dry bulk density, specifically. If this is the case, please clarify here.

lines 107-108: Please explain your leaf sample methodology further. What do you mean by “according to the local mangrove community composition”?

line 110: Please provide information on what kind of soil corer you used as you mention compaction issues further down.

lines 111-112: Please provide details on why you adjusted your soil core section intervals as you got deeper.

line 117: At what temperature did you refrigerate the samples?

lines 120-121: Please provide an explanation and a citation for a publication to support this assumption.

line 121: Please provide more information in this section of the manuscript on why you did not assess sediment accumulation rates for tidal flats.

lines 125-135: Please provide citations for your soil parameter measurement protocols.

lines 134-135: It might be worthwhile to define SBD as DBD (dry bulk density) to be more specific about the kind of soil bulk density you measured.

lines 158-159: I think this methodology is probably fine. Ideally, data exploration would involve a few more steps than listed here. A paper that provides a detailed protocol for data exploration with ecological data is Zuur, A. F., Ieno, E.N., and Elphick, C. S. 2010. A protocol for data exploration to avoid common statistical problems. *Methods in Ecology and Evolution*. <https://doi.org/10.1111/j.2041-210X.2009.00001.x>.

line 191: Table 1, line 1, column 3 (High-urbanization natural mangroves, Salinity): 52 g kg<sup>-1</sup> seems high for this part of the world. Please double-check this is not a typo. If this is correct, please discuss the high salinity in more depth in your discussion section. If this salinity level is a known feature of this particular area, please include that in section 2.1 Study area.

lines 194-196: Figure 2 description: Please include units in all of your figure descriptions.

lines 198-199: Figure 3 description: Please include units in all of your figure descriptions. What do you mean by "different letters indicated significant differences in soil organic carbon among urbanization levels within the same ecosystem type..."? Define what the letters are and what each of them means, exactly.

line 208: Figure 4: It seems you have two main rows for these figure insets (Natural Mangroves and Restored Mangroves) and three main columns (High-urbanization, Moderate-urbanization, and Low-urbanization). Can you adjust the figure so it is more obvious that these insets all fit inside these different categories? Simply making the row and column titles bigger may achieve this or you could add a background grid or ribbons like you did in Figure 6.

lines 209-210: Figure 4 description: Please provide more details in your figure description, such as units. This would also be a good place to clarify which of the Inset Figures are natural mangroves vs restored mangroves and high vs moderate vs low-urbanization.

lines 208-210: What locations do Inset Figures A, B, C, D, and E correspond with (ex: Shantou, Zhanjiang, or Huizhou)? Please provide the location names in either the figure or in the figure description.

lines 231-232: Figure 5 description: Please include more details in your figure description. What do the different colored boxes for your different depth intervals represent? Do Insets A, B, C, D, and E correspond with the same Insets in Figure 4? If so, it may be helpful to include the locations for each of these either in the figure or in the figure description.

lines 246-247: Figure 6 description: Please provide more details in this figure description. What do you mean by "different letters indicated significant differences in Beta values among urbanization levels within the same ecosystem type..."? Define what the letters are and what each of them means, exactly.

line 270: "Once those limits are crossed, previously buried horizons return to active cycling and carbon stock decline rapidly..." Provide citation.