

I would like to congratulate the authors for the time and efforts dedicated to this study which serves to extend the barriers of knowledge about the future of mangrove environments and the impact of different anthropogenic and natural dynamics on the conservation of these ecosystems.

Please find attached a review document with some comments and suggestions which I believe can contribute to enhancing the quality of the current manuscript.

In general, there is good use of English although some expressions and minor corrections must be undertaken. Please refer to the attached document with suggestions.

Dear Reviewer:

We greatly appreciate your comments on the manuscript. We have addressed minor errors, provided further explanations for unclear expressions, and the revised manuscript has undergone professional language editing (as evidenced below) to ensure that readers understand the information we intend to convey. Based on your feedback, we have improved the manuscript in the revised version. Once again, thank you very much for your comments and suggestions. They are very helpful to us.



We certify that the following article

Dynamic Estimation of Mangrove Carbon Storage in Hainan Island Based on the InVEST-PLUS Model

Xian Shi, Lan Wu, Yinqi Zheng, Xiang Zhang, Yijia Wang, Quan Chen, Zhongyi Sun *, Tangzhe Nie *

has undergone English language editing by MDPI. The text has been checked for correct use of grammar and common technical terms, and edited to a level suitable for reporting research in a scholarly journal.

MDPI uses experienced, native English speaking editors. Full details of the editing service can be found at
► <https://www.mdpi.com/authors/english>.



For the specific comments you raised, we illustrated one by one in the followings

1. General comments

Please review the units presented in the manuscript. Some of the figures lack interpretable units (e.g. per area, per time).

Review the format of references to studies and figures. Add a space between the end of the sentence and the reference (' [' or '(').

Response:

We are very sorry for not managing these details properly. Thank you very much for your

reminder, and we have made the necessary changes in the revised manuscript.

2. P1 L.70 – Please reconstruct this sentence: “Currently, two primary methodologies exist for the estimation of carbon storage: a 70 quantitative approach anchored in geophysical and chemical processes”

Suggestion: At present, there are two methodologies that dominate/commonly used for the estimation of....

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

3. P2 L.76 – “Remarkably efficacy”: Please amend (e.g. high performance).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

4. P2 L.81 – “encapsulating”: Please amend (e.g. considering, assessing, investigating)

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "investigating".

5. P2 L.82 – “Additionally, some...”: Some people?, some studies? Some research groups? Please use a non-ambiguous language.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "some studies".

6. P2 L.85 – “Additionally,” Expression used in the previous sentence; please modify

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "Furthermore".

7. P3 L.117 – “Inquiry”: Please modify this for “study, research”

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "study".

8. P3 L.117 – Please add country after the Hainan Island (China).

Response:

Thank you very much for your comment. We have added (China) after the Hainan Island.

9. P3 L.124 - “Reserve (Figure 1-d)”. This was mentioned in the general comments, please leave a blank space.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

10. P6 L.147 – Please add study or citation to the study or program that published the InVEST model. Same for the rest of models.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

11. P6 L.149 – “arsenal”: Please modify the term for a more academic expression (e.g. wide range of tools).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "wide range of tools".

12. P6 L.149 – “distinguishes itself through its...” → The carbon module stands out due to its high capability to asses...

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

13. P6 L.152 – “varied land use classifications”: Please correct (e.g. diverse land use classes (not classifications)).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

14. P6 L.169 – Table 2. Important. Please always add the units to the values. Please move C_{above}, C_{below} and C_{soil} descriptions to the table caption and add the units (e.g. tons/ha-1)..

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

15. P7 L.191 – “celebrated for”: Not academic language. Please modify.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

16. P7 L.200 – “the prognostication”: Please modify (e.g. forecasting).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "forecasting".

17. P7 L.202 – “forecasting”: Please modify (e.g. predicting)

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "predicting".

18. P7 L.276 – “Augmentation” → Rise. Please pay attention to units, 0.15 TgC (per m², ha, the whole island?)

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

19. P10 L.280 – “delineated”: Please correct (e.g. described, explained).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to "explained".

20. P10 L.289-299 – Great paragraph.

Response:

Your affirmation fills us with great honor. Thank you very much for your support of our manuscript.

21. P10 L.328 – Please check figures alignment

Response:

Thank you for your feedback. We have made adjustments to the alignment of the figures.

22. P11 L.334 – Figure 5. Nice and very descriptive graph.

Response:

Your affirmation fills us with great honor. Thank you very much for your support of our manuscript.

23. P11 L.342 – “*Spatially, the distribution of carbon storage demonstrates a pattern of higher concentrations in the eastern regions as opposed to the western, and more in the northern parts in comparison to the southern.*”

Does the higher concentration of carbon in the northeastern area of the island have anything to do with some type of climatic phenomenon (prevailing winds, tides) or human patterns (lower population, less agriculture)?

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion (L. 426-443).

In our study, “Spatially, the distribution of carbon storage demonstrates a pattern of higher concentrations in the eastern regions as opposed to the western, and more in the northern parts in comparison to the southern.”

“Furthermore, the carbon density of mangroves may be determined by the joint influence of climate factors such as temperature, precipitation, biomass variables, and other factors. Research by Bachelet et al. suggests that moderate temperature increases lead to an increase in

regional vegetation density and carbon fixation, while significant temperature rises result in carbon loss [56]. In another review, Wu et al. concluded that reduced precipitation can decrease respiration, biomass, and productivity, further lowering carbon density [57]. Ray et al. found that tree species with larger diameter at breast height (DBH) and higher wood specific gravity (WSG) typically have higher carbon density [58]. Additionally, Bunker et al. reported that introducing species with high WSG in artificial forests may increase their aboveground carbon storage by 75% [59]. In terms of spatial distribution, this study observes that the carbon storage of mangroves on Hainan Island is higher in the eastern than the western regions, and higher in the northern than the southern regions. This may be attributed to the suitable temperature and precipitation conditions in the northeastern part of Hainan Island. Furthermore, the northern and eastern regions of the island mostly consist of older trees with larger DBH, such as Dongzhai Harbor, and are predominantly national and provincial-level mangrove conservation areas with minimal human disturbance.”

24. P13 L.340 Please pay attention to units.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

25. P13 L.350 – “noteworthy”. Too ambiguous, please correct (e.g. significant)

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion, changing that section to " significant ".

26. P13 L. 360 – Figure 6. The connection lines are hardly visible. Please correct this and add a bit of explanation to the caption (what do the bars mean?)

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion. The bar chart in the figure represents the temporal change sequence of carbon stock in seven zones of Hainan Island over the next 40 years, with the unit TgC.

27. P13 L.366 – “The spatial distribution outcomes derived from this investigation”. Please simplify (e.g. The findings of this research...).

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion (L.423-416).

28. P13 L.372-376 - Too much information in one sentence. Please modify

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.

29. P13 L. 363-424. Please pay attention to units.

Response:

Thank you very much for your comment. We have revised the manuscript according to your suggestion.