Responses to reviewer comments

Title: Satellite-based Monitoring of Coastal Wetlands in Yancheng, Jiangsu Province, China
Authors: Chen Chen, Jiajun Feng, Changyou Wang, Longjiang Mao, Yuanzhi Zhang

Dear Editors and Reviewers,

Thank you very much for your valuable comments on our manuscript entitled "Satellite-based Monitoring of Coastal Wetlands in Yancheng, Jiangsu Province, China". In this revision, all comments have been replied and revised.

Please see the point-to-point letter for all we made in response to reviewers' concerns.

We believe the quality of manuscript has been further improved and many thanks for your kind consideration for publication.

Thank you very much,
Authors

Texts in red are the reviewer's comments; **those in black** are the authors' explanations to the reviewer's comments; and those in blue are the revised texts appeared in the revised manuscript. In addition to the point-to-point responses letter, we enclosed a track-enabled version and a clean version of the revised manuscript. The line numbers appearing in this letter correspond to those in the **track-enabled document**.

Responses to Reviewer 1

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1. Line 15-24: This part described the study findings. It seems to be described as too much of a qualitative expression now. I think that the authors need to use more quantitative expression to recapitulate the sentences briefly.

Answer:

Thank you for your comments. We have revised and improved according to your comments.

We have rewritten the part in page 1.

We added quantitative expression to make the part more accurate and complete.

2. Line 12-13: is-sue and in-creasing àissue and increasing. The authors need to confirm and revise these parts in this manuscript.

Answer:

Thank you for raising this concern. We have revised these parts.

3. Line 158: The authors only used a total 10 scenes during 1991-2021. Why are the authors only 10 scenes? Is there a special reason why the time interval between the used images is not constant? Landsat imagery has a temporal resolution of 16 days. I think that the authors can obtain more imagery during the study period.

Answer:

Thank you for raising this concern. As one image is not enough to cover the entire study area, two images are needed to combine. Considering the clear sky and cloudless conditions, if constant time interval is adopted, some spliced images are unable to meet our requirements. Taking this into account, we select 10 images with close time that meet the conditions. The rewritten sentences are at new Lines 160-168 as below.

In this study, Landsat TM and Landsat 8 OLI Collection 1 Level-2 surface reflectance data were obtained under clear and cloudless conditions. All images were downloaded from the website of United States Geological Survey (USGS) global visualization viewer (https://earthexplorer.usgs.gov/). As one image is not enough to cover the entire study area, two images are needed to combine. Considering the clear sky and cloudless conditions, if constant time interval is adopted, some spliced images are unable to meet our requirements. A total 10 scenes of imagery were selected from five individual years (i.e., 1991, 2000, 2008, 2016, and 2021). All images were acquired in winter and spring (between January and April) (as shown in Table 1).

4. Line 188-190: The authors mentioned "wetland types". What is the wetland type

referred to her and by what criteria can it be divided? How did you refer to Google Earth images?

Answer:

According to the National standard of Wetland Classification in China, the national wetland classification system is divided into natural wetland and artificial wetland. The natural wetland is divided into two and three levels according to the geomorphological characteristics, hydrological characteristics, and vegetation types of wetland, and the artificial wetland is divided into two and three levels according to its main uses. Considering the specific situation of Yancheng wetland, we divided the land cover into construction land, vegetation, river system, farmland, aquaculture, saltpan, and tidal flat.

When we made visual interpretation, we used Google Earth history images to help us identify these types of land features and classify them. We also had two times of fieldwork in April 8-11 and July 9-12, 2021 to take some samples and some photos to verify our results of image classification.

Line 213 and 318: The lengths of Section titles are very long. It would be better to revise the shorter title.

Answer:

Thank you very much for your suggestion to make our manuscript more accurate. We have revised the Section titles. They were changed into "*Assessment of human activity impact intensity*" in the revision.

5. Line 249 (Figure 2) and Line 346 (Figure 4): If possible, I would like the authors to make Figures look better.

Answer:

Thank you very much for your valuable advice. We reedited the two images. As shown below:

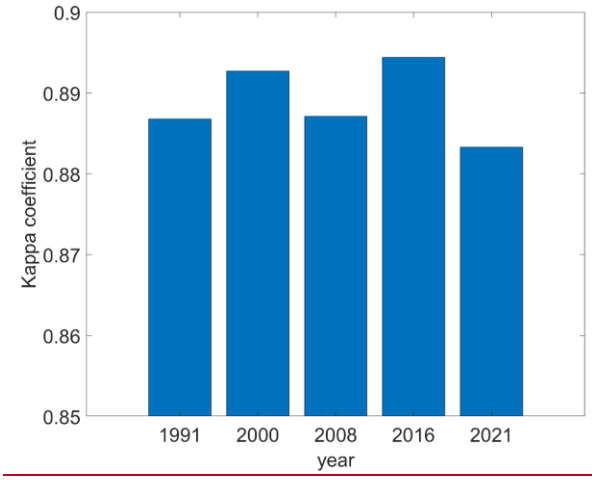


Figure2. Accuracy of wetland classification.

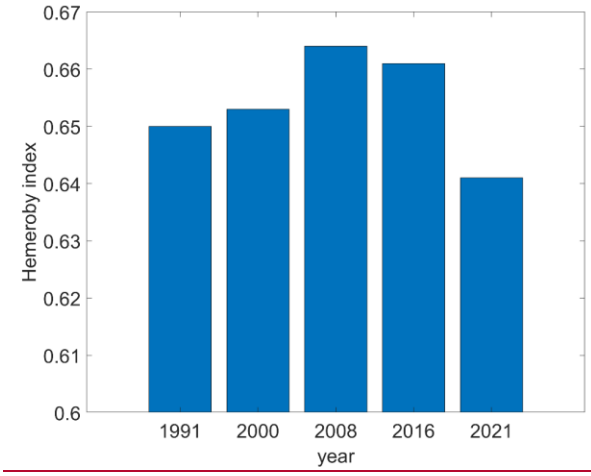


Figure 5. Dynamic change of Hemeroby Index in Yancheng coast.

6. Line 250: In Section 4.1, when calculating the area of tidal flat, did the authors consider tidal height of each image? This area is expected to show a lot of differences in area depending on tidal height. Thus, only when it is considered, the area change analysis will have reliability.

Answer:

Thank you for raising this concern. The question you raised is very important. When we selected the study area, we mainly used the administrative boundary. In the study area, tidal flat changes are almost unaffected by tidal height. We hope our answers will suffice to explain the matter to your satisfaction.

7. Line 275 (Table 2): I think it would be easier to understand this table by changing it to a graph. Tidal falt à Tidal flat.

Answer:

Thank you for raising this concern.

We improved the part, but due to the difference in order of magnitude, we still considered the area data to be displayed in the form of table, and made the area proportion into a graph as shown below (see Table 2 and Figure 3):

Table 2. Area statistic of landscape types in the Yancheng coast.

Landscape type	**AREA(km²)**				
	1991	2000	2008	2016	2021
River system	324.23	416.26	328.13	480.00	472.31
Vegetation	207.71	520.65	555.17	893.34	1695.95
Tidal flat	898.90	479.76	277.22	448.56	455.71
Salt pan	525.86	611.55	429.82	30.11	33.24
Aquaculture	17.21	121.55	248.97	162.07	448.22
Farmland	9379.15	8924.54	9243.13	8066.59	6536.63
Construction land	512.87	778.52	783.62	1785.25	2223.87

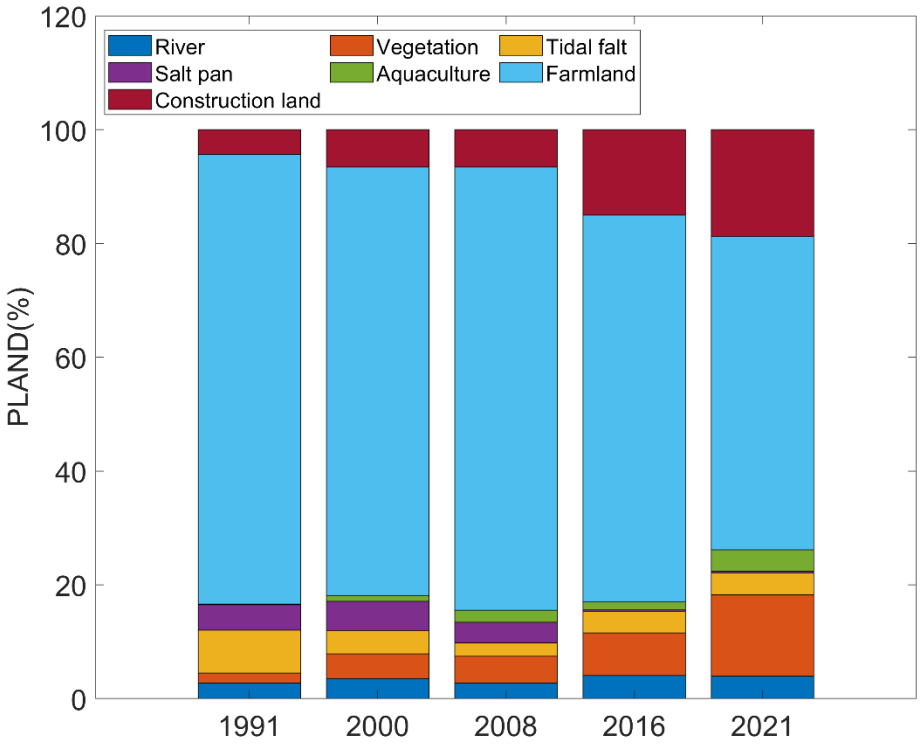


Figure 3. Percentage of landscape (PLAND).

8. Line 384-421 (Section 4.4): This section explains driving factors of land use changes rather than the results. It would be better to mix this part properly with Section 4.2.

Answer:

Thank you for raising this concern. We have revised this section in the revised version as below in new lines 425-436.

In terms of human factors, population pressure is one of the main driving forces leading to land use change, and population growth is usually accompanied by the enhancement of human activity intensity. The study shows that human activity is a very important factor causing wetland landscape changes in Yancheng during the past 30 years. In 1991, 2000, 2008, 2016, and 2021, the value of intensity affected by human activities was 0.650, 0.653, 0.664, 0.661, and 0.641, respectively. On one hand, due to the growth of population, people's demand for housing, living infrastructure and construction land is also rising; on the other hand, the demand for food is also increasing. To some extent, this will have an impact on land use types and environment changes. Economic interest is another major factor in the human driving force. With the unique conditions for the development of aquaculture, aquaculture has developed rapidly. A large number of expansion of artificial farms is one of the reasons for the conversion of wetland types.

Responses to Reviewer 2

This manuscript is very interesting and important for monitoring Coastal Wetlands. But some major revisions are needed.

Answer:

Thank you for your comments. We have revised the manuscript according to your comments.

Specific comments:

1. Abstract is informative, including the presentation of the problem, introducing the materials and methods used, the main results and the importance of the work. However, the last part should contain more information about the worldwide usefulness of the work.

Answer:

Thank you very much for your valuable advice. We have rewritten this part in lines 27-28.

2. Add more words to Keywords section (e.g., Landsat TM and Landsat 8 OLI)

Answer:

We have revised and updated.

Keywords: Remote sensing; Wetland monitoring; Yancheng coast; Driving force; Landsat images

3. The introduction presents the aim of the work and provides a brief background, citing the literature as appropriate. Also, a working hypothesis is missing.

Answer:

Thank you for raising this concern. We have revised and updated the part in page3, new lines 124-125.

On the assumption that Yancheng wetland environment is greatly influenced by human factors, a series of studies and discussions are carried out.

4. Lines 149 and 160: The following statements are defect: "Figure 1 shows the study area:", "As shown in Table 1:". Merge them with previous sentences.

Answer:

Thank you for raising this concern. We have revised and updated the part.

5. Line 194: Add some new citations for random forest technique, e.g.,
** https://doi.org/10.3390/rs14091977
** https://doi.org/10.1016/j.ecolind.2021.107612

Answer:

Thank you for pointing it out, it is very important to us. We have added the new citations for random forest technique in the manuscript.

48. Nasiri V, Deljouei A, Moradi F, et al. Land Use and Land Cover Mapping Using

Sentinel-2, Landsat-8 Satellite Images, and Google Earth Engine: A Comparison of Two Composition Methods[J]. Remote Sensing, 2022, 14(9): 1977.

49. Talukdar S, Eibek K U, Akhter S, et al. Modeling fragmentation probability of land-use and land-cover using the bagging, random forest and random subspace in the Teesta River Basin, Bangladesh[J]. Ecological Indicators, 2021, 126: 107612.

6. Table 2: "PLAND"???

Answer:

PLAND means “Percentage of landscape”. We have added instructions in this section.

7. Discussion section: This part would appear to be inadequately supported by bibliography.

Answer:

Thank you very much for your valuable advice, which is very important for perfecting our manuscript.

We have added some literature to support this part of the description. For instance:

51. Mohammadi A, Karimzadeh S, Valizadeh Kamran K, et al. Extraction of land information, future landscape changes and seismic hazard assessment: A case study of Tabriz, Iran [J]. Sensors, 2020, 20(24): 7010.

52. Tian Y. Mapping suburbs based on spatial interactions and effect analysis on ecological landscape change: A case study of Jiangsu Province from 1998 to 2018, Eastern China [J]. Land, 2020, 9(5): 159.

53. Wang S W, Gebru B M, Lamchin M, et al. Land use and land cover change detection and prediction in the Kathmandu District of Nepal using remote sensing and GIS [J]. Sustainability, 2020, 12(9): 3925.

54. Hall F G, Strebel D E, Sellers P J. Linking knowledge among spatial and temporal scales: vegetation, atmosphere, climate and remote sensing [J]. Landscape Ecology, 1988, 2(1): 3-22.

8. Conclusion section: In the second paragraph, please briefly explain the limitations of the study and future work.

Answer:

We have revised and updated.

Due to the limitations of available data and technical conditions, we have not analyzed the Yancheng wetland situation with a more precise perspective, which is something we need to be refined in the future. Meanwhile, for wetland landscape changes and driving force analysis, such as the impact of human policies, continuous monitoring and future prediction of human activities is one of our promising further studies.

---------- End of responses to reviewer comments----------