

Interactive comment on “A Landsat-based model for retrieving total suspended solids concentration of estuaries and coasts” by Chongyang Wang et al.

Anonymous Referee #2

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General comments

The authors have provided a potential novel methodology to estimate total suspended solids concentrations of estuaries and coastal areas of China. However, we have a number of concerns about the approach that should be considered before being allowed to advance further through the review process. Unfortunately, there are numerous grammatical and structural errors throughout the document which has made comprehension difficult in some places. The flow between sentences, and paragraphs could be improved, with better linkages between ideas, concepts and explanations. Before the next submission, we strongly suggest having a native English speaker review

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and correct the manuscript.

While the background is quite easy to follow, the rationale for this study and what it is aiming to achieve could be better articulated. It is not clear in the abstract that the authors are evaluating a model they themselves have developed nor does it mention the novelty of their approach. It reads more like they are just testing an existing method. They also mention the 'adjusted' QRLTSS model (line 18), but I am not sure how this differs to the QRLTSS model mentioned in the previous sentence (line 16).

Of particular concern is the sampling method for the in-situ data. There is a lack of information about the time and depth of each sample, and then how this corresponds to the timing of the satellite image used in the analysis. Samples were taken between 10 am to 5 pm, during which it is likely tides may have significantly altered turbidity and TSS concentrations. But the tidal effect on turbidity has not been mentioned. Further some analysis of the time of the satellite image and the sample should be undertaken – a longer length of time between the two may impact the accuracy of results. Finally, we would like some justification for the location of the samples taken. Sampling locations tend to be in areas which have similar turbidity characteristics and do not represent the wide variability of tss/turbidity within the individual estuaries and coastal areas under investigation. As a result, we have concerns about the validity of the approach for extrapolating over larger areas in which there will be a large amount of variability in TSS concentrations. We would recommend that the limitations of the work are discussed more thoroughly with this in mind. Alternatively, considerably more samples would need to be collected that cover a wider area of the estuaries and coastal areas under investigation.

Specific comments

Abstract – states 129 samples were used but in the body of the text 119 were used in total.

Page 7, line 7-10. Please explain ETM+, TM and OLI in more detail and how they differ.

Page 8 Section 2.3. It is not clear why atmospheric correction is needed, nor why the 6S method has been chosen above other methods.

Page 9, Section 2.4. There is no justification for why all three assessment methods are needed or why they are chosen. Please clarify.

Page 9, section 3.1. It needs to be clearer why the reflectance in the red band and near infrared band is only used.

Page 9, Eqn3 – r is not defined in the numerator.

There is no discussion of the impact of sun glint and marine vessel contamination in the area (especially in the Pearl River estuary) – how is this dealt with?

The authors mention that they review and analyse 20 models (section 1) but only 5 models are discussed later (section 3.1), with little discussion about why only 5 were selected.

Depth of samples and time of each sample should be mentioned.

Some samples were taken from clear water (e.g. like the ones from Yangtze river estuary) which impacts reflectance due to higher amounts of water vapour and aerosols. This would need to be accounted for.

Some samples were taken from narrow canals with a width a bit bigger than TM spatial resolution. There would be an effect from the surrounding land on the reflectance of this water. This effect should be discussed.

There was minimal variability in sampling locations in each estuary/coastal area. Samples were taken either in areas which were turbid or clear, despite there being wider ranging turbidity in the area.

The selection of sampling locations should be discussed, with comment on why the sampling locations tended to be clustered in this way.

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It is better to mention that root mean square of Trimble global positioning system is related to real time or post processed accuracy (page 6 line 21)

The process of matching image and sample points should be discussed.

Section 3.2, page 12 line 12. I am not clear how the vertex values have been calculated. This should be clarified.

Page 18, line 1. New results have been introduced in the summary and conclusions. These should be in the body of the text or in figures first.

Technical corrections

There are numerous grammatical and structural issues that should be addressed. This manuscript would benefit from editing and review from a native English speaker to improve structure, flow and readability.

Section 2.2, I would recommend the dates being in day month year order to make them easier to read/follow.

Sentences should not start with the word 'And'

The writing is sometimes too conversational. For example, page 4 line 20 "What's more" could be replaced with "furthermore".

Tables 1-3 could be easier to read if each section was more clearly separated. For example, table 1, it is not clear what dates and samples are specific to Region c. Table 2, it is difficult to tell which turbidity models are used for TM 1,3, 4 as opposed to TM, 1,2,3,4. Table 3, I suggest adding a line between the previous models and the ones used in this study. . .etc

Figure 1 should go from a to e rather than e,a,b,c,d, as is currently the case. Need to make it clearer in the caption that the black dots are the sampling locations. Please explain the difference between circles and triangle in figure 1c (page 21).

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