Geoscientific

Model Development

Discussions

[GMDD]

Interactive

comment

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

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General comments

Writing: Although my English is not very good, I've noted some writing errors along the paper. Although I've marked a few points, I strongly suggest an additional professional overhaul.

About the title: The title does not represents precisely the content of the paper. I think that it needs to include the geographic specificity of the model ("only" in China). This specification does not denigrate the research relevance, because the coastal environ-

ments of China are giant, have great social importance and have a rich remote sensing TSS modelling background.

Page 1 (abstract): The abstract contains a great number of details concerning the validation and modelling results. However, a first read (without reading the whole paper) does not provided an understanding of the general strategy of modelling. For example, in the line 15 is written N=129, while in lines 18-20 the N (model) is 84 and N (validation) is 35 (84+35 = 119?). After this, another model is mentioned (lines 27-28). A reorganization of the abstract is needed, taking into account the explanation of the modelling, not only the specific indexes as RMSE and R^2.

A very important source of error in estimating water components concentration and/or water quality parameters is the sun glint effect. However, there are simple strategies to remove the glint which are based on the SWIR bands. These bands are available for many Landsat sensors. I suggest reading the following papers:

HEDLEY, J. D.; HARBORNE, A. R.; MUMBY, P. J. Simple and robust removal of sun glint for mapping shallow-water benthos. International Journal of Remote Sensing, v. 26, p. 2107 −2112, 2005.

HOCHBERG, E. J.; ANDREFOUET, S.; TYLER, M. R. Sea surface correction of high spatial resolution IKONOS images to improve bottom mapping in near-shore environments. IEEE Transactions on Geoscience and Remote Sensing, v. 41, p. 1724 – 1729, 2003.

KAY, S.; HEDLEY, J. D.; LAVENDER, S. Sun Glint Correction of High and Low Spatial Resolution Images of Aquatic Scenes: a Review of Methods for Visible and Near-Infrared Wavelengths. Remote Sensing, v. 1, n. 4, p. 697-730, 2009.

Wang, M., 2007. Remote sensing of the ocean contributions from ultraviolet to near-infrared using the shortwave infrared bands: simulations. Applied Optics 46,1535–1547.

Wang, J.J., Lu, X.X., Liew, S.C., Zhou, Y., 2009. Retrieval of suspended sediment concentrations in large turbid rivers using Landsat ETM+: an example from the Yangtze River, China. Earth Surface Processes and Landforms 34, 1082–1092.

Following these references, I've used the band 5 (Landsat 5, TM) as a proxy of the Sun glint effect in modelling TSS in the Amazon basin (with co-authors, of course):

Montanher, O. C.; Novo, E. M. L. M.; Barbosa, C. C. F.; Renno, C. D.; Silva, T. S. F. Empirical models for estimating the suspended sediment concentration in Amazonian white water rivers using Landsat/TM. International Journal of Applied Earth Observation and Geoinformation, v. 29, p. 67-77, 2014.

Removing Sun glint effect might improve significantly your results. For example, even the reflectance threshold (0.032 in the red band,) could be affected by Sun glint, resulting in wrong choices (see equation 5 and page 12, lines 23-27). At this stage, performing the sun glint removal means remake all the work. . . So, this option could be a future strategy for your work.

Specific comments Page 1 - line 21: is there a statistical significant difference between the R^2 values? I think that the R^2 values difference does not justify: "The QRLTSS model based on Landsat OLI is better than TM and ETM+ ... because of the optimization of OLI sensor's design." A way to verify that may be by means of a statistical test. Page 9 – lines 9-16: This part of the manuscript is a methodology step, including the equation 3. Page 17 – line 13: this sentence is excessively repetitive along the whole paper: "a quadratic model using the ratio of logarithmic transformation of red band and near infrared band and logarithmic transformation of TSS concentration (QRLTSS) for estimating TSS concentration". If the acronym was proposed, would be better use it along the paper. Page 18 – line 7: the 30 m resolution only began in 1982, with Landsat 4. Rewrite to take into account the 80 m MSS.

Technical corrections Page 4 - line 26: Based "on" the above analysis. . . Page 4 - line 28: Rewrite the beginning of the sentence: "And we focus on. . ." Figure 1: The map of

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China should be improved and noted as "a". Add a scale, coordinates, etc.. Page 5 – lines 13-14: ton/year (or tons per year..), on average. $3 \cdot 10^4$ instead of using 3*104. Reorganize these notations along the whole paper. Page 5 – line 21: 199 km and $6 \cdot 10^3$ km^2 Page 6 – lines 22-26: suggestion: include this information in a table. Page 7: "TM, ETM+ and OLI sensors onboard the Landsat 5, 7 and 8 satellites, respectively, have..."

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