

Interactive comment on “On the consistency in variations of chlorophyll *a* concentration in the South China Sea as revealed by three remote sensing datasets” by S. L. Shang et al.

Anonymous Referee #1

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OVERVIEW:

The objective of this study is to evaluate three standard chlorophyll products from the MODIS sensor for consistency in the South China Sea (SCS). A limited number of in situ measurements are also compared to the satellite derived products. The authors mainly use climatological data for their algorithm comparisons in various regions within the SCS. While the results show inconsistencies between the chlorophyll products, I would not consider this a novel concept or a thorough evaluation of satellite chlorophyll algorithms in the SCS.

There are no definitive results or final recommendations other than a suggestion for

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continuous improvements in remote sensing algorithms. The authors reference a submitted manuscript by Brewin et al. that evaluates 17 different chlorophyll algorithms; however they only include three global open ocean algorithms in their analysis. A better focus for this manuscript would be to evaluate relevant global and regional algorithms for the SCS using in situ data from this study and publicly available databases. The manuscript should also include more details on the optical complexity of this region and how changes in the optical properties influence the performance of the algorithms. If an algorithm is unable to accurately measure chlorophyll concentrations in optically complex waters, it likely will not be consistent with better performing algorithms.

The manuscript should be carefully edited for grammatical errors, coherency, flow, and sentence structure. In addition, the authors need to use definitive and conclusive words to describe the data and results. Descriptions such as “relatively consistent”, “similar”, “corresponds well”, “appeared to have” do not adequately (or statistically) describe the how well the algorithms measure chlorophyll concentrations. Statistical results and plots should be used.

This region appears to be fairly well studied and yet several papers that were found during a simple search for satellite derived chlorophyll concentrations in the SCS were not cited in this manuscript.

At this time, I do not recommend this paper for publication. In order to be suitable for publication, I would recommend major changes including a new objective/focus for the overall manuscript, new data analyses in the results, and a much more detailed discussion section.

Below are some specific comments listed by section.

Abstract: Pg 7550, Ln 10-15: Revise run-on sentence.

Introduction: Pg 7551, Ln 17: Define IOP

Data and Methods: At what depth were the in situ chlorophyll samples measured?

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Pg 7553, Ln 2: A 48 hour time window for satellite match-ups is too long, especially in a highly variable ecosystem. See Bailey & Werdel (2006) for recommended methods.

Pg 7553: How many pixels from the satellite data were used to compare to the in situ data?

Results: Pg 7554, Ln 8: Based on the data in Figure 3, it does not appear that the fall concentrations are the same as measured in the spring. If the fall is an important component of the seasonal cycle, it should be included.

Pg 7555, Ln 3-5: Where are the statistics describing the “strong correlation” and “best performance”?

Pg 7555, Ln 4: Do the in situ data represent daily or monthly values? The large departure described in winter 2010 (Ln 6), could simply be because you are comparing a daily value to a monthly average.

Pg 7555, Ln24: “similar phenomenon was” should be “similar phenomena were”

Pg 7557, Ln 26: This statement seems out of place.

Discussion: The evaluation of the chlorophyll algorithms should be the first part of the results section.

The discussion on the optical properties and how that relates to the performance of the various algorithms needs to be expanded.

Once you have determined the “best” algorithm to use in your various regions, the discussion could then focus on the seasonality or anomalous events you are able to detect with the satellite imagery.

Figures: The figures, especially the time series figures, lack a consistent look. Fig 1: It is difficult to see the open black circles and green crosses.

Fig 7 & 8: The text is small and not clear.

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Fig 11-13: Do the solid lines represent the 1:1 or regression line? Both should be included in the figure.

Interactive comment on Biogeosciences Discuss., 10, 7549, 2013.

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