Interactive comment on "Seasonal to interannual variability of Chlorophyll-a and sea surface temperature in the Yellow Sea using MODIS satellite datasets" by Chunli Liu et al.

Anonymous Referee #1

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This manuscript examined the spatio-temporal variability of satellite-derived chlorophyll and temperature in 2003-2015 in the Yellow Sea. EOF, Morlet wavelet transform and wavelet coherence analyses were used in the data processing. Results and conclusions were also shown clearly. However, there are still several big problems in the manuscript structure and discussion part, which question the quality of this study. Therefore, I cannot recommend this paper to be published in OS until major improvement.

Authors: Thank you for the review of our manuscript. We appreciate your constructive comments and have revised the manuscript in accordance with your suggestions below, point by point.

First, the sections of results and discussion are confused. Results part presented in this manuscript should be simplified, and figures 3-6 should be redrawn to show clear and important information. These figures could be easily got from satellite data without DINEOF method. The advantage of DINEOF should be shown, instead. Discussion part presented should be treated as the major results of this study, i.e. EOF analysis, CWT and so on.

Authors: Figures 3-6 have been redrawn using different color bars to show the spatial pattern more clearly. These figures were created using the DINEOF constructed data because they would be more continuous since no data points are missing. The advantage of DINEOF was shown in section 2.2.1. Since the EOF and wavelet analyses generally require a complete time series of input maps without data voids, the DINEOF method was used to construct and fill the missing data.

We arranged the Results and Discussion parts in the manuscript in the way that we did for the following reasons:

In section 3.1, we presented the monthly climatology of CHL and SST. Correspondingly, in the Discussion section 4.1, we used the datasets of

CHL and SST for the EOF analysis in which the seasonal cycles had not been removed. These two parts identify the seasonal and monthly features of CHL and SST completely and are used to discuss the main factors that affect the spatial and temporal variations of the seasonal and monthly CHL and SST.

In section 3.2, the annual climatology of CHL and SST were presented. Correspondingly, in the Discussion section 4.2, and in order to analyse the inter-annual variability of CHL and SST presented in part 3.2, the morlet wavelet was used as a tool by which to discuss the scales and oscillation periods.

In section 3.3, the mean and temporal variability of CHL and SST were presented. Correspondingly, in the last part of Discussion section 4.2, the correlation between CHL and SST during the study period was discussed by using the wavelet coherence method as a tool.

With regards to the suggestions that "Results part presented in this manuscript should be simplified" and "Discussion part presented should be treated as the major results of this study, i.e. EOF analysis, CWT and so on", we have combined the Results and Discussion sections together, and revised the presentation of the results to be more simplified and clearer. The section 3.3 was combined with section 2.1.

Second, there are not enough discussions after the results analysis, for example, the interactions between physical processes (YSCWM, YSWC) and seasonal phytoplankton blooms in the YS.

Authors: Thank you for your suggestions. More information has been added to the Discussion section. In the revised manuscript, section 3.1 has been combined with section 4.1, and additional relationships between seasonal phytoplankton blooms and physical processes (YSCWM, YSWC) wave been discussed.

Third, some conclusions lack reasonable explanation, for example, the negative cross correlation between CHL and SST. "Lags of 4 months suggested that the CHL reached the maximum value 4 months after the SST got the minimum value in the YS" means June vs. February? These conclusions should be discussed detailed with enough scientific evidence.

Authors: Thank you for your suggestions. Probably the conclusion sentence was not well constructed leading to possible misunderstands. "Lags of 4 months suggested that the CHL reached the maximum value 4

months after the SST reached the minimum value in the YS" means that the variability in Chl-a in the YS has a lead of 4 months to get the peak when compared with the SST in the YS. This means that the seasonal variability in the CHL reaches a peak in April, 4 months later (August) than the SST does. We have added more information to this section.

Minor points:

Line 44, "affect human life" is improper here.

Authors: Agreed. The words "affect human life" have been changed to "influence the ocean environment".

Line 48, "light and nutrient loads of CHL", phytoplankton instead.

Authors: Agreed. The abbreviation "CHL" has been replaced by "phytoplankton"

Page 19, Fig. 8 b & dïij˘Nlabels of x-axis should be years

Authors: In Fig.8 and Fig.9, the x-axis unit labels of "years" have been used.