

Interactive comment on “Phytoplankton size class in the East China Sea derived from MODIS satellite data” by Hailong Zhang et al.

Anonymous Referee #2

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The authors used in situ datasets and reconstructed Rrs data from MODIS to estimate the PSC in the East China Sea and investigated the seasonal variability of the PSC in the ECS using ~14 years MODIS-Rrs derived PSC data. The authors tuned the PCA approach proposed in an earlier study by Wang et al. 2014 to derive PSC from absorption measurements. The tuned approach was also applied to MODIS data via reconstructing MODIS Rrs in the blue bands and the QAA inversion method for MODIS-derived phytoplankton absorption. Improvements in methods led to better retrievals in this region, which is encouraging. Seasonality of PSC was also investigated by discussing the relating factors such as water vertical structure, temperature, upwelling, etc., providing a better understanding on the PSC in this region with regard to environmental changes. The manuscript was overall well written despite a few inconsistencies

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in the tense and wording. The authors have also improved the manuscript according to what I suggested in the first review, including selecting a few typical subregions and analyzing the climatological variation besides the seasonality.

My further suggestions are as below and details were highlighted in the manuscript. 1 As phytoplankton absorption and Chla are quite important in PSC estimation, probably the authors can also display the seasonal distributions of QAA derived aph (for example aph(440) as aph(675) is not successfully estimated) and QAA derived aph from reconstructed MODIS Rrs in the ECS? As QAA only retrieves IOPs but not Chla, this can at least give a hint on how the Chla distributes and changes over seasons by showing aph distributions. I then noticed that MODIS Chla products were also used. How is the MODIS Chla compared with the in situ ones at matchups? and how was the MODIS derived aph versus in situ Chla? compared to the MODIS chla, does QAA aph(440) had a better correlation with in situ Chla? 2 The authors stated that the findings presented here complement and enhance recent studies that have demonstrated that satellite ocean color data can be used to retrieve the PSC in the ECS. What other studies in this region or in China's seas? How are your results compared to these studies? are they basically in consistence with the others? 3 Description on statistics sometimes is not very precise. Such as the authors used 'acceptable errors' or 'significant correlation' but did not explain how you defined acceptable or significant, maybe P values help a bit or change the way of interpretation. 4 The description of the sub-regions is inadequate, please specify their sizes, and use boxes to specify the exact size and location in the map. 5 When discussing the PSC response to the SST, it might be also helpful to also show the SST variations.

More detailed comments and technical corrections were listed in the attached file.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2017-508/bg-2017-508-RC2-supplement.pdf>

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