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Interactive comment on "Inter-annual variation of chlorophyll in the northern South China Sea observed at the SEATS Station and its asymmetric responses to climate oscillation" *by* K.-K. Liu et al.

Anonymous Referee #2

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General Comments

The authors present an analysis of the inter-annual variation of chlorophyll a (Chl a) in the South China Sea (SCS) and its relationship with various climate driven factors as measured by both in situ and satellite platforms. They show that Chl a responds asymmetrically to the multivariate ENSO index (MEI) and that under positive MEI conditions (El Nina), this correlation is relatively strong, whilst under negative MEI conditions (La Nina) the correlation is weak or insignificant. These differing responses are attributed to differences in water column structure under the two ENSO regimes that affect the availability of nutrients to the upper water column. The paper is very well written and organised, and offers insight into the climate related dynamics that affect biogeochemical

cycles in this region of the SCS. My comments are rather minor in nature and, I think, can be very easily addressed. In particular, the interesting hypothesis that eddies may be partially responsible for suppressed Chl a response during one of the study La Nina years could be strengthened by supporting evidence either from published studies or, perhaps, satellite SST or Chl a. Other minor specific comments are detailed below.

Specific Comments

p. 6902, line 10: I don't think WPS has been defined yet. Please define the abbreviation.

p. 6905, eqn. 1: Please provide number of points (N) and some metrics of error such as bias and RMSE for this regression.

p. 6905, lines 26-27: What does "compatible with MODIS dataset mean"? Can you re-write this sentence to make it a bit clearer, please?

p. 6906, line 12: Please provide N and an R2 value for this regression.

p. 6906, line 13: Please provide a reference for "the accuracy of the daily data".

p. 6907, line 3: You say here the data were averaged. Do you mean spatially and temporally? Please clarify.

p. 6907, line 23: Please change m S-1 to m s-1 here and anywhere else in the manuscript where relevant.

p. 6908, line 14: See comment above.

p. 69009, line 5: As above.

p. 6909, line 15: Suggest changing "pretty" to "relatively".

p. 6910: Here you discuss the correlation, R, between the various variables and how these correlations compare with the correlations between the EOF modes of the same variables found in a previous study. Can you take a few sentences to explain how these

two different correlation analyses are comparable? One is of the variables themselves, while the other is of the EOF modes of the same variables.

p. 6910, line 29: Do you mean “stronger” rather than “strong” here?

p. 6911, line 24: Please insert “in” between “symmetric” and “that”.

p. 6912, line 27: Please insert “and” between “(Fig. 9d),” and “the”.

p. 6914, lines 2-3: Suggest providing the La Nina years in parentheses to make the figure easier to follow.

p. 6916, line 22: Suggest changing this sentence slightly to read, “. . .the intra-seasonal variation is apparent as noise in the main signal.”

p. 6916, line 24: Please change this to read, “ 10 yr statistical analysis. . .”

p. 6916 - 6917: While you cite Xiu et al. to support the existence of eddies in the region over a ten year period, can you provide any evidence of an eddy during the La Nina period you discuss either in the form of an existing study or, perhaps, from satellite SST or Chl during the period of interest?

p. 6917, line 2: Please change “contradicting” to “to contradict”.

p. 6917, line 10: Suggest changing this sentence to something like, “Therefore, we present a mechanism that could explain the unusually strong Chl peak during. . .”

p. 6918, line 7: Insert “that” between “indicating” and “the”.

p. 6918, line 7: Insert “are” after “processes”.

p. 6918, line 15: Suggest changing to “likely attributable”.

Interactive comment on Biogeosciences Discuss., 10, 6899, 2013.