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Interactive comment on "The influence of episodic flooding on pelagic ecosystem in the East China Sea" *by* Chung-Chi Chen et al.

Anonymous Referee #1

General Comments: This study presents an interesting analysis of pelagic ecosystem responses in the East China Sea to the large flood event in the Changjiang River in 2010. This research is fundamentally focused on "an episodic event", so it would not be too surprising if the scope of relevant measurement is limited. Nonetheless, the authors conducted a fairly good job of synthesizing what they have learned based on their current and others' previous observations and various indices and metrics (e.g. volumetric values in surface water, averaged over the depth of euphotic zone, and depth-integrated values for the entire ECS and the Changjiang Diluted Water (CDW) region). Overall, the analysis is thorough, but I still have a few major suggestions and revisions in terms of statistics/statistical interpretation to suggest before I think this study is ready for publication. These include the status of nutrient limitations based on significant regression relationships (below comment #8) and the relative strength

of coupling/control of one variable to another with the regression slope values (below comment #10). I also suggest authors to clarify their calculations on estimating the effect of freshwater discharge on fCO2 using end-member mixing equations. Below are a range of suggestions, questions, and comments that should be addressed in the revision. Overall, I think this study would be of high interest to the readership after substantial revisions.

Specific Comments: 1. Abstract, line 43: The sentence ". . . which were not characterized by low SSS in 2009" is not correct. Table 1 indicates SSS in CDW zone was also lower than the entire area (the area for all sampling stations) in 2009. 2. Keywords, line 51: It would be better to be more specific. Perhaps you could add "flooding", "CDW", "freshwater discharge" and also "Yangtze River"? 3. Comments on Figure 1: 1) The color of the SSS contour plot is confusing to read. Usually with salinity contours, the bluer the fresher and the redder the saltier, 2) you could add the color bars for Figures 1 and 2 both, and 3) please increase the font size. 4. Comments on Table 1: 1) I think it is critical to compare if there are significant differences between the entire area and CDW zone for all variables in each year as well as overall all 2 years combined, and 2) why zooplankton values are not reported? They are in Table 2, so it should be able to calculate them. 5. Comments on Table 2: 1) To be consistent with Table 1, you could use brackets for values in the CDW zone instead of parentheses. Also, in Table 1 you could report average values for the entire area (what are in parentheses for now) without parentheses and their ranges in parentheses instead (e.g. SSS: 32.62+/-2.07 (23.80-34.11)). 6. Results & discussion, line 226: Please clarify and write more clearly if 2003 was also an anomalous flooding year and how does its area of CDW zone compare with that in 2010. 7. Results & discussion, line 235: Add the sentence what the response time of phytoplankton bloom is to flooding events if reference exists. 8. Results & discussion, line 272: I think you need to be cautious about relying solely on N/P elemental ratio for discussing the status of nutrient limitation. The fact that during the 2010 flood chlorophyll was positively correlated with nitrate and silicate (lines 290) but not to (at alpha = 0.05) phosphate (line 291) suggests limitations of ni-

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trate and silicate predominantly, and to a lesser extent, of phosphate on phytoplankton productivity. This is opposite to your statement that 2010 was more likely affected by phosphate limitation. Similarly, phytoplankton might be limited by all three nutrients in 2009 (lines 294-296). Other suggestion is that it would better to focus only on the area in which nitrate and phosphate values were below detection limits as indicated in Table 1. 9. Results & discussion, line 413-414: I do not follow. Please see below comments on Figures 3-5. 10. Comments on Figures 3, 4, 5: When two variables are regressed onto each other, the slope of regression could be used to assess the strength of coupling between the two or control of one to another – the higher slope, the strong coupling/control, where even a small change in X-values results in a huge response in Y-values. In this regard, for Figure 3 I would consider stronger control of chlorophyll and bacterial biomass on CR in 2010 than in 2009 if you do inter-year comparisons. Figure 4 might also be similarly interpreted (the stronger control of PP on CR in 2010 than in 2009). The same goes for Figure 5. Additionally, if the unit of chlorophyll is converted to that of bacterial biomass, the relative strength of control by each on CR could also be inferred. 11. Results & discussion, line 468: This is only true relative to global average values in coastal oceans. I do not think you could say this unless you compare with P/R value in the non-flooding year, which you do not have the data for. 12. Results & discussion, lines 487-499: I suggest you provide a full summary of values calculated from endmember mixing equations, including equations and how to calculate uncertainties, RMSE, etc. Also, you might want to more emphasize that the calculations presented in this paragraph give you estimates that are expected by purely physical processes, without taking biological effect into account. Deviation from what is estimated based on endmember mixing model is due to biological effect, which you nicely described in the following paragraph.

Technical Corrections: 1. Line 129: Replace "estimated" with "calculated" 2. Line 159: Replace "multiple" with "multiplied" 3. Line 189: Avoid subjective words like "devastating". 4. Line 240: "immense" to "large" 5. Line 264: Replace "16" with canonical Redfield ratio for N:P of 16 or so. 6. Line 418: Awkward phrase "to gain greater insight".

7. Lines 433-444: Please be specific. 8. Line 463: I think it is "overestimated" given the vertical profile of P and R? 9. Line 484-486: Please be specific and give numbers from the calculation.

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