We thank the reviewer for the constructive comments and suggestions. We have addressed all raised issues in our response letter and the revised manuscript.

Details of methods are not provided, for example, for C14 PP measurement, is it 24 h incubation?

Response: Primary productivity (PP) was measured by the $^{14}C$ assimilation method. In brief, water samples for the PP measurements were prescreened through a 200-μm mesh and filled into acid-cleaned polycarbonate carboy (10 L; Nalgene). Each subsample was inoculated with 10 μCi $NaH^{14}CO_3$ before incubation. The $P^B$-E (photosynthetic-irradiance) curve at each sampling depth was constructed in a seawater-cooled incubator with artificial illumination and was incubated for 2 hours. PP at each depth was calculated with the photosynthetic parameters. The detailed procedures can be found in Gong et al. (2003).

Gong, G.-C., Wen, Y.-H., Wang, B.-W., Liu, G.-J. (2003) Seasonal variation of chlorophyll a concentration, primary production and environmental conditions in the subtropical East China Sea. Deep-Sea Research II, 50, 1219-1236.

Specific comments:

1. The authors should do a careful proof-reading. There are some obvious mistakes. For example, P3525, L16 should be “typhoon”, rather than “typhoons”; Table 1, TD should be MLD.

Response: All errors have been revised accordingly.

2. P3525, L1-3: “the cited reports were based on study of satellite images, and the reported phytoplankton biomass (e.g. usually determined from chlorophyll absorption spectra)”. Actually almost all of the reported biomass change was estimated by using the empirical band ratio algorithm (OC4) rather than deriving from absorption spectrum.

Response: The sentence has been revised to “Actually almost all of the reported biomass change was estimated by using the empirical band ratio algorithm (OC4). The reported phytoplankton biomass has seldom been validated by in situ measurements.”

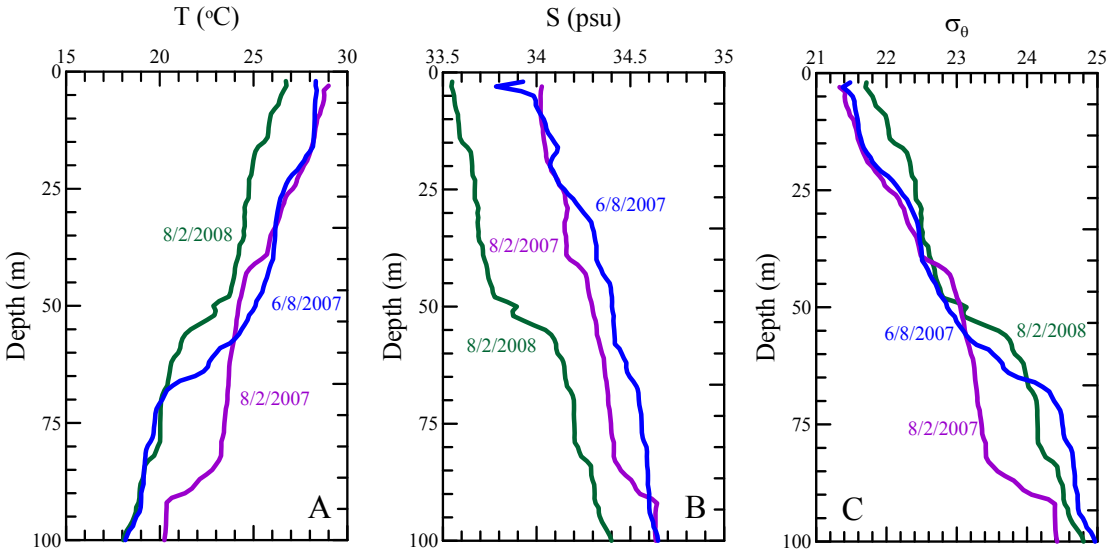
3. Annotation of dates on figures is not consistent and thus is confusing. For example,

on Fig.1, it is 02/08/2008, while on Fig.3, it is 8/2/08.

Response: Annotation of dates of figures 1, 3, 4 and 5 is consistent in the revised manuscript.

4. Fig.3, T/S figure is not comprehensive. Why not show T & S profiles?

Response: T-S-D (Temperature-salinity-density) diagrams clearly show the mixing/upwelling process during non-typhoon and typhoon periods. However, the profiles of T, S and D are difficult to explain the mixing/upwelling process due to possible interannual variations. As we mentioned in the submitted manuscript, we used temperature-salinity-density (T-S-D) diagrams (Fig.2) to demonstrate variation of hydrographic data between non-typhoon (in 2007) and typhoon conditions because the characteristics of the Kuroshio Current are almost constant. One can easily see variations of water properties (T-S-D diagrams) due to the effect of typhoons. The detailed description of variations of water properties due to the effect of typhoons was addressed at page 3528. In stead, the vertical profiles of water temperature, salinity and density during non-typhoon and typhoon conditions are difficult to understand the changes in water properties due to the typhoon. This is why we did not show the vertical profiles of T, S and density in the original submitted manuscript.




5. Fig.4, Is the MODIS Chl from Aqua or Terra? It looks that there might be something wrong with data processing. Never seen those kind of high chl (»1 mg/m3)

bands across the Taiwan Strait. I would like to suggest the authors to double-check the data processing and use the newly updated MODIS data (Version r2009.1). One way to convince people about the data quality is to compare the MODIS data with SeaWiFS data (also use Version r2009.1) when both having data (because there is no SeaWiFS data during the period under study). As to the reason why in situ chl is higher than satellite chl (p3533, paragraph two), it is not likely to be item 2-3.

Response: The MODIS chl *a* data were the average value from Aqua and Terra. The derived MODIS chl *a* values across the Taiwan Strait (water depth≦ 70m, Case 2 waters) was overestimated and unbelievable because there was interference from the strong absorption of colored dissolved organic matter (CDOM) in the blue band that overlaps with phytoplankton chlorophyll absorption (Gong, 2004; Gong et al., 2007; Tang et al., 2008). As shown in Fig. 3, the upwelled cold water mixed with warm surface water of the SECS and then resulted in slightly low salinity (>33.5) as compared to non-typhoon conditions. Consequently, the mixed surface water should contain a portion of CDOM from the SECS and this is our explanation (3). As we mentioned in our original manuscript, the *in situ* chl *a* data are limited, but we indeed observed that the phytoplankton community changed after a typhoon (see detailed discussion in Sect. 4.3). Therefore, we would like to keep this possible explanation.

Gong, G.-C. (2004) Absorption coefficients of colored dissolved organic matter in the surface waters of the East China Sea, Terrestrial, Atmospheric and Oceanic Sciences, 15, 75-87.
Gong, G.-C., Hung, C.-C. and Chang, J. (2007) Reply to comment by Jinchun Yuan et al. on “Reduction of primary production and changing of nutrient ratio in the East China Sea: Effect of the Three Gorges Dam?”, Geophyical Research Letters, 34, L14610, doi:10.1029/2007GL029633.
Tang, S. , Chen, C., Zhan, H. , Zhang, J. and Yang, J. (2008) An appraisal of surface chlorophyll estimation by satellite remote sensing in the South China Sea. International Journal of Remote Sensing, 29: 21, 6217 – 6226, doi:10.1080/01431160802175579

6. Logic is not clear. The authors actually plan to show two cases. So it is better to mention this clearly, rather than mentioning only one at first (in Section 1 & 2) and then mentioning one more in Section 3. And there is no need to repeat the description of cooling in the discussion section.

Response: We have addressed two typhoon cases together in introduction and results

(e.g. Section 1& 2) and deleted the description of cooling caused by typhoon in the discussion section.

7. There is a pre-existing upwelling in the study area, right? It looks like that typhoons enhance the upwelling and/or mixing. In a word, I see weak physics in this paper. Clearer and more careful interpretation is necessary.

Response: Based on the figure 1A, it indeed looks like that there is a pre-existing weak upwelling in the study area. As we mentioned in the introduction (p.3524, lines 13-25) of submitted manuscript, we already addressed the fact that the wax and wane of the outcrop of cool upwelled water were attributed to different mechanisms. We recognized that we did not investigate hydrographic conditions before typhoon because the study area is an inhospitable place during (or before) the passage of a typhoon. The upwelling phenomenon (at page 3524) on the shelf-break of the SECS is very complicated based on literature (Chen, et al., 1990; Gong et al., 1995; Wu et al., 2008; Tsai et al., 2008). Detailed interpretation of the typhoon enhancement of the upwelling and/or mixing is beyond the scope of the present study because we did not have any observations of vertical profiles of water properties before typhoon.

8. It is not good to compare 07 with 08, to represent the differences between pre-typhoon and post typhoon. At least the authors should keep caution of potential interannual variations. I suggest using satellite data to evaluate this impact.

Response: As we addressed in the introduction, the main objective of this research is to better understand biogenic POC sinking flux during non-typhoon and post-typhoon conditions. As other reviewers pointed out that POC fluxes, after typhoon passage, were rare. It is almost impossible to use satellite data to evaluate POC flux after typhoon passage because previous derived POC flux data were mainly based on algorithm under non-typhoon conditions and no in situ observations of vertical profiles of various parameter, nutrients, chl *a* and POC flux. Indeed, we did not have POC flux pre-typhoon condition in this study. In order to reduce possible interannual variations of POC flux, we can only compare POC fluxes at similar season (e.g. 07 vs. 08).