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

Specific comments:
Title: I suggest that the title should be changed, because POC flux is only one of the effects of typhoons discussed in this paper (for example "Changes in ocean properties associated with typhoons in the southern East China Sea".

Response: The observed changes in SST, nutrients, and chlorophyll are ubiquitous phenomena after the passages of typhoons. The flux of biogenic carbon from the euphotic zone of the ocean to the deep waters is one of the main controls on the CO_2 partial pressure in the atmosphere. Therefore, measurement of this POC flux is critically important for understanding the global carbon cycle and its response to climate change (Emerson et al., 1997, Nature, 389, 951-954). Also, many scientists (Raven and Falkowski, Plant Cell Environ., 1999, 22, 741-755; Yool et al., Nature, 447, 999-1002, 2007) have pointed out that the sinking flux of organic matter to depth is a major control on the inventory of carbon in the ocean. The other reviewers and we have pointed out that the effect of typhoons on biogenic carbon sinking in this study is new and rare. So, we would like to keep our original title to emphasize the impact of typhoons on POC flux.

Most important problem: I think that all the calculations discussing dilution of organic matter, injections of nutrients etc. due to the effects of typhoon on surface waters should be based on changes of the mixed layer depth (MLD) and not changes of the euphotic depth. A nice example how such calculations can be done is given in the following paper by S. Son et al., Possible biogeochemical response to the passage of Hurricane Fabian observed by satellites, JOURNAL OF PLANKTON RESEARCH,
VOL. 29,NUMBER 8, PAGES 687–697, 2007.

Response: As we addressed above, the main objective is to understand biogenic carbon sinking flux (sediment trap was deployed at 70 m) after the passage of a typhoon. All the calculations are now based on changes at a depth of 75 m (described at p. 3530, line 7, line 9, line 13, p. 3532, line 7) close to the lower limit of phytoplankton biomass (Fig. 2B) rather than the depth of the euphotic zone (65, 43 and 34 m in different cruises) in the original manuscript.
We agree that the mixed layer depth (MLD) should be defined by density (e.g. Sun et

al., 2007) rather than by water temperature (see following table). However, as observed in the vertical profiles of Chl-a in Fig. 2A, phytoplankton biomass can extend to almost 80 m. So, we preferred to do all the calculations based on the depth of 75 m.

Table 1. Data of mixed layer depth (MLD), euphotic zone (EZ: 1% of surface light intensity), integrated nitrate (I-NO_3), chl *a* (IB), POC (I-POC) and POC flux from different cruises.

Date	MLD (m)	EZ (m)	I-NO_3 mol m^{-2}	IB g m^{-2}	I-POC g m^{-2}	C flux[a] (trap)	C flux[b] (model)	I-PP (model)	e[a] (trap)	e[b] (model)
6/10/2007	34	65	0.046	0.031	3.2	180±10	183	1111	0.16±0.01	0.16
8/3/2007	28	43	0.060	0.051	3.5	140±22	219	1283/1773*	0.11±0.02	0.17
8/3/2008	45	34	0.534	0.116	5.5	265±14	567	2775	0.10±0.01	0.20
9/19/2008	n.a	32	n.a	n.a	n.a	225±34	277	1384	0.16±0.03	0.20
9/21/2008	n.a	30	n.a	n.a	n.a	224±33	359	1711	0.13±0.04	0.21

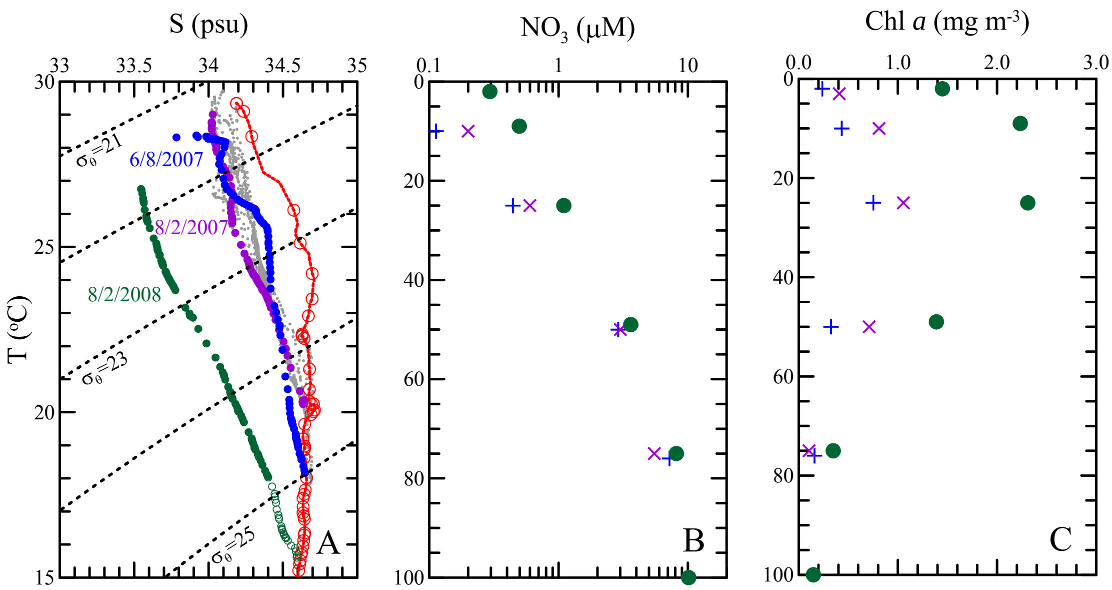

Fig 1. (A) Diagrams of temperature, salinity and density (A: a red curve represents the characteristics of the Kuroshio Current; a green curve represents the nature of the upwelled water from the deeper water of the Kuroshio upwelling after a typhoon event; blue, purple, and gray curves represent the upwelled water from the shallow water of the Kuroshio Current under non-typhoon periods). One can clearly see the colder water from deep water (after typhoon event was brought to the surface deeper than non-typhoon periods. Vertical distributions of nitrate concentration (B) and chlorophyll *a* (chl *a*) concentration (C) in the study area of the southern East China Sea during non-typhoon periods (blue, purple, and gray symbols) and a typhoon event

(green symbols). Note: nitrate concentrations (below detection limit, ~ 0 μM) in the surface water during non-typhoon periods did not appear because of log scale.

The Other comments:

1) page 3525 line 2: Standard satellite algorithm OC4v4 is not based on “chlorophyll absorption spectra” but on the remote sensing reflectance.

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) rather than deriving from absorption spectrum.

2) Page 3526: What MODIS chl data have you used, from Terra or Aqua? Why did you not use MODIS SST data, which would be concurrent with the Chl data used in your paper?

Response: During the investigating period, we found it difficult to get good cloud-free SST and Chl-a data. Thus, we tried to use the mean data of MODIS-Terra and Aqua for getting more cloud-free Chl-a data. Additionally, the NOAA AVHRR derived-SST data can generally obtain better and more cloud-free data than MODIS SST data.

3) Page 3528 and Fig 3: I would like to see the vertical profiles of water temperature, salinity and density in order to be able to understand the changes in water properties due to the typhoon.

Response: Because we did not have hydrographic data before the passage of typhoon Fengwong (in 2008), it is difficult to directly compare the differences between pre- and post-typhoon due to possible interannual variation of hydrographic data (Fig. 1). 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. Instead, 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.

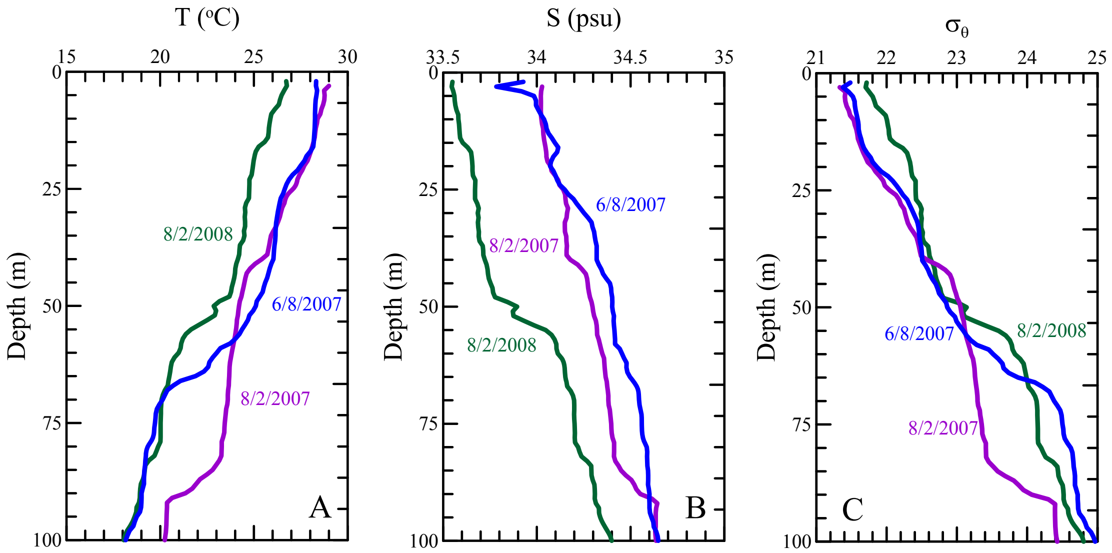

Fig. 2. Vertical profiles of water temperature (T), salinity (S) and density (σ_θ) in the study area during non-typhoon and typhoon conditions.

4) Table 1. There is a mistake in the Table: there should be MLD and not TD in the Table header. The MLD estimate should be based on water density and not water temperature, since you have salinity and temperature data. Why was MLD defined as the depth where water temperature INCREASED? I was surprised by the fact that MLD after the typhoon was less than before the typhoon. Could you discuss this in comparison to the climatological data for this region?

Response: The header (TD) of the Table 1 has been revised to MLD in the revised Table 1 (see follows).

Date	MLD (m)	EZ (m)	I-NO_3 mol m^{-2}	IB g m^{-2}	I-POC g m^{-2}	C flux[a] (trap)	C flux[b] (model)	I-PP (model)	e[a] (trap)	e[b] (model)
6/10/2007	34	65	0.046	0.031	3.2	180±10	183	1111	0.16±0.01	0.16
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9/19/2008	n.a	32	n.a	n.a	n.a	225±34	277	1384	0.16±0.03	0.20
9/21/2008	n.a	30	n.a	n.a	n.a	224±33	359	1711	0.13±0.04	0.21

MLD: defined at depth which density increased by 0.1 kg m^{-3} from the density at surface (Son et al., 2007)

NO_3, IB, I-POC: integrated NO_3, chl *a* , POC from 0 to 75 m.
C flux^a: measured by sediment traps.
C flux^b: estimated by model (=I-PP x e ratio (i.e. e^b)) of Laws et al. (2000)
I-PP: estimated by the model (of Behrenfeld and Falkowski (1997).
e^a: C flux^a/I-PP; e^b: C flux^b/I-PP.
n.a.: data not available. *: PP value was measured by C-14 incubation.
Data in 2007 from non-typhoon periods. Data in 2008 from post-typhoon periods.

5) I think that you often use the term "upwelling" when you most likely mean "cooling"

Response: Some "upwelling" have been revised to "cooling".

6) Why are the 3-day average MODIS Chl data compared with instantaneous in situ Chl-a determinations? I suggest you compare MODIS data from the same day when in situ data were collected and indicate time difference (in hours) between the two estimates. It could be then interesting to discuss how Chl concentrations have changed in time after the typhoon. I think, that it is reasonable to expect the following. Just after the passage of the typhoon the concentration of surface Chl is likely to decrease, because Chl is mixed from surface waters to greater depth. Shortly after the typhoon the Chl is expected to increase in response to higher nutrient concentrations and increasing water stability. After some more time Chl concentration is likely to decrease again, when nutrients are used up and their concentrations are decreasing. You should also include the following reference when discussing satellite Chl data: 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, URL: http://dx.doi.org/10.1080/01431160802175579

Response: Because of heavy cloud cover, it is difficult to get 1-day MODIS Chl data. So, we used the 3-day average MODIS chl data to compare the in situ Chl determinations. Regarding the Chl concentration changes in time after typhoon, we really appreciate reviewer's explanation and suggested reference. We have included explanation and reference into our revised manuscript. See the following description. Although we recognize that the data are limited, we, we would suggest several possible explanations. (1) Just after the passage of the typhoon the concentration of surface chl *a* is likely to decrease, because chl *a* is mixed from surface waters to greater depth. Shortly after the typhoon the chl *a* is expected to increase in response to higher nutrient concentrations and increasing water stability. After some more time chl *a* concentration is like to decrease again when nutrient are used up and their concentrations are decreasing. As a consequence, the measured chl *a* concentration was obtained at a specific location post-typhoon (e.g. almost during high phytoplankton growth period) whereas the derived chl *a* value was a 3-day (e.g. including low and high phytoplankton growth periods) mean value derived from a large area (1 x 1 km^2) (2) The phytoplankton community may change after a typhoon (see detailed discussion in section 4.3) and chl *a* may not be the principal pigment of some phytoplankton; (3) The presence of suspended particles and/or chromophoric dissolved organic matter may affect satellite derived chl *a* measurements (Hoge and Lyon, 2002; Tang et al., 2008; Shang et al., 2008) and result in chl a overestimates; and (4) Sampling time differences between the two approaches could be influential if phytoplankton show diel variation. Clearly, evaluation of the relationship between *in situ* chl *a* and satellite derived chl *a* is warranted.

7) pages 3532 -3: You should include in the methods section the information about how was the diffuse attenuation coefficient for downwelling irradiance determined and what were the light wavelengths.

Response: The mean downwelling attenuation coefficient (K_c) was calculated from the linear regression of the log-transformed underwater irradiance profile. The underwater irradiance profile was measured by PAR (photosynthetic active radiation) scalar quantum irradiance sensor (Chelsea Technologies Group Ltd, UK). The euphotic depth (EZ) was defined as the depth of 1% surface light penetration (=4.605/K_c). Since the irradiance meter is used to measure PAR, the relevant wavelengths are 400-700 nm.