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Interactive comment on "Joint effect of freshwater plume and coastal upwelling on phytoplankton growth off the Changjiang River" *by* Y.-F. Tseng et al.

Anonymous Referee #2

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Review on "Joint effect of freshwater plume and coastal upwelling on phytoplankton growth off the Changjiang River" by Y.-F Tseng, J. Lin, M. Dai, and S.-J. Kao

I. General comments

This paper reports nutrients, Chl a, bulk alkaline phosphatase activity and other pertinent hydrographic data in the Changjiang plume impacted area in summer 2011. Using these data, the authors discuss nutrient dynamics and P stress potential, which are largely controlled by the joint effect of Changjiang discharge and coastal upwelling, for phytoplankton growth. Generally, the data are of good quality, the manuscript was well written, and the topic meets the general interest of Biogeosciences. Therefore,

I support the publication of this paper after the following concerns being adequately addressed.

II. Major comments

1. p.10366 line 22-24: "none study was conducted for the distributions of APA in this region, particularly, during flood period" This statement is not true. Very recently, Liu et al. (2013) used APA and the maximum quantum efficiency of photosynthesis (Fv/Fm) to evaluate the status of microphytoplankton phosphorus stress during the summer flood seasons on the East China Sea (ECS) shelf, in which the authors found that the phosphorus status of microphytoplankton was largely controlled by the Changjiang plume and coastal upwelling. This would be very interesting to see a comparison between the present work and Liu et al's findings.

Liu, H.-C., C.-Y Shih, G.-C. Gong, T.-Y. Ho, F.-K. Shiah, C.-H, Hsieh, and J. Chang. 2013. Discrimination between the influences of river discharge and coastal upwelling on summer microphytoplankton phosphorus stress in the East China Sea. Continental Shelf Research, 60, 104-112.

2. p.10373 line 27 to p. 10374 line 15: The NKBC not only injects nutrients into the CJ plume system, but also carries nutrients out of the system. Instead, the CJ River only discharges nutrients into the system. Therefore, I don't think that the estimate can shed light on the conclusion that the NKBC is the most important P supplier to this area.

3. p.10379 line 6-7: The criteria used to separate all surface waters into three catagoris (turbidity-influenced, upwelling-influenced, and plume fringe) should be clearly defined.

III. Minor comments

1. p.10368 line 1: a typo "warped"

2. p.10368 line 6-7: Please explain why the trend in QT Estuary was above that of CJ.

3. p.10372 line 3-4: CDW was defined as water with salinity < 31 by Gong et al (1996)

4. p.10374 line 6: a typo “appled”

5. p.10375 line 27-28: Is there any reference that can explain why allochthonous APA is so high in the nutrient-replete freshwater (both N and P)?

6. p.10377 line 15-16: I don’t understand why fast nutrient consumption would cause high N/P ratios in surface waters in the bloom area, unless the organic matters are produced with an extremely low N/P ratio. Additionally, is there any published N/P ratio of particulate organic matter in this area?

7. p.10379 line 17-19: As mentioned by the authors, the upwelled water is featured by low N/P ratio. So, I don’t understand why upwelling may lead to low APA values corresponding to high N/P ratios.

Interactive comment on Biogeosciences Discuss., 10, 10363, 2013.