We would like to thank reviewer 2 for the comprehensive feedback to the manuscript. Please find our detailed responses to all comments below.

Comments #1-1:

At no point authors mentioned that they measured the stable isotope composition of the riverborne POM, although this was a central requirement in their experimental design. Authors use a value for terrestrial POM (fig. 2) which origin is quite unclear.

Response #1-1:

We thank the reviewer for this important comment. More information about the isotope composition for terrestrial POM has been added to the materials and methods sections of the manuscript. Previous studies which investigated the source and fate of carbon in the Changjiag mainstream and tributaries demonstrated very little spatial variations in the stable carbon and nitrogen isotope compositions for the POM (Wu et al., 2007). Moreover, the carbon and nitrogen isotope compositions of POM in the Changjiang lower reach ($\delta^{13}C$ = -25.7 ± 0.1‰; $\delta^{15}N$ = 4.3 ± 1.0‰) were very similar to the mean isotopic composition ($\delta^{13}C$ = -25.6 ± 0.7‰; $\delta^{15}N$ = 4.3 ± 1.7‰) among the whole river system. Therefore, we used the reported stable isotopic composition of POM in the Changjiang lower reach to represent the terrestrial organic matters transported into the ECS.

Cited Literature:

Wu, Y., Zhang, J., Liu, S. M., Zhang, Z. F., Yao, Q. Z., Hong, G. H., and Copper, L.: Sources and distribution of carbon within the Yangtze River system. Est. Cont. Shelf Sci., 71, 13-25, 2007.

Comments #1-2:

A single zooplankton sample, with no replicates. As a result, they cannot statistically compare the stable isotope composition of the claimed marine pelagic primary production between sites. (the difference is usually rather small (<0.6 ‰ for 2009 and 2010)

Response #1-2:

Although the zooplankton samples of specific size fraction (200-363μm) had no replicates, the zooplankton samples collected from 200 μm mesh net were wet-sieved and total of 5 size fractions were obtained and analyzed for stable isotopes. For most studied sites, carbon isotope ratios for zooplankton slightly elevated with increasing size fractions. However, $\delta^{13}C$ values for the zooplankton of 200-363μm and 363-500μm were quite similar ($\Delta\delta^{13}C$ < 0.5‰), suggesting the reliability of these measurements. When comparing the carbon isotope ratios of zooplankton samples by non-metric ANOVA (Kruskal-Wallis), mean $\delta^{13}C$ values were significantly different between inshore and offshore sites in July 2008 ($p < 0.01$) and 2009 ($p < 0.01$), whereas no significant difference was observed in 2010 ($p = 0.75$). The similar $\delta^{13}C$ values for the inshore and offshore zooplankton were probably caused by the influence of Changjiang flood in July 2010, which induced a widespread algal bloom within the 100 m isobath (Gong et al., 2011). Even the outer shelf experienced the unprecedented growth in algal biomass. Thereupon the isotopic signatures of zooplankton in both inner and outer shelf may exhibit overall elevated $\delta^{13}C$.

Mean values of $\delta^{13}C$ and $\delta^{15}N$ for zooplankton samples across the 5 size fractions (i.e. 200-363, 363-500, 500-1000, 1000-2000, > 2000 μm) were added to the Table 2. Also, the Statistical analyses of the spatial variance in zooplankton $\delta^{13}C$ values would be included in the results and discussion sections.

Cited Literature:

Gong, G. C., Liu, K. K., Chiang, K. P., Hsiung, T. M., Chang, J., Chen, C. C., Hung, C. C., Chou, W. C., Chung, C. C., Chen, H. Y., Shiah, F. K., Tsai, A. Y., Hsieh, C. H., Shiao, J. C., Tseng, C. M., Hsu, S. C., Lee, H. J., Lee, M. A., Lin, I. I., and Tsai, F.: Yangtze River floods enhance coastal ocean phytoplankton biomass and potential fish production, Geo. Res. Lett., 38, L13603, 2011.

Comments #1-3:

Authors did not consider other potential organic matter sources, such as coastal, benthic micro-algae, which have been shown to be a major source of organic matter to coastal food webs.

Response #1-3:

Plenty of studies demonstrated great contributions of benthic primary production to the benthic food web in coastal areas as indicated by elevated $\delta^{13}C$ of benthos. However, according to our literature review, there is no study reporting the existence of benthic microalgae on the East China Sea continental shelf. The environment of the ECS inshore area was characterized as highly turbid due to the large sediment load from the Changjiang. Previous study that estimated the primary production in the ECS suggested very high light extinction coefficient (K) and shallow euphotic depth in the coastal and river-influenced areas (Chen et al., 2004). Our in situ measurements of photosynthetically active radiation (PAR), which is one of the critical factors for algal growth, also demonstrated only 10 to 15 m of euphotic zone (defined as the depth with 0.6% of surface light irradiation; Chen et al., 1999), whereas our inshore sampling sites were generally deeper than 30 m and far away from the coast (48 – 465 km). Therefore, the contribution of benthic microalgae to the ECS benthic food web could be very few if there were any. Other studies also observed enriched $\delta^{13}C$ signatures of benthos in the waters far removed from sources of benthic microalgae, implying some factors other than uptake of benthic primary production affecting the carbon ratios in benthic consumers, namely the phytoplankton blooms and selective feeding (or digest) on isotopic enriched POM by primary consumers (Nadon and Himmelman, 2006).

Cited Literatures:

Chen, Y. L. L., Lu, H., Shiah, F., Gong, G., Liu, K., and Kanda, J.: New production and f-ratio on the continental shelf of the East China Sea: comparisons between nitrate inputs from the subsurface Kuroshio Current and the Changjiang River. Estuarine, Coast. Shelf Sci., 48, 59-75, 1999.

Chen, Y. L. L., Chen, H. Y., Gong, G. C., Lin, Y. H., Jan, S., and Takahashi, M.: Phytoplankton production during a summer coastal upwelling in the East China Sea. Cont. Shelf Res., 24, 1321-1338, 2004.

Nadon, M. O. and Himmelman, J. H.: Stable isotopes in subtidal food webs: Have enriched carbon ratios in benthic consumers been misinterpreted? Limnol. Oceanogr., 51, 2828-2836, 2006.

Comments #2-1:

Overall, $\delta^{15}N$ are poorly exploited and discussed. $\delta^{15}N$ values for fish and crustaceans are 6 to 12‰ higher than the 'marine pelagic' endmember. A 6-12‰ range of $\delta^{15}N$ would then mean that benthic crustaceans are 2-4 trophic levels higher than zooplankton in the food chain, which is not sound.

Response #2-1:

As we considered the spatial variation in $\delta^{15}N$ for the marine pelagic end-members (i.e. zooplankton in this study) the calculated $\delta^{15}N$ differences between fish (crustaceans) and marine pelagic end-member generally ranged between 3 to 9‰, no more than 10‰, thus suggesting 2 to 3 trophic levels. For instance, the most enriched nitrogen isotope was observed for the top-predator species (*Gymnothorax undulatus* at st. A3 in 2008) with the $\delta^{15}N$ value = 13.99‰, which was 8.43‰ higher than the offshore zooplankton ($\delta^{15}N$~ 5.56‰). Since several analyzed fishes, such as moray (*Gymnothorax undulatus*), white croaker (*Pennahia argentata*), and other piscivorous fishes, were the top predator in the ECS benthic ecosystem, 3 trophic levels higher than zooplankton was fairly reasonable. (e.g. zooplankton→ benthic invertebrates→ crustacean-feeding fish→ piscivorous fish).

More information and discussion about the nitrogen isotopic variability, spatial variation and its implications for trophic structures would be added into the text.

Comments #2-2:

The high variability of crustacean $\delta^{15}N$ values in inshore sites strengthens the idea of multiple N sources to inshore food webs. It may also suggest OM microbial reworking when transferred to benthic habitats that could increase its $\delta^{15}N$ values.

Response #2-2:

As *Reply #1-3* mentioned, other organic sources (e.g. benthic microalgae) may not contribute to the benthic consumers in the ECS and also influence the isotope compositions. Instead, the high variability of crustacean $\delta^{15}N$ values in inshore sites was originated from the base of food web since $\delta^{15}N$ values for zooplankton also showed relatively higher variation in the inner shelf than outer shelf. This high variability in isotope composition is mainly caused by the influence of land-based inorganic nitrogen. In the Changjiang river basin, major sources contributing to the nitrate (NO_3^-) were nitrification of nitrogen-containing organic materials, urban sewage effluent and chemical fertilizers, which were greatly different in their nitrogen isotope signatures (Li et al., 2010). And the nitrate transported from Changjiang (allochthonous) was the major N source for the inner shelf of ECS. In addition, in the shallow ECS shelf area, the remineralized N (autochthonous) can be frequently transported back to the euphotic zone and form new production (i.e. phytoplankton; Chen, 2003). Moreover, subsequent biological processes in the marine ecosystems, such as spring blooms could further modified in the isotope compositions for nitrate. The nitrogen isotopes for nitrate in the Changjiang Estuary and adjacent marine areas were reported to have highly spatial and temporal variations (Liu et al., 2009); therefore, uptake of these nitrate sources by phytoplankton may result in higher variability in $\delta^{15}N$ values for both pelagic and benthic consumers. In contrast to the various sources of nitrate in the inner shelf, the outer shelf was relatively far from these sources and received lower import of nutrient, thus revealing lower variability in $\delta^{15}N$ values for primary producers and subsequent consumers.

In addition, as suggested by the reviewer, microbial reworking may also contribute to higher variability in $\delta^{15}N$ values in the inshore sites. Previous study suggested that the inner shelf of ECS supported higher bacterial biomass and production than the outer shelf, thus implying stronger impacts of microbial activities on the deposit organic matters in this area (Chen et al., 2003).

This result of higher variability in $\delta^{15}N$ values at the inshore sites also strengthen the evidence for the utilization of terrestrial inorganic nutrients by marine primary producers and the exuberant biological activities in the inner shelf of ECS. More discussion and implications for the variability in nitrogen isotopes would be provided in the text.

Cited literature:

Chen, C. C., Shiah, F. K., Gong, G. C., Chiang, K. P.: Planktonic community respiration in the East China Sea: importance of microbial consumption of organic carbon. Deep-Sea Res. Pt. II., 50, 1311-1325.

Chen , C.-T. A.: New vs. export production on the continental shelf. Deep-Sea Res. Pt. II., 50, 1327-1333, 2003.

Liu, X., Yu, Z., Song, X., Cao, X.: The nitrogen isotopic composition of dissolved nitrate in the Yangtze River (Changjiang) estuary, China. Estuar. Coast. Shelf S., 85, 641-650, 2009.

Li, S. L., Liu,C. Q., Li, J., Liu, X., Chetelat , B., Wang, B., Wang , F.: Assessment of the sources of nitrate in the Changjiang River, China: using a nitrogen and orxygen isotopic approach. Environ. Sci. Technol., 44, 1573-1578, 2010.

Comment #3-1:

The range of $\delta^{13}C$ values observed for fish and benthic crustaceans is much larger than that observed for the ‘marine pelagic’ endmember. (Another evidence that there might be other POM sources to the system?)

Response #3-1:

This difference in range of $\delta^{13}C$ values for zooplankton and benthic consumers is mainly caused by the entirely different isotope turnover rates. Similar to the phytoplankton, zooplankton showed relatively shorter life span and greater seasonal variation in their stable isotope compositions, compared with that of the benthic consumers (Perga and Gerdeaux, 2005; Aita et al., 2011). In contrast, muscle tissue of fish has slow isotope turnover rate and it was suggested to reflect $\delta^{13}C$ and $\delta^{15}N$ of food sources only in spring and summer, when are corresponding to their somatic growth period (i.e. protein synthesis), with the time lag of about 1-2 months. Notwithstanding the $\delta^{13}C$ of zooplankton (basic food source) showed large temporal variation and decreased from summer to winter, fish muscle remained high $\delta^{13}C$ values during this period (Perga and Gerdeaux, 2005).

The occurrences of algal blooms in the ECS mainly concentrated in May to June (Tang et al., 2006). Therefore, during our sampling period in July, the larger spatial variation in $\delta^{13}C$ value for benthic crustacean and fish was probably reflecting the incorporation of spring bloom (enriched $\delta^{13}C$) by inshore consumers but assimilation of general phytoplankton by offshore consumers (with 1-2 months time lag). In contrast, zooplankton $\delta^{13}C$ rapidly reflects the variations in phytoplankton and the $\delta^{13}C$ for inshore zooplankton may decrease after the algal blooms, thus showing relatively smaller spatial variations in $\delta^{13}C$ values.

Cited Literatures:

Aita, M. N., Tadokoro, K., Ogawa, N. O., Hyodo, F., Ishii, R., Smith, S. L., Saino, T., Kishi, M. J., Saitoh, S. I., Wada, E.: Linear relationship between carbon and nitrogen isotope ratios along simple food chain in marine environments. J. Plankton Res., 0, 1-14, 2011.

Perga, G. and Gerdeaux, D.: 'Are fish what they eat' all year round? Oecologia, 144: 598-606, 2005.

Tang, D. L., Di, B. P., Wei, G., Ni, I. H., Oh, I. S., and Wang, S. F.: Spatial, seasonal and species variations of harmful algal blooms in the South Yellow Sea and East China Sea. Hydrobiologia, 568: 245-253, 2006.