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## ***Interactive comment on “Distinct bacterial production–DOC–primary production relationships and implications for biogenic C-cycling in the South China Sea shelf” by C.-C. Lai et al.***

**Anonymous Referee #2**

Received and published: 29 July 2013

General Comments: This paper provide some interesting information about the microbial loop in a river dominated coastal margin but does not break much new ground. It does appear to demonstrate a increasing ratio of bacterial to primary production with increasing phosphate concentrations on the inner shelf, phosphate concentrations are too low to detect any such relationship on the outer shelf. This is also reflected in the positive correlations between DOC concentration and bacterial production, and between primary production and DOC concentration, again only on the inner shelf. This emphasizes the importance of phosphate and presumably other inorganic nutrients,

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to the control of the ratio of bacterial to primary production and the functioning of the microbial loop. With increasing coastal eutrophication a better understanding of this relationship is important.

Specific comments:

1. Unfortunately the nitrate samples were lost, so phosphate concentrations were used for inorganic nutrients, due to the tight regression between the two shown in Fig. 2. However, we do not know that the ratio of bacterial production to primary production would behave exactly the same way with nitrate as with phosphate (Fig. 8), especially because nitrate is likely the limiting nutrient which is close to zero while a small concentration of phosphate remains (Fig. 2). The ratio of the two is also less than 16 to 1, suggesting that nitrate will be limiting nutrient for primary production.
2. Many of the comments in the results are rather obvious, for instance that salinity and Sigma-t increased seaward and with depth. These comments could be removed or made more substantial.
3. The manuscript needs to be closely reviewed for proper English usage, there are numerous places where word usage is incorrect.

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Interactive comment on Biogeosciences Discuss., 10, 9069, 2013.

**BGD**

10, C3819–C3820, 2013

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