

Dear Prof. Gerhard Herndl

First, we very appreciate the useful comments from two anonymous reviewers and these comments are very meaningful to improve the quality of this paper and our further study.

Our paper is a research paper about the stoichiometry of particulate organic carbon (POC) and particulate organic nitrogen (PON) based on expanded the global marine dataset and additional large number of inland water data. The first anonymous reviewer focuses on stoichiometry of POC and PON in the global ocean water and gave us a positive evaluation. However, the anonymous reviewer is much interesting in the review of POC, PON and carbon cycle (such as CO<sub>2</sub> emission from inland water) in inland water and point out the data insufficient of POC and PON in inland water of our study. This is very useful and meaningful for our further study and gets an ambitious objective for global study of carbon cycle, mapped by reviewer.

Compared to the stoichiometry of POC and PON in inland water, the stoichiometry of POC and PON in the global ocean water is much stable. We also got some new findings different from previous studies based on the expanded the global marine dataset. In personal mind, we did not necessary to collect all the inland water data for the analyses of variation of POC/PON and inland water data worked as subsidiary in this study. The inland data of POC and PON includes 11875 samples in 253 lakes (small lakes in similar region were not listed separately in the supporting information). The analysis is validated if the representativeness of analyses dataset for the inland water can satisfy the variation range of such 'global synthesis'. Of course, the representativeness will be increased with much more data was utilized, and we should pay more attention to the complete collection of inland water data if we want to estimate the discharge flux to the ocean from rivers in further study.

### **Anonymous Referee #2**

- 1) This paper expanded the global marine dataset on POC and PON, including extending the range northward a few degrees of latitude, and produced many new insights or conclusions compared to previously published studies. It's also good to see freshwater data included, and got some evidence of variability in different lake data. Such as, the finding of high C:N at high northern latitudes (ms. Fig. 2) is as far as I know novel and more or less inverts the temperature-based conclusions of Martiny et al. (who showed C:N increasing with temperature). The ms. figure 7C is quite different from what Martiny et al. (2013) showed in their figure 4. These new insights or conclusions compared to previously published studies suggest that there still are some critical things we need to know to deepen our understanding of global patterns in linkages of C and N. The authors have performed a great service in assembling these data and this is important to extend current knowledge to a wider range of geography. This paper should be published and I offer the following specific comments or suggestions on ways to improve the manuscript.

Response: Yes, as expert (reviewer 1) said, there is much knowledge of variation in POC and PON hasn't been sufficiently studied. Our study also suggest that there still are some critical things we need to know and more research on the stoichiometry is needed although our study shows some new findings.

- 2) Title – What is meant by “variation pattern?” Suggest a more descriptive title would be something like “Global patterns in particulate and dissolved organic carbon and nitrogen in

the global ocean and inland waters.”

Response: We were considered of the title using ' Global patterns '. However, the inland dataset missed many data of POC and PON in inland waters, which also mentioned by expert (reviewer 2), although our data set can satisfy the variation range of “global synthesis” in inland water.

- 3) Figures – All of them are too small, which made it really hard to see what was going on with the data. Suggest converting each on to landscape orientation and then filling the entire page with it, or submitted each figure respectively.

Response: We will submit each figure respectively when we submit the revised edition.

- 4) The Abstract is adequate. but the means of  $(12.2 \pm 7.5)$  should be noted, mean value  $\pm$  error or standard deviation?

Response: It means mean value  $\pm$  standard deviation, we revised it in the MS.

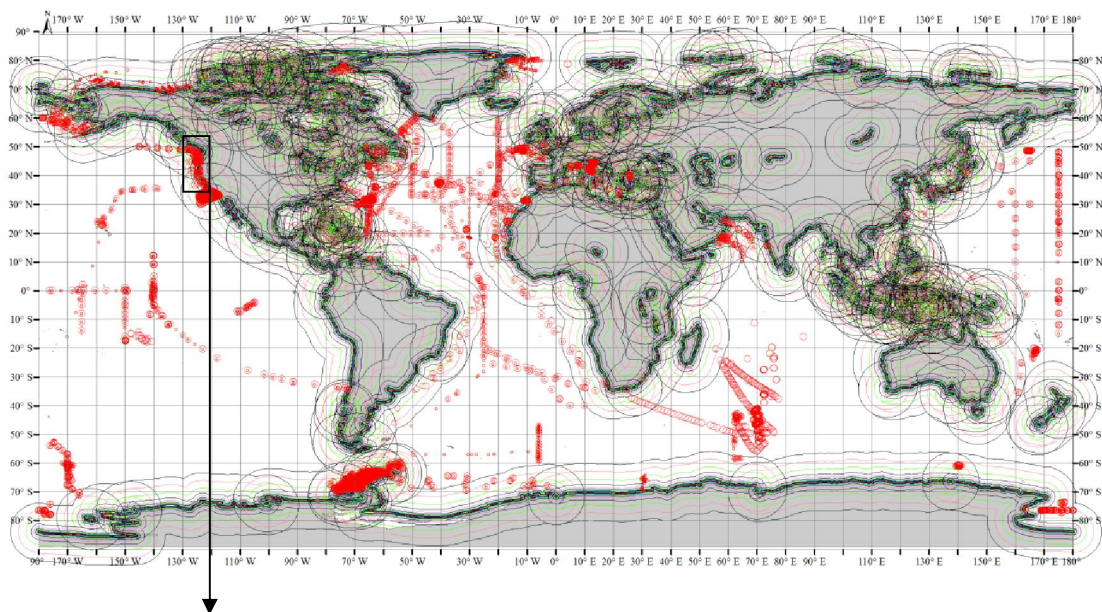
- 5) The Introduction is okay but not very inspiring.

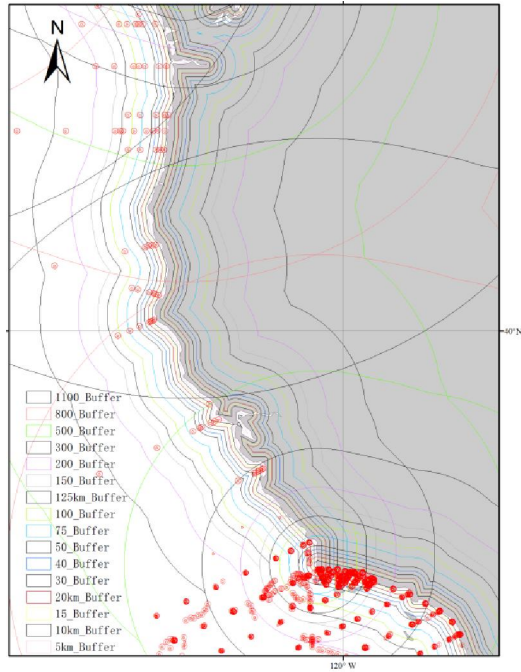
Response: we revised the introduction and added some information according to the expert's (reviewer 2) suggestion.

- 6) I believe the analysis of distance to land (Fig. 4) is by far the most extensive one yet. The detailed analysis method should be introduced in section 2.2, although '3) Offshore distance ranges.....' was mentioned.

Response: We added the some detailed description of data process in the section of method.

Offshore distance ranges (5, 10, 15, 20, 25, 50, 75, 100, 125, 150, 200, 300, 500, 800 and 1100 km) were created via buffers establishment module in Arcgis 10 (Esri) (Following figure). The buffers overlap with continent was erased by terrestrial vector data. The samples located on different ranges of buffers (different distance from offshore) can show the variation of POC, PON and POC/PON from coastal to open sea.





The establishment of buffers for different distance from offshore was implemented by Arcgis 10 (Esri). The amplification of regional part in United States West Coast ( USWC ) can clearly show the distribution of sampling points in each buffer.

- 7) The analysis concerning soil carbon and nitrogen is novel. However, there was no mention in the Methods as to where these soil data come from or how they were matched to the marine data.

Response: We added the detailed description of data process in the section of method.

- 8) There are some really intriguing patterns here that depart from previous work and which are based on what I believe to be the most comprehensive dataset yet assembled on these parameters although some imperfections should be polished. This dataset has some interesting patterns that will help us move stoichiometry forward.

Response: We very appreciate the helpful suggestion and comments from expert (reviewer 1). We carefully revised the MS according to the expert's comments.