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Discussions

Interactive comment on "Variation pattern of particulate organic carbon and nitrogen in oceans and inland waters" *by* Changchun Huang et al.

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Please see the Supplement.

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±7.5) should be noted, mean value ± error or standard deviation?

Response: It means mean value ± 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.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/bg-2017-68/bg-2017-68-AC2-supplement.pdf

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