

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

**Anonymous Referee #2**

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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. Considering new scientific

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findings in this paper, i recommend a potential acceptance in this journal, but necessary revisions are needed. I have the following specific comments and suggestions: 1) 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.” 2) 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. 3) The Abstract is adequate. but the means of  $(12.2 \pm 7.5)$  should be noted, mean value  $\pm$  error or standard deviation? 4) The Introduction is okay but not very inspiring. 5) 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. 6) 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.

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.

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