Review of "Variation pattern of particulate organic carbon and nitrogen in oceans and inland waters".

In this manuscript, Huang et al. compile and describe an updated dataset of POC and PON measurements from the ocean and inland waterways. They describe spatial and biophysical relationships in an attempt to explain variations in the dataset. There is clearly a lot of information present in this dataset and the authors do an exhaustive comparison of the data in many ways. However, I think the authors do not convincingly support their conclusions and do not put their work in a context where the reader can assess its importance. For instance, many of the values or relationships they cite as significantly different have overlapping standard deviations, and many of the significant relationships they describe are accompanied by figures that do not clearly show the relationships they describe. The authors present many relationships without identifying their significance to our understanding of organic matter production and consumption. I think a manuscript that clearly identifies new and statistically significant relationships and their importance would be a useful contribution to the field.

Specific comments:
1. The major conclusions appear to be:
    a. The global average POC/PON from this study is higher than the Redfield ratio.
    b. The relationship between POC and PON in the northern hemisphere is different (higher regression slope) than in the southern hemisphere.

I do not find support in the text for the first conclusion. The POC/PON ratio you describe has an uncertainty that easily overlaps the Redfield ratio, not to mention published uncertainty in the Redfield ratio. It is not clear that your new value represents a new understanding or simply a different subset of data. Perhaps focusing your analysis on the one latitudinal region that appears significantly different than Redfield (80-90 deg N, Fig. 2), would be a worthwhile approach.

I believe your second point is derived from Figure 2, and at multiple points in the text you describe the latitudinal dependency of POC/PON as much higher in the northern hemisphere than in the southern hemisphere (lines 142-3). It is difficult to draw this conclusion from your figures. If you plotted POC/PON as a function of latitude (not forcing the separation through latitude bins) I do not think a relationship would emerge. Certainly there are only ~2-3 latitude ranges with POC/PON ratios that do not overlap the Redfield ratio at the 25th percentile.

2. Distance from shore:
    There does appear to be a difference between PON within 50km of shore in the northern hemisphere and further than 50km from shore. Is it possible to distinguish terrestrial inputs from coastal productivity? Perhaps you can expand on this finding.

Other comments:
Line 15: "some new points" – it is unclear what this means
Line 23 and elsewhere: "morphology"? Do you mean size? Or does the shape of the lake impact its organic matter?

Line 24: "significantly" – you use the word significantly throughout the text when presenting two values that do not appear to be statistically distinguishable. 6.89 ± 2.38 to 7.59 ± 4.22 does not appear to be a significant change.

Line 35: Over what time frame and due to what influences do you expect these changes?

Line 61: This larger range for the Redfield ratio appears to contradict your abstract and conclusions.

Figure 1: Perhaps showing the sample density (using a heat map?) on the global map would make it easier to see where the majority of the samples come from.

Figure captions throughout: "…with whiskers covering most of the data" – I don't know what this means, but it does not appear that the whiskers cover the majority of the data range for most samples.

Figures throughout: Many of your figures (for example Figure 4) present data in bins vs. POC or PON or POC/PON. Without grid lines or some straight reference it is difficult to distinguish any relationship between the data and the y-axis values. These plots often give the impression that no relationship exists. You do not show your regression lines in the plots, only in your Supplemental tables. This makes it very hard for readers to follow your chain of argument and believe your results.