

Dear Dr. Wilson,
first of all we would like to thank you for the helpful and constructive comments. We really appreciate that you found our approach interesting. We are convinced that addressing your comments and those from the other two anonymous reviewers will improve the ms.

Please find answers to your comments in the following:

Comment: ... to calculate the carrying coefficient

Answer: will be done

Comment: Specific Comments on the use of the Wilson et al., (2012) dataset

1. Any change made to the dataset or the way it is reported should be described clearly in the manuscript text.
2. The dataset in Wilson et al., (2012) consists of 156 data points but Figure 11b reports 104 data points. I am unsure if this includes the additional data from the Indian Ocean but either way a third of data points have been omitted.
3. The dataset is not cited properly in the figure caption for Figure 13. It reads Wilson et al., (2002). It should be (2012).

Answer: Thanks for pointing to the fact that we did not mention that we excluded data from polar regions in figures 13. This and the publication date of Wilson et al. will be changed in the revised version of the ms. Furthermore we will include a table into the revised version of the ms showing how the data we added to the compiled global data set.

Comment: General Comments - Treatment of uncertainty in Section 3.2 on Ballast Effect

Answer: We will assess uncertainties caused by the range of densities and decay rates and add error bars to the data presented in respective figures in the revised version of the ms.

Comment: The authors present an estimation of the density of particles in equation 11 as a mass-weighted average of the densities for each flux component. The sum of weights (the % of each component) for every sample in Table 2 are <100% because the total flux reported does not equal the summed masses of POC, CaCO₃, Opal and Lithogenic fluxes (Table 2). Therefore, dividing by 100 is incorrect and instead it should be the sum of the weights (% of each component) for each respective sediment trap sample.

Answer: Sorry, instead of Corg we should have written OM (organic matter) as in equation 10. OM is Corg * 1.8. This will be changed.

Comment: Box Modelling - I am not sure whether the global modelling adds to the understanding of ballasting in the Indian Ocean or how it is informed by insights into ballasting in the Indian Ocean generated by the manuscript.

Answer: The suggestion to skip the global box model and to focus on the ballast effect in the Indian Ocean only is appealing because it helps to streamline the ms as requested also by the two anonymous reviewers. On the other hand we found it quite interesting because it showed the link between the ballast effect and the CO₂ uptake. Skip it is the easiest solution but we would like to see whether adding a section on material and methods as requested by the two anonymous reviewers will also help to solve this issue.