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Interactive comment on "The vertical distribution of buoyant plastics at sea" *by* J. Reisser et al.

A. Ballent (Referee)

4anikab@earthlink.net

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Overall / General Comments: This paper is scientifically significant (rated: excellent) due to the novelty of using a multi-level trawl to quantitatively address the lack of understanding about the vertical distribution of microplastics within the surface layer of the world's oceans. The authors' thorough investigation of the effect of sea-state on surface plastic estimations has important implications for improving estimations and models of total surface plastic loads in the oceans. The scientific quality (rated: good) could be improved by addressing a couple instances of overgeneralization within the text and clarifying statements which are ambiguous as to where the information was take from (see below). In text citations could be used more specifically. For example, there are several cases where a citation is listed at the end of the sentence, although it only refers to a part of the previous statement. These instances could be improved by instead writting "Author et al., year suggested/reported/etc. that ...". Otherwise,

the experiments and calculations are clearly traceable allowing for reproduction of the work presented here in future studies. The paper's presentation quality is excellent. Overall, the paper is clearly written and flows well. It is well structured and demonstrates appropriate use of the English language. Tables and figures are supportive in presenting the results. In my opinion, pronouns "It, them, they, etc" were used too often, especially within the methods section, however this simply an aspect of writing style. Although the pronouns are used correctly, this style may increase the chance for readers to misunderstand the methods. The abstract is concise and complete and the title is representative of the paper, but it could be clarified with a subtitle, for example, "The vertical distribution of buoyant plastics at sea: a case study in the North Atlantic Ocean."

Specific Issues/Concerns: In the introduction, on page 16209, line 9, "mostly fragments of packaging and fishing line" is only supported by Reisser et al., 2013 for the waters surrounding Australia. I would suggest finding additional support for this statement, e.g. Hidalgo-Ruz et al., 2012, or clarify the statement by making it less generalized. The methods and assumptions are valid and clearly outlined, but in several cases it was necessary to read the figure captions to fully comprehend some points. I would suggest to include the information that is in the figure captions within the text as well so as to minimize confusion when reading. For example, it is not clear whether or not each of the four sampling stations were sampled at each of the 3 sea-states until one reads Figure 3. Also, in the methods section, it is not clear whether the Kukulka model is specifically for the prediction of numerical or mass concentration. In the discussion section, I suggest to discuss the implications of not including any thin filaments from samples in analysis. Additionally, on page 16215, lines 11-20, other studies concerning estimation of total surface plastic amounts are mentioned. I would suggest also mentioning of the most recent publication by Eriksen et al. 2014 (Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea) which aims to extrapolate and estimate total global plastic amounts. On page 16215, line 25, the citation of Ballent et al, 2013

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is inaccurate; it was not specifically a turbulence assay but rather and examination of the effects of subsurface velocity and shear stress on subsurface transport of plastics using a model. I would change "As shown here, in a previous turbulence assay (Ballent et al. 2013). . .surface." to “As shown here and in two modelling studies, vertical mixing affects the subsurface transport of plastics and the size distribution of plastics floating at the surface.” On page 16216, the statement in lines 15-17 is underdeveloped and does not satisfactorily support the previous statement. How do/may the study results affect this observation? In general, the discussion could go into more depth regarding potential effects of the results on estimates of plastics concentration, total amounts, models, subsurface transport, and effects on biota.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/11/C7667/2014/bgd-11-C7667-2014-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 11, 16207, 2014.