

## ***Interactive comment on “The contribution of zooplankton faecal pellets to deep carbon transport in the Scotia Sea (Southern Ocean)” by C. Manno et al.***

### **Anonymous Referee #2**

Received and published: 13 January 2015

This paper presents particulate organic carbon and fecal pellet fluxes measured with sediment traps at 2 sites in the northern Scotia Sea of the Southern Ocean. The results presented give insight on the role of zooplankton in regulating the magnitude of carbon export in this region. The paper is interesting and well written but some problems need to be addressed to improve the scientific quality of the manuscript.

First, to better illustrate the contribution of fecal pellets to the carbon export, all fecal pellet fluxes should be presented in fecal pellet carbon (FPC) fluxes ( $\text{mg C m}^{-2} \text{d}^{-1}$ ) instead of fecal pellet abundances. Presenting FP fluxes in terms of abundance is not informative (because of different sizes of pellets) and not relevant. I suggest removing FP fluxes and using FPC fluxes only throughout the manuscript (results, discussion,

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and figures 3 and 8).

In the 'Trap sample processing and analyses' section it is described that copepod fecal pellets were categorized as ovoid pellets although copepod pellets are usually described as cylindrical pellets. This is potentially an important source of error when calculating FPC fluxes and ultimately in determining which zooplankton group dominated through their fecal pellet production. This should be checked and corrected.

The different shapes of pellets are associated to different zooplankton groups in the Material and Methods section. Once this is done and when discussing changes in FPC fluxes, the authors should use the zooplankton group associated with each pellet shape and stop referring to the shape of the pellets (to help the reader). For example: instead of saying cylindrical and ellipsoidal pellets contributed to... please say: copepod and appendicularian fecal pellets contributed to... This should be modified throughout the manuscript, and in Figure 4.

It is mentioned in the discussion that 'FP became smaller'. Such statement would be better supported by a graph showing temporal variations in the width of the fecal pellets (reflecting the size of zooplankton).

In a section of the discussion the authors speculate on bloom phases. It would be a good addition to the study to further use the sediment trap samples to conduct phytoplankton identification and support these speculations.

Table 2: It should be specified during which season each of these measurements were made.

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Interactive comment on Biogeosciences Discuss., 11, 16105, 2014.

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