

Interactive
Comment

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

C. Manno et al.

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- Authors wrote that the study is based on a 4-year long series of POC and faecal pellet fluxes, but from February 2008 to April 2011 there are only 3 years and 2 months; >Yes, you are perfectly right. We have replaced all along the text 4-year long series with 3-year long series.

- I think it could be useful to provide also the mean values of the %FPC not only the maximum values. >Yes we agree that to provide the mean values of the %FPC is useful for the readers. This is why we show in Figure 7 the %FPC mean values at 3 different seasons instead to provide only the annual ones. Conversely, %FPC maximum values

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presented in Tab 2 does not have to illustrate and/or compare the annual average of %FPC; rather the reason we focus only on maximum values is because we want highlights wherever or not in the different regions FP can be the main driver of vertical flux in some period of the year. For this reason we prefer to leave the table 2 as it is.

- No mention is given on the kind of removed swimmers. Are they compatible with the zooplankton producers inferred by faecal pellets found in the traps? You should find some relationships at least at the P2 site, where deep-dwelling zooplankton prevails. >This is a really good point. Thank you for the suggestion. The number of swimmers we picked at P3 was extremely low (< 5 organisms for samples) wherever at P2 (even if still low) the presence of swimmers was significantly higher (>20 organisms) especially in correspondence of the high values of oval FP flux. This can of course support our results concerning the contribution of deep-dwelling zooplankton to the FP flux. We found many large amphipods and large copepods. At the same time, since the bathypelagic zone include a quite large portion of the water column (up to 2000m), we also believe that the most part of deep-dwelling zooplankton FP producers may not have been “captured” by sediment traps. We have elaborated those observations and added them in the discussion.

- Lateral advection of material to the sediment trap has not been taken into account in the manuscript. Please, add a comment on this topic. Explain why can be neglected in this area, that looks hard in absence of current meter data. >We perfectly agree with you that this was important missing information. As he suggested in this area data of currents can be neglected and so we assume any significant lateral advection. We referred to a previous publication “ Whitehouse, Michael; Atkinson, Angus; Korb, Rebecca; Venables, Hugh; Pond, David; Gordon, Marina. 2012 Substantial primary production in the land-remote region of the central and northern Scotia Sea. Deep Sea Research II, 59-60. 47-56” and we added in the text the following sentence “Since mean current velocity were <10cm s⁻¹ at both sites (Whithouse et al. 2012) we assume that lateral advection of material in this area can be neglected”

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- In Methods, it is not clear the difference between the surface area (0.5 m²) and the collecting area (0.6 m²) of the sediment trap. In the trap manual from manufacturer site, the aperture area is specified to be 0.5 m² (diameter, 80 cm). I am not sure that it is only a typing error. If the area of 0.6 m² was used to calculate fluxes, then they were underestimated by 20%; >Even if we have to admit that it would be stimulating to realize that fluxes in this study have been underestimated by 20% this was not the case. In fact 0.6 m² was just a typing error probably do to confusion during the writing between aperture area (0.5 m²) and Vertical surface area (0.6 m²). Anyway we double-checked all the data files to be sure that this typing error was never done during the flux calculation and it was not.

>Technical Corrections. We replaced the other typing errors note by the reviewer as follow: Row 23 of page 16115: reflect by reflects Last line of Section 4.4: with by within Sections 3.2 and 4.1: silicoflagellates by silicoflagellates

>We improved and corrected the table and figures as suggested by the reviewer:

Table 1: we replaced Ovoid/Ellips with Ovoid+Ellips

Figure 7: we replaced cil. with cyl.; ellis. with ellip.

Figure 8: we modified the legend from “Schematic diagram of the relationship between POC, FP flux and the bloom periods at the P3 site” to “Schematic diagram representing the recurrent trend of POC and FP flux (from 2008 to 2011) in relation to the bloom periods at the P3 site”.

Please have a look of the updates marked up version of the manuscript

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