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Discussions

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Interactive comment on "Mesozooplankton structure and functioning during the onset of the Kerguelen phytoplankton bloom during the Keops2 survey" *by* F. Carlotti et al.

Anonymous Referee #3

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Journal: BG Title: Mesozooplankton structure and functioning during the onset of the Kerguelen Bloom during Keops2 survey Author(s): F. Carlotti et al. MS No.: bg-2014-598 General Comments Carlotti et al. present and extensive and intensive overview of the zooplankton abundance, biomass, taxonomic composition, and stable isotope composition observed around the Kerguelen Island survey during the spring of 2011. They particularly investigate an undulation of the Polar Front east of the region, and the effect of time over their 6 week survey (a positive effect with time approaching early summer), the effect of day-night (little effect), and the influence of HNLC waters and Fe enrichment over the plateau. The zooplankton is sampled with a bongo net and 333 um mesh; it is significant that all the samples are analysed with Zooscan which

is an achievement in itself. In some ways this paper is actually 2 papers in one. The separation and identification of specific taxa for stable isotope analysis is impressive; Figures 5, 7 and 8 are very revealing. My concerns are: 1) It is a rich data set and the conclusions mostly sound, but from an external perspective of this paper for a special Keops issue it seems rather colloquial. I realise the readership will be from the Keops2 group, but to others it may seem rich with jargon on the station names and "T-groups" and it is hard to glean the major findings. At some points the paper seems like a technical report. 2) Could the analyses be made more general rather than cruise specific, by relating the conditions of zooplankton to water mass and bathymetry rather than latitude, longitude and voyage track? 3) More importantly there is no discrete question on why this survey was done. The main objective is to compare the zooplankton with Keops1 (which was not explicitly possible with OPC vs. zooscan?) and "its responses to primary production" – presumably to Chl-a biomass (as primary production was not measured). 4) The stable isotope analysis lacks an ecosystem analysis, to compare composition of phytoplankton (?) (the source) with the other members of the zooplankton community. There are many elegant methods (some Bayesian) in the public domain to quantitatively compare the predator-prey relationships. Most copepods are omnivorous, and the degree herbivory reflects the availability of alternative prey. In summary, the Introduction needs to better justify why this study was made, and where the knowledge gaps are that need to be filled. In the Methods section (p. 2386) are many papers of 2014 about the fate of phytoplankton, but not much about how this paper fits in. These papers should be cited more in the Introduction.

Specific Comments The mesh size does affect the size data from sieves, so that the smaller sizes (as they acknowledge) are not quantitatively sampled, but merely indicative because of occasional, sporadic clogging.

The species composition is useful for long-term ocean observing, but it does not contribute to their specific questions (how does the biodiversity compare with Keops1?). They could take their ECD data, or sieve data, and compare it with the Keops1 OPC

data series by amalgamating size classes.

Can Tables 1 and 2 be put into an appendix or supplementary information (it is very useful data) but can they be graphed in some way?

Technical corrections

Line 5, p. 238, 330 micron (not mm) Line 6 – how did the bongo nets to 250 m depth compare with the thermocline depth? Line 21, p 2390. You may have compared 13C to VPDB and 15N to atmospheric N, but there is the internal laboratory (working) standard of acetanilide. This is not a simple comparison. How was this compared; did the working standard overlap the observed values for zooplankton? A two point calibration is needed, see Paul D, Skrzypek G, Forizs I (2007) Normalization of Measured Stable Isotopic Compositions to Isotope Reference Scales - a Review. Rapid Communications in Mass Spectrometry 21:3006-3014); and Coplen TB, Brand WA, Gehre M, Groning M, Meijer HAJ, Toman B, Verkouteren RM (2006). New guidelines for delta c-13 measurements. Analytical Chemistry 78:2439-2441.

Line 20, p. 2392. The ANOVA tables would be useful, at least as supplementary information. Fig. 6. Pie charts are very hard to quantitatively compare – can these be presented as bar graphs?

Fig. 7. The 80% similarity for grouping your samples is arbitrary, and the discrimination of groups is tenuous considering that there are branching just above and below 80%. What was the stress statistic for the associate MDS plot?

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