

Interactive comment on “Macrobenthic assemblage structure and organismal stoichiometry control faunal processing of particulate organic carbon and nitrogen in oxygen minimum zone sediments” by W. R. Hunter et al.

A. Norkko (Referee)

alf.norkko@helsinki.fi

Received and published: 7 February 2012

This paper addresses the importance of macrofaunal community composition for the uptake of labelled phytodetritus across Indian continental margin sediments that are impacted by OMZ's. In a set of in situ field experiments the authors make use of natural isotopes and dual stable isotope labelling experiments to quantify uptake rates of phytodetritus additions. The patterns of these uptake rates are then explored in relation to the stoichiometric ratios of carbon and nitrogen in different taxa to identify taxon-specific feeding responses and selectivity.

C5642

The results indicate faunal activity is a strong driver of carbon and nitrogen cycling and new information is provided on the feeding biology of the macrofauna in these habitats. The preferential uptake results are very interesting and also demonstrate that assemblage structure is important in driving recycling of POM. Continental margin soft-sediment habitats are important zones for the recycling of sedimentary organic matter, but there are still major knowledge gaps in our understanding of organic matter processing. As highlighted by the authors, quantifying the role of macrofauna in carbon and nitrogen cycling is key for better models of nutrient regeneration in these habitats.

I have no major criticisms regarding this paper. It is novel, thoughtful, well-written and provides new information of significant value. I like this paper and think it should be published more or less at it stands. I only have a few minor questions/comments:

- While oxygen is shown to be strong driver of the macrofaunal assemblages and therefore patterns of uptake, the quantitative link to other environmental drivers, including habitat characteristics remain somewhat elusive. - I was left wondering if not more could have been done in terms of characterising what is driving the patterns, e.g. using distance-based linear models (e.g. DISTLM/dbRDA) to partition some of the variance by an extended set of environmental predictors (now in the appendix)? However, as acknowledged by the authors there is strong co-linearity and there are also obvious limitations in the sampling design that are understandable considering the significant logistic constraints of experimenting in this type of environment. - Line 156-158: how many additional cores? - Line 226: check spelling of Akaike - Line 265-269: you might want to highlight these taxa, with heavy N15 as being typically predatory? - Table 1: there is a marked difference in temperature between the 800 and 1100 m sites. Does this matter for uptake rates? - Figs 4 & 5: what are the error bars?

Interactive comment on Biogeosciences Discuss., 8, 10725, 2011.

C5643