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Interactive comment on "Uptake of phytodetritus by benthic foraminifera under oxygen depletion at the Indian Margin (Arabian Sea)" *by* A. J. Enge et al.

C. Woulds (Referee)

c.woulds@leeds.ac.uk

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This manuscript reports the results of an isotope tracing experiment conducted in the heart of the oxygen minimum zone on the Indian continental margin. The work was well conducted and is well presented, and the taxonomic resolution of foraminiferal C and N uptake is impressive. It is one of only a few studies that have simultaneously quantified organic C and N cycling in benthic ecosystems. It also highlights interesting contrasts with previous studies. I therefore suggest that it is suitable for publication in Biogeosciences.

I have a few comments which I feel should be addressed before publication. In their

comparison of C uptake rates with Woulds et al., 2007, the authors might like to note that there is also a difference in the sieve sizes used by the two studies. The Woulds et al uptake data are only from individuals retained on a 300 micron sieve, therefore a smaller fraction of the foraminiferal community will have been captured. This may have contributed to the difference in observed uptake rates.

In the second paragraph on page 16 it is implied that the high foraminiferal density at 540 m on the Indian margin compared to at 300 m on the Pakistan margin could be due to the absence of metazoan macrofaunal grazing pressure on the Indian margin. It should be noted that grazing pressure/competition from metazoan macrofauna was also thought to be absent (or almost entirely absent) at 300 m on the Pakistan margin, therefore the presence/absence of macrofauna cannot be used as an explanation.

Page 18 paragraph 2. The start of this paragraph makes the point that foraminiferal uptake of N was less than that of C in absolute terms. This is unsurprising, as the C:N ratio in the algae with which the sediment was fed will not have been 1:1 (Redfield ratio is 106:16). The way the text is currently worded is therefore a little distracting, as it seems to imply that the lower absolute N uptake compared to C uptake is surprising, and in need of explanation. I would argue that this result is rather trivial, and the only valuable way to compare C and N uptake is to consider C:N ratios in food and foraminifera. Thus, the second point in the paragraph, that relative uptake of N was reduced compared to C (the scale of the difference could be better quantified in the text, using ratios), is certainly interesting, and worthy of discussion. Further, I would appeal for all of the C to N comparisons made in this paragraph to be clarified. It is stated that for other studies certain types of fauna took up 'more C then N'. It is not clear from this phrasing whether the assimilated material had a higher C:N ratio than the food added to each experiment (i.e. was there actual selectivity occurring in favour of ingestion and retention of C compared to N?), or whether there was simply a greater absolute uptake of C (which is unsurprising). I would suggest that C:N ratios are a good tool for this, but I accept that the authors may prefer a different way of expressing

the same idea.

Interactive comment on Biogeosciences Discuss., 10, 15305, 2013.