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Interactive comment on “The marine sedimentary nitrogen isotope record” by J. E. Tesdal et al.

J. E. Tesdal et al.

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Received and published: 20 August 2012

We thank the reviewer for providing comments, and agree that this is an extremely useful dataset. The purpose of this contribution is primarily to document the dataset, with an analysis of the reliability of downcore bulk sedimentary d15N as a recorder of seafloor d15N, such that it will be a useful tool for future investigators in the biogeochemical community.

As the referee points out, the dataset includes data from many prior publications - over a hundred - each of which discussed one or more of the individual records. The strength of the assembled database is that it can be analyzed in multiple ways, over multiple timespans, for multiple purposes. One such analysis is carried out by Galbraith et al. (in review), which focuses on how the data inform changes in denitrification over the last deglaciation, and does not overlap with the purpose of this article. Therefore,

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we feel that combining the two would not produce a coherent or digestible result.

However, we welcome the suggestion to include further analysis in the current manuscript. Therefore, we are now preparing a thoroughly revised manuscript that includes background information regarding the mechanisms behind apparent spatial patterns in seafloor d15N (e.g. water column denitrification, nitrate utilization and nitrogen fixation) and the mechanisms behind diagenesis. Furthermore, the revised manuscript will make a much fuller examination of the data in terms of what it can tell us about the fidelity with which downcore records reflect past seafloor d15N, some details of which are outlined in the response to Referee #2.

Interactive comment on Biogeosciences Discuss., 9, 4067, 2012.

BGD

9, C3413–C3414, 2012

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