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Interactive comment on "Coastal hypoxia and sediment biogeochemistry" *by* J. J. Middelburg and L. A. Levin

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We thank Greg Cowie for his constructive evaluation and for highlighting the key issues of our paper. Basically we were aware of the minor issues raised and we will accommodate his remarks if it will not disturb the flow of information and if it will not cause an imbalance in terms of detail among the various sections. We will also include most of the references mentioned.

Greg Cowie suggested emphasizing stronger the basin-wide (both global as well as regional) consequences of bottom-water/coastal hypoxia. Our paper focuses on sediments (sediment biogeochemistry and benthic ecology) rather than on the water-column biogeochemical processes and how they depend on underlying sediments. This was a deliberate choice, partly based on agreement among potential contributors

to this special issue (e.g. see also Kemp et al., Biogeosciences Discussion), partly because we focus our review on biogeochemistry-benthic community interactions. Sections 5.1 and 5.2 of our paper specifically deal with benthic-pelagic coupling and the consequences of sediment biogeochemistry for water column processes. Moreover, Soetaert and Middelburg (2009) specifically address this issue and we refer to that paper for details.

Greg Cowie believes that more reference to the Baltic Sea literature could have been made. Indeed, we could have, but our aim was to present a balanced process-oriented view rather than a summary of what is known for specific basins. The Baltic Sea is the most, perhaps also the best, studied hypoxic system and in our revised version we will include cite a small selection of very recent overviews/reviews on the Baltic Sea (e.g. Conley et al., 2009).

Finally, Greg Cowie would like us to emphasize a little more that the oxygen effect on organic carbon degradation/preservation in coastal sediments may be difficult to infer because of high variability in carbon preservation in coastal settings. Factors governing organic carbon preservation have been discussed at length for decades. In our text we have presented the evidence for enhanced preservation of high quality organic matter is a concise way, implying generalization at the expense of discussing the details. In our revised manuscript we will inform the reader that in coastal sediments the subtle oxygen effect on organic carbon preservation may be difficult to detect given other sources of variability.

The technical issues identified will be corrected.

Jack Middelburg and Lisa Levin

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