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Biogeosciences Discussions

Interactive comment on "Coastal hypoxia responses to remediation" *by* W. M. Kemp et al.

Anonymous Referee #3

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General Comments:

The title of this ms is a worthwhile venture, either with theory, mathematical models, conceptual models, and the limited data that are available. But, there are few examples of remediation provided. Most of the obvious trajectories for remediation (although the worsening trajectory is not shown) are for organic loading. The more incipient nonpoint source loading is harder to remediate. There are limited examples of real remediation of human-caused nutrient pollution that has led to reduction in hypoxia and other symptoms of nutrient-driven eutrophication. There is only one example of an economically-driven reduction in nutrients and a real ecosystem response, most obvious in hypoxia reduction, but other aspects of the nw Black Sea shelf are not "recovered." The ms should be clear about the forces and distinctions for the shelf area and the open basin area. The descriptions of well-documented coastal hypoxic areas and their nutrient dynamics are good, but are not the focus of this ms, at least not the title. The ms is

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more of a discussion of nutrients, ecosystem changes, including hypoxia, and little with regard to remediation, or what conceptual models might be application to a remediation that might eventually be accomplished. The general descriptive material in general and the case studies that do not show any decrease in nutrient or organic loading or attempts at remediation should not be part of the ms. The Chesapeake Bay is relevant because remediation has taken place, but with limited success. The details of formation of hypoxia there are not as important as the responses to nutrient reductions, and those aspects of the ecosystem that have not responded. The idea of multiple stressors is a good one to bring into the discussion of expected outcomes of remediation. More on time lags, aquatic or terrestrial or both, would be useful. I recommend stick to ecosystems that have seen reductions, either managed, remediated, or accidental, and further examine, try to reconstruct the trajectories in both directions, and consider other aspects of ecosystem structure and trophic interactions in addition to improved oxygen conditions.

The Conclusion brings in many new ideas that could be more fully explored in the text, than examples of increasing hypoxia with increasing nutrient loads.

The ms needs to focus on the topic of response of ecosystems, particularly in hypoxia, to reductions in organic or nutrient loading, or the stated focus of the ms needs to change. Much material is unnecessary or too detailed.

Specific Comments:

Marked in the text.

Please also note the Supplement to this comment.

Interactive comment on Biogeosciences Discuss., 6, 6889, 2009.