

Interactive comment on “Coastal hypoxia responses to remediation” by W. M. Kemp et al.

Anonymous Referee #2

Received and published: 7 September 2009

This paper reviews theory and data relating variations in hypoxia to changes in anthropogenic loading for nutrients and organic matter. After an enumeration of the physical and biological processes (external and internal) responsible for hypoxia/anoxia, theoretical trajectories of hypoxia as a function of nutrient input are discussed. This is followed by an extensive enumeration of case studies. Rivers and estuaries were the first to suffer severely from these phenomena, but, due to extensive efforts to reduce loadings, are well underway at restoring towards more oligotrophic conditions. Next comes a review of some systems where anoxia/hypoxia is still problematic, and increasing. There are very few remarks to be made on this paper, except that it is quite lengthy, and at the end, I would have liked to see a more comprehensive discussion of the data in view of the theoretical concepts explained before. There is a tendency to overly emphasize organic pollution (“p 6894, line 10: estuaries and tidal rivers that are heavily loaded with large inputs of labile organic material”, similar p. 3895 line 25”).

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Mainly in some well-mixed estuarine systems, the chemical and bacterial oxidation of reduced substances other than OM can also play an important role. In the Scheldt for instance, extreme hypoxia/anoxia has been caused both by organic pollution and high ammonia inputs, at times most of the oxygen demand made up by nitrification. Some strange reasoning (p 6899-line15):“The fraction of organic matter deposited on the sediments tends to increase with organic matter deposition rate, ...”

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

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