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Interactive comment on “Formation of anoxia and denitrification in the bottom waters of a tropical estuary, southwest coast of India” by G. D. Martin et al.

Anonymous Referee #2

Received and published: 23 May 2010

GENERAL This manuscript uses a series of data sets to describe the distribution of nutrients and physico-chemical parameters in the Cochin Estuary and nearshore coastal waters. The data appear to be of good quality and would add to the limited information available for tropical systems. However, I was disappointed when I read this manuscript that all I got was a description of the nutrients and physico-chemical distributions, which were interpreted as denitrification. Similarly, production of greenhouse gases are discussed but not measured. To reflect the title, and to be a significant contribution to the literature, this manuscript needs denitrification (and anammox?) rate measurements. Measurements of greenhouse gas production would also have been significant. The title should read something like “Nutrients, primary productivity and anoxia in a tropical

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estuary. . .”

I also have some concern about how the disparate data sets relate to each other. The spatial data was collected in July 2004, the tidal cycle data in July 2007, the DOC, POC and PN data in September 2005, and its not clear when the H₂S data were collected. The system hydrology will influence all these data sets, but only data until 2002 is given. Each data set needs to be placed in a hydrological context and how these data relate to each other needs to be discussed. Does hydrological variability over the study period (2004 to 2007) influence the interpretations?

SPECIFIC

The whole manuscript needs to be edited for expression and grammar. e.g L. 1754. L1. Remove within; L4. Remove thus; L. 15. Replace “gets” with “is”; p. 1754. L. 21. Replace “has” with “was” etc. etc.

p. 1752. L3. We are told that denitrification was observed. Whereas in fact only nutrient and physico-chemical distributions were observed and denitrification was inferred.

p. 1753. L. 17-18. This sentence is not clear. Are the rates one third, or is the amount of denitrification one third?

p. 1754. A hypothesis is needed.

p. 1755. Not all named places are on Fig. 1 e.g. Azhikode.

p. 1756 and 1757. More detail on methods is required – error, detection limits etc.

p. 1757. L. 22. No method for H₂S.

p. 1762. L. 15. Decrease in DOC, POC etc. probably just due to dilution with low concentration coastal water.

p. 1763. L. 23-24. This is not clear. In other tropical estuaries?

p. 1764/ 1765. Some estimates of denitrification rates based on mass balances of

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nitrate etc. would help constrain the interpretations.

Fig. 2. Why stop in 2002? Extend to end of study period and include sampling times.

Figs. 3, 4b,c, 5b were hard to read due to the small font size. Colour helps, but if they are published in B&W they will be difficult to read.

Fig. 4a could be removed. I am also not sure why this is labelled 4a?

Interactive comment on Biogeosciences Discuss., 7, 1751, 2010.

BGD

7, C1046–C1048, 2010

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