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Biogeosciences Discussions

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.

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General Comments

Water column anoxia is a well-described phenomenon in many estuaries receiving anthropogenic nutrient loads. The contribution of suboxic coastal upwelling waters to estuarine anoxia in the Cochin backwaters may offer an interesting twist on the usual story. The authors could perhaps have made a more compelling case for their story with some simpler presentation of data. I would have liked to have seen, for example, a table showing mean nutrient contents for freshwater vs. marine water fluxes into the backwaters. As it is, from Fig. 4, it is hard to see any correlation between the salinity

of the water and is nutrient content, as one might expect.

There is also frequent reference to the production of greenhouse gasses. However, no measurements were made. The authors might perhaps be more specific about what gasses they are referring to, and how their putative production is related to the conditions found in the estuary.

There are many figures or panels included which do not contribute to the authors' story and are not referenced in the text. Perhaps these could be omitted to make the authors' story clearer.

Since the authors frequently refer to the influence of organic matter on estuarine biogeochemical cycling, it would have been nice if some measurements of organic or particulate matter were included.

Specific Comments

1. Please cite source or methods for data in Fig. 2 and Fig 4a. I would much prefer to see standard time units rather decimal units.

2. Why does the data in Fig 2b stop in 2001?

3. The manuscript would be much improved by a careful revision and editing of grammar and sentence construction.

4. It may be difficult to draw any conclusions about denitrification from the authors' data, other than that it is probably occurring. In this heavily organically-loaded environment, I do not think it would be unusual for denitrification to proceed directly to N2 without a significant accumulation of nitrite, so perhaps nitrite cannot be used to gauge the intensity of denitrification.

Technical Corrections

1. The definition of suboxic and hypoxic given differs from one part of the manuscript to another.

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7, C1030–C1032, 2010

2. The data in Fig. 5 could perhaps be presented in a simpler manner . The horizontal resolution of sampling stations appears insufficient to permit this kind of interpolation. The shapes of the lines appear to be artifacts of the smoothing algorithm.

3. I would appreciate it if the figure legends were more descriptive.

Fig. 1: Please explain the transects and sampling points illustrated.

Fig 3, 4b, and 4c: Please use correct notation for chemical constituents and units and define abbreviations.

Fig 5: Figure legend should explain negative and positive distances from bar mouth relative to Fig. 1. What is the meaning of the two crosses on the inset figure? Please describe other features of figure such as bathymetry.

Fig 6. Please use correct notation for units, and define abbreviations. Please indicate the meaning of S and C in the bar labels in the legend.

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