



***Interactive comment on “Modeling the nitrogen fluxes in the Black Sea using a 3D coupled hydrodynamical-biogeochemical model: transport versus biogeochemical processes, exchanges across the shelf break and comparison of the shelf and deep sea ecodynamics” by M. Grégoire and J. M. Beckers***

**M. Grégoire and J. M. Beckers**

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Answers to Reviewer 1

Dear Helmut,

Here are my answers to your remarks. In bold, I have repeated your remarks. Thank you very much for your opinion on our paper.

It would be helpful to the reader to have a better and more obvious comparison of the model output with observational data. The validation appears to be somewhat hidden in the text.

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The biological model used in this study is very simple. This is the Fasham model with 5 state variables to which we have added sediments on the shelf and the description of some processes of importance in the Black Sea such as denitrification. This type of models has been applied in several areas of the world in a 3D frame and has been found to give valuable information. Model results have been validated by comparison with available satellite SeaWiFS and CZCS data as well as with in-situ observations. The validation exercise is described in extenso in Beckers et al, 2002, Estuarine, coastal and shelf science and in Gregoire et al., Journal of Geophysical research, May 2004. We may also argue that the nitrogen budget of the model is verified and the different type of errors on the numerical discretisation and on the computation of exchange fluxes are totally acceptable considering the unavoidable error on the data used to force the model. Possibly, also a line in Fig 6 is missing or at least not visible. I do not understand the two continuous lines representing model results are visible on the web!!

Similarly, the conclusions appear to be rather long and a short concise summary helps the reader to abstract the scientific findings from the rather technical information.

We have separated the discussion and conclusions. In the conclusion, the main findings of this study are enumerated.

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