

Interactive comment on “Influence of climate parameters on long-term variations of the distribution of phytoplankton biomass and nutrient concentration in the Baltic Sea simulated by a 3-D model” by L. Dzierzbicka-Głowacka et al.

Anonymous Referee #2

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Review of ‘Influence of climate parameters on long-term variations of the distribution of phytoplankton biomass and nutrient concentration in the Baltic Sea simulated by a 3-D model’ by L. Dzierzbicka-Głowacka, J. Piskozub, J. Jakacki, M. Janecki, and A. Nowicki.

The aim of the submitted MS was to investigate the influence of long term trends in climate variability on temperature, nutrients (DIN) and phytoplankton dynamics in the Baltic Sea using a 3D coupled ecological model. However, the applied biogeochemical model does not consider phosphorous even though the N:P - ratio is important for

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the competition between species in the Baltic Sea and primary production. Blue-green algae are completely ignored although they make harmful blooms every summer. Zooplankton is also not dynamically described. River loads were ignored in this set-up although the Baltic Sea is highly eutrophicated due to run-off from a large catchment area. I believe that the applied model is too simple to make realistic long-term scenarios. In addition, the model was only validated for the southern part of the model domain and for surface values of T and phytoplankton, and not for DIN. Model scenarios outside the validation area are therefore questionable. I therefore suggest to reject the MS for publication in Ocean Sci.

Specific comments:

p.1, line 1: a parameter is a constant. Don't you mean climate variables?

p.1, line5: ‘A simple ecosystem model...’

p.3, line 13: parameters or variables?

p.3, line 16-19: did you mean that the nutrient loads from atm. and rivers were ignored or kept constant?

p. 4, line19: the spring bloom is triggered by increasing light. Nutrients are not limiting this time of year.

p. 6, line 10-18: I find the model too simple since it does not contain P. The N:P ratio is very important for the outcome of the competition between phytoplankton species fx. diatoms and blue-green algae. Also, the model does not describe blue-green algae growth which is an important feature during summer in the Baltic Sea.

p. 10, line 7: River loads were ignored even though you stated on p.3, lines 5-10, that nutrient loads from rivers are important? I don't see how it makes any sense to run the model without river loads in a closed estuary receiving high amounts of nutrients from the catchment area?

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p.12, line 22-24: the comparison is only done for the southern Baltic Sea and the surface area. Also, DIN has not been validated at all. But results from the scenarios are shown for 9 stations all over the Baltic Sea – not validated by the model. I suggest that the authors focus on the southern part only, if the model has not been validated elsewhere.

Fig. 1. Delete the figure to the right and use real depths instead of model levels. The reader is probably more interested in depths than in model levels.

Fig. 2. maybe use 'predation mortality' and 'other sources of mortality'

Fig. 5. There seems not to be any spring bloom and generally very low chl a concentrations in the Kattegat? Also, DIN concentrations are very low west of Bornholm.

Fig. 6. Why not show the correlation for DIN? Does the data come from the stations in fig 7? Is it monthly means or point-by-point comparisons?

Interactive comment on Ocean Sci. Discuss., 8, 533, 2011.