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Ocean Science Discussions

Interactive comment on "N/P ratio of nutrient uptake in the Baltic Sea" *by* Z. Wan et al.

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I was very happy to see most of my suggestions in the revised article. Unfortunately the language is still improvable and a couple of mistakes are in the article (p. 1240, l. 21: Results; l. 24: of THE first four years, p. 1241, l. 4: The model results of Case NP10 show the best accord with the observations of all tested cases., p. 1244, l. 21 First, THE mean, ...).
But I also have some more general comments:

- The question, if the use of a non-Redfield-Ratio can increase the model performance, is highly interesting for modelers as well as for persons, dealing with the model results. The presented simulations with 3 different N/P-ratios show clearly, that there is a lots of work to do. Therefore the article's aim is urgent and important. Nevertheless I got the question, why over time and space fixed N/P ratios were used and not a variable one (like in the work of Kuznetsov et al.)?

- I'm not sure, if it was a good idea to ignore the re-suspension of the sedimental detritus, especially if you see that all simulations show too high oxygen values at the bottom (this figure got unfortunately lost in fig. 3 of the revised article). Why did you changed this (and the other parameters listed in tab. 1)?
- Why did you use WOA01 and not a more urgent database? To my knowledge ammonium is not included in the WOA-data – am I wrong?
- In chapter 3 I would still prefer to have one section for every N/P-scenario (if doing so the order should be changed to a) NP16 b) NP10 c) NP6), with a brief summary of the simulation results, especially what coincides with the observed values and what is different). In addition a table with a correlation analysis of the model results and the observations would be very helpful.
- The calculation of the DIN/DIP uptake on p. 1240/1241 is not convincing, since the DIP flux is missing. Furthermore the atmospheric decomposition is measured per m^2 (not m^3). Why is the atmospheric decomposition allocated over 20m depth? Is this the mixing depth? Or do you need the 20m to get the N/P-ratio near 10?
- The reference to Osterroht creates the question, why did you not run the simulation with a N/P-uptake rate of 16:1 but a non-Redfield remineralization, resp. what are your results worth if the remineralization is missing?
- In fig. 5 I'm missing some curve of the wind stress, what about inflows of saltier and oxygen-richer water? I don't believe you, that the vertical mixing is the problem. Instead due to the ignored resuspension the main oxygen-consumption process is missing, what results in the high oxygen values (and although too high nitrate values, since the denitrification don't takes place, if oxygen is available). Some temperature or salinity profiles could show the too strong vertical mixing.

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