

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

Z. Wan et al.

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Q1: Do you plan a simulation with a variable N/P-ratio in the future?

A1: We have not learned a scheme to implement a variable N/P-ratio for simulation of years. To my understanding, this type of treatment of Kuznetsov et al. can only work for short time simulation, where no total mass balance is concerned, with different N/P ratios for uptake and remineralization.

Q2: Why re-suspension is simplified? Why have other parameters been changed again?

A2: An explicit simulation of re-suspension was subjectively evaluated minor importance when we started our project. The model fitness shown in Fig. 2 and 3 (OSD-8-1-2011) are comparable to, or even better than, most other work of this type model. It

C417

reflects this simplification did not cause fundamental problem. As explained before, the poor result of oxygen was not caused by this simplification. The simplification cutting an explicit simulation of detritus re-suspension keeps more detritus in bottom, whose impact is likely to increase oxygen consumption in bottom and makes bottom oxygen lower. The poor oxygen result is too high in bottom. Changes of some parameter values are made to calibrate bloom timings of phytoplankton and total mass balance. The original parameters did not produce very good results with our initial fields and driving condition. Changes of parameter are not made to compensate an 'improper' simplification which cuts re-suspension of benthic detritus, as there are no direct mechanism linkages. Notation that cutting re-suspension of benthic detritus does not move away detritus from system, and it does not change mass balance at all.

Q3: If ammonium at the open boundaries is ignored, delete it from the text (p. 1238, l. 16) or be honest and say that it has been set to zero.

A3: We will take this suggestion and you will see a revised version following this reply soon.

Q4: Why was a layer thickness of 20m selected in estimating impact of atmospheric deposition?

A4: It was a conservative estimation. Even if atmospheric deposition acts on only upper layer of 20m nevertheless mixing depth is deeper than 20m, it is not sufficient to increase DIN/DIP rate to close to Redfield Ratio. We should point out this consideration while we are presenting that estimation. We will make this in a revision which you will see soon.

Last comments regarding English.

Answer: English is being polished by a native-speaker editor which you will see soon.

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C418