

## ***Interactive comment on “Cyanobacteria Blooms in the Baltic Sea: A Review of Models and Facts” by Britta Munkes et al.***

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Review of Cyanobacteria Blooms in the Baltic: A review of Models and Facts By Britta Munkes et al.

In this paper, the authors discuss Cyanobacteria blooms in the Baltic. These blooms may cause environmental problems including toxic events or large biomass productions leading to coastal anoxia. A correct modeling of such blooms is important to check measures to combat eutrophication. The authors aim to bring together both a modelers view and a biologists view. They compare 5 models that are used for political decision making regarding the approach to model cyano-blooms. Against this background, the factors that determine the cyanobacteria blooms in the real world

C1

are discussed. Based on the comparison of models and field/lab studies, the authors conclude that modelers tend to keep models simple (with good reasons), whereas in the real world cyano-blooms are complex with several species each with their specific requirements responding differently to changes in drivers (like nutrients, light, temperature, grazing). The paper is well written, but the discussion and outlook needs more substance. It does not come as a surprise that modelers tend to (have to) keep models simple and that biologists have an eye on complexity. Given this, I expect a more in depth discussion on the next steps to be taken to overcome this schism. For instance, given the focus on those models that are used for policy purposes, the limits of using these models should be discussed and suggestions should be made how this dilemma can be solved. Could for instance the combination of “simple” biogeochemical models and conceptual models be a solution? And are examples available?

Minor comments: P1L12, delete commas around “. . .severe”

P2L4. This sentence is not very clear but very important. I would add a sentence, that explains the main Question: How will future, management-induced changes in nutrient loads affect the blooms and how does this interact with expected warming?

P2L11 Phosphorus (not .ous) P1L19: Sedimentary processes: this needs some explanation. Especially feedbacks between cyanos and P-release should at least be mentioned.

P3L4. Alternatives: So in the end I expect suggestions on how superior alternatives can be developed.

P4L6: prognostic variables: add s

P5L31: Typo in .19°C? (dot 19)

P6L32 PAR instead of RAR

P11L30 POsubscript4, superscript 3 (you swapped both)

C2

P13, header: You discuss Pmax, but no mention is made of alpha. I suggest to add at least some words to this.

P13L13 forNodularia: space between the words

P14L11: Should this be Table 10?

P15L18: Claessen et al describe (no s)

P18L9 Inline -> In line ? (see also P21L33)

P18 L28: hamatusarexs ->hamatus?

P19L24: exceed -> exert?

P21L31: specie ->species

P21L32: add space after (2002)

P23L27: processes on the Baltic. (delete respectively

P25L33: politic->policy?

P25L14: "A comparison of". Do you refer to the present study?

P25L17ff: an unclear sentence. Maybe delete at the end "of which"?

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