

Interactive comment on “Evaluation of atmospheric nitrogen inputs into marine ecosystems of the North Sea and Baltic Sea – part B: contribution by shipping and agricultural emissions” by Daniel Neumann et al.

Anonymous Referee #3

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This manuscript describes a model-based assessment of the impact of atmospheric nitrogen emissions from the shipping and agricultural sectors on the marine ecosystems of the Baltic and North Seas. The subject matter is interesting and appropriate for the journal. I have very few scientific comments related to the work, but I found the manuscript to be unnecessarily long and very repetitive. Reducing the length of the text and correcting the many typographical errors will help to make the manuscript more accessible and increase its impact.

Specific Comments: Reactivity of ammonia with sea salt: It is stated several times

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that condensation of ammonia on seasalt particles enhances the removal of ammonium from the atmosphere in the coastal zone. Please could some specific citations of observational reports be added that support this statement? (Some literature is cited at the first occurrence (line 24, page 2), while subsequent statements do not include citations. Of the sources cited on page 2, the observational data presented in Kelly et al. 2010 (Figure 5 of the paper) directly contradict the statement). What mechanism drives this process? Length of manuscript and repetition: There are many examples where sections of text are repeated in this manuscript. I can see no advantage to this. I list some examples, but there are more. I would encourage the authors to remove as much repetition as possible from the manuscript. Examples: Page 10, line 1; P 11, L 16-17; P 17 L 17-20; P 17 L 24-26; P 18 L 11-15. In addition, I suggest that the following paragraph (P 3, L 27-34) is removed, since a) phosphorus is not the focus of the manuscript, b) the manuscript is already very long and c) there are other statements that address the limitations associated with phosphorus in the context of the manuscript.

P2, L22: I think the end of this line should be “at sea and partly deposit” P2, L30: Change “contribution to the oxidized nitrogen” to “contribution of the oxidized nitrogen”. P3, L25-26: What is the “19%” a percentage of? P4, L6: delete the comma after “both”. P4, L26 & L34: add an apostrophe after “sectors”. P5, L12: Sentence should start “The dry deposition. . .” P5, L22: Insert “for” after “used”. P5, L26: change to “considered to be the”. P5, L29: Insert “the” before “difference”. P6, L1: add a comma after “emission”. P6, L3: change “word” to “work”. P6, L5: Grid is 16 x 16 km, not km². P7, L11: insert “by” after “applied”. P7, L21: “spun” not “spin”. P8, L19: I’m not sure whether the description of Section 3.2 is intended to be humorous, but it is subjective and inappropriate. P9, L13: “coastal” not “coastline”. Is it really necessary to include this long quotation from the companion paper? P10, L8-9: Change end of sentence to “emissions from other sectors.” P10, L 12: Change start of sentence to “The shipping sector . . .” P10, L14: Change to “found a relative contribution of”. P11, L2: “agricultural” P11, L7: delete “by”. P11, L22: insert space after “1/3”. P12, L5: Change to “remains

high during summer but decreases” P12, L 9: insert “proportionally” after “contributes”. P14, L6: insert “such” after “rivers”. P14, L7: Change to “share than is the case” P16, L11: please explain the remark about denitrification in the Wadden Sea and add a reference. P16, L16-17: “It is though as reference for the comparison”. I’m afraid I do not understand this phrase. P16, L20: delete comma after “Baltic Sea”. P16, L23: Change to “deposition sources such as”. P17, L29: Change to “NECAs”? P18, L20-26: I do not think that the authors have established why this paragraph contains a comparison to riverine inputs. What about measures to reduce agricultural emissions to the atmosphere? P19, L4: Change to “English Channel”. P19, L11: Change to “Germany”. P19, L28: delete “are considered”. P19, L31: delete comma after “region”. P19, L34: “ratio”, not “ration”. P21, L3: Change to “in part A”. P22, L1-2: It is not clear to me why the authors specifically discuss the N:P ratio of shipping emissions here, when other emission sources are not discussed. Why is this introduced for the first time in the Conclusions section? P22, L7: Change “Until” to “Once”.

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