

# **Response to the review of "Sensitivity of modeled atmospheric nitrogen species and nitrogen deposition to variations in sea salt emissions in the North and Baltic Sea regions" by D. Neumann et al.**

**D. Neumann, V. Matthias, J. Bieser, A. Aulinger, and M. Quante**

Helmholtz-Zentrum Geesthacht, Institute of Coastal Research, Max-Planck-Straße 1,  
21502 Geesthacht, Germany

Correspondence to: D. Neumann (daniel.neumann@hzg.de)

## Response to the comments of Reviewer #1

We thank the reviewer for the constructive comments on the manuscript.

### 1) Page 2: Please rewrite the sentence starting “In order to ...”

> We rewrote the sentence “In order to take into the effect of the low salinity, particularly in large parts of the Baltic Sea, into account, the sea salt emission module is extended by a salinity depended scaling of the sea salt emissions.” to “The sea salt emission module is extended by a salinity depended scaling of the sea salt emissions because the salinity in large parts of the Baltic Sea is very low which leads to considerably lower sea salt mass emissions compared to other oceanic regions.”.

### 2) Page 9: I'd suggest changing “steep cliffy coasts” to “steep cliffs”

> Changed as suggested.

3) Page 10: I'd suggest rewriting “The technical procedure of including salinity dependence is described in the Supplement Sect. A and references to the model the salinity data were calculated with are given in Sect. 2.3.” to “The technical procedure of including salinity dependence is described in the Supplement Sect. A and references to the modeled salinity are given in Sect. 2.3.”.

> Rewritten as suggested.

4) Page 10: Please address whether annual average salinity data are similar to monthly averages.

> We added the sentences “In the central, eastern, and northern parts of the Baltic Sea, the seasonal variability of the salinity is low - on the scales relevant for sea salt emissions. In contrast, in the Kattegat, the seasonal variation can be up to  $\pm 10\%$  with respect to the

annual average.” and change the sentence “Its affect on the sea salt emissions is low compared to the difference between salinity-scaled and non-salinity-scaled sea salt emissions (for example, see Fig. S4).” to “*The inter-annual and seasonal affects* on the sea salt emissions *are* low compared to the difference between salinity-scaled and non-salinity-scaled sea salt emissions (for example, see Fig. S4).”.

#### **5) Page 22: I'd suggest changing “prediction quality” to “predictions”**

> We had the feeling that the sentence might be misunderstood if just “prediction quality” was changed to “predictions”. Therefore, we also changed the verb in the sub-sentence “. . . , deactivating sea salt emissions decreases the prediction quality.” leading to “. . . , deactivating sea salt emissions *does not improve the predictions.*”

#### **6) Page 28: Change "nitrogen depositions" to "nitrogen deposition"**

> Changed as suggested.