

## ***Interactive comment on “Characteristics of Convective Snow Bands in the Baltic Sea Area” by Julia Jeworrek et al.***

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We would like to thank Reviewer #2 for the helpful and insightful comments on the manuscript.

1) Following the comments by both reviewers we suggest the title to “Characteristics of Convective Snow Bands along the Swedish East Coast”.

2) The second section of the paper provides a small literature review about previous studies and current knowledge about convective snow bands to the extent required to motivate the method of this paper. However, more literature will be reviewed in the introduction to give a better background on the state of art. The objective and research questions will be formulated more clearly.

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3) The first two sections will be combined in the final paper to merge objectives and research questions better with the literature review of previous studies. The synoptic situations leading to convective snow bands can be very different. What they have in common are the strong pressure gradients over the Baltic Sea guiding cold air masses from the northeast over the warm water surface towards Sweden. Cold fronts move commonly from west to east, while snow bands only affect the Swedish east coast at strong prevailing NE winds. This unusual synoptic flow can be caused by a deep low pressure system southeast of the Baltic Sea and/or indirectly by a local high pressure developing over the cold north of Scandinavia. Since the large scale synoptic situation for convective snow bands cannot be identified by typical conditions and only the strong NE winds with small vertical shear advecting cold air matter in connection with the local conditions, I consider the present description to be sufficient. Sea ice limits the heat fluxes from the sea surface and changes the coastline. The development of snow bands requires an ice-free and open water surface. This was discussed at different parts of the paper. However, it can be clarified in the introduction once again.

4) The paragraph repeating information shown in the table will be shortened or even skipped.

5) An 11-year dataset cannot be understood as climatology and the mean results are clearly biased by single events. The phrase “climatology” was therefore not used in the paper. However, with various snow band events occurring per year, a dataset covering 11 years is able to represent qualitative distributions of affected regions. It can therefore be assumed that Gävle and Västervik experience the most intense convective snow band events in the studied area, the Swedish east coast. That also other locations at the Baltic Sea are affected under similar atmospheric conditions has been seen in the Gdansk region. The focus of this study is on the Swedish East coast because the atmospheric conditions causing lake effect snow in Sweden have clearly repeating patterns, while other areas could experience snow bands under different atmospheric conditions (e.g. other wind directions due to other coastal orientations). Convective

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snow bands in the Gulf of Finland have been studied widely before. Extending our method to the entire Baltic Sea would require a different approach with more loose and generous criteria. This could lead to capturing other precipitation events, which are unrelated to convective snow bands, also in different regions and would manipulate the results.

6) These are the months with the highest frequency, this should be clarified in the text.

7) We apologize for the confusion. We mean northeast winds, which are related to cold air outbreaks from Finland or Russia. Westerly winds are usually not cold enough in winter and could either way not generate snow bands affecting the Swedish coast, because they align with the wind direction.

8) The figure numerations are corrected now.

9) The typo has been corrected now.

10) The reference has been corrected.

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