

## ***Interactive comment on “Brief Communication: Trends in sea ice extent north of Svalbard and its impact on cold air outbreaks as observed in spring 2013” by A. Tetzlaff et al.***

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Review of Tetzlaff et al. Trends in sea ice extent north of Svalbard and its impact on cold air outbreaks as observed in spring 2013.

General Comments:

The authors examine the relationship between the size and fetch of the Whaler Bay Polynya, boundary layer structure associated with the polynya within the boundary layer, and cold air outbreaks associated with enhance boundary layer convection created by the open water. The paper provides two short case studies of this relationship using aircraft dropsonde data, SSM/I data reanalysis data. Two case studies are pro-

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vided which show how cold air outbreaks (CAO) occurred during the winter of 2013. There are useful data in the paper on the recent change in the size of the WBP, thickness of the BBL over this polynya and evidence of two CAO due to the presence of the polynya. The paper is well structure, clearly written, and an interesting short case study.

I suggest this paper be published with very minor edits.

Specific Comments:

Paragraph -1 in introduction (P15). You state that there is evidence for negative trends outside of summer and fall – you should cite some of these papers.

Last paragraph if section 2 you state - We define the polynya length as the cumulative open water path along the yellow area . . . .you should state which value of SIC you used as your definition of open water. . . .

Figure 3D shows both a linear and a non linear fit between ERA 2m temps and mean polynya length. I would suggest you remove the linear relationship as it clearly is more a non linear relationship; the residuals for the linear will be biased upwards; it also fit with you text explanation better to just show the non linear.

I would have liked to have seen how far south this effect could be observed (i.e., what is the regional rather than just the local effect) – I suggest a short paragraph summarizing this would be useful – either in your discussion of the case studies or even just in the conclusions.

I would also suggest making reference to a similar work but in the Canadian Arctic - R. L. Raddatz , R. J. Galley , L. M. Candlish , M. G. Asplin & D. G. Barber (2013): Integral Profile Estimates of Sensible Heat Flux from an Unconsolidated Sea-Ice Surface, Atmosphere-Ocean, DOI:10.1080/07055900.2012.759900

Technical Corrections: I have no technical corrections to suggest; paper is well written and presented

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