

The case of polar lows (*Invited*)

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Accompanied by high wind speeds and heavy precipitation, polar lows present a regionally constrained phenomenon with significant risks for off-shore activities in sub-polar seas. In satellite images, these often explosively developing storms appear as spiralforn cloud patterns, sometimes surrounding a characteristic hurricane like hole, or as comma shaped clouds.

So far the absence of highly resolved long-term and homogeneous observation data has hindered an assessment of changing inter decadal frequencies of these small scale storms. To overcome this obstacle we have developed a tracking methodology which we applied to data dynamical downscaled from global re-analysis data.

For the North Atlantic region we found an unchanged frequency without any significant trends for the past 60 years, but strong year-to-year variability and some decade-to-decade variability.

When applying the same methodology to global climate change simulations, we find a decline of the number of such storms in the North Atlantic, and a northward shift (with the ice edge). This result is robust with respect to different global simulations and different scenarios.