



## **An ensemble prediction system for polar lows over the Norwegian and Barents Sea**

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During the winter season violent mesoscale cyclones known as polar lows are frequent over the Norwegian and Barents Sea, putting maritime operations as well as human life and property along coast of northern Norway at risk. The 2008 Norwegian IPY-Thorpex campaign provided unique observations of polar lows, which in several studies have been used to investigate the performance of numerical weather prediction models. These studies indicated that ensemble prediction systems (EPS) with high spatial resolution would improve our ability to forecast polar lows. As part of BarentsWatch the Norwegian Meteorological Institute has during the 2012-2013 winter season run an on-demand EPS with 2.5 km grid spacing and 11 members where the duty forecasters can select between two different domains. For each ensemble member polar low tracks are calculated, and the ensemble is used to calculate so-called strike probability maps. The 925 hPa vorticity field is used to locate the polar low tracks, and a minimum and maximum diameter as well as a minimum wind speed and a minimum temperature difference between 500 hPa and sea level is specified in order to distinguish polar lows from other cyclones.

This EPS was run twice daily from October 2012 and throughout the polar low season, providing polar low tracks and probability forecasts between initialization time, 0600 and 1800 UTC, and up to 42 h lead time. While there were few polar low events between October and the end of February, the activity increased significantly in March with prevailing favourable flow conditions, i.e. cold air outbreaks. The predictions from the EPS are currently being verified against wind and precipitation observations as well as observed tracks estimated from satellite images and observations of wind and precipitation. Due to the short lifetime of polar lows, the evaluation will focus on the system's early warning capabilities.