The Role of Intense Cyclones for Precipitation, Sea Ice and Snow Cover Distribution in the Nordic Seas

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The Arctic is warming twice as fast as the global average[1]. This feature, referred to as the Arctic amplification, is a result of and results in substantial changes in the regional cryosphere, heat and moisture transport[1,2]. Here we present a study that investigates the impact cyclones in the Nordic Seas has on the regional precipitation, sea ice and snow cover distribution.

Compositing late fall (October through December; OND) months of high and low cyclone-associated precipitation compared to its climatology 1979-2016, we identify the role these cyclones have on the regional precipitation amount and phase, sea ice, snow cover and sea surface temperature. Data for these time periods are from the reanalysis ERA-Interim[3] and regional climate model HIRHAM5[4], while a short-term case study also includes weather station and satellite data for comparison and a more detailed analysis of the physical interactions.

The results of this study are contributing to the understanding of the anomalous temperature, moisture and sea ice trends of the Barents Sea region compared to the Arctic-wide trends[5,6]. Outcomes are also of substantial interest to actors following the opening up of the region. In this talk, the latest results of this ongoing study will be presented.

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