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# Tracking of synoptic weather systems in the Siberian Arctic and their impact on the Laptev Sea polynya

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Synoptic weather systems in the Arctic are studied using a track algorithm based on a feature-tracking method. The tracking is performed with the 850 hPa relative vorticity field derived from the NCEP/NCAR reanalysis dataset for the winter seasons 1978-2007. A climatology of synoptic systems is calculated for the whole Arctic. A low cyclone track density is found for eastern Siberia and the Pacific part of the Arctic. Cyclonic and anticyclonic track density decreases from the first half to the second half of the 30-year investigation period in large parts of the Arctic. A detailed study is performed for the Laptev Sea area of the Siberian Arctic, whis is an active area for sea ice production in flaw polynyas. The reaction of the Laptev polynya system to tracks of cyclones and anticyclones is investigated by selecting favourate track directions. The Anabar-Lena Polynya is affected by cyclones moving eastwards across the Laptev Sea. These cyclones cause an opening of the polynya on the day before the cyclone passage and a closing on the day after. The West-New-Siberian Polynya (WNS) is affected by cyclone tracks moving northwards along the western flank of the Laptev Sea. The cyclones mainly have an opening impact one and two days before the cyclone passage. For the WNS polynya, anticyclones passing from the east have the largest effect.