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Climate change during the last 200 years in the Baltic Sea region

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Observed changes in atmospheric conditions, river run-off and cryosphere in the Baltic Sea drainage basin are described over the past 200–300 years. The Baltic Sea area is relatively unique with a dense observational network covering an extended time period. Data analysis covers three periods: an early period with sparse and relatively uncertain measurements, a period with well developed synoptic stations, and a final period with 30+ years of satellite data and sounding systems. The atmospheric circulation in the European/Atlantic sector has an important role in the regional climate of the Baltic Sea basin, especially the North Atlantic Oscillation. A continued warming have been observed, in particularly during spring the warming have also been stronger over northern regions. There have been observed a northward shift of storm tracks and increased cyclonic activity has been observed in recent decades with an increased persistence of weather types. No long-term trend in have been observed in annual wind statistics since the 19th century, but considerable variations on (multi-)decadal timescale. Neither have any long term trend have been observed in precipitation, but an indication for an increased length of precipitation periods and possibly an increased risk of extreme precipitation events. No statistical significant trends have been detected in annual river discharges, however, winter discharges increase due to higher temperatures and there are regional variations in discharge cyclicity. Warming have resulted in reduction of snow cover, especially because of earlier snow melt and also a decrease in glacier coverage.