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# The general circulation of the Baltic Sea in the context of climate variability

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A detailed assessment of climate variability of the Baltic Sea area for the period 1958-2009 revealed that the recent changes in the warming trend since the mid-1980s are associated with changes in the large-scale atmospheric circulation over the North Atlantic. The analysis of winter sea level pressure (SLP) data highlighted considerable changes in the number and pathways of deep cyclones (<980 hPa) in parallel with the eastward shift of the North Atlantic Oscillation (NAO) centres of action. Additionally, a seasonal shift of strong wind events from autumn to winter and early spring exists for the Baltic area.
Earlier studies showed that different atmospheric climate regimes force different circulation regimes in the Baltic Sea. The analysis of the winter (DJFM) circulation patterns for the period 1970-2008 reveals changes in the general circulation of the Baltic Sea. While it is difficult to clearly link individual winter circulation patterns to one of the four dominant atmospheric climate regimes for the North Atlantic domain, the comparison of mean winter circulation patterns for 20-year periods (1970-1989 and 1990-2009) highlights that for the later 20-year period an intensified cyclonic circulation exists in the central Baltic Sea. This intensified circulation results from stronger westerly and north-westerly winds and is most likely connected to changes in the large-scale atmospheric circulation. As climate, to a large extent, controls patterns of water circulation and biophysical aspects relevant for biological production, such as the vertical distribution of temperature, salinity and oxygen, alterations in climate may severely impact the trophic structure and functioning of marine food webs.