



Remarkable link between projected uncertainties of Arctic sea ice decline and winter Eurasian climate

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The projected uncertainty in the pan-Arctic sea ice concentration (SIC) is strongly coupled with the Eurasian circulation in the boreal winter (December–March; DJFM), based on a singular value decomposition (SVD) analysis of the forced response of 11 CMIP5 models. In the models showing a stronger sea ice decline, the Polar cell becomes weaker and there is an anomalous increase of the sea level pressure (SLP) along 60°N, including the Urals–Siberian region and the Iceland low region. There is an accompanying weakening of both the mid-latitude westerly winds and the Ferrell cell, where the SVD signals are also related to anomalous sea surface temperature (SST) warming in the mid-latitude North Atlantic. In the Mediterranean region, the anomalous circulation response shows a decreasing SLP and an increasing precipitation. The anomalous SLP responses over the Euro–Atlantic region project on to the negative North Atlantic Oscillation (NAO)-like pattern. The aforementioned statistical linkages from the CMIP5 coupled models are further examined by sensitivity experiments using atmosphere-only general circulation models. We will present the relative contribution of SST and sea ice decline.