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## Positive feedback between Arctic sea ice thickness changes and the NAO

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Recent model experiments show a negative feedback between the NAO and Arctic/subarctic sea ice cover anomalies. North Atlantic SST anomalies have a weak positive feedback with the NAO. The effect of sea ice thickness has so far not been considered because of lack of data and the preconception that sea ice thickness variations only weakly affect the ocean-atmosphere heat fluxes. However, individual ice export events can considerably change the Arctic sea ice volume and lead to very thin ice over relatively large areas. The associated heat flux changes might be large enough to cause significant changes in the atmospheric circulation. Here, we report results from experiments with GFDL's AM2 forced with different SST and sea ice cover/thickness distributions. The sea ice data is taken from a simulation with an ocean-sea ice model driven with NCEP reanalysis data. We find that realistic changes in Arctic and subarctic ice extent over recent decades have no significant effect on the atmospheric circulation. However, the thinning of sea ice between the late 1960s and the mid-1990s in the interior Arctic leads to a significant decrease of SLP over the Arctic and the Nordic Seas while SLP increases over the northern North Atlantic and Pacific oceans. This suggests that the sea ice thinning and increasing NAO strength have reinforced each other over the last 3 to 4 decades. We propose the hypothesis that the large ice export event of the late 1960s has initiated the subsequent positive trend in the NAO.