



The North Atlantic storm track and its moisture transports

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Many recent studies of anthropogenic climate change indicate that the thermohaline circulation in the North Atlantic is likely to weaken over the next century. This weakening will lead to cooler sea surface temperatures (SSTs) in the North East Atlantic and could produce significant changes in the strength and orientation of the overlying atmospheric storm track. The moisture transports and wind stresses associated with the storm track may also feedback onto the ocean circulation.

This study uses the HadAM3 atmospheric model to investigate these storm track linkages. Beginning from a zonally uniform aquaplanet, idealised SST anomalies, landmasses and orography are introduced and the storm track's responses including its fluxes into the ocean are diagnosed. The observed North Atlantic storm track is thought to depend on a combination of all these factors and understanding their respective roles is crucial to determining the likely response of the storm track to a change in the oceanic overturning circulation.

Results confirm that extratropical SST anomalies can localize a storm track in the zonal direction. This response is analysed in terms of changes in baroclinicity and atmospheric moisture transports, both of which fuel the individual weather systems. The changes in the atmospheric forcing of the ocean are quantified by examining the fresh water fluxes and surface wind stresses. Experiments including idealised continents and orography will also be presented.