# Weather's Effect on Atlantic Meridional Overturning Circulation and Climate Change

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The Atlantic Meridional Overturning Circulation (AMOC) is a vital component of global ocean circulation and the heat engine of the climate system. Past climate change records indicate that abrupt climate transitions between glacial and interglacial conditions are associated with pronounced changes in the AMOC. The AMOC has also been suggested as the underlying ocean circulation responsible for the Atlantic Multidecadal Oscillation (AMO) that affects Atlantic hurricane activity，Sahelian rainfall and summer climate conditions over much North America and Europe. While recent studies have begun to unravel the complex interactions between large-scale ocean dynamics and small-scale oceanic eddies in determining AMOC structure, we present compelling evidence that internally generated high-frequency, synoptic-scale weather variability in the atmosphere also plays a significant role in maintaining the overall strength and variability of the AMOC that affects climate variability and change. We contend that the intensified Atlantic storm track activity during the 20$^{th}$ century may have exerted a strong influence on AMOC's long-term trend variability by counteracting the effect due to subpolar ocean surface buoyancy increase in response to global warming. Thus, interactions between storm tracks and AMOC may be an important feedback mechanism of the global climate system and need to be taken into consideration in climate change studies.