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# Sensitivity of the subpolar Atlantic climate to local winds

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The mild climate of northern Europe is thought to be in part maintained by the deep water formation in the northern North Atlantic and the associated meridional overturning circulation. It has been argued that this circulation is controlled by the wind stress in the Southern Ocean. Using a coupled climate model it is shown that the subpolar Atlantic wind stress also plays an important role. A partial or a complete suppression of this wind stress results in a weakening of the subpolar boundary currents, so that the associated low salinity Arctic waters spread into the oceanic interior, capping the subpolar Atlantic with freshwater. As a result, the regions of deep water sinking shift southward and the associated overturning circulation, convective activity and oceanic heat loss in the northern North Atlantic strongly weaken. The sea ice advances southward and the North Atlantic climate, including over much of Europe, becomes much colder.