



Sensitivity of the Atlantic Meridional Overturning Circulation to South Atlantic freshwater anomalies.

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The sensitivity of the Atlantic Meridional Overturning Circulation (AMOC) to changes in basin integrated net evaporation is highly dependent on the zonal salinity contrast at the southern border of the Atlantic. Biases in the freshwater budget strongly affect the stability of the AMOC in numerical models. The impact of these biases is investigated in a coarse resolution global climate model, by adding local anomaly patterns in the South Atlantic to the freshwater fluxes at the surface. These anomalies alter the freshwater and salt transport by the different components of the ocean circulation, affecting in particular the basin-scale salt–advection feedback, completely changing the response of the AMOC to arbitrary perturbations. It is found that an appropriate dipole anomaly pattern at the southern border of the Atlantic Ocean can collapse the AMOC entirely even without a further hosing. The results suggest a new view on the stability of the AMOC, controlled by processes in the South Atlantic.