

Response of Atlantic Heat and Freshwater Transports in Future Climate Scenarios

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Ocean heat and freshwater transports play an important role in today's climate system. The Atlantic meridional heat transport transports 1.2 PW of heat northward leading to the warm climate we experience in Europe today, while the freshwater transport due to the Atlantic Meridional Overturning Circulation (AMOC) is often used as an indicator for the stability of the AMOC. Future climate projections show that the AMOC is expected to weaken over the next several decades. These changes to the AMOC as well as other circulations changes will not only impact the heat and freshwater transports in the Atlantic but also the temperature and salinity structure. Using both CMIP5 and CMIP6 data this study untangles the impacts of velocity changes versus temperature/salinity in future climate projections on Atlantic heat and freshwater transports. Results show that changes in velocity dominate heat transport changes while the changes in salinity structure play a large role in freshwater transports with the impact of velocity changes being latitude and model dependent.