

Warm Deep Water Changes in the Brazilian Earth System Model Climate Projections

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Water transformation at the Weddell Sea margins links the upper and lower limbs of Meridional Overturning Circulation by means of dense water formation, which may be affected by rapid climate change. Warm Deep Water (WDW) is the primary heat source for the Weddell Sea and accounts for 71% of Weddell Sea Bottom Water (WSBW), which is the regional variety of Antarctic Bottom Water (AABW) - one of the densest water masses in the ocean bearing directly on the global ocean bottom ventilation. In this presentation we will examine WDW evolution simulated by the Brazilian Earth System Model (BESM) in a 21th century projection compared to four realistic CMIP5 models (ESMs). Salinity and temperature results from a cross-section in the Weddell Sea were assessed with the Optimum Multiparameter Analysis (OMP) water masses separation scheme. Results show a shoaling trend of WDW who becomes lighter throughout the simulation period. This is likely to increase the onshore heat transport with potential impacts to AABW formation and export from the Weddell Sea. Moreover, these trends might also increase ice shelf basal melting, ice sheet retreat and eventually sea level rise.

Publication:

American Geophysical Union, Fall Meeting 2018, abstract #OS13D-1514

Pub Date:

December 2018

Bibcode:

2018AGUFMOS13D1514T

Keywords:

4299 General or miscellaneous; OCEANOGRAPHY: GENERAL

