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## Mechanisms for decadal Subantarctic Mode Water variability

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Subantarctic Mode Water (SAMW) is a voluminous water mass that forms on the equatorward side of the Antarctic Circumpolar Current. The subduction and export of SAMW plays an important role in the global redistribution of heat, freshwater, nutrients, and dissolved gases such as oxygen and carbon dioxide. Recently the global Argo program of profiling floats provided for the first time near-global coverage of temperature and salinity in the upper 2000 m, revealing basin-wide spatial patterns of strong interannual SAMW variability. The same observations also indicate variations on decadal time scales. Combined with the output from an ocean state estimate, we investigate the mechanisms that drive the regional distribution of decadal variability of the SAMW. We show that the decadal variability of SAMW volume and formation rate is strongly correlated with the decadal variability in the atmospheric circulation, in particular the zonal sea-level pressure gradients, governing the meridional wind component and meridional heat and moisture redistribution. These findings imply that strong quasi-decadal variability of surface heat and freshwater fluxes also governs the regional uptake of anthropogenic heat and carbon dioxide by SAMW.