Geophysical Research Abstracts
Vol. 15, EGU2013-11919, 2013
EGU General Assembly 2013
© Author(s) 2013. CC Attribution 3.0 License.

Weddell Sea Warm Deep Water and the Southern Annular Mode

Sunke Schmidtko (1), Karen Heywood (1), Andrew Thompson (2), and Adrian Matthews (1)

(1) University of East Anglia, School of Environmental Sciences, Norwich, United Kingdom (s.schmidtko@uea.ac.uk), (2) California Institute of Technology, Pasadena, CA, USA

Weddell Sea Warm Deep Water (WDW) circulates anti-cyclonically in the Weddell gyre, cooling as it does so. WDW is fed by Circumpolar Deep Water (CDW) that bifurcates between 40°E and 80°E from the Antarctic Circumpolar Current (ACC). WDW is remarkably stable in its theta and salinity properties with no statistically significant trend over the last three decades. Small decadal variability is superimposed. A different state of the Weddell Sea gyre is found in the late-70ies and early-80ies, with significant colder temperatures downstream of the CDW bifurcation. The decadal variations are correlated with the Southern Annular Mode (SAM), in particular the meridional atmospheric pressure gradient in the Atlantic sector. We propose this occurs due to a reduction in the supply of new WDW into the Weddell gyre during times of negative SAM. Impact of the WDW-SAM connection on AABW and polynya formation is discussed.