

The Meridional Overturning Circulation north of the AR7W and A25-Ovide lines in recent decades

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A time-mean 2002-2010 full-depth circulation along the AR7W (Canada-Greenland) and A25-Ovide (Greenland-Portugal) sections in the North Atlantic subpolar gyre is estimated from repeated hydrographic surveys, altimetry data, and inverse calculations. It enables to quantify the basin scale state of the climate-relevant Meridional Overturning Circulation in density space ($MOC\sigma$). The basin-scale $MOC\sigma$ reaches 18 Sv in the 2000's. It is largely induced by the light-to-dense conversion of Atlantic waters in the eastern subpolar gyre and in the Nordic Seas, the actual formation of Labrador Sea Water (LSW) contributing to 17% of the total value. However, further examination of the preceding decade strongly suggests that the Labrador Sea is involved in the MOC variability as the $MOC\sigma$ across the AR7W section decreased by 3 Sv from the early-mid 1990's to the 2000's, reflecting the well documented changes in deep convection and LSW properties between these two periods.