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Deep water formation, the subpolar gyre and the meridional overturning circulation in the subpolar North Atlantic

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Climate models suggest that in the next decades the meridional overturning circulation in the Atlantic (AMOC) will slow down, which will delay the warming and enhance the sea level rise in western Europe. Whether the modelled relation between deep water formation, strength of the AMOC and the subpolar gyre in the North Atlantic is valid can only be confirmed by observations. Several measurement components are already in place, but crucial arrays to calculate the meridional volume and heat transport in the subpolar North Atlantic are still missing. Here the recent developments of the deep water formation rates and the subpolar gyre transports are summarized and the results of the high resolution FLAME model together with the observations are used to discuss how existing observational components in the subpolar North Atlantic could be supplemented to provide long-term monitoring of the meridional heat and volume transport.