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Subsurface temperature maxima in North Atlantic deep water formation regions

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Since the mid 1990's subsurface temperature maxima (Tmax) are observed in the three major deep water formation areas of the North Atlantic: the Greenland Sea, the Labrador Sea, and the Irminger Sea. It is shown that Tmax is established as a consequence of an anomalous low salinity in the upper layer water which is mixed downward during convection. Utilizing hydrographic data (CTD, moorings, floats) the characteristic (T/S properties, extend) of Tmax are deduced. As Tmax is also a maximum in the vertical stability its existence has consequence for the vertical mixing in the regions. Utilizing lADCP current shear profile data the vertical mixing is computed and consequence for the water transformation processes within the regions are discussed.