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NADW properties at the western boundary at 16°N and 10°N

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The variability of the properties of North Atlantic Deep Water (NADW) in the western boundary current at 16°N is investigated based on repeated hydrographic sections. The greatest change occurs in the density range of the Labrador Sea Water (LSW), where a continuous freshening between 2000 and 2004 is observed. This is prescribed to the arrival of salinity poor LSW formed in the Labrador Sea after 1988. The NADW properties at 16°N on isopycnals show large spatial variability along the section. Profiles with properties typical for the boundary current (e.g. high concentration of anthropogenic CFC, low salinity in the LSW layer) also occur away from the boundary and are alternating with profiles which indicate mixing with water from the interior. Isopycnal mean values of water mass properties are therefore variable not only due to changes in the boundary current properties, but also due to a change in volume and location of water originating from the boundary current. At 10°N the properties especially in the upper NADW are horizontally homogenised. This is induced by the change of the shape of the continental slope, which is very steep at 16°N and extremly flat at 10°N, so the boundary current is broadening between the two sections. Nevertheless, a direct transport path for NADW from 16°N to 10°N exists. The water mass properties at 10°N are similar to those at 16°N within the boundary current, with small admixtures of water from the interior and the layers above and below.