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Inventory changes of anthropogenic carbon in the Atlantic between 20°S and 65°N

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The oceans absorb a significant portion of the anthropogenic carbon emissions to the atmosphere, thus mitigating the greenhouse effect. One important sink for anthropogenic carbon is the newly formed North Atlantic Deep Water. The concentrations of anthropogenic carbon are calculated by means of the Transit Time Distribution (TTD) method. Therefore, the parameters of the TTDs are inferred from CFC data from the WOCE and after WOCE period. These TTDs are then used to compute the inventory of anthropogenic carbon for the Atlantic between 20°S and 65°N in 1997 and 2003. The overall increase of Cant within this period is about 10% from 32.5 Pg to 36 Pg carbon, which is in agreement with the temporal evolution of the atmospheric CO2. Looking at the inventory change in the subpolar region gives a less uniform picture. There, the temporal increase of anthropogenic carbon varies between different water masses, reflecting the variability of water mass formation. The first half of the 1990s was characterised by high formation rates of Labrador Sea Water (LSW), which is now more and more replaced by the lighter Upper LSW.