



Variability of the storage of anthropogenic carbon in the subpolar North Atlantic over the last two decades

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The subpolar North Atlantic is the region of the global ocean with the highest column inventory of anthropogenic carbon (Cant). The main reason is the presence of newly formed North Atlantic Deep Water (NADW), which consists of Overflow Water originating in the Nordic Seas and Labrador Sea Water formed directly in the northwest Atlantic. Here we use transient tracer data (CFCs, SF₆) from the 1990s up to 2016 to calculate Cant inventories by means of the transit time distribution method. The Cant content of NADW is increasing due to the rising atmospheric CO₂, but also modulated by the variability of water mass formation. The relatively weak convective activity in the Labrador Sea during most winters from the mid 1990s to 2013 has the greatest impact on the variability of the Cant inventories in the subpolar North Atlantic. Since winter 2013/14, the convection intensified again, leading to an increase of the formation of Cant-rich LSW. The related interannual variability of the Cant storage rates will be quantified, and the effect of volume changes and changes of water mass age on the Cant inventories will be deciphered.