



Freshwater exports from Arctic to the Labrador and Greenland shelf and slope.

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We investigate whether one can detect changes in the freshwater contributions to the North Atlantic subpolar gyre (SPG), in light of the observed recent decrease of salinity in the region. We focus on two important conduits of freshwater from the Arctic to the interior North Atlantic subpolar gyre: the Coastal Labrador Current and the southern Greenland shelf, and use a dataset of different freshwater tracers from a set of cruises over the period 2010-2014. Mass balance calculations are done to evaluate the contribution of the different freshwater sources and the influence from the accelerated continental glacial melt and the sea ice volume decrease in the Arctic region. Over the Labrador shelf and slope, the dataset reveals a large contribution of water from the Canadian Arctic to the southern Labrador shelf. Moreover, we suggest that the fraction of brine and Pacific water on the shelf has decreased in recent years compared to that observed in the mid-1990s. Over the southern Greenland shelf and slope, contribution of Pacific water is smaller and isotopic data reveal generally less brine influence than over the Labrador shelf. This is consistent with a stronger contribution from the Baffin/Hudson Bay waters joining the system along the Labrador Coast. However, data highlight the temporal and spatial variability of the brine influence over the southern Greenland shelf, with a strong unusual brine signal observed in Spring 2014.