



## **Observed covariability of Arctic and North Atlantic freshwater content**

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Recently, freshwater changes have been observed both in the Arctic Ocean and the subpolar North Atlantic. Aiming on investigating possible links we compared the liquid freshwater content of the subarctic North Atlantic with the sum of liquid and solid freshwater content of the Arctic Ocean from observations. We find a significant multi-decadal anti-correlation of the freshwater anomalies in these two regions. Furthermore these changes are correlated with the Arctic and North Atlantic Oscillation indices. We suggest Arctic freshwater accumulation and release as a response to multidecadal alternations of the dominant large-scale atmospheric variability. Moreover, we suggest changing freshwater export from the Arctic Ocean as a consequence to be responsible for the anti-correlation between the two regions. According to the present phase of this large-scale atmospheric variability, the freshwater accumulated during the previous decades in the Arctic Ocean might be released into the sub-Arctic Seas in the coming years. This has the potential to impact on the North Atlantic meridional overturning circulation. To further investigate the involved processes and proof our hypotheses we show results from a simulation using a global finite-element sea-ice-ocean model.