Geophysical Research Abstracts
Vol. 20, EGU2018-18605, 2018
EGU General Assembly 2018

Anomalously low central Arctic salinity in years of high sea-ice melt and converging atmospheric conditions

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The Arctic Ocean has shown several years of very low sea-ice extent and redistribution of liquid freshwater within the region since the the 1990s. Yet, the mechanisms underlying this variability in the light of decadal trends and oscillations are not fully understood. Using observations, we show anomalously low salinity in the central Arctic during summer 2015. Values of practical salinity at the North Pole were around 28, whereas they were 30 or more in prior observations since 1992. The freshwater inventory from the surface to the 34 isohaline paints a similar picture with the anomaly continuing into 2016. We find that the freshwater anomaly is likely driven by above average levels of sea-ice melt and wind-ice-motion driven Ekman transport from the direction of the Siberian shelves and of the Canada Basin. This is associated with strong freshening of Polar Surface Water and elevated levels of waters of Pacific origin throughout this layer. Our results are part of Arctic-wide changes in sea-ice cover and freshwater distribution on decadal timescales.