



Central Arctic Ocean freshwater during a period of anomalous melt and advection in 2015

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During the recent decade the Arctic Ocean has shown several years of very low sea-ice extent and an increase in liquid freshwater. Yet, the processes underlying the interannual variability are still not fully understood.

Hydrographic observations by ship campaigns and autonomous platforms reveal that summer 2015 showed above average liquid freshwater in the upper ocean of the central Arctic. Surface temperatures and sea level pressure were also higher than the average of the preceding two decades.

From hydrographic observations and atmospheric reanalysis data we show that this liquid freshwater anomaly is associated with above average sea-ice melt and intensified northward Ekman transport. We, further, found significant amounts of Pacific Water in the upper water column, from the mixed-layer to the upper halocline. Our results suggest that the freshening was due to both advection of low-salinity water from the direction of the Siberian shelves, the Beaufort Gyre and the Bering Strait, and enhance sea-ice melt.