



Characterization and consequences of the 2017 Arctic cyclonic circulation

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Analysis of NCAR/NCEP atmospheric data, sea-ice extent, buoy drift and model simulations shows that in 2017 the atmospheric circulation regime (CR) over the Arctic Ocean was predominantly cyclonic (for the first time since 1997), with a small anticyclonic cell in the southeastern Beaufort Gyre region. Features of the 2017 CR are similar to conditions observed in 1989 when the anticyclonic CR that had persisted during 1983-1988 shifted to a cyclonic CR that lasted until 1996 (Proshutinsky et al., 2015: Arctic circulation regimes, <http://rsta.royalsocietypublishing.org/content/373/2052/20140160>). We speculate that the 2017 shift to cyclonic can be a precursor for a cyclonic CR to dominate for the next 3-5 years, resembling the 1989-1996 tendencies. A cyclonic regime has generally been associated with some increase and stabilization of sea ice extent, intensification of Atlantic water transport via Fram Strait, weakened Siberian river runoff, decreased Beaufort Gyre freshwater content, and freshwater release to the North Atlantic, among other changes to be considered in context with changes projected under global warming. Potential changes to the Arctic Ocean under a changed CR will be analyzed and discussed.