A MECHANISM FOR THE EARLY 20TH CENTURY WARMING IN THE ARCTIC: A MISSING LINK

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A year ago, a mechanism for the early century warming in the Arctic was presented in the EGS General Assembly 2002. The huge warming of the Arctic, which started in the early 1920s and lasted for almost two decades, was attributed to the reduced sea ice cover mostly in the Barents Sea due to enhanced wind driven oceanic inflow. Simulations with atmospheric and coupled atmosphere-ocean general circulation models suggested the possibility of such a mechanism, where the magnitude of the inflow is linked to the strength of westerlies into the Barents Sea. Recent studies show a positive feedback sustaining the enhanced westerly winds by a cyclonic atmospheric circulation in the Barents Sea region created by a strong surface heat flux over the ice-free areas. Observational data suggest a similar series of events during the early 20th century Arctic warming including increasing westerly winds between Spitsbergen and the northernmost Norwegian coast, reduced sea ice and enhanced cyclonic circulation over the Barents Sea. It is interesting to note that the increasing high latitude westerly flow at this time was unrelated to the North Atlantic Oscillation, which at the same time was weakening.