



Siberian cooling trends and the linkage to Arctic sea ice loss

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Siberia is a region where despite global warming a winter cooling trend has been observed over last decades. This cooling trend and its potential linkage to Arctic sea ice loss are controversially discussed. However, recent winters have not been taken into account in the discussions so far. Here, we analyze ERA-Interim reanalysis data until 2017 and ERA20C reanalysis data to investigate the robustness of the winter surface air temperature trends to updated and extended time periods. Our results show that winter temperatures in Siberia were above normal after 2013 leading to strongly reduced cooling trends since 1980. The trend before 2014 was dominated by four cold winters between 2010 and 2013. These cold winters were mainly caused by strong negative phases of the North Atlantic Oscillation, except for the winter 2011/2012, where the NAO was positive, and a strongly negative phase of the Pacific Decadal Oscillation caused the cold winter. Both modes shift from more negative to positive phases in 2014 and cause a return to warmer Siberian temperatures. Furthermore, the North Atlantic Oscillation shows no trend between 1980 and 2017 indicating that the suggested linkage between Arctic sea ice loss and a negative trend in this mode is not robust. However, continuously low Arctic sea ice in recent years and a slightly negative trend in the Pacific Decadal Oscillation since 1980 contribute to the remaining observed cold trends over parts of Eurasia between 1980 and 2017.