

Subseasonal relationship between Arctic and Eurasian surface air temperature anomalies in the boreal winter

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Warm Arctic often causes anomalously cold Eurasia in the boreal winter. The present study extends this finding into subseasonal time scale by establishing warm Arctic-cold Eurasian (WACE) surface air temperature relationship in each winter month. It turns out that Arctic temperature anomalies over the Barents and Kara seas tend to lead Eurasian temperature anomalies only in early and late winters (e.g., December and February). Such a relationship does not appear in mid-winter (e.g., January), implying the importance of background flow in setting WACE-like teleconnection pattern. The comparison between Decembers with and without WACE pattern indeed shows that WACE pattern becomes robust when NAO like pattern is dominant. A series of linear baroclinic model experiments, where thermal forcing is imposed over the Barents and Kara seas, further indicate that WACE pattern is partly explained by linear wave dynamics, but is highly sensitive to the background flow.