

PAMIP Webinar Series

Response of the wintertime Siberian high to Arctic amplification, in multi-model large ensembles and nudged experiments

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Abstract

Arctic Amplification (AA) in the troposphere represents additional warming in high-latitudes, versus lower latitudes, due to various local feedbacks and poleward heat transport. In this study we investigate the large-scale atmospheric response to AA when the influence of mid-latitude warming is suppressed, i.e., the response to “true” AA. We use two anomalous AA temperature profiles from late-21st-century climate projections, from the Community Earth System Model version 1 (CESM1) large ensemble of RCP8.5 scenarios, and the equivalent from the latest CESM2 large ensemble, that we prescribe in the Whole Atmosphere Community Climate Model (WACCM) version 4. In line with previous work, a robust but weak response to AA is found in the mid-latitudes in winter, the most notable response being a strengthening of the Siberian high. The impact of weaker AA in CESM2 versus CESM1 is discussed, and model outputs from the multi-model large ensemble archive (MMLEA) are used to further examine the AA-Siberian High connection.



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