



Do stratosphere-resolving models make better seasonal climate predictions in boreal winter?

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Using an international, multi-model suite of historical forecasts from the World Climate Research Programme (WCRP) Climate-system Historical Forecast Project (CHFP), we compare the difference in seasonal prediction skill in boreal wintertime between models that resolve the stratosphere and its dynamics (“high-top”) and models that do not (“low-top”). We were unable to detect more skill in the high-top ensemble mean than the low-top ensemble mean in forecasting the wintertime North Atlantic Oscillation, and skill varies widely between individual models. Increasing the ensemble size increases the skill. We then briefly examine two major processes involving stratosphere-troposphere interactions (the El Niño-Southern Oscillation/ENSO and the Quasi-biennial Oscillation/QBO) and how they relate to predictive skill on seasonal timescales, particularly over the North Atlantic and Eurasia. High-top models tend to have more realistic stratosphere-troposphere coupling related to ENSO and the QBO, which may enhance wintertime skill over high-latitudes in these models compared to low-top models during winters with ENSO or QBO forcing. However, it is not clear whether the improvement in skill in the high-top models is due entirely to better stratospheric processes.