



## Multimodel analysis of Northern Hemisphere winter blocking and its relation to the stratosphere

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Tropospheric blocking during Northern Hemisphere winter and its relation to the stratospheric circulation is examined using the multimodel ensemble of coupled atmosphere-ocean general circulation models (AOGCMs) obtained from the Coupled Model Intercomparison Project Phase 5 (CMIP5). Most models exhibit blocking frequency biases that are consistent with errors in their underlying climatologies, including the position of the tropospheric jets. Models with well-resolved stratospheres, or “high top” models, generally have overall biases that are similar to their “low top” counterparts, although changes in blocking associated with improved stratospheric resolution have some consistency across multiple models. Future projections following the RCP4.5 and RCP8.5 scenarios predict that blocking will become less frequent in many regions, but projections in some regions can be sensitive to stratospheric resolution. The statistical relationship between blocking events both preceding and following extreme states of the stratospheric polar vortex – sudden warmings and vortex intensifications – is examined in the models and compared to that seen in reanalysis data.