

# Future change of Northern Hemisphere Blocking in CESM Large Ensemble simulations

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The Northern Hemisphere (NH) blocking and its future change are investigated by using 40 ensemble simulations of Community Earth System Model (CESM). The historical simulations qualitatively reproduce the spatial distribution of NH blocking frequency. However, ensemble spreads are substantially large with significantly underestimated Euro-Atlantic (EA) blockings but overestimated North Pacific (PA) blockings. These dipolar biases, which are largely associated with the model mean biases, are remarkably similar to those in climate model simulations archived for the Coupled Model Inter-comparison Project phase 5 (CMIP5). The future climate simulations, driven by Representative Concentration Pathway 8.5 (RCP 8.5) scenario, further reveal that overall blocking frequency may decrease in a warm climate. The decrease of EA blockings is primarily found in short-lived blockings, whereas that of PA blockings is found in most blockings regardless of the durations. A clear exception is blocking in the western Russia whose frequency is projected to increase in a warm climate. This result, which is particularly robust in cold season, is consistent with previous studies based on the CMIP5 models.

Key words: blocking, large ensemble

## References

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