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Atmospheric blocking and its effect on temperatures under climate change

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Blocking weather patterns are often the proximate cause for extreme midlatitude weather, such as heatwaves in summer and cold events in winter. Climate models generally predict a reduction in blocking frequency under climate change, though there remains concern over the ability of models to adequately simulate the underlying dynamics. Here we use one climate model to investigate the mechanisms of the blocking response. In this model, we find the blocking to be most sensitive to tropical changes, although there is also some sensitivity to Arctic change. In addition to the changes in occurrence, there are changes in the temperature impact of blocking, which we attribute to a robust thermal advection mechanism. These findings have implications for the robustness of projected changes in temperature extremes in the midlatitudes.