



Improved blocking at 25km resolution?

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It has been suggested that relatively coarse resolution of atmospheric general circulation models (AGCMs) limits their ability to represent mid-latitude blocking. Assessing the role of model resolution for blocking is computationally expensive, as multi-decadal simulations at the desired resolution are necessary for a robust estimation of blocking statistics. Through the joint NERC/Met Office modelling project UPSCALE (UK on PrACE - weather-resolving Simulations of Climate for globAL Environmental risk), a series of atmosphere-only simulations that fulfil this requirement have become available. UPSCALE has been allocated an unprecedented amount of computing time by PRACE (Partnership for Advanced Computing in Europe), and it has been possible to produce ensembles of 26-year simulations of both present and idealised future climate with the HadGEM3-GA3.0 AGCM at a horizontal atmospheric resolution of 25km.

Here, we present a two-dimensional blocking index as represented by HadGEM3-GA3.0 at resolutions between 100 and 25km, and reanalysis data. We find that the representation of North-Atlantic/European blocking improves with resolution in the spring. Furthermore, we quantify the degree to which blocking biases in HadGEM3-GA3.0 are associated with mean-state biases, and also discuss the role of the choice of the blocking index for the evaluation of model performance and sensitivity to resolution.