

Improved Atlantic blocking in a climate model

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Most climate models underestimate the frequency of Atlantic blocking. This has been cited as a likely source of error in near term climate predictions and long term (CMIP) climate projections. Horizontal resolution is often cited as the main culprit for the deficit in modeled blocking due to poorly resolved small-scale variability whose upscale effects help to maintain blocks. However, recent studies show that diagnosed blocking errors are also very sensitive to the large scale climatological bias of the model. Furthermore, even modest resolution models can contain enough intrinsic variability to generate greatly improved blocking frequency if they are corrected to account for time-mean bias. Here we show a much improved simulation of Atlantic blocking frequency in a climate model. We show that reduction of the mean bias, itself connected to an improved simulation of the Atlantic Ocean, is a key element contributing to the improvement in blocking frequency. Our results demonstrate that a greatly improved representation of Atlantic blocking frequency can be achieved in coupled ocean-atmosphere models with a relatively modest increase in resolution.