

# Greater Arctic Warming, a Stronger Jet? North Atlantic Jet Sensitivity to Arctic Amplification

**Julian Arnheim**  
University of California Irvine

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Uncertainties persist regarding the influence of Arctic amplification on mid-latitude circulation, particularly over the North Atlantic, where climate models exhibit significant differences in both Arctic warming and the response of the jet stream. Using large ensembles from the Community Earth System Model (CESM), I first show how differences in Arctic warming across model generations are associated with markedly different North Atlantic circulation responses by 2100. To isolate the role of Arctic amplification, I then present a coupled experiment in CESM2 in which Arctic warming is augmented to reproduce the stronger Arctic amplification found in CESM1. Enhanced Arctic warming strengthens the North Atlantic jet and accelerates projected declines in jet waviness and associated blocking through the 21st century. In the ocean, increased Arctic warming accelerates the slowdown of the Atlantic Meridional Overturning Circulation, while limiting the further expansion of the North Atlantic warming hole in the late 21st century. Together, these results demonstrate that the magnitude of Arctic amplification plays a critical role in shaping atmospheric circulation and ocean dynamics in the North Atlantic.

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Contacts

Joonsuk Kang ([jk5081@columbia.edu](mailto:jk5081@columbia.edu))

Lantao Sun ([lantao.sun@colostate.edu](mailto:lantao.sun@colostate.edu))

Yu-Chiao Liang ([yuchiaoliang@ntu.edu.tw](mailto:yuchiaoliang@ntu.edu.tw))



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