

PAMIP Webinar Series

Robust but weak winter atmospheric circulation response to future Arctic sea ice loss

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Date: September 29th, 2021
Time: 3 pm (GMT)

Registration: shorturl.at/ltzH0

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Abstract

The possibility that Arctic sea ice loss weakens mid-latitude westerlies, promoting more severe cold winters, has sparked more than a decade of scientific debate, with apparent support from observations but inconclusive modelling evidence. Here we show that sixteen models contributing to the Polar Amplification Model Intercomparison Project simulate a weakening of mid-latitude westerlies in response to projected Arctic sea ice loss. We develop an emergent constraint based on eddy feedback, which is 1.2 to 3 times too weak in the models, suggesting that the real-world lies towards the higher end of the model simulations. Still, the modelled response to Arctic sea ice loss is weak: the North Atlantic Oscillation response is similar in magnitude and offsets the projected response to increased greenhouse gases, but would only account for around 10% of variations in individual years. We further find that relationships between Arctic sea ice and atmospheric circulation have weakened recently in observations and are no longer inconsistent with those in models.



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