

Arctic warming, increasing snow cover and widespread boreal winter cooling

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The most up to date consensus from global climate models predicts warming in the Northern Hemisphere (NH) high latitudes to middle latitudes during boreal winter. However, recent trends in observed NH winter surface temperatures diverge from these projections. For the last two decades, large-scale cooling trends have existed instead across large stretches of eastern North America and northern Eurasia. We argue that this unforeseen trend is probably not due to internal variability alone. Instead, evidence suggests that summer and autumn warming trends are concurrent with increases in high-latitude moisture and an increase in Eurasian snow cover, which dynamically induces large-scale wintertime cooling. Understanding this counterintuitive response to radiative warming of the climate system has the potential for improving climate predictions at seasonal and longer timescales.

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