**No link between human-induced Arctic sea ice loss   
and cold Eurasian winters**

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Arctic sea ice loss has been implicated in the recent prevalence of unusually cold Eurasian winters1,2. Whether the linkage follows from anthropogenic sea ice loss, however, remains an open question as the sea-ice loss combines anthropogenic response and internal (random) variability3,4, and because of confounding wintertime variability over the Eurasian continent5,6 Here, we isolate the anthropogenic and random components of the linkage using a large ensemble of atmosphere-only model simulations with prescribed sea ice loss taken from simulations of the companion atmosphere-ocean-cryosphere model. We find no evidence of a sea-ice loss related increase in the prevalence of cold Eurasian winters. However, we do find long periods of significant early winter Eurasian cooling linked to internally-generated circulation features over the Barents and Kara Sea regions of the Arctic. These results challenge the perception that Arctic sea ice loss was responsible for the recent prevalence of unusually cold Eurasian winters, showing instead that these winters were more likely the consequence of internal variability, with implications for our understanding of impacts and adaptation in human and natural high-northern latitude systems.

Main text.

**Methods**

**Observations.** Text.

**Model simulations.** Text.

**References**

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2. Kay, J. E., Holland, M. M. & Jahn, A. Inter-annual to multi-decadal Arctic sea ice extent trends in a warming world. *Geophys. Res. Lett.* **38**, L15708 (2011).

**Supplementary Information** accompanies the paper on **www.nature.com/nature**.

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**Author Contributions** .

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**Figure 1 | Blah blah blah.** Text.

**Supplementary information for**

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**Supplementary Figure 1 | Blah, blah, blah.** Text.