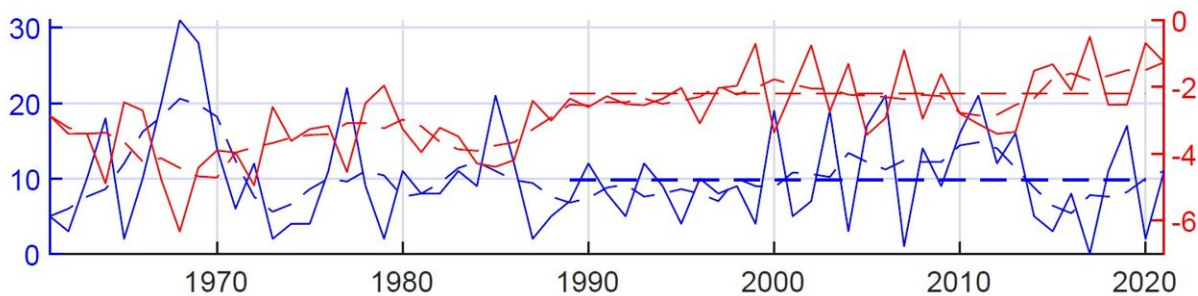


Researchers see an increase in the number of extreme cold days in North China during 2003–2012

March 8 2024



Winter temperature (red solid curve) increases over past decades. Within the study period (1989–2021), the number of extreme cold days (blue solid line) in North China increases around the year 2003 and then decreases around the year 2013. The dashed lines are 5-year-smoothed data. Credit: Zhu Yali

How extreme weather and climate events change is an intriguing issue in the context of global warming. As IPCC AR6 points out, cold extremes have become less frequent and less severe since the 1950s, mainly driven by human-induced climate change. However, cold extremes could also exhibit robust interdecadal changes at regional scale.

A study by researchers from the Institute of Atmospheric Physics, Chinese Academy of Sciences, presents robust interdecadal changes in the number of extreme cold days in [winter](#) over North China during

1989–2021, and the findings have been published in [Atmospheric and Oceanic Science Letters](#).

Specifically, the number of extreme cold days increased around the year 2003 and then decreased around the year 2013, with a value of 8.7 days per year during 1989–2002, 13.5 during 2003–2012, and 6.6 during 2013–2021.

During 2003–2012, the Siberian–Ural High strengthened and the [polar jet stream](#) weakened, which favored frequent cold air intrusion into North China, inducing more extreme cold days. In addition, the intensity of extreme cold days in North China showed no significant difference in the three periods. However, the related cold air could influence a larger area, which was especially the case for the stronger cold air center located to the west of Lake Baikal during 2013–2021.

The increase in the number of extreme cold days in North China in 2003–2012 probably arose from natural decadal variability. However, as pointed out by the corresponding author of this study, Prof. Yali Zhu, "This is still a challenging issue that needs further exploration to quantify the relative contributions of natural variability and [human activity](#) to regional extreme events."

More information: Yali Zhu et al, Interdecadal changes in the frequency of winter extreme cold events in North China during 1989–2021, *Atmospheric and Oceanic Science Letters* (2024). [DOI: 10.1016/j.aosl.2024.100468](https://doi.org/10.1016/j.aosl.2024.100468)

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