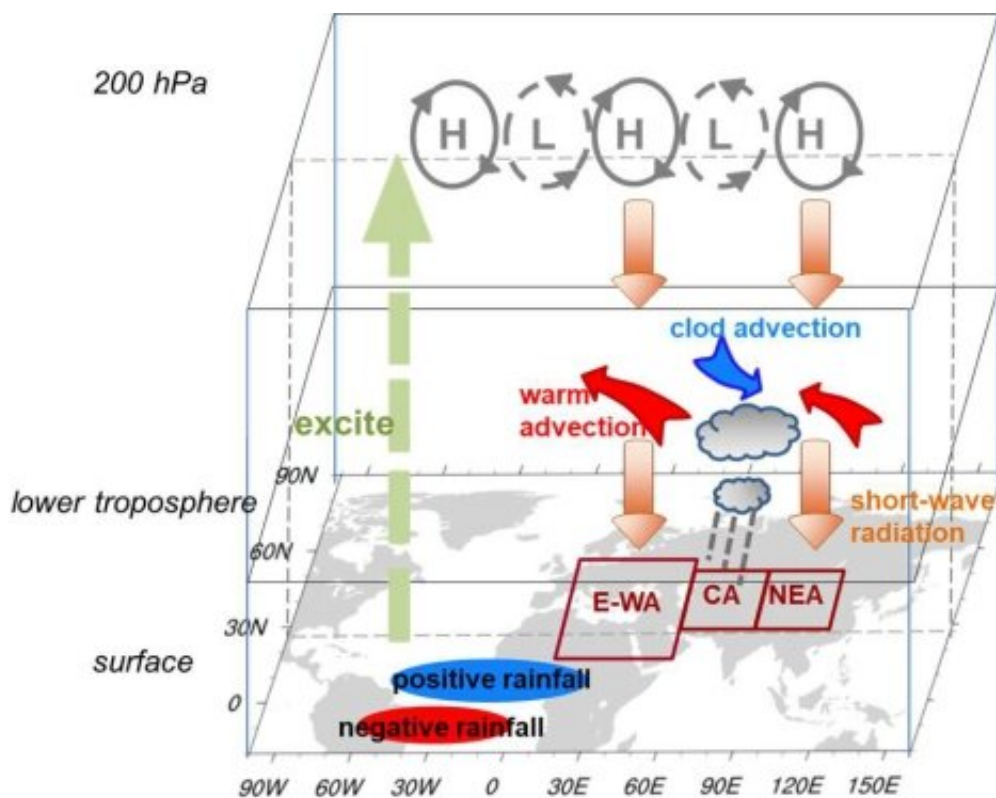


# Summer Eurasian nonuniform warming found related to the Atlantic Multidecadal Oscillation

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Schematic diagram illustrating the mechanism of the AMO affecting the Eurasian surface temperature. E-WA, CA and NEA are short for Europe–West Asia, Central Asia and Northeast Asia, respectively. H represents “positive geopotential height anomaly” and L represents “negative geopotential height anomaly. Credit: Sun Xueqian

The positive-phase of Atlantic Multidecadal Oscillation (AMO) can indeed cause Eurasian summer nonuniform warming, according to Prof. Shuanglin Li, Dean of Atmospheric Science at the University of Geosciences (Wuhan) and Executive Vice-Director at the Climate Change Research Center, Chinese Academy of Sciences, and one of the authors of a recently published study.

Prof. Shuanglin Li and his team—a group of researchers from the Climate Change Research Center and State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Institute of Atmospheric Physics—have had their findings published in *Advances of Atmospheric Sciences*.

"Previous studies indicate the Eurasian nonuniform warming since the mid-1990s may be related with the phase shift of the AMO, and we validate this point by using ensemble experiments with three AGCMs [atmospheric general circulation models]," the lead author says. "The overall consistency among the three AGCMs illustrates the robustness of the AMO's influence, although the models are not the most recent updated versions," she adds.

The authors diagnose the underlying mechanism of the AMO's influence on the Eurasian nonuniform warming from the perspective that the boundary forcing modulates the intrinsic atmospheric variability. The results highlight the role of the Silk Road Pattern.

"The AMO-related tropical diabatic heating anomaly excites the Silk Road wave-train over Eurasia with positive geopotential height and anticyclonic circulation anomalies over Europe-West Asia and Northeast Asia, but negative geopotential height and cyclonic circulation over Central Asia. Such opposite circulations lead to opposite changes in temperature advection, precipitation, cloud cover and solar radiation. When these effects overlap the signals of global warming, it causes

amplified warming," the authors explain.

"This work did not consider the effects of the negative phase of the AMO. Future work may be needed to find out whether symmetric, inverted nonuniform surface air temperature anomalies will be obtained for the cold period of the AMO," Prof. Li adds.

**More information:** Xueqian Sun et al, Simulated Influence of the Atlantic Multidecadal Oscillation on Summer Eurasian Nonuniform Warming since the Mid-1990s, *Advances in Atmospheric Sciences* (2019). [DOI: 10.1007/s00376-019-8169-z](https://doi.org/10.1007/s00376-019-8169-z)

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