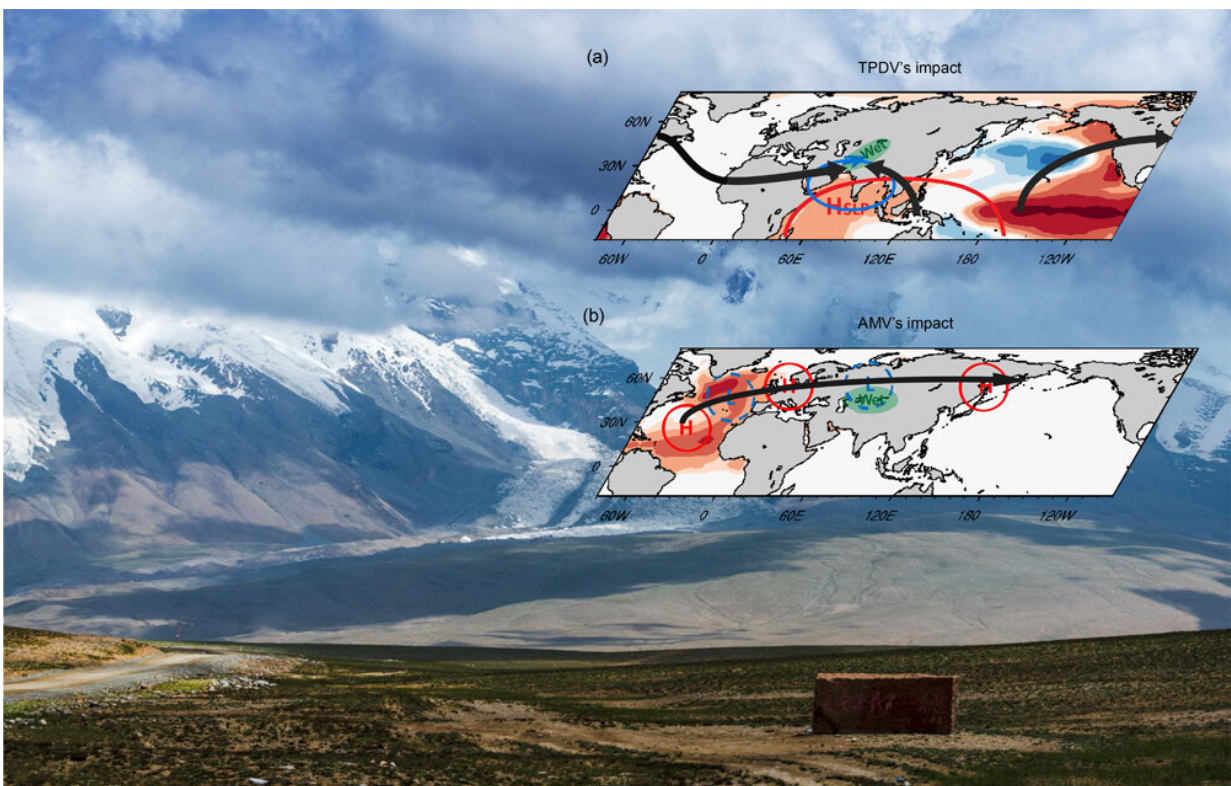


Precipitation in Central Asia shaped by sea surface temperature over tropical Pacific and North Atlantic

August 26 2021



The effect of tropical Pacific decadal variability and the Atlantic multidecadal variability on Central Asian precipitation. Credit: Jiang Jie and Zhou Tianjun

Central Asia is one of the major food-producing regions in the world. Its agricultural production relies heavily on climate conditions, especially

precipitation. Understanding the reasons for historical changes in Central Asian precipitation is crucial for predicting precipitation changes in the next few decades.

Researchers from the Institute of Atmospheric Physics (IAP) of the Chinese Academy of Sciences indicated that the tropical Pacific decadal variability (TPDV) and the Atlantic multidecadal variability (AMV) are the main drivers of the interdecadal variability in Central Asian precipitation.

The study was published in *Journal of Climate* on August 20.

The researchers found that both the decadal-scale warming over the tropical Pacific and North Atlantic are favorable for wetter conditions over Central Asia. During the positive phase of TPDV (warm tropical Pacific), the [sea surface temperature](#) (SST) anomalies over tropical Pacific can lead to more precipitation over Central Asia, especially the southern and southeastern region. The warm phase of AMV (warm North Atlantic) can excite a circumglobal teleconnection pattern and favors precipitation over Central Asia, especially the northern part.

They obtained these results based on the pacemaker experiments of two coupled models (CESM1.2 and MRI-ESM2-0). "Precipitation records are reliable after the 1950s over Central Asia. During the short period (~60years), it's hard to identify and isolate the contributions of TPDV and AMV as the SST-related signals in observation may be obscured by the other one," said Dr. Jiang Jie, first author of the study. "The pacemaker-coupled historical experiments restored observed SST anomalies in specific basins, which help to understand the remote impact of SST anomalies in Pacific or Atlantic."

Based on the observational TPDV and AMV indices, the researchers reconstructed the historical precipitation over Central Asia. "Different

phase combinations of TPDV and AMV can result in different precipitation conditions over Central Asia. Our findings provide implications for the near-term projection of [precipitation](#) over this region," said Jiang.

More information: Jie Jiang et al, Central Asian Precipitation Shaped by the Tropical Pacific Decadal Variability and the Atlantic Multidecadal Variability, *Journal of Climate* (2021). [DOI: 10.1175/JCLI-D-20-0905.1](https://doi.org/10.1175/JCLI-D-20-0905.1)

Provided by Chinese Academy of Sciences

Citation: Precipitation in Central Asia shaped by sea surface temperature over tropical Pacific and North Atlantic (2021, August 26) retrieved 6 February 2023 from <https://phys.org/news/2021-08-precipitation-central-asia-sea-surface.html>

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