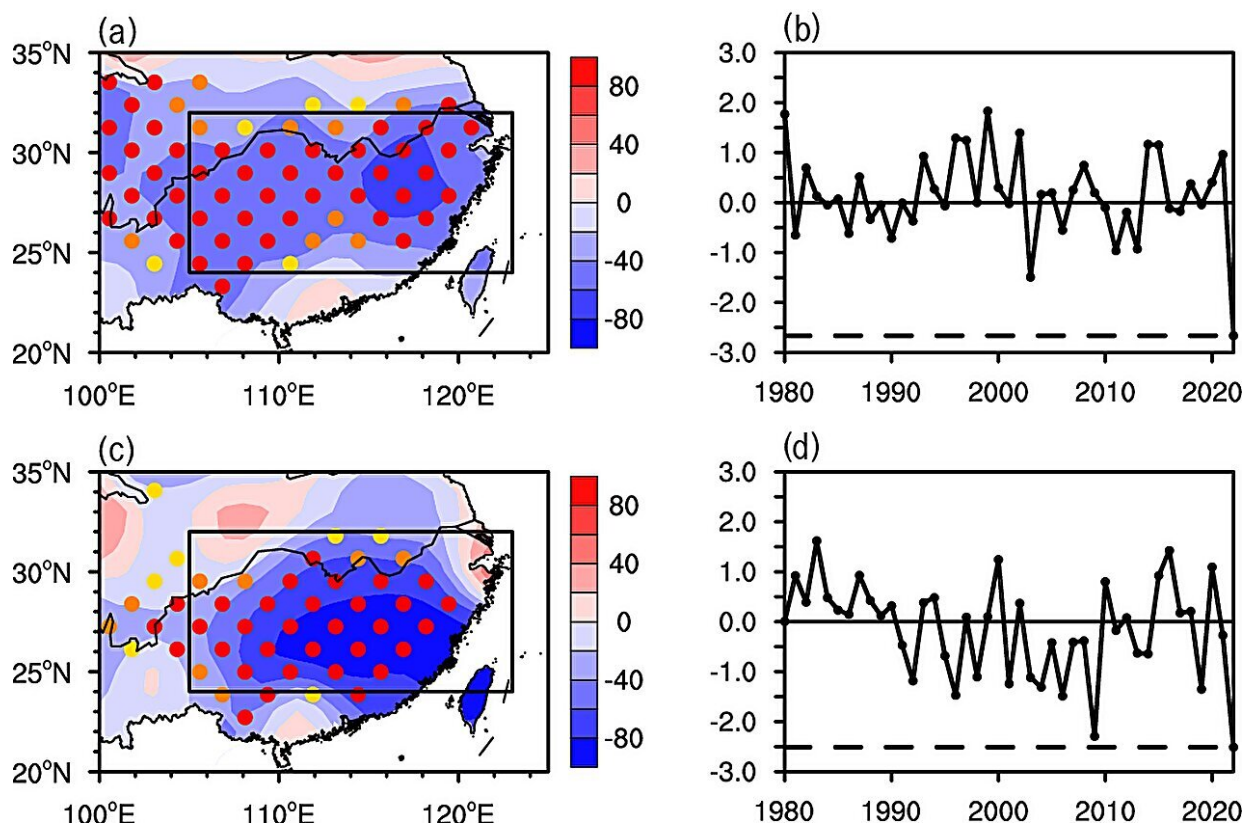


Record-breaking drought in southern China linked to Eurasian warming and tropical sea surface temperature

August 26 2024



Percentage anomalies of precipitation (% , relative to 1980–2010) during (a) July–August, (c) September–October, and (e) July–October in 2022, superimposed with red, orange, and yellow dots indicating extreme, severe, and moderate drought levels based on the SPEI, respectively. Rectangles indicate the southern China region. Time series of the area-averaged SPEI within southern China during (b) July–August, (d) September–October, and (f) July–October.

Dashed lines show the anomalies in 2022. Credit: Science China Press

Southern China experienced an extreme drought that persisted from summer to autumn in 2022, ranking as the most severe drought since 1980. The reason for the occurrence of this extreme drought event was investigated. It shows that both the Eurasian warming and the tropical sea surface temperature (SST) played key roles in the occurrence of this event.

The work is [published](#) in the journal *Science China Earth Sciences*.

The drought in southern China during the summer of 2022 was strongly linked to the divergence of water vapor flux and descending motions, which resulted from the anomalous anticyclone over the western North Pacific and the northward movement of the East Asian subtropical jet, respectively. In comparison, the sustained drought in autumn was mainly influenced by the cyclonic circulation anomaly over the region from the Bay of Bengal to the South China Sea, which led to decreased moisture and descending motions in southern China.

The rarely strong Eurasian warming and the extreme La Niña-like pattern jointly resulted in the western North Pacific anticyclonic circulation anomaly and the northward shift of the East Asian subtropical jet during summer, while the cyclonic circulation anomaly prevailing over the region from the Bay of Bengal to the South China Sea in autumn was largely attributed to the extremely negative SST anomalies in the tropical Indian Ocean.

The findings are expected to deepen the understanding of physical mechanisms underlying the persistent droughts and provide scientific basis for disaster prevention and mitigation, since Southern China has

suffered from frequent occurrences of droughts after entering into the 21st century.

More information: Yuepeng Hu et al, Record-breaking summer-autumn drought in southern China in 2022: Roles of tropical sea surface temperature and Eurasian warming, *Science China Earth Sciences* (2024). DOI: [10.1007/s11430-023-1242-8](https://doi.org/10.1007/s11430-023-1242-8)

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