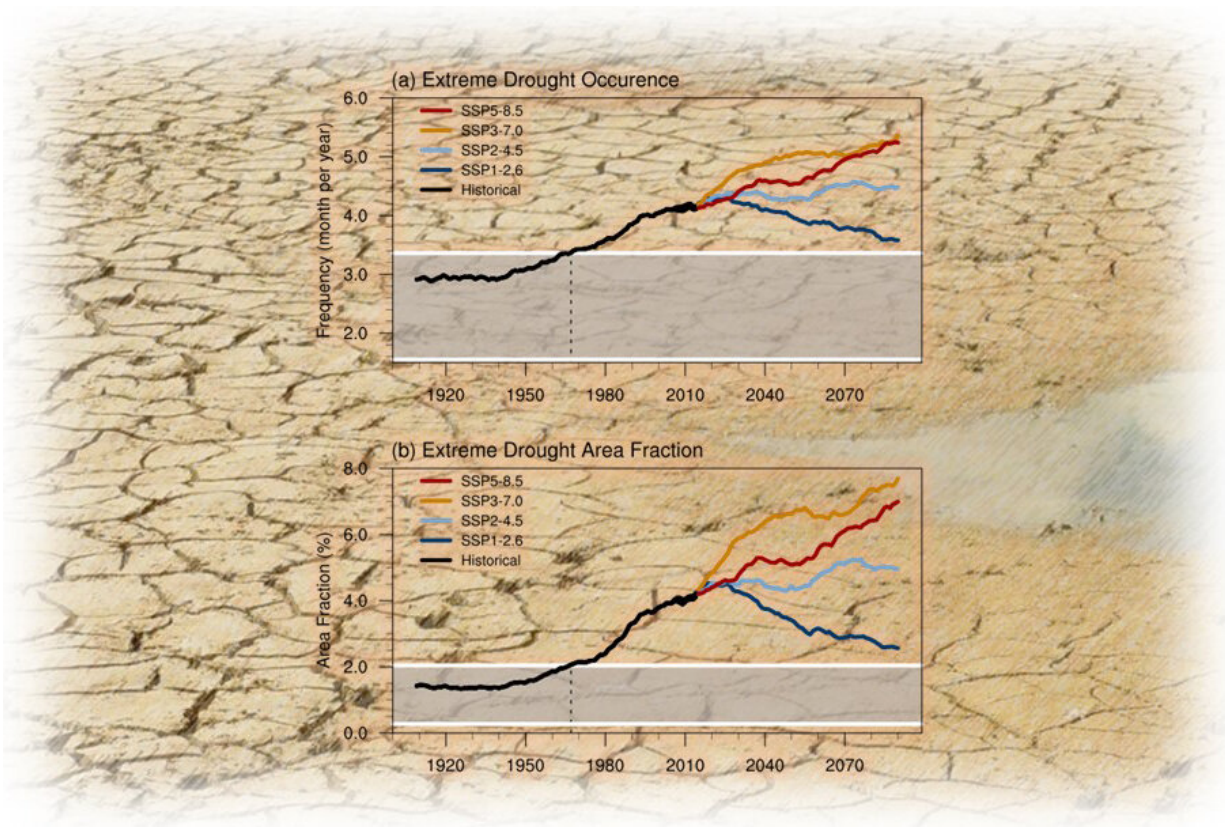


# Anthropogenic forcing increases drought risks in Southeast Asia

June 17 2021



Changes in extreme drought (a) occurrence (month year<sup>-1</sup>) and (b) affected area fraction (%) over the Southeast Asian monsoon region. Gray shadings denote the range of internal variability, and black vertical dash lines are the time of emergence (TOE). Credit: Zhang Lixia

The Southeast Asian monsoon region is located in warm and humid tropics. It is home to nearly 15% of the world's tropical forests and is one of the biodiversity hotspots in the world.

With unprecedented urbanization and population growth rate, water scarcity issues have already posed a serious challenge for [sustainable development](#) in the Southeast Asian monsoon region. However, the impact of anthropogenic forcing, such as [greenhouse gases](#) and [anthropogenic aerosols](#), on extreme drought events in the region is still unclear.

Scientists from the Institute of Atmospheric Physics (IAP) of the Chinese Academy of Sciences investigated the observed drought changes over the Southeast Asian monsoon region and the impacts of anthropogenic forcing using the Coupled Model Intercomparison Project phase 6 (CMIP6) models.

Their findings were published in *Geophysical Research Letters* on June 1.

They revealed an increasing drought risk from 1951 to 2018 due to more frequent and wide-spread droughts over the Southeast Asian monsoon region.

They also detected the influence of anthropogenic forcing, which has increased the likelihood of the extreme droughts in historical simulation by reducing precipitation and enhancing evapotranspiration.

The time of emergence (ToE) of anthropogenic forcing in extreme drought frequency and affected area first appeared around the 1960s. Even though drought risk will start to decrease in the 2030s under the lowest emission scenario of CMIP6, the projected drought risks are still beyond the changes caused by nature alone.

"The impact of anthropogenic forcing on drought risk over Southeast Asia has already exceeded internal climate variability in the late 20th century. It is urgent to take actions to reduce anthropogenic aerosol loading and [greenhouse gas emissions](#) to reduce drought risks in Southeast Asia," said Dr. Lixia Zhang, the lead author of the study.

**More information:** Lixia Zhang et al, Human Influence on the Increasing Drought Risk Over Southeast Asian Monsoon Region, *Geophysical Research Letters* (2021). [DOI: 10.1029/2021GL093777](https://doi.org/10.1029/2021GL093777)

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