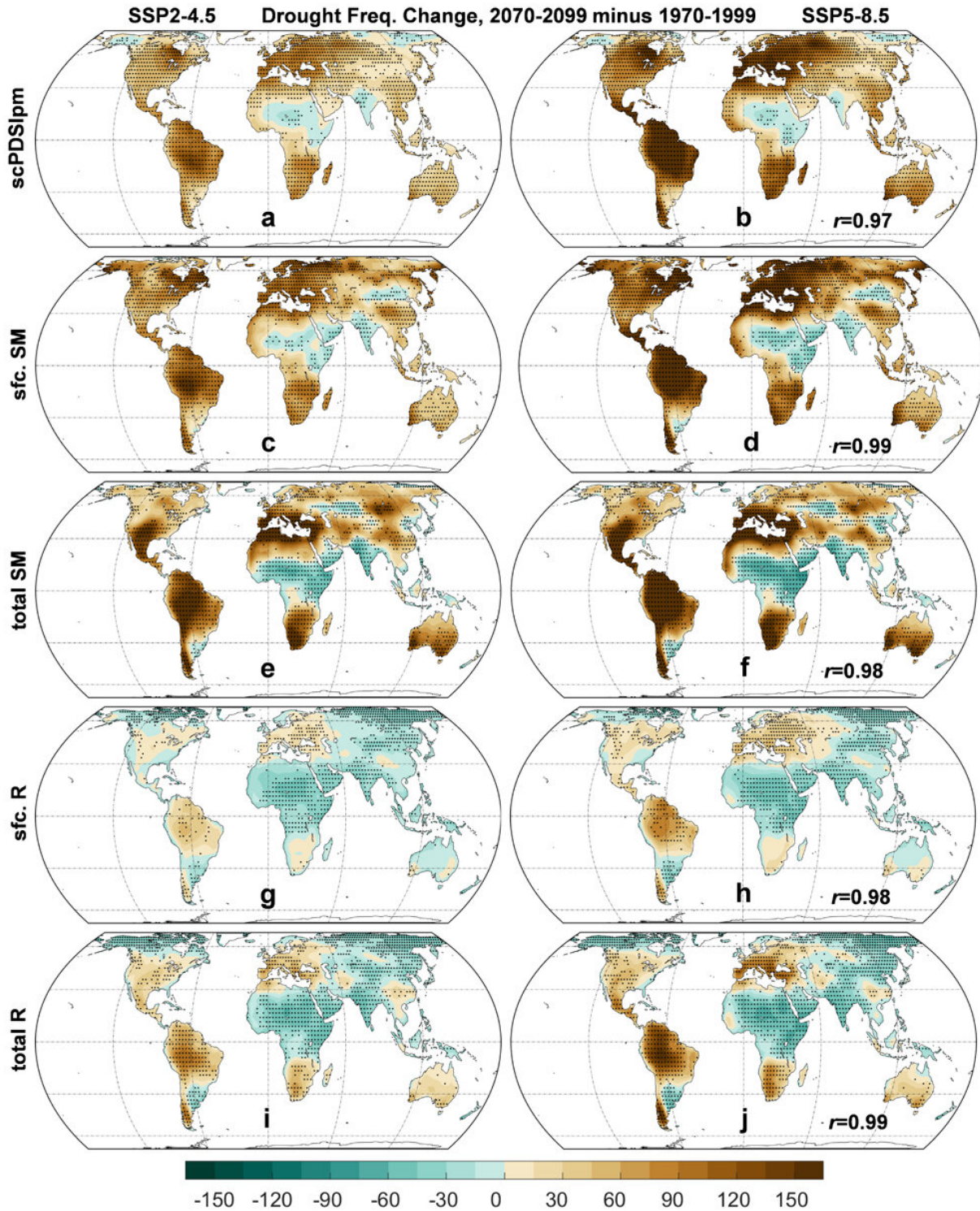


# Scientists warn of widespread drought in the 21st century

January 28 2022, by Li Yuan

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Frequency changes (%) of different drought metrics from 1970–99 to 2070–99 under the (left) SSP2-4.5 and (right) SSP5-8.5 scenarios projected by CMIP6

multimodel ensemble mean. Credit: IAP

Drought is among the most damaging natural hazards in the world, often causing severe losses to agriculture, ecosystems and human societies.

Historical records of precipitation, streamflow and observation-derived [drought](#) indices all show increased aridity since 1950s over several hotspot regions, including Africa, southern Europe, East Asia, eastern Australia, Northwest Canada, and southern Brazil.

"Climate model projections also suggest that drought may become more severe and widespread as the [greenhouse gas](#)-induced global warming continues in the 21st century," said Prof. Zhao Tianbao from the Institute of Atmospheric Physics (IAP) of the Chinese Academy of Sciences.

Recently, Zhao and Prof. Dai Aiguo from University at Albany, State University of New York, further investigated hydroclimatic and drought changes in the latest projections from 25 models of the Phase Six of the Coupled Model Intercomparison Project (CMIP6).

Their results were published in the *Journal of Climate* on Jan. 5.

The study suggests that the latest projections from CMIP6 models reaffirm the widespread drying and increases in agricultural drought by up to 200 percent over most of the Americas (including the Amazon), Europe and the Mediterranean region, southern Africa, Southeast Asia, and Australia under moderate-high emissions scenarios in the 21st century.

As if that wasn't bad enough, the drought is also expected to last longer

and spread wider in the late 21st century (2070–99), Zhao noted.

The model results suggest a decrease in the mean and flattening of the probability distribution functions of drought metrics, despite large uncertainties in individual projections partly due to internal variability.

"With rising temperatures, everywhere there's increasing demand of moisture from atmosphere, and precipitation decreases over many subtropical regions. These are the main driver of the projected widespread and increasing drought," said Zhao.

**More information:** CMIP6 Model-Projected Hydroclimatic and Drought Changes and Their Causes in the Twenty-First Century, *Journal of Climate* (2021). [DOI: 10.1175/JCLI-D-21-0442.1](https://doi.org/10.1175/JCLI-D-21-0442.1)

Provided by Chinese Academy of Sciences

Citation: Scientists warn of widespread drought in the 21st century (2022, January 28) retrieved 23 June 2024 from

<https://phys.org/news/2022-01-scientists-widespread-drought-21st-century.html>

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