Global precipitation variability decreased from 1940 to 2009

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One of the strongly held assumptions of climate change is that the variability of precipitation will grow with an increase in temperature. Storms will become heavier but less frequent. Flash floods and droughts will increase. Regions that see extensive rainfall will get even more while arid regions will dry out.

These projections stem from the way temperature affects precipitation patterns in global models. However, drawing on seven databases representing global monthly mean precipitation values, Sun et al.find that from 1940 to 2009 global overland precipitation variability actually decreased. In addition, they find that the changes in precipitation patterns that did occur led to a redistribution of rainfall such that on average wet areas and seasons got drier, and dry areas and seasons got wetter.

The authors' findings stem from a novel interpretation of existing precipitation databases that enabled them to separate the overall precipitation variability into temporal and spatial components. They find that, in agreement with previous research, some regions saw increases in the temporal variability of precipitation. These increases were offset by decreases in other regions and concurrent changes in spatial variability. They find that precipitation increased in mid and high latitudes but decreased near the equator and in the subtropics.

The authors suggest that although precipitation variability may increase with rising carbon dioxide, the overall decreasing trend is driven by the

effects of atmospheric aerosols. They suggest that aerosol emissions generally dampen precipitation variability in heavily emitting regions, leading to a net decline in global land precipitation variability over the study period.

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