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Anthropogenic aerosols and the weakening of the South Asian summer monsoon

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Observations show that South Asia underwent a widespread summertime drying during the second half of the 20th century, but it is unclear whether this trend was due to natural variations or human activities. Here we use a series of climate model experiments to investigate the South Asian monsoon response to natural and anthropogenic forcings. We find that the observed precipitation decrease can be attributed mainly to human-influenced aerosol emissions. The drying is a robust outcome of a slowdown of the tropical meridional overturning circulation, which compensates for the aerosol-induced energy imbalance between the northern and southern hemispheres. These results provide compelling evidence of the prominent role of aerosols in shaping regional climate change over South Asia.