

Relieved drought in China by 1.5°C global warming under a low emission scenario

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Drought is detrimental to both natural systems and human societies. It remains unclear how the drought activities may respond to a low warming target such as 1.5°C, which is set by the Paris Agreement to combat climate change. In this study, future changes of self-calibrating Palmer Drought Severity Index (scPDSI) in China are projected for the periods of 1.5°C global warming under two different scenarios based on outputs from Coupled Model Intercomparison Project phase 5 (CMIP5). For a high emission scenario, national average scPDSI decreases by 0.04 relative to present day, because warmer climate enhances evapotranspiration while changes in precipitation are too limited to compensate the water loss. On the contrary, for a low emission scenario, mean scPDSI increases by 0.20 with regional enhancement of 0.52 in the Southeast, where precipitation is projected to increase likely because of reductions in aerosols. Consequently, an associated control of both carbon and air pollution emissions helps retain the warming target globally and relieve drought risks regionally.