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RESOURCE

The implications of climate policy for the impacts of climate change on global water resources

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Description / Abstract

This paper assesses the implications of climate policy for exposure to water resources stresses. It compares a Reference scenario which leads to an increase in global mean temperature of 4°C by the end of the 21st century with a Mitigation scenario which stabilises greenhouse gas concentrations at around 450ppm CO2e and leads to a 2°C increase in 2100. Associated changes in river runoff are simulated using a global hydrological model, for four spatial patterns of change in temperature and rainfall. There is a considerable difference in hydrological change between these four patterns, but the percentages of change avoided at the global scale are relatively robust. By the 2050s, the Mitigation scenario typically avoids between 16 and 30% of the change in runoff under the Reference scenario, and by 2100 it avoids between 43 and 65%. Two different measures of exposure to water resources stress are calculated, based on resources per capita and the ratio of withdrawals to resources. Using the first measure, the Mitigation scenario avoids 8–17% of the impact in 2050 and 20–31% in 2100; with the second measure, the avoided impacts are 5–21% and 15–47% respectively. However, at the same time, the Mitigation scenario also reduces the positive impacts of climate change on water scarcity in other areas. The absolute numbers and locations of people affected by climate change and climate policy vary considerably between the four climate model patterns.

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