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Models agree on forced response pattern of precipitation and temperature extremes

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Model projections of heavy precipitation and temperature extremes include large uncertainties. We demonstrate that the disagreement between individual simulations primarily arises from internal variability, whereas models agree remarkably well on the forced signal, the change in the absence of internal variability. Agreement is high on the spatial pattern of the forced heavy precipitation response showing an intensification over most land regions, in particular Eurasia and North America. The forced response of heavy precipitation is even more robust than that of annual mean precipitation. Likewise, models agree on the forced response pattern of hot extremes showing the greatest intensification over mid-latitudinal land regions. Thus, confidence in the forced changes of temperature and precipitation extremes in response to a certain warming is high. Although in reality internal variability will be superimposed on that pattern, it is the forced response that determines the changes in temperature and precipitation extremes in a risk perspective.

Reference:

Fischer, E.M., J. Sedláček, E. Hawkins and R. Knutti, 2014: Models agree on forced response pattern of precipitation and temperature extremes, Geophys. Res. Lett., 10.1002/2014GL062018.