



Projected changes in extreme weather in Africa under global warming

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As changes in the climate system in response to changes in radiative forcing become increasingly evident, there is a clear need to investigate likely trends in mean and extreme levels of climate variables. The severe impacts of global warming will manifest through changes in the extremes. Developing countries are more susceptible to the severe impacts of e.g. droughts, floods and storms.

In this study we investigate the likely changes in extreme precipitation in Africa under global warming using output from objectively selected IPCC Fourth Assessment Report - developed climate models. A Bayesian approach to multi-model ensembling is applied. The model predictions are then fitted to a Generalised Pareto Distribution from which 10-year return levels are estimated for a selection of regions in Africa. The future to control climate ratio of the return levels is used to give an indication of possible changes in African precipitation extremes.

In much of equatorial regions, the wettest extremes are projected to become more intense, with the dry extremes becoming less severe. This is consistent with upward precipitation trends possibly associated with enhanced convection/atmospheric instability in the equatorial belt. In the subtropics such as the Sahel and much of Southern Africa, dry events become more severe in the future climate though the uncertainty is larger in the former area. In Northeast Africa, more interannual rainfall variability is implied by the increase in severity of both wet and dry extremes.