



Assessing regional and warming level dependent differences in climate impacts

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Differentiation between climate impacts at different levels of warming is of great relevance for scientists and policy makers. Knowledge of the consequences of different development and temperature pathways is essential to inform international climate negotiations and regional adaptation planning alike. At the same time, not only the warming dimension but also the regional dimension of changes in impacts is of interest, since regional changes might not be linearly related to global mean temperature increase. A detailed understanding of regionally differentiated impacts is an important basis on which to develop suitable coping strategies and adaptation options.

Here we present a framework that allows for a differentiation of regional changes in climate impacts at different levels of temperature increase. Based on data from the CMIP5 archive as well as output from the AgMIP project, we assess the climate impact projections for an increase in global mean surface air temperature of 1.5 and 2 °C above pre-industrial levels for the 26 regions used in the IPCC SREX report. We show results for several extreme event indices as well as projections of water availability and agricultural yields. Based on a method developed by Fischer et al. (2013), we are able to test for statistical significance of changes in climate impact projections between the different warming levels across the model ensemble.

References:

Fischer, E. M., Beyerle, U. & Knutti, R. Robust spatially aggregated projections of climate extremes. *Nature Climate Change* 3, 1033–1038 (2013).