



Allowable CO₂ emissions based on projected changes in regional extremes and related impacts

Sonia I. Seneviratne (1), Markus Donat (2,3), Andy Pitman (2,3), Reto Knutti (1), and Robert Wilby (4)

(1) ETH Zurich, Institute for Atmospheric and Climate Science, Zurich, Switzerland (sonia.seneviratne@ethz.ch, +41-(0)44-6331058), (2) ARC Centre of Excellence in Climate System Science, University of New South Wales, Sydney, Australia, (3) Climate Change Research Centre, University of New South Wales, Sydney, Australia, (4) Department of Geography, Loughborough University, Loughborough, UK

Global temperature targets, such as the widely accepted 2°C and 1.5° limits, may fail to communicate the urgency of reducing CO₂ emissions. Translation of CO₂ emissions into regional- and impact-related climate targets could be more powerful because they resonate better with national interests. We illustrate this approach using regional changes in extreme temperatures and precipitation. These scale robustly with global temperature across scenarios, and thus with cumulative CO₂ emissions. This is particularly relevant for changes in regional extreme temperatures on land, which are much greater than changes in the associated global mean. Linking cumulative CO₂ emission targets to regional consequences, such as changing climate extremes, would be of particular benefit for political decision making, both in the context of climate negotiations and adaptation.