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Determining optimum climate drivers for weather risk projections

Erik Chavez (1,2), Markus Kilian (3), Valerio Lucarini (3,4)

(1) Imperial Collage London, Centre for Environmental Policy, London, UK (erik.chavez07@imperial.ac.uk), (2) Imperial Collage London, Imperial Collage Business School, Finance Department, London, UK, (3) Meterological Institute, University of Hamburg, Germany, (4) Department of Mathematics and Statistics, University of Reading, Reading, UK

In spite of the exponential increase of available data, the uncertainties of projections of weather variability, especially at local scale, have not decreased. This poses important challenges for the design of weather risk management strategies in various vulnerable sectors such as energy or agricultural production.
This paper focuses on a two step methodology to enable projection of local weather risk in future climate scenarios. First, we focus on the optimum selection of drivers of regional weather patterns in order to project local weather variability risk estimates in future climate scenarios. This is carried out through the use of stochastic downscaling enabling conditional modelling of pixel-level distributions of weather variables as a function of inter-annual and inter-decadal climate variability drivers. Secondly, a statistical and physically-based climate model selection methodology is developed in order to produce a sub-ensemble of inter-annual and decadal variability drivers dataset that allows accurate and robust projection of weather variability.
The case study of South Eastern Africa will be used. Datasets retrieved from CMIP5 repository in three RCP scenarios (historical, 8.5 and 2.5) are used as well as observed historical weather data.