Geophysical Research Abstracts
Vol. 19, EGU2017-3345, 2017
EGU General Assembly 2017

Pattern scaling for impact models: can we refine the technique for high warming levels?

Craig Wallace and Timothy Osborn
UNIVERSITY OF EAST ANGLIA, SCHOOL OF ENVIRONMENTAL SCIENCES, NORWICH, United Kingdom (craig.wallace@uea.ac.uk)

Pattern scaling is a widely-used technique for the fast generation of global climate projections, derived from GCM simulations of the future climate, in order to drive climate impact models. The technique relies upon the diagnosis of variable-specific functions describing the relationship between the local (i.e. grid-cell) response and the global-mean air temperature change. The patterns can then be combined (scaled) with several time series of global-mean air temperature changes and, thus, produce an ensemble of future climate scenarios. Diagnosis of the scaling functions often pools GCM data from several emissions scenarios and so in the analyses presented here we test whether this practice is justified when producing pattern-scaled data for high-end global warming scenarios, or whether the pattern-scaled data is more accurate (in terms of replicating the actual GCM trajectory) if selective GCM scenarios that do not encapsulate high-end global warming are excluded from the calculations. We find that pattern-scaling performance is very good using patterns diagnosed from either pooled GCM scenarios or individual, selective scenarios, when generating projections up to $\sim$3ºC of global warming but that beyond this threshold patterns made from individual GCM scenarios appear to be more accurate. Quantifying such differences in performance is important if we are to retain confidence in the pattern-scaling:impact model chain when impact experiments are being conducted for high levels of global warming.