

Future projections of the Asian summer monsoon in the Stream-2 integrations of the EU-ENSEMBLES project

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A number of studies have inter-compared changes to the Asian summer monsoon under future projections of greenhouse gas concentrations in the CMIP3 multi-model dataset prepared for the IPCC Fourth Assessment Report. More recently, the EU-ENSEMBLES project has devised a series of coupled earth system model integrations (known as "stream-2") in which 20th century land-use changes are also taken into account. In this study we compare future projections of the Asian summer monsoon in the ENSEMBLES SRES A1B scenario (in which the increase in emissions is approximately consistent with real emissions growth) with 20th century integrations. Further, future changes are examined in the new "E1" stabilization scenario, devised such that anthropogenic radiative forcing is consistent with carbon dioxide equivalent concentrations of 450ppm beyond the end of the 21st century. This extreme mitigation scenario results in a global mean warming of 2 degrees above pre-industrial levels. We show changes to the mean monsoon and its interannual variability, as well as examining whether changes to extremes of monsoon rainfall can be entirely based on expectations from local surface temperature change and the Clausius-Clapeyron relationship.