3rd International Conference on Earth System Modelling
Vol. , 3ICESM-364, 2012
3rd International Conference on Earth System Modelling

Performance of both AR4 and AR5 IPCC models in Mexico

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This work presents the results derived from a series of metric analysis of the general circulation models (GCMs) used in both Fourth and Fifth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC). The purpose of this study is to quantitatively assess whether there were improvements in the performance of the models used in the Fifth Report in regard to those used in the Fourth Report. All statistical analyzes were restricted to a region covering Mexico. For the metric validation, both the monthly database from the Climate Research Unit (CRU) of the University of East Anglia and the Global Precipitation Climatology Center (GPCC) global rain gauge analysis dataset were used as the observed climate data for the period 1901-2009. The metrics were evaluated for air temperature and precipitation. Analyzes were performed for the whole region and for four sub-regions: northwest, northeast, south and southeast, covering all Mexico. The most outstanding result is the low performance of the models of both IPCC reports to correctly simulate the annual cycle of precipitation in southeastern Mexico. It is also evident the failure of AR4 and AR5 IPCC models to capture the observed trend in precipitation.