



Projections of drought for the 21st Century using representative concentrations pathways and CMIP5 data

J. Syktus (1,2) and K. Wong (1)

(1) Queensland Climate Change Centre of Excellence, Brisbane, Australia (jozefs@tpg.com.au), (2) University of Queensland, Brisbane, Australia

The new set of future climate simulations produced by the major international climate modelling groups has been made available as a part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). We use the CMIP5 data from the historical experiments and experiments using Representative Concentration Pathways (RCPs) to complete multi-model assessment of changes in metrological drought indices using the Standardized Precipitation Index (SPI).

The results of the analysis using historical simulations show a significant increase in the frequency of the extreme drought for many sub-tropical regions across the world during later part of 20th Century. Analysis of climate change simulations during the 21st Century show progressive increase in frequency of wet events in high-to mid latitudes and increased frequency of droughts over large parts of Australia, Africa, south-east Asia, southern Europe, the Middle East and Northern and Southern Americas. This presentation will explore relative contribution of different emission scenarios on the projected changes in droughts during the 21st Century. In particular a potential impact of greenhouse gases and anthropogenic aerosols will be explored. In addition we have completed analysis of joint distribution of precipitation and temperature changes using standardize precipitation and temperature index. Results of this analysis will be also presented.

The presentation will conclude by addressing the role of dynamical changes in atmospheric circulation as the main driver of increased aridity in these regions throughout the 21st Century.