

Statistical Downscaling of Projected Precipitation in Two Major Southeast Queensland Catchments

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Southeast Queensland has experienced a drying trend over the last 50 years and dam levels have reached critically low levels. The region is subject to significant natural climate variability making it difficult to attribute the drying trend to climate change or natural variability. Accurate rainfall projections would be useful for water resources managers of the region. Global climate model (GCM) resolution is unable to resolve rainfall on a local to regional scale and downscaling of this data can be employed to provide information on a regional scale. This study uses linear regression to correlate climatic predictors with precipitation at locations in the catchments of Upper Brisbane and Stanley, which feed into Wivenhoe and Somerset dams respectively. Australian Bureau of Meteorology monthly rainfall data from 1945 to 2000 are correlated with climate predictors from 19 Intergovernmental Panel on Climate Change GCM simulations for the 20th Century using stepwise regression in the statistical program “R”. These statistical models are then used to recreate monthly rainfall totals for the same period and a correlation coefficient is calculated to determine the level of skill of each. Initial results show that the simulations are able to track seasonal variations but are unable to detect extreme events which are often responsible for the significant increases in dam levels. A 150 year projection of future rainfall in the region has been made using a 720ppm emission scenario. Monthly rainfall at Crows Nest and Mount Brisbane showed a general decrease whilst Peachester showed an increase.