

Spatial Temporal Rainfall Trends in Australia

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Abstract : Rainfall is one of the most essential quantities in meteorology and hydrology. It has important impacts on people's daily life and excess or inadequate of it could bring tremendous losses in economy and cause fatalities. Population increase around the globe tends to have a corresponding increase in settlement and industrialization. Some countries are affected by flood and drought occasionally due to climate change, which disrupt most of the daily activities. Knowledge of trends in spatial and temporal rainfall variability and their physical explanations would be beneficial in climate change assessment and to determine erosivity. This study describes the spatial-temporal variability of daily rainfall in Australia and their corresponding long-term trend during 1950-2013. The spatial patterns were investigated by using exploratory factor analysis and the long term trend in rainfall time series were determined by linear regression, Mann-Kendall rank statistics and the Sen's slope test. The exploratory factor analysis explained most of the variations in the data and grouped Australia into eight distinct rainfall regions with different rainfall patterns. Significant increasing trends in annual rainfall were observed in the northern regions of Australia. However, the northeastern part was the wettest of all the eight rainfall regions.

Keywords : climate change, explanatory factor analysis, Mann-Kendall and Sen's slope test, rainfall.

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