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Climate variability and extreme rainfall events

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A number of studies have shown that the intensity of rainfall events will increase under the enhanced green house conditions, even in places where a decrease in the annual rainfall is predicted. As most of the studies used some form of downscaling or extrapolation techniques to obtain rainfall at point locations or catchments, it is important to verify this, or at least, to see whether this type of phenomenon occurs in the observed data. Daily rainfall data from 100 stations located in various parts of Australia were used to investigate the relationship between extreme rainfall and climate variability. A number of approaches were used to stratify the rainfall data. In the first approach, the rainfall data were classified into tercile groups based on the annual rainfall. In the second, rainfall data were grouped into "flood-dominated" regimes and "drought dominated" regimes. The third approached is based on the ENSO and the fourth based on Interdecadal Pacific Oscillation. The annual maximum rainfall for the different regimes were analysed to determine the influence of climate variability on the magnitude of the extreme rainfalls. Generalised extreme value distribution was fitted to annual maximum daily rainfall series to determine the rainfall with return periods of 50 to 100 years. The results of this analysis will be presented.