Total wet season (September to April) precipitation at Darwin has increased over the past 50 years by approximately 6mm per year. An important question arises as to whether this is due to changes in the intensity of precipitation events, or changes in the atmospheric circulation and therefore the type or frequency of precipitation event.

In a previous study, the variability of the North Australian wet season has been described in terms of 5 distinct regimes, with associated distinct circulation patterns. Inter-annual variability and trends in the frequency of occurrence of each regime, as well as the within regime precipitation have been investigated to try to explain the trend in Darwin precipitation.

The driest regimes show a decrease in the relative frequency of occurrence, while the wettest regimes show an increase in RFO over the period. There are no significant trends in the within regime precipitation, suggesting that the trend in Darwin precipitation is due to circulation changes. The wet regimes occur more often near the beginning and end of the wet season, rather than during the typical monsoon season of December to February. Possible reasons for the circulation changes and controls on the large inter-annual variability of the “Deep West” monsoon regime are investigated.