



South Eastern Australian Climate initiative

MEDIA RELEASE

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South Eastern Australian Climate Initiative - Historical Review

The dry conditions experienced during the past decade in the Murray-Darling Basin are not unprecedented in historical record, according to Drs Brad Murphy and Bertrand Timbal from the Bureau of Meteorology.

In a review conducted as part of the South Eastern Australian Climate Initiative, the scientists found the driest period on record in terms of rainfall was from 1936 to 1945, while the earlier period from 1900 to 1909, including part of the so-called Federation drought, was nearly as dry as the past decade.

Although not the driest period, the past decade is the worst on record in terms of water run-off. In a paper submitted to the *International Journal of Climate* (Murphy and Timbal, 2007) Dr Murphy says the impact of the current dry period has been exacerbated by three factors –

- higher air temperatures due to on-going global warming;
- lowest on record year-to-year variability in rainfall, indeed there has not been a single year of markedly above average rainfall since 1996;
- the recent decline has mainly occurred in autumn/early winter.

These three factors are believed to have magnified the effect of reduced rainfall on water availability.

The scientists evaluated 100 years of data in the research, developing high quality data sets for the Murray-Darling Basin for temperature, rainfall, evaporation and humidity.

Features of their assessment were –

- 2006 was the third driest year since 1900.
- April 2005 was the warmest April in the record.
- Changes are occurring mainly in autumn, with colder nights, fewer clouds and drier soil. This pattern is consistent across the whole region.
- Rainfall intensity during storm events is less, especially in Victoria.
- Warming has been faster since about 1975.
- There have been fewer cold fronts and low pressure systems bringing rain.

In a separate review, Drs Murphy and Timbal analysed the impact of well-known large-scale features of variation on regional climate. The features considered were –

- the El Nino Southern Oscillation (ENSO) using a region in the Western Pacific known to be related to Australian rainfall
- a similar phenomenon in the Indian Ocean called the Indian Ocean Dipole
- sea surface temperatures in the Tasman Sea
- the Southern Annular Mode whose influence on the climate of Southern Australian has been shown by Bureau and CSIRO researchers.

Each of these features was evaluated for its seasonal influence on rainfall with and without the direct relationship between atmospheric pressure and rainfall.

“From these relationships observed between south eastern Australia climate and these large-scale features of influence, it is hard to explain the step change of rainfall which has occurred in autumn.

“At this stage it appears that the rainfall decline can only be explained as part of a response to an increase in atmospheric pressure.

“What causes that pressure increase is not yet known but it appears to be strongest in the south-west of the south eastern Australian region.

“This suggests the possibility that the warming of the tropical central Pacific Ocean in line with global ocean warming together with the increasing atmospheric pressure over South east Australia have contributed to the observed autumn rainfall decline,” they reported.

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