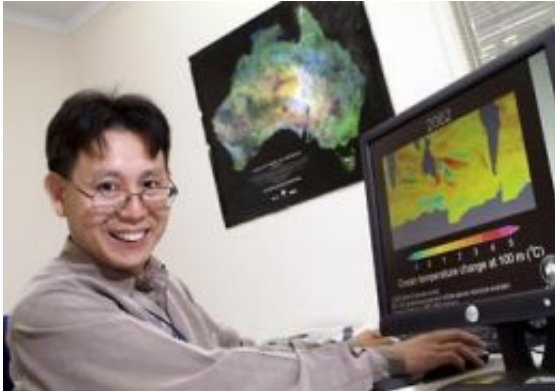


Australian rainfall – a view of the future

4 October 2007



Dr Wenju Cai.

Southern Australia will continue to experience a reduction in rainfall in winter and spring, the impact of which will be magnified by increased temperatures.

Speaking at Greenhouse 2007, CSIRO's Dr Wenju Cai said the latest modelling by the Intergovernmental Panel on Climate Change (IPCC) showed a 5 to 15 per cent rainfall decrease by 2070.

"There is no longer any doubt that climate change caused by increases in greenhouse gases is influencing seasonal shifts in rainfall patterns," Dr Cai said.

"Our results provide strong evidence that rising temperatures, hence increasing evaporation due to the enhanced greenhouse effect, impact on Australia's water resources, in addition to any reduction in rainfall."

What could partially offset this is an increase in summer rainfall in south east Australia, as simulated by some IPCC models. This increase is consistent with a large Tasman Sea warming where the ocean warming rate is the fastest in the Southern Hemisphere.

Dr Cai said climate models also indicate that about half of the rainfall decline in south west Western Australia can be directly linked to increases in atmospheric greenhouse gas levels. He said there are also likely to be further declines in rainfall in north west Western Australia in the future.

He said rainfall shifts and seasonal variability in the Australian region had three engines:

the El Niño-Southern Oscillation phenomenon in the Pacific Ocean
 a similar feature in the Indian Ocean known as the Indian Ocean Dipole
 the Southern Annular Mode, a pattern in the Southern Ocean that promotes air flows towards south east Australia.

"I see two important challenges for Australian scientists in this research field, the first being the realistic simulation of the drivers linking ocean and atmospheric conditions and seasonal rainfall," Dr Cai said.

"The second is the development of more powerful models that will narrow the uncertainties of climate modelling and develop more specific projections for separate regions and centres within Australia."

Dr Cai is a lead author and co-author on several recent papers examining the links between a changing climate and rainfall. His work is supported by the Australian Greenhouse Office, the Indian Ocean Climate Initiative, South East Australia Climate Initiative and two CSIRO national research flagship programs – Wealth from Oceans and Water for a Healthy Country.

His latest paper An interpretation of future projections of Australian summer and winter rainfall co-authored with G. Shi, J. Ribbe and T. Cowan has been accepted for publication in the science journal, *Geophysical Research Letters*.

Source: CSIRO

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