

# +4C scenarios for Australia's future climate

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A 4°C rise in average annual temperatures is predicted to have major impacts on Australian agriculture.

(PhysOrg.com) -- The impacts on Australia of a 4 C increase in average annual temperatures – including major reductions in annual rainfall in southern Australia, marked increases in evaporation nationwide and reduced snow cover in alpine regions – were presented today by CSIRO's Dr Penny Whetton at the Four Degrees climate change conference in Melbourne.

A CSIRO [Climate](#) Adaptation Flagship climate researcher, Dr Whetton said that, compared to annual average temperatures recorded in 1850, a 4°C warming might occur by the end of this century if greenhouse gas emissions stay high.

"Rapid global warming of 4 C would be unlike anything experienced before by modern human societies – presenting us with huge challenges

in terms of our ability to adapt," Dr Whetton said

She said according to a review of recent climate models by CSIRO and Melbourne University, Australian climate changes at 4°C or more of global warming include:

- [Temperature](#) increases of about 3 C to 5 C in coastal areas and 4 C to 6 C in inland areas
- Likely declines of annual rainfall in southern Australia, particularly in winter, of up to about 50% but uncertain rainfall changes in other regions
- Marked increases of potential evaporation of about 5% to 20%
- More droughts in southern [Australia](#)
- Snow cover duration falling to zero in most alpine regions.

The joint paper presents figures for Australian capital cities and regional centres centred on current climate and the impact of combined temperature and rainfall change. Since records began in 1910, the average temperature has risen nearly 1.0 °C.

"It is important to note that although some climate change is inevitable, changes of the magnitude described here are still avoidable as long as we are able to significantly reduce global greenhouse emissions," Dr Whetton said.

She said the projections are based primarily on the Australian regional results from up to 23 global climate models. Projected changes to extreme events in the Australian region are described in a companion paper (Braganza et al., 2011) also to be presented at Four Degrees or More?

CSIRO produced national climate projections in 1990, 1992, 1996 and

2001 and, jointly with the Bureau of Meteorology (BoM), in 2007. The next set of national climate projections are planned for release in 2014, representing a significant climate science milestone timed to follow the next global assessment by the Intergovernmental Panel on [Climate Change](#) (IPCC).

"In three years, Australians will have the latest climate projections for the 21st Century for a range of factors including; sea levels, seasonal-average temperatures, rainfall, as well as extreme weather events such as heatwaves, fires, droughts, floods, and cyclones," Dr Whetton said.

"Our research will only be of value if it is clearly communicated and then rigorously applied in formulating adaptation strategies."

Dr Whetton's presentation was based on a paper co-authored by CSIRO and University of Melbourne scientists: David Karoly, Ian Watterson, Leanne Webb, Frank Drost, Dewi Kirono, and Kathleen McInnes.

Provided by CSIRO

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