

Fewer rain storms across southern Australia

July 4 2011



The frequency of storms over southern Australia is forecast to continue to fall. (CSIRO)

(PhysOrg.com) -- Decreasing autumn and winter rainfall over southern Australia has been attributed to a 50-year decrease in the average intensity of storms in the region – a trend which is forecast to continue for another 50 years.

In an address today to the International Union of Geodesy and Geophysics conference in Melbourne, CSIRO climate scientist, Dr Jorgen Frederiksen, said these changes are due to reductions in the

strength of the mid-latitude jet stream and changes in atmospheric temperatures. The jet stream comprises fast moving westerly winds in the upper atmosphere. "The drop in winter and autumn [rainfall](#) observed across southern Australia is due to a large downturn in the intensity of storm formations over at least the last three decades compared with the previous three decades, and these effects have become more pronounced with time," Dr Frederiksen said.

"Our recent work on climate model projections suggests a continuation of these trends over the next 50 years."

Dr Frederiksen's address was based on recent CSIRO and Bureau of Meteorology research that has just been published in the *International Journal of Climate Change: Impacts and Responses*.

The research, based on observations and climate modelling, centres on the changes in southern Australian winter rainfall linked to atmospheric circulation changes that are directly associated with storm formation, and particularly rain bearing lows and frontal systems crossing southern Australia.

The most important circulation feature associated with winter storm formation is the strength of the sub-tropical jet stream. For example, winter storms give south-west Western Australia much of its rain. Between the 20-year periods 1949 to 1968 and 1975 to 1994 south-west WA rainfall reduced by 20 per cent. In south-east Australia, there were reductions of 10 per cent.

"Our research has identified the historic relationship between the reduction in the intensity of storms, the southward shift in storm tracks, changing atmospheric temperatures and reductions in mid-latitude vertical wind shear affecting rainfall." Vertical wind shear is the change in the westerly winds with height.

"We expect a continuation of these trends as atmospheric temperatures rise based on projections from climate models forced by increasing carbon dioxide concentrations.

"Trends during the 21st Century are likely to be similar to those observed during the second half of the 20th Century, when we saw substantial declines in seasonal rainfall across parts of southern Australia.

"Indeed, reductions in projected southern Australian rainfall during the 21st Century, particularly over south-west WA, may be as much as, or larger than, those seen in recent decades," Dr Frederiksen said.

Provided by CSIRO

Citation: Fewer rain storms across southern Australia (2011, July 4) retrieved 9 April 2024 from <https://phys.org/news/2011-07-storms-southern-australia.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--