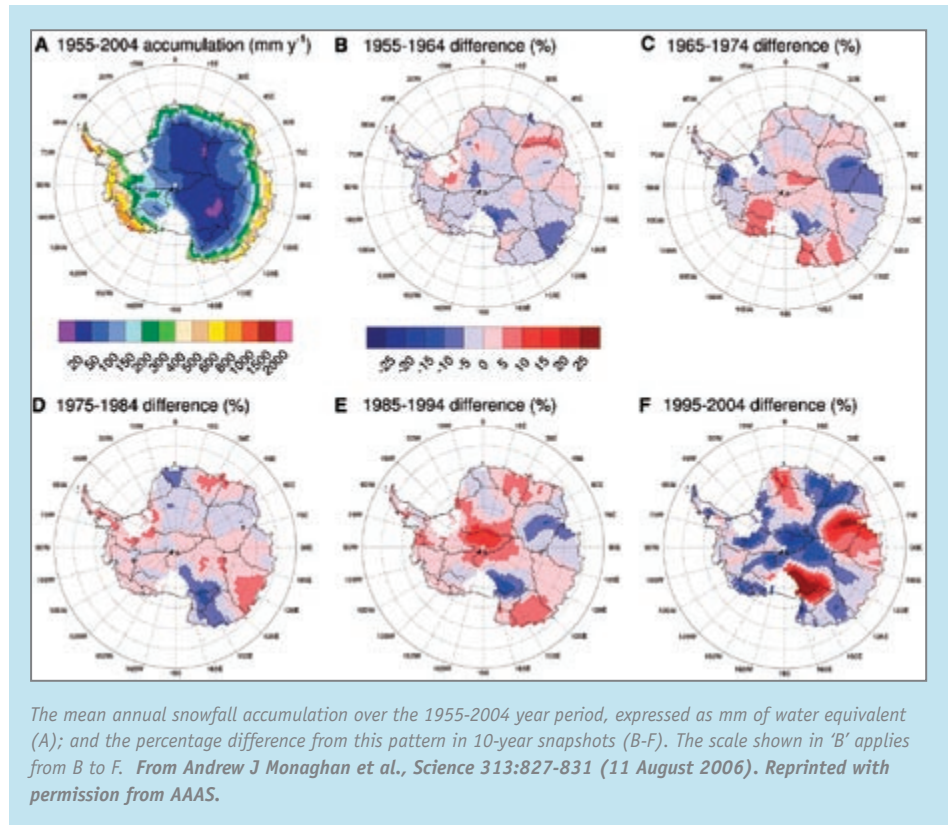


SEA LEVELS RISE AS ANTARCTIC SNOW FALLS SHORT

Global climate models have predicted that Antarctic snowfall should increase in a warming climate – as warmer air can hold more moisture – partially offsetting sea level rise caused by the melting and calving of ice along the coast. However, new research published in *Science*, shows that snowfall in Antarctica has changed little in the past 50 years, despite changes in climate.



The research, conducted by an international team of 16 scientists including Tas van Ommen and Vin Morgan of the Australian Government Antarctic Division and the Antarctic Climate and Ecosystems Cooperative Research Centre, reconstructed the past 50 years of snowfall accumulation over Antarctica, using model simulations, satellite and meteorological data and ice cores.

The results showed that although snowfall is highly variable across Antarctica, and through time, there has been little overall change since the 1950s.

'We found that snowfall was quite variable, with yearly fluctuations equivalent to ± 20 mm of water averaged across the continent, which could easily mask underlying trends in the short term,' Dr van Ommen said.

'So we extended the snowfall record back to the International Geophysical Year (1957-58), using snow and ice accumulation data, mainly from ice cores.'

The extended record was reconstructed at 16 sites across the continent, providing a map of regional snowfall variations for the last 50 years. This allowed the researchers to assess trends

over a longer term, compare snowfall with the temperature record over the same period, and develop a 50-year benchmark for evaluating global climate models.

The study looked at both the West Antarctic Ice Sheet, which has been thinning over the past decade and contributing to global sea level rise by 0.13 to 0.16 mm per year, and the East Antarctic Ice Sheet, whose thickness is reported to be increasing.

'We found regions of both positive and negative change in all five decades, but no continental-scale changes in either direction dominated any period,' Dr van Ommen said.

'In contrast, satellite measurements showed that the ice sheet is growing in places and thinning in others, but such results give only a short-term snapshot of a much longer, slower drama.

'Ongoing ice core studies by many national programmes, including Australia, as well as radar studies that track ice layers beneath the surface, will provide more complete coverage and longer records that can be used to extend this work beyond 50 years.'

The absence of increased snowfall in the last 50 years, despite atmospheric warming, means that sea level rise has not been mitigated by increasing precipitation. For future projections of sea level it is important to understand why this is so and if this pattern will continue.

More information

A. Monaghan, D. Bromwich, R. Fogt *et al* (2006). Insignificant change in Antarctic snowfall since the International Geophysical Year. *Science* Vol 313, no. 5788 pp 827-831.

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