

## FACT SHEET

7 February 2011

# Cyclones and climate change

“All across the world, in every kind of environment and region known to man, increasingly dangerous weather patterns and devastating storms are abruptly putting an end to the long-running debate over whether or not climate change is real. Not only is it real, it's here, and its effects are giving rise to a frighteningly new global phenomenon: the man-made natural disaster.”

– Barack Obama, speech, 3 April 2006

While no individual weather event can be directly attributed to climate change alone, increases in the frequency and severity of extreme weather events is exactly what climate scientists have predicted for decades.

### What the scientists say

Don White, Weatherwatch chief executive:

“We've had La Ninas before and the bad ones normally come about every 25 or so years, but everything has been aggravated by global warming... Ocean temperatures are warmer now than they have been at any time in the last century – that's why these massive weather events have come about.”

Ref: La Nina means there's more to come, The Australian, 4 February 2011

Chris Ryan, director of the Bureau of Meteorology's National Meteorological and Oceanographic Centre:

“Of course climate change is a long term thing and the weather fluctuates on short time frames. We've had severe tropical cyclones before, but the severity and the frequency of the weather that we've been experiencing this summer is in line with what you would expect if the atmosphere was warming and that extra energy was being provided to the atmosphere. It's the frequency overall with which these things happen and the frequency of really intense systems is what we need to look at and this matches those expectations.”

Ref: ABC radio, The World Today, 3 February 2011

The United Nations' Intergovernmental Panel on Climate Change says the following about tropical cyclones:

“There is observational evidence for an increase in intense tropical cyclone activity in the North Atlantic since about 1970, correlated with increases of tropical sea surface

temperatures. There are also suggestions of increased intense tropical cyclone activity in some other regions where concerns over data quality are greater. Multidecadal variability and the quality of the tropical cyclone records prior to routine satellite observations in about 1970 complicate the detection of long-term trends in tropical cyclone activity. There is no clear trend in the annual numbers of tropical cyclones.”

Ref: IPCC AR4 (2007a) summary

In Australia there appears to be a trend towards more intense tropical cyclones, with the proportion of tropical cyclones rated as ‘severe’ increasing from 29 per cent in the period 1974–1988 to 41 per cent in the period 1989–1998.<sup>1</sup>

This trend is consistent with projected changes in cyclone activity with climate change, as documented in a scientific paper published in the journal *Nature Geoscience*:

“projections based on theory and high-resolution dynamical models consistently indicate that greenhouse warming will cause the globally averaged intensity of tropical cyclones to shift towards stronger storms, with intensity increases of 2–11 per cent by 2100.”

Ref: [Nature Geoscience](#), 2010 ‘Tropical cyclones and climate change’

The same says rainfall from cyclones is projected to increase in the order of 20 per cent within 100 kilometres of the storm centre.

## Modelling

Three recent studies of projections for changes in tropical cyclone activity for the Australian region all found a marked increase in the category 3 to category 5 storms. CSIRO modelling showed a possible increase in the intensity of the most extreme storms of 60 per cent by 2030 and 140 per cent by 2070.<sup>2</sup> The CSIRO modelling supports the likelihood of more intense tropical cyclone activity, but not necessarily more frequent cyclones:

“Australian region studies indicate a likely increase in the proportion of the tropical cyclones in the more intense categories, but a possible decrease in the total number of cyclones”

Ref: CSIRO, [Climate Change in Australia](#) Technical report, 2007 p102

## Insurance

Re-insurer Swiss Re has warned Australia is becoming a riskier place to do business after a string of extreme natural disasters over the past two years.

Ref: Extreme weather is just the beginning: Garnaut, *The Age*, 4 February 2011

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<sup>1</sup> CSIRO; [Climate Change in Australia](#) Technical report, 2007 p 23

<sup>2</sup> CSIRO; [Climate Change in Australia](#) Technical report, 2007 p 103