

February 3 , 2007: AusSMC Briefing

IPCC AR4 “Climate Change 2007: The Physical Science Basis” – an Australian perspective

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Bio Note

Michael Coughlan was born in Melbourne and received his professional education from The Royal Melbourne Institute of Technology, Reading University (United Kingdom) and Monash University, Melbourne.

He began his career in 1965, working as an aviation and public weather forecaster in the Australian Bureau of Meteorology, with tours of duty in Darwin and Perth, Australia, and for a short time with the UK Meteorological Office in London, England. He has lectured to trainee meteorological technicians and meteorologists in the Bureau of Meteorology, and to undergraduates at Monash University.

He began his association with climate in the Research Branch of the Bureau of Meteorology in 1975. As part of a major reorganisation of the Bureau in 1984 he helped formulate the structure of the National Climate Centre and subsequently took up the position of Supervisor of the Climate Analysis Section and acted for extended periods as Head of the Centre.

In 1990 he was seconded to the NOAA Office of Global Programmes in Washington DC, and remained there for five years as Programme Manager for GEWEX Programmes, including the Mississippi River Basin Project. In 1995 he was appointed founding Director of the International CLIVAR Project Office in Hamburg, Germany and in 1997 joined the Secretariat of the World Meteorological Organization as Director of the World Climate Programme Department. In April 2000, he assumed responsibility for coordinating all climate activities within the WMO Secretariat.

In January 2003 he returned to the Bureau of Meteorology and took up his current position as Head of the National Climate Centre.

Mike Coughlan is a review editor for the chapter on Australia and New Zealand, which forms part of the IPCC Working Group II Report to be released in early April.

Abstract

What does the SPM say about observed Climate Change?

The IPCC Working Group I, Summary for Policy makers (SPM) for the Fourth Assessment Report (AR4) reemphasis the marked increase in greenhouse gas concentrations that have occurred in the earth’s atmosphere over the last 100 years or so – notably in carbon dioxide, methane and nitrous oxide. Concentrations in these greenhouse gases now far exceed any values that have occurred during the past 10,000 years.

The report concludes unequivocally that there has been significant warming of near surface temperatures over the past 50 years averaged over all continents except Antarctica – i.e. including over Australia. Temperatures have also generally increased over the oceans. Discrepancies that appeared evident between surface based measurements of temperatures and temperatures measured from satellites have been resolved. Associated with the observed changes in recorded temperatures there have been general decreases in the numbers of cold nights and frosts, along with increases in the numbers of hot days over most land masses. Records of such changes over Australia are generally consistent with the global trends.

The SPM also points to systematic changes in atmospheric circulation, including changes in storm tracks, winds and rainfall patterns in both hemispheres, and aspects of extreme weather. It notes that global sea level has continued to rise at the same time that so-called permanent snow and ice cover has been in retreat. There have been varying trends in rainfall, with some areas becoming markedly drier and other areas markedly wetter. Again Australia demonstrates evidence for both shifts having occurred over the past 50 years, with declines in rainfall over southern and eastern parts of the continent and increases in rainfall across the north, especially the northwest.

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