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CLIMATE PROJECTIONS

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KEY MESSAGES:

- Warming of the climate system over the past century is beyond doubt, and it is partly due to anthropogenic increases in atmospheric concentrations of greenhouse gases.
- Since 1950, Australia has become warmer, with less rainfall in the south and east, and more rainfall in the north-west.
- Further global warming and climate change is expected due to projected increases in greenhouse gases.
- Australia is likely to become warmer and drier in the future.
- Small changes in average climate can have large effects on extreme weather events.
- Extremely hot years and days are likely to occur more often, with fewer frosts, more heavy rainfall in summer and autumn, less heavy rainfall in winter and spring in the south, more droughts, more fires, more intense tropical cyclones, less hail in the south and more hail along the east coast.

Introduction

Warming of the climate system over the past century is beyond doubt, and it is partly due to increases in greenhouse gases (IPCC 2007a). Further climate change is expected due to projected increases in greenhouse gases (IPCC 2007a). The consequences of such climate change will vary across regions and sectors (IPCC 2007b). While global warming can be slowed through large reductions in greenhouse gas emissions, some warming is unavoidable and adaptation will be needed to reduce damages and take advantage of opportunities (IPCC 2007b). A key part of planning for climate change is having access to reliable and relevant regional projections of climate change.

This chapter summarises the latest information about the climate change that has been observed in Australia since the early 20th century and its attribution to natural and anthropogenic causes. In addition, this chapter presents projections of global climate change over the 21st century as well as regional projections for Australia. This information is based on international climate change research, including conclusions and data from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), and builds on a large body of climate research that has been undertaken for Australia in recent years. More detail is available in a technical report (CSIRO and Australian Bureau of Meteorology 2007).

Observed climate variability and change

Internal and external factors drive climate variability on a range of timescales. Internal factors are natural in origin and arise from complex interactions within the climate system, such as the