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WATER RESOURCES

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KEY MESSAGES:

- Recent climate change in southern and eastern Australia has resulted in catchment yields as low as the worst-case model projections for 2030 to 2050. These changes have not always been gradual: step changes in rainfall and streamflow were observed in south-western Australia in the mid 1970s and in southern and eastern Australia in 1997, shifting many water systems beyond their historical operating limits.
- Changes in some climate processes linked to rainfall decreases have been attributed to anthropogenic climate change, as have warming temperatures over most of Australia. Natural climate variability may also be contributing to recently observed rainfall changes.
- The use of historical climate to construct the likely range of operating conditions for water resource management and to provide a baseline from which to measure potential future change is no longer sufficient. A 'whole of climate' approach to operational and strategic decision-making is recommended, combining the analysis of past and recent climate with model projections of future change.
- For eastern and southern Australia, the use of a 'whole of climate' approach recognises that the observed decreased rainfall occurring over the past decade is a significant and persistent departure. A 'new normal' or operating baseline for rainfall for this area is required. Most of Australia is projected to warm at a rate of 0.2°C or more per decade for the next few decades. Rainfall over southern Australia is projected as very likely to decrease in future, so further declines may be anticipated in line with continued global warming. Changes in other regions are less clear.
- The challenge for agriculture is to continue to improve its productivity during a period of historically unprecedented low water supply. Continuing water shortages over the southern and eastern parts of the continent can be anticipated.
- Agriculture in Australia will also need to play its part in the water reform process by aiming to achieve sustainable management during a period of resource constraint and increased competition between water users.

Introduction

Australian agriculture has been largely successful in coping with some of the highest moisture variability in the world, which affects rainfall, soil moisture, stream water, stored water and groundwater. However, measures that have coped effectively with historical climate are being tested by recent climate change, and will be tested further by changes to come.

Until recently, climate change was thought of as tomorrow's problem rather than today's. Recent changes to rainfall and temperature over much of southern and eastern Australia have moved many river systems beyond their historical climate