



# Managing Climate Variability Program

Helping Australia manage climate risk

Better seasonal forecasts

Accessible climate knowledge and tools

For farmers and natural resource managers

# The evolution of MCV

Australia is the world's driest inhabited continent and has the most variable climate. It is a land of extremes—of droughts and flooding rains.

The consequences of climate variability can be severe. The 2002–03 drought devastated many farmers and land and water resources. Climate change is expected to have an increasing impact on Australia's agriculture and natural resources.

Research and development can increase the resilience of rural communities by building their capacity to both cope with adverse seasonal conditions and take advantage of favourable conditions. Resilient communities will be better prepared for any impacts of climate change.

The Managing Climate Variability Program (MCV) was created to increase Australia's capacity to capture opportunities and manage risks related to climate variability.



Building on more than a decade of research by its predecessor, the Climate Variability in Agriculture Program (CVAP), MCV focuses explicitly on agriculture and natural resources management.

A major indicator of success will be an increase in the number of farmers and natural resource managers who factor seasonal climate forecasts into their management decisions.

Specifically, MCV is focusing on improving how we manage climate risk by developing and applying seasonal climate forecasting for improved decision making.

Seasonal climate forecasting currently relies heavily on statistical techniques. As the science progresses, these will gradually be superseded by more sophisticated techniques that incorporate the impacts of climate change. Communicating this new generation of forecasting techniques is also a major future challenge for MCV.

The current phase of MCV runs from July 2003 to June 2007, with planning already underway for a new phase.





# MCV objectives

The current phase of MCV has three objectives:

## 1. To improve seasonal forecasting – accuracy, lead-time, and ease of use

Our highest priority objective is to improve the accuracy and increase the lead-time of seasonal forecasts. Three-month forecasts of rainfall and temperature are widely available, but most resource managers need lead-times of 12 months and beyond.

## 2. To provide tools and services for managing climate risk

Building on research into improved seasonal forecasting, MCV is developing tools and services that help farmers and natural resource managers to better manage climate risks.

## 3. To increase adoption of climate risk management

The success of MCV ultimately depends on farmers and natural resource managers adopting improved climate risk management.

## Paying a premium in the face of climate uncertainty

Mark O'Brien  
National Grain Manager  
Weston Cereal Industries  
Tamworth, New South Wales

Mark O'Brien purchases grain for his company to process into stock feed and flour.

'If the forecasts are telling us we're going to have a drought, then we may buy more grain well ahead of the harvest to avoid the drought premium that comes from reduced crops. If the predictions are for plentiful rainfall, that means a large crop, but it might have lower protein levels and, for making various flours, there are specific protein requirements for baking. Then we have an idea if high protein wheats will be hard to get.'

'The tools work very well, but we didn't use them as well in the 2002 drought', says Mark. Monitoring the Southern Oscillation Index (SOI), he held off buying grain in the hope of rain, and ended up paying a premium when eastern Australia came to experience a severe drought.

'The main thing I learned was to accept the lack of certainty. You've got to work with probability better, and accept that there's no such thing as a guaranteed outcome.'



# MCV partners

MCV is a joint R&D program with the following eight partners:

- Grains Research & Development Corporation
- Dairy Australia
- Meat & Livestock Australia
- Natural Heritage Trust
- Australian Government Department of Agriculture, Fisheries and Forestry
- Rural Industries Research and Development Corporation
- Sugar Research and Development Corporation
- Land & Water Australia

The partnership recognises that meeting the demand for improved climate risk management requires technologies and principles common to most rural industries.

In doing so, it also meets an emerging need of rural industries and other land managers to manage the impacts of climate change.

Land & Water Australia provides management, coordination and administrative services to MCV.

## MCV associate partners

- Australian Wool Innovation Limited
- Land, Water & Wool initiative
- National Farmers' Federation

## South-east Australian climate initiative (SEACI)

MCV has partnered with the Murray Darling Basin Commission, Australian Greenhouse Office and the Victoria Department of Sustainability and Environment in a \$7 million program of research into climate change in south-east Australia.

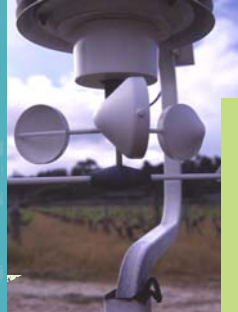
The project, through CSIRO and the Bureau of Meteorology, is developing and testing global climate models to analyse climate change and variability across south-east Australia. The potential benefits to MCV industry partners include more accurate and longer lead-time climate forecasts.



# World class research with world class outcomes

MCV maintains world class research through regular program reviews and evaluation.

It commissions independent reviews of the program by evaluation experts and international climate specialists to ensure its climate science, its engagement with farmers and natural resource managers, and its delivery are world class.



## Example projects

### Managing climate risk

#### Agriculture

- Improving dairy farmers' feedbase management with seasonal climate forecasts
- Increasing the adoption and accuracy of AussieGRASS in the Northern Territory
- Assessing and developing targeted climate forecasts for the sugar industry
- Improving prediction of the northern Australian wet season

#### Natural resources

- Climate science for better natural resource management in western New South Wales
- Increasing success of tree establishment by using seasonal climate forecasts
- Producing, verifying and distributing synthetic evaporation and evapotranspiration data
- Integrating NRM implications into a production-based seasonal climate risk management system

#### The grains industry

- 'Propheta' cropping using seasonal forecasting tools
- Oceans to Grains: a new approach to targeted seasonal forecasts
- Horses for courses: using the best tools for managing climate risk
- National WhopperCropper – delivering risk management to agricultural advisers

#### Economic applications

- Enhanced forecasting of farm financial performance
- Farmers applying seasonal climate forecasting for profitable, sustainable resource use
- Innovative weather and climate risk management using derivative trading
- Enabling natural resource management decision makers to make better use of climate science



### Adapting to climate change

- Incorporating climate change in catchment management strategies
- Managing grazing systems in a variable non-stationary climate
- Managing cropping systems in a variable non-stationary climate
- Agro-ecological implications of changes in the terrestrial water balance

### Communicating climate risk management

- Masters of climate revisited – innovative farmers coming through drought
- Building effective climate risk management in the Western Australia grainbelt
- Growing capacity in seasonal climate risk management in south-east Australia

# Achievements

– a snapshot

MCV funding has been a vital catalyst to innovations with significant benefits to rural communities and industry partners. These achievements are realised in partnership with a diverse community of research providers.

## SOI-based seasonal climate forecasting

MCV has played a critical role in the development of SOI-based seasonal climate forecasts for agricultural industries. Connecting scientists with farmers, the program has helped to create a new field of user-focused applied climate science.

## Making forecasts relevant to agriculture

Focused investment has supported the development and extension of software and other tools that make seasonal climate forecasts relevant to agriculture.

MCV has contributed to the evolution of seasonal climate forecasting with tools that forecast rainfall, such as Australian Rainman, and tools that forecast crop and pasture growth, such as Yield Prophet, WhopperCropper and AussieGRASS. These technologies can now forecast the impact of climate variability on farm incomes.

And with MCV support, the Climate Risk Management Farmer Association (CRIMFA) has created a package of climate risk technologies and services—monthly newsletters, specific forecasts, yield analyses, climate risk workshops etc—to support management decisions for a variety of industries and regions.



## Taking technology to the people

To realise the benefits of great science, MCV has developed a strategy that puts a human face to climate risk technologies; connects researchers, advisors and land managers; and takes these technologies into new industries and regions. A stocktake of available climate risk technologies is already complete.



## Old records and new technology

Bill, Anne and Andrew Yates  
'Amondale', Garah, New South Wales

540 mm average rainfall

11,000 hectares

Producing wool, beef cattle  
and rotated crops

It's a natural human tendency to base your understanding of climate on your most recent experiences. Bill Yates knows the problems this can cause when making management decisions in a highly variable climate.

For 100 years, Bill's family has kept a record of the property's climate and its impact on farming decisions. Drought devastated sheep numbers in 1902 and again in the 1930s and 40s. Bill's father moderated the stocking rate, and in the 1960s the family gradually moved into broadacre cropping, diversifying from a strong reliance on wool.

In 1999, Bill was getting comfortable with technology that his father and grandfather could barely imagine. Using the SOI and the Bureau of Meteorology website in making cropping decisions and managing livestock, he moved sheep to higher ground several times—these turned out to be cost-effective decisions.

Bill and Anne are now incorporating cutting edge forecasting into their management decisions, while also realising the limitations of the technologies.

'For all our records and interpretation, we realise how quickly the climate is changing, particularly temperature... I'll be watching that weather like a hawk... You've got to be smart enough to stay ahead.'

## Future directions

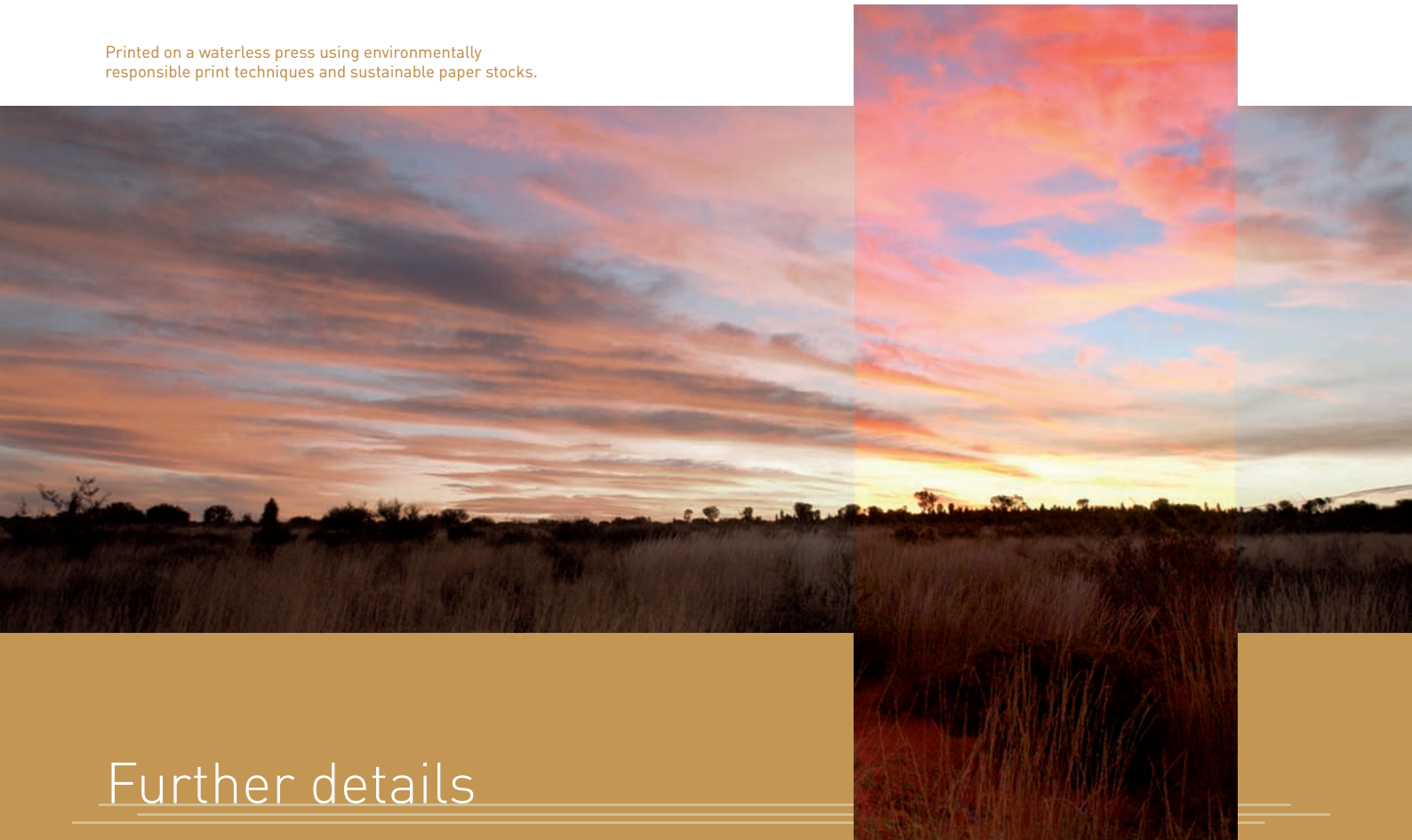
Farmers and natural resource managers will remain the primary focus of MCV. In the next phase, the research agenda is expected to incorporate adaptation to climate change, by rural industry and resource managers.

Emerging technologies will help natural resource managers explore the ecological impacts of climate variability and climate change on biodiversity and water resources across the landscape.

And, as awareness of climate change grows, so too will the demand for information and technologies that anticipate its impacts. In the next few years, global climate models have the potential to greatly improve forecast accuracy and lead times and to replace forecasts based on El Niño/Southern Oscillation (ENSO).

Getting this new technology into the hands of land managers and potential users across a range of industries is both a challenge and a key future priority for MCV.

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## Further details

For more information on MCV,  
visit <http://www.managingclimate.gov.au>

Land & Water Australia is the managing agent for MCV.

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