Climate science for better natural resource management in western New South Wales

December 2004 – May 2007

Location: Western New South Wales

Principal investigator

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The need

Ground cover is a fundamental sustainability indicator for land resources because of its linkage with soil erosion. Targets for ground cover have been identified in several Catchment Action Plans developed by Catchment Management Authorities (CMAs) in western New South Wales. An ability to monitor ground cover over large areas, and to forecast likely future trends, is therefore fundamental to the capacity of CMAs to monitor the success of their investments and to proactively foster sustainable management. Rural Lands Protection Boards (RLPBs) would also benefit from this capacity given their role in developing applications for 'Exceptional Circumstances' assistance.

Achievement of regional ground cover targets is dependent on the landholders' decisions. Development of a capacity to forecast forage and ground cover trends on individual properties should improve pastoralists' capacity to match stocking rate to forage availability, and to assess the environmental implications of current stocking polices.

This project addresses the need for improved monitoring and risk management tools for natural resource management (NRM) at both regional and property levels.

How this project fits with MCV objectives

This project addresses the MCV objective of increasing adoption of climate risk management in the natural resource management sector. It will provide regional organisations responsible for achieving natural resource management targets, and individual landholders whose decisions are critical to the achievement of those targets, with a capacity to monitor and forecast tends in ground cover and forage production to support improved management decision making, and to demonstrate NRM outcomes.

Project objectives

1. Develop a capacity to predict regional trends in total ground cover, and provide early warning of potential degradation events, by linking AussieGRASS products and seasonal climate forecasts
2. Demonstrate the potential of the PaddockGRASP model to support sustainable NRM at the property level
3. Develop protocols to allow the PaddockGRASP model to be readily parameterised for individual properties

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Methods

The project will develop relationships between total standing dry matter (TSDM) produced by the AussieGRASS spatial growth model and the dynamic component of ground cover derived from the NSW Rangeland Assessment Program (RAP). Relationships will be developed for 11 regional vegetation communities covering 85% of the three target CMAs.

Estimates of total ground cover can then be produced by adding this dynamic component to estimates of the static component contributed by surface features such as rock, cryptogamic crust and low shrub.

Combining a capacity to model total ground cover with seasonal climate forecasts, to estimate the probability of future ground cover trends, will allow land degradation alerts to be issued under specified conditions.

The project will also develop the PaddockGRASP model—the individual property analogue of the regional AussieGRASS spatial framework—for two prototype properties as a demonstration of the capacity to model and project forage and ground cover trends at paddock scale. This will include developing protocols for rapid parameterisation of PaddockGRASP for individual properties.

Desired outcomes

- Operational use of ground cover estimates and forecast trends by CMAs and RLPBs
- Interest by individual landholders in achieving the capacity to monitor and predict forage and ground cover trends on their property

Achievements to date

We have developed quality assurance protocols for the large amount of data available from the RAP program.

PaddockGRASP prototypes for two properties are well advanced and we have applied simple techniques to allow the rapid collection of data required for model parameterisation.

What is left to do?

Determining the TSDM-ground cover relationship at the RAP site level (9ha) for the selected vegetation communities will proceed over the next 12 months. Developments are also in train to allow the validation of the resulting ground cover estimates at the AussieGRASS pixel scale (5km^2).

We will promote the results to CMAs, RLPBs and individual landholders in the latter part of the project. This will follow the extension of results of the Land Water and Wool project 'Improved seasonal forecasts for wool producers in western NSW', particularly the publication and distribution of the book *Betting on rain: managing seasonal risk in western NSW* which is currently in press.

MCV is a collaborative program between the Grains, Rural Industries and Sugar Research and Development Corporations; the Australian Government Natural Heritage Trust and Department of Agriculture, Fisheries and Forestry; Dairy Australia; Meat & Livestock Australia; and Land & Water Australia. The National Farmers Federation and Australian Wool Innovation Limited are associate partners.

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