

Remote sensing of ground cover for better land management: some insights from Australia



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LAND AND WATER
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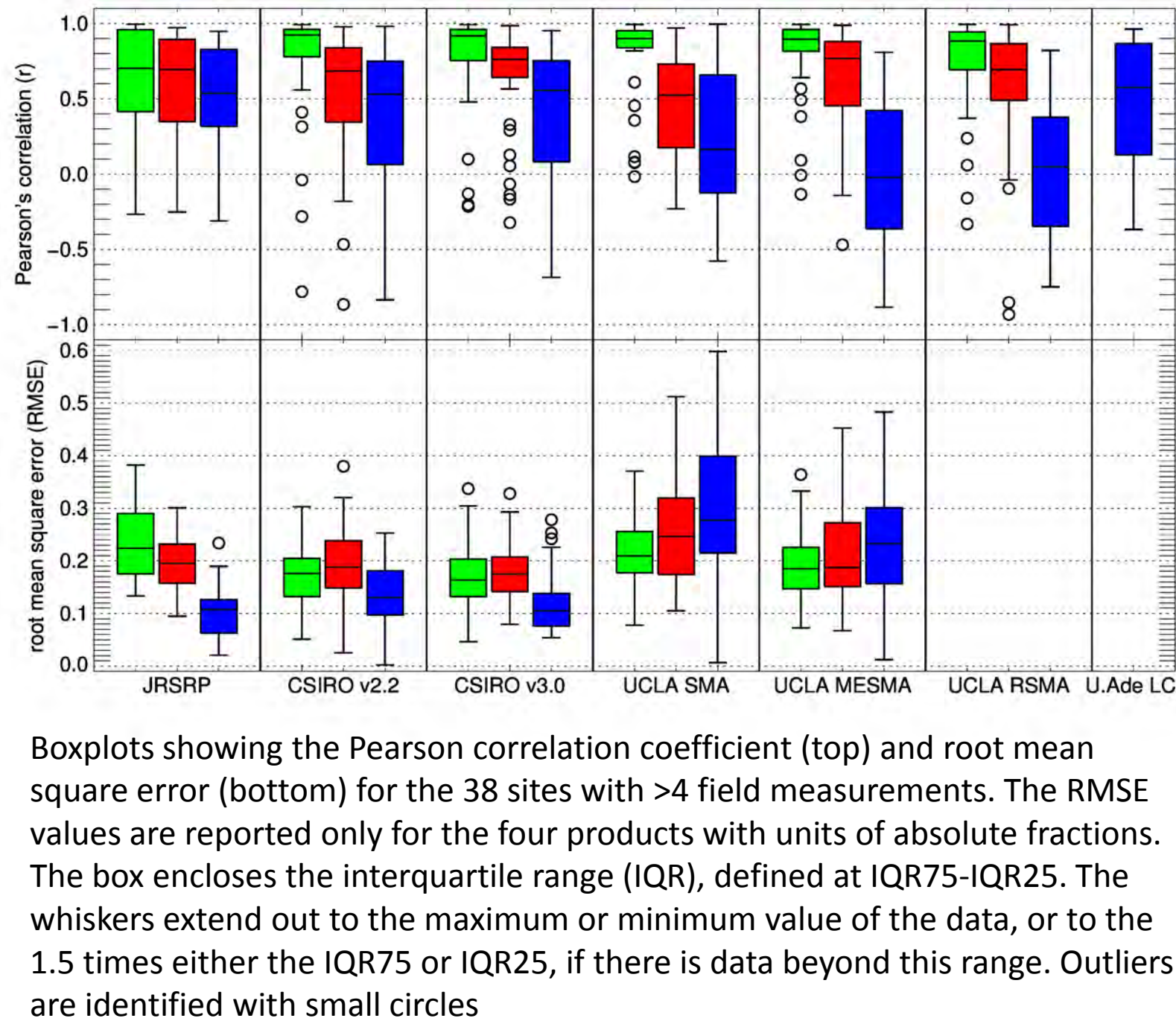
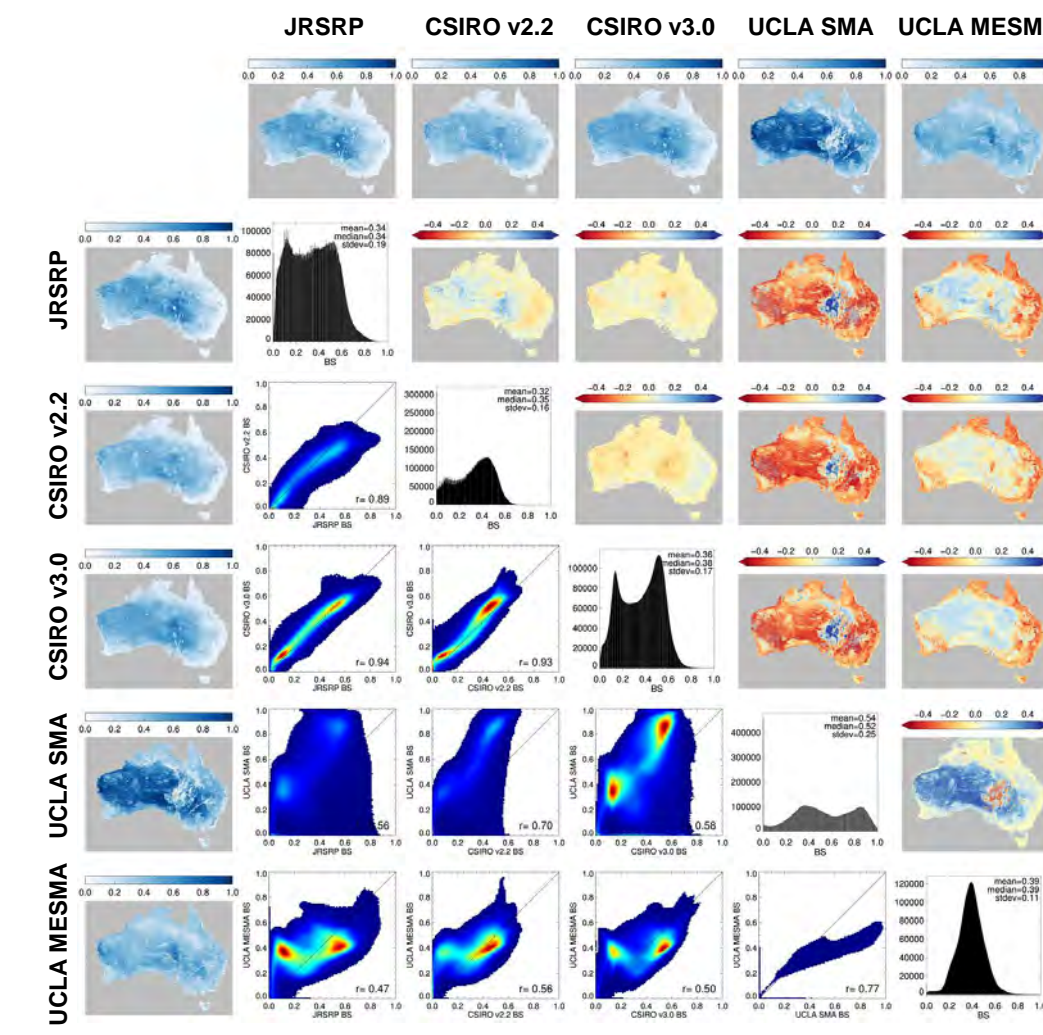
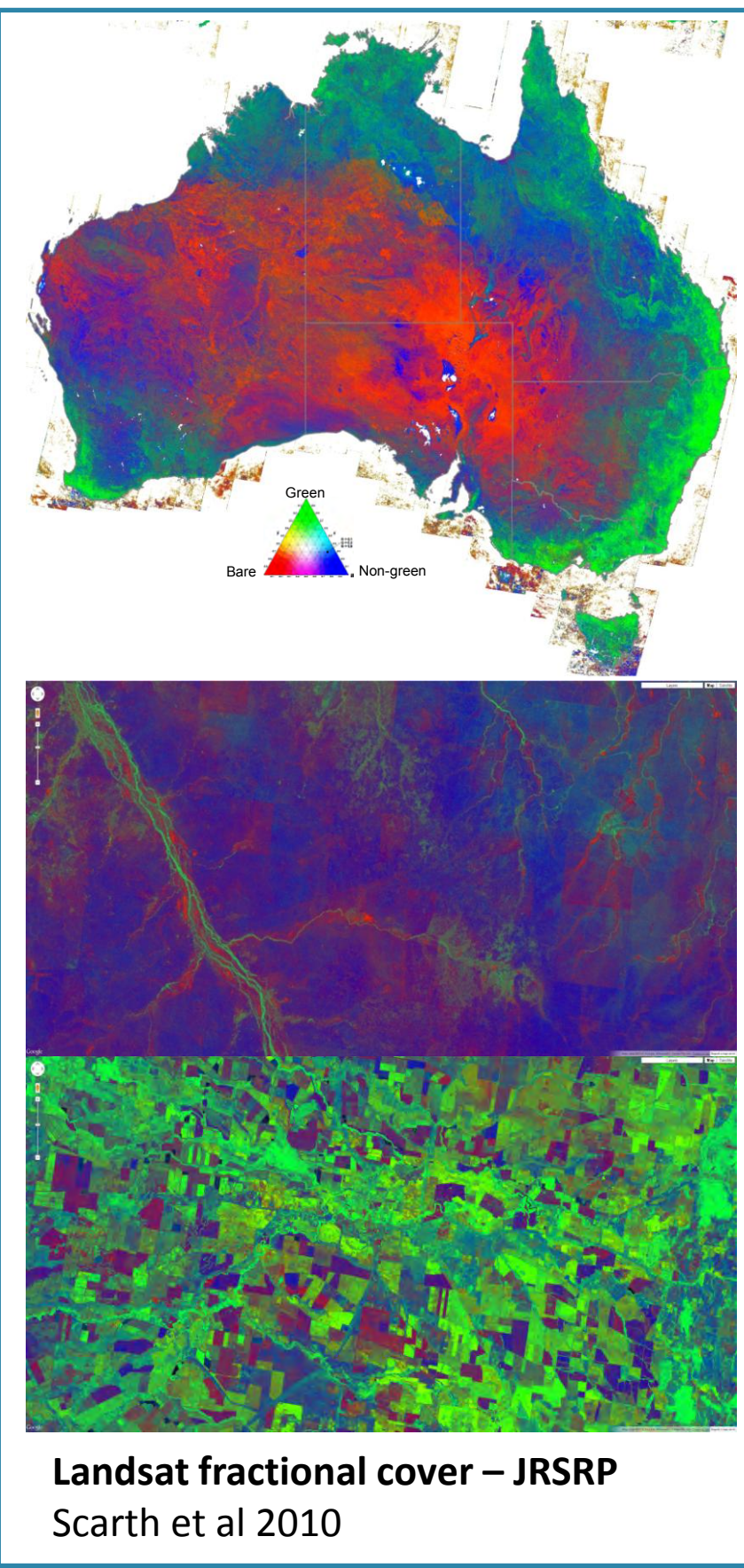
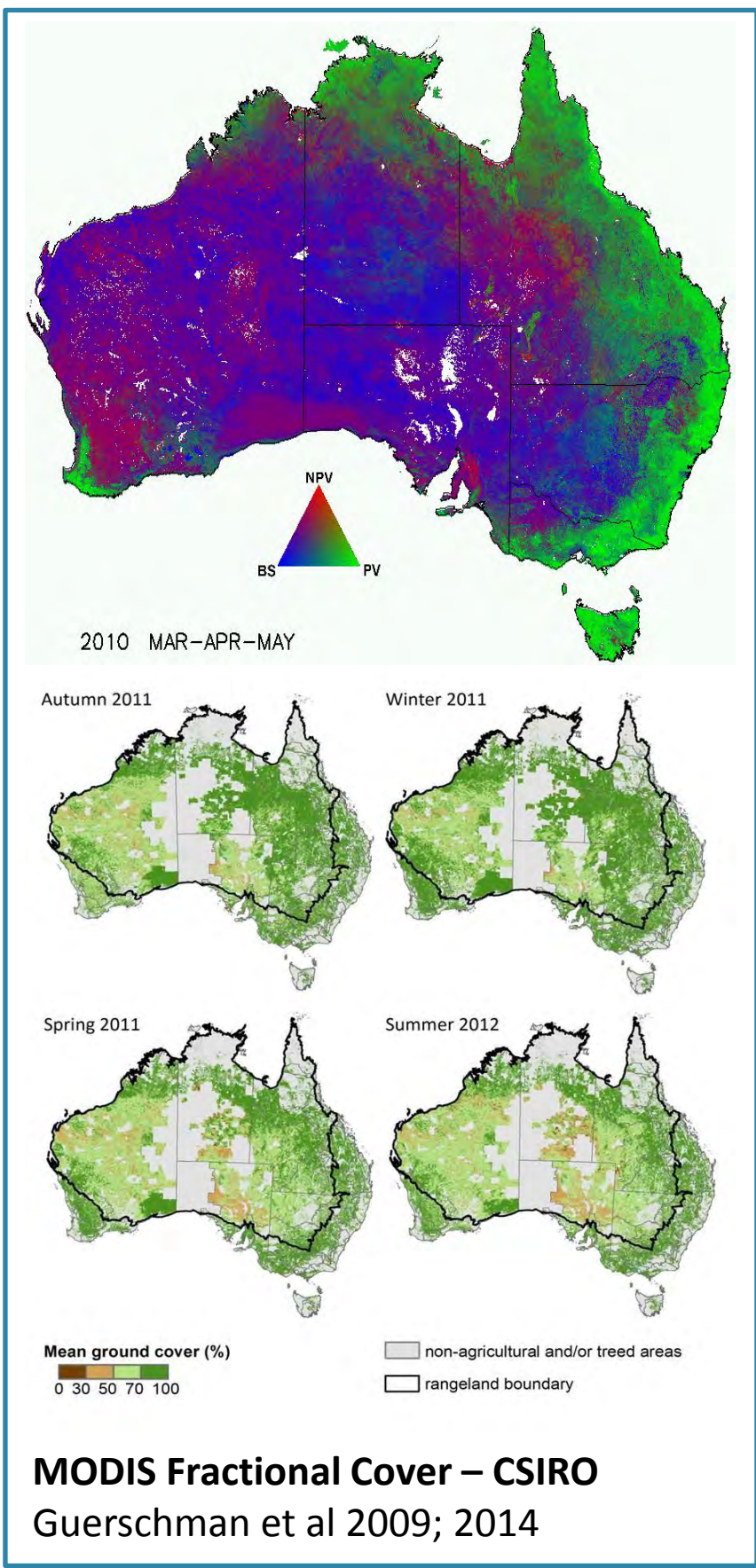
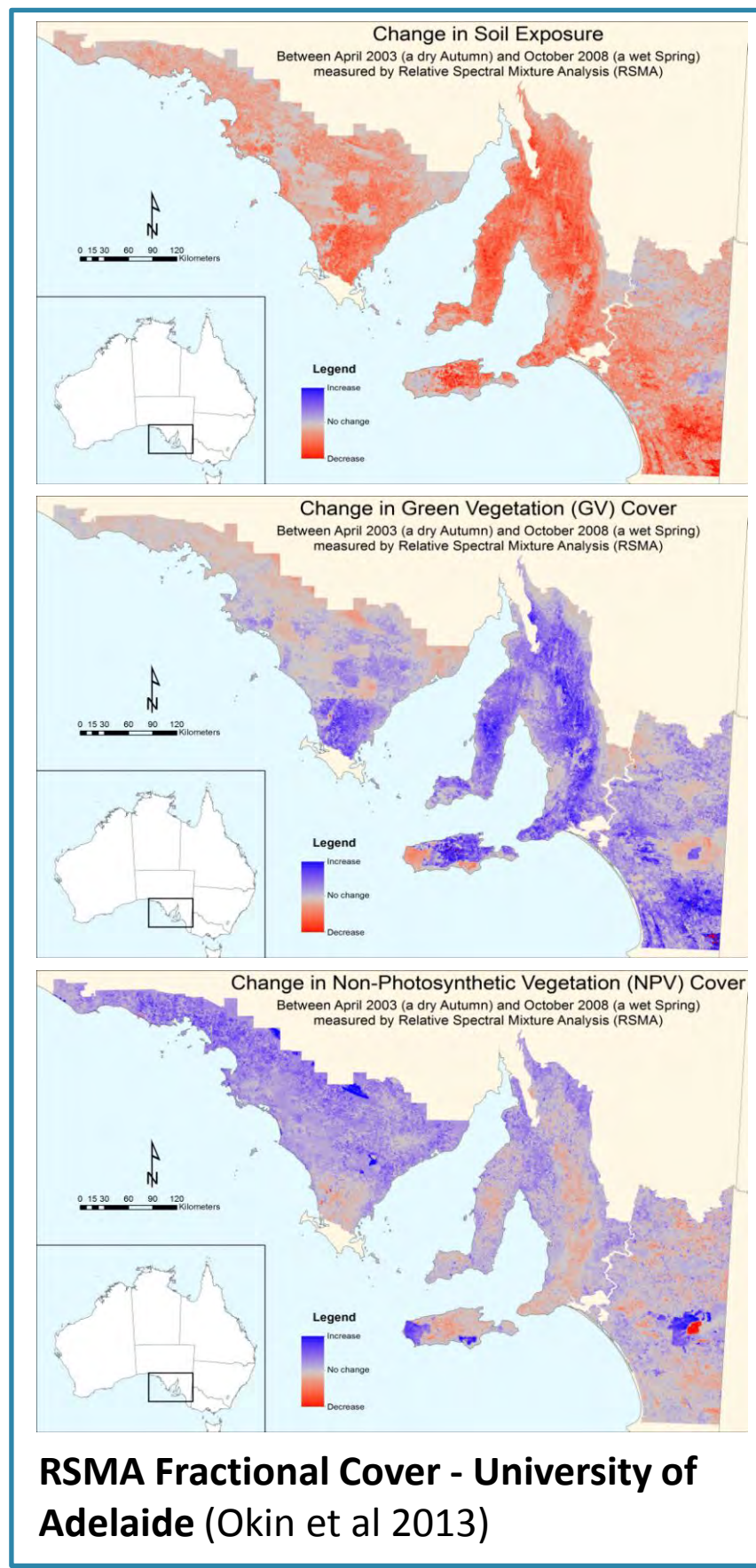


This poster presents an **overview of techniques for ground cover estimation using remotely sensed information** integrated with field data, and how this **ground cover information** is being **used by land managers** in Australia

Remote Sensing

Land Management

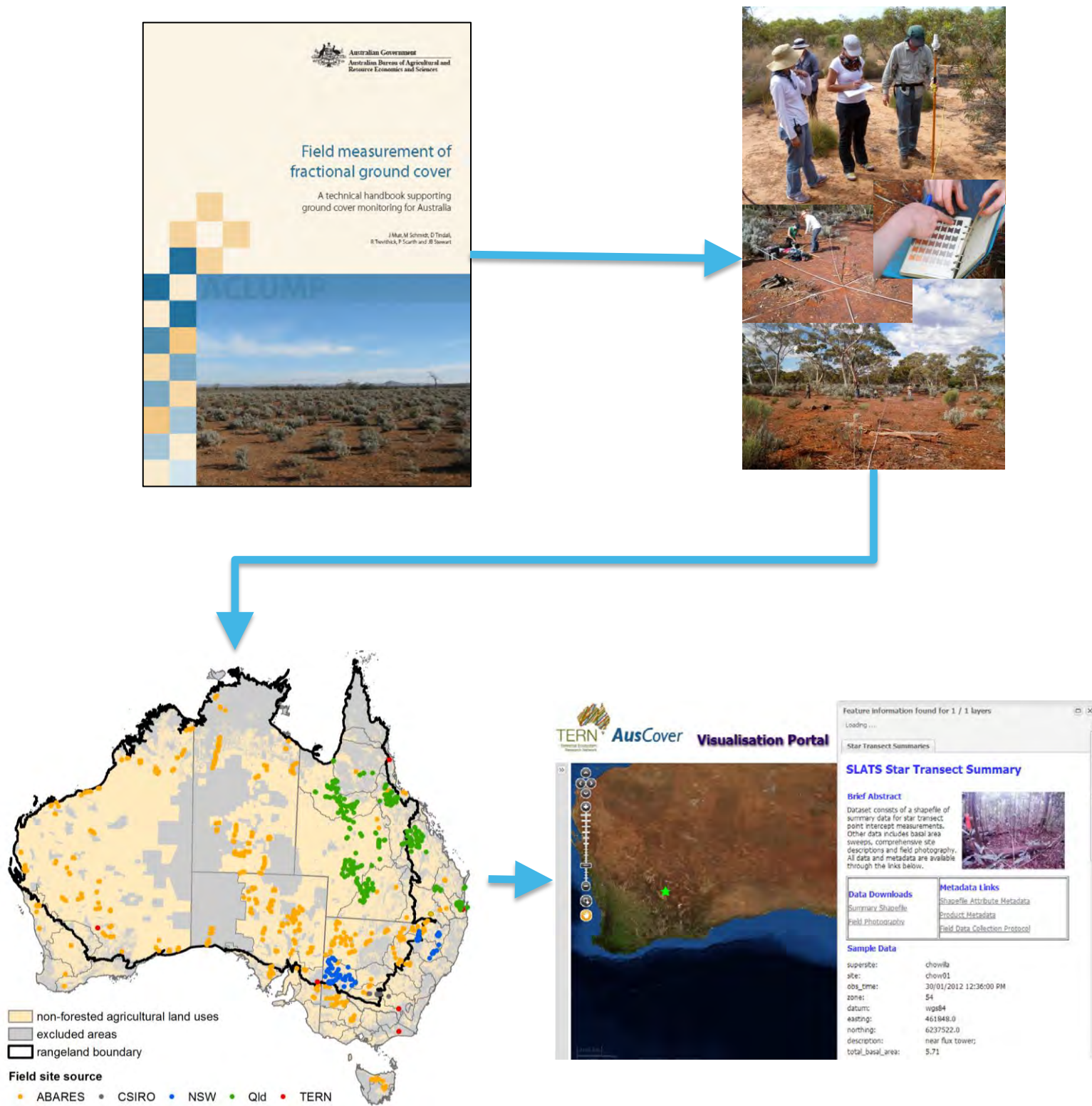
Data Products



Spatial comparison between models for the bare soil fraction (BS). The maps at the top and left show the mean BS fraction for 2002, 2007 and 2010 for each product. The histograms in the diagonal show the distribution of BS values for each product. The maps in the top right side show the difference between each pair of models. The plots in the bottom left side show the distribution of such differences (colours indicate density).

Field Measurements

- The Australian Government Department of Agriculture implemented a nationally agreed basis for monitoring ground cover using satellite imagery. This is assisting the assessment of Australia's soil resources and agricultural productivity at national, state and regional scales.
- Spatially comprehensive, well documented and accessible database of field measurements
- Standardised protocol (Muir et al 2011)
- Currently ~1500 observations, starting in 1997
- Data and metadata searchable and downloadable from the TERN portal



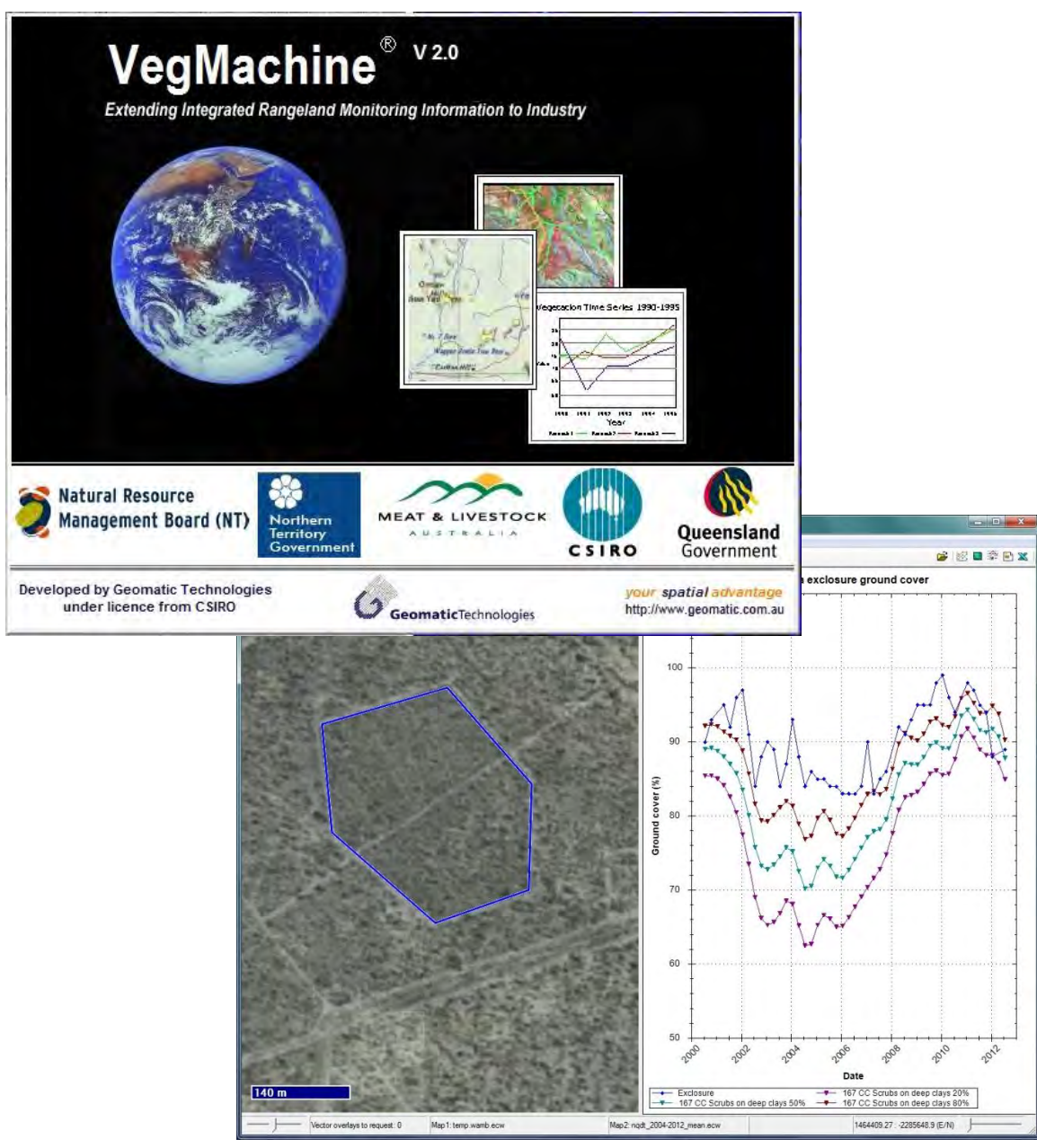
DustWatch

- Report on the severity of wind erosion
- Raise awareness of the effects of wind erosion on the landscape
- Raise awareness of the impacts of dust on the community
- www.environment.nsw.gov.au/dustwatch/



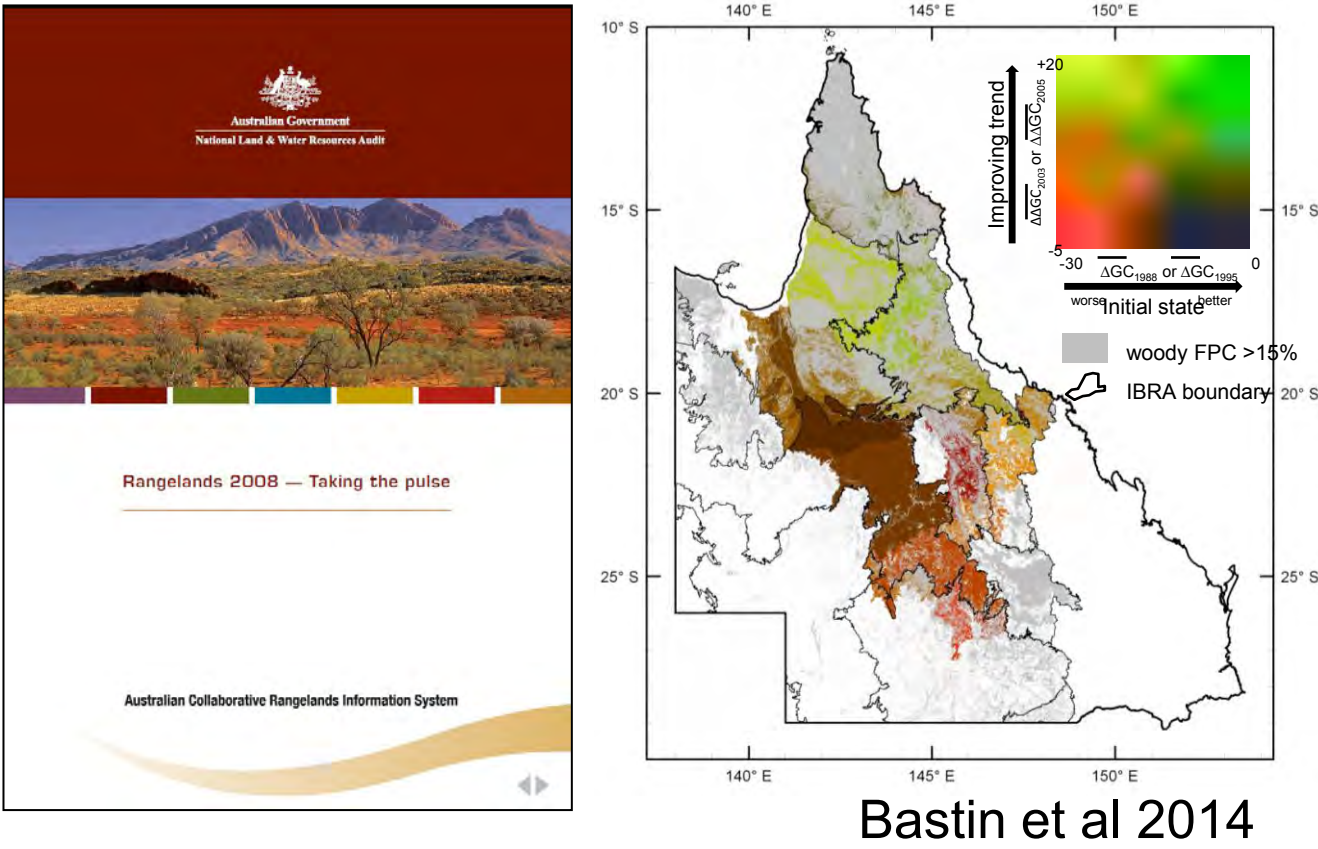
VegMachine®

- Software to display, interrogate and summarise time-series satellite data
- Typically Landsat sequences underpin image dataset (in extensive grazing land)
- Uses Ground Cover Index and transitioning to Fractional Cover
- Target advisors
- Over 100 users in NRMs and DAFFQ + WA (grazing and conservation applications)
- futurebeef.com.au/resources/vegmachine/



Australian Collaborative Rangelands Information System (ACRIS)

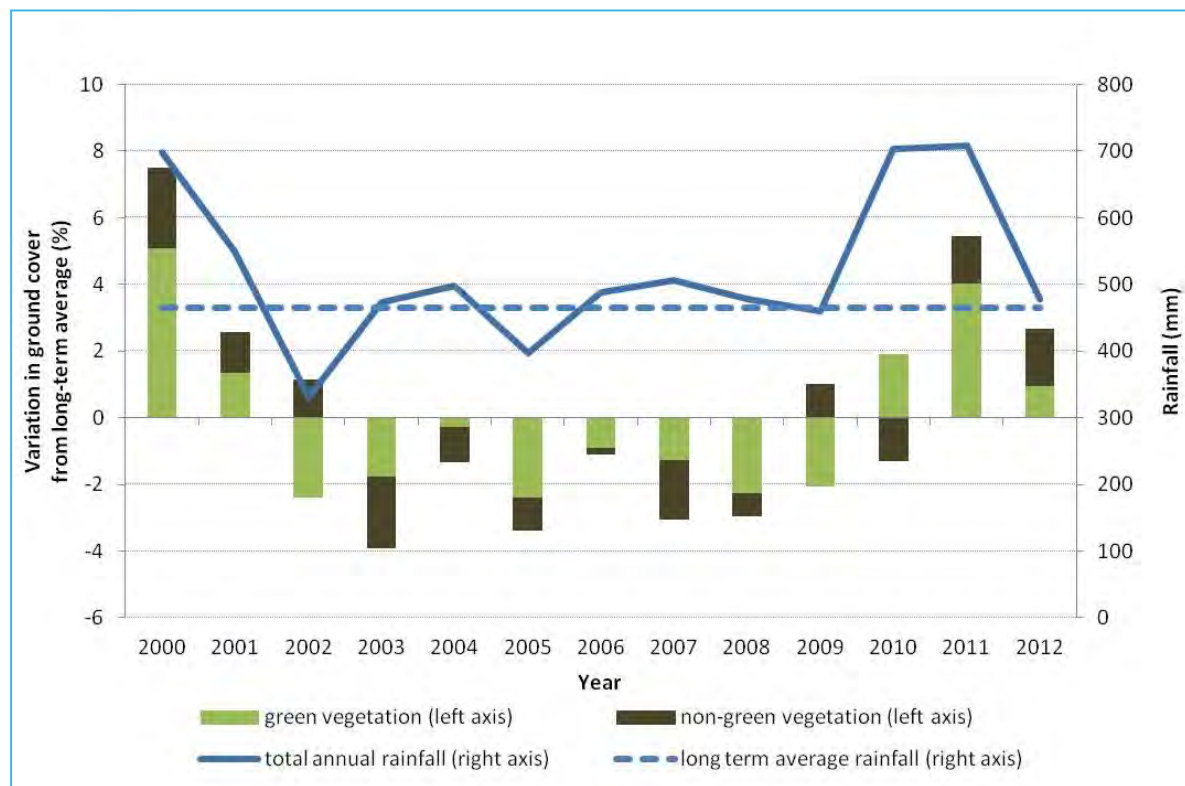
- Rangelands 2008 – Taking the pulse reported change for a number of biophysical and socio-economic themes
- Reporting period was 1992 to 2005. More recent updates for several themes on the web.
- Reporting mainly by 52 bioregions in the rangelands.
- Climate variability, particularly rainfall, the most important driver of change.
- www.environment.gov.au/topics/land/rangelands



Seasonal quality	Trends in landscape function and critical stock forage		
	Most of the region showing decline	Most of the region showing no change	Most of the region showing increase
Above average	Management has suppressed the expected response. Further investigation required	Management has not allowed the landscape to respond to favourable seasons. Further investigation required	Management has delivered a response consistent with expectations
Average	Management has not delivered the expected response. Further investigation required	Management has delivered a response consistent with expectations	Management has delivered a better than expected response. Investigate, acknowledge and promote
Below average	Management has delivered a response consistent with expectations	Management has limited the impact of below-average seasons. Investigate, acknowledge and promote	Management has had a significantly beneficial impact on the outcome. Investigate, acknowledge and promote

Ground cover monitoring

- Ground cover is the **fraction of living and dry or dead vegetation** covering the soil surface. Ground not covered by vegetation is scored as bare ground. Climate and land management affect ground cover levels.
- Remote sensing provides estimates** of the area of dry or dead vegetation, which, like living vegetation, protects soil from wind and water erosion. These results give **better estimates of the area at risk of wind and water erosion** than previously possible.



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FOR FURTHER INFORMATION

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