DustWatch Report

September 2024

Community-based wind erosion monitoring across Australia

Dust activity	Increase dust hours; below average for September
Wind strength	Unchanged from August, below average for September
Groundcover	Decrease in Western Local Land Services , stable in all regions
Rainfall	Average to below average for most of the state

Dust activity

There was an increase in dust activity at long term sites during September 2024, averaging 5.0 hours of dust compared to 1.7 hours in August. Dust activity is below the September average of 7.4 dust hours. Increases in dusty activity from August to September occurred in the Riverina, Murray and Central West Local Land Services regions, as well as the Mallee Catchment Management Authority region (Figure 2). This is due to a reduction in groundcover, especially in the Western Local Land Services and South Australian Murray-Darling Basin regions (Table 1). There was generally average to below-average rainfall across much of the state (Figure 7a). Below-average winds for September made transport of dust emissions less likely (Figure 1).

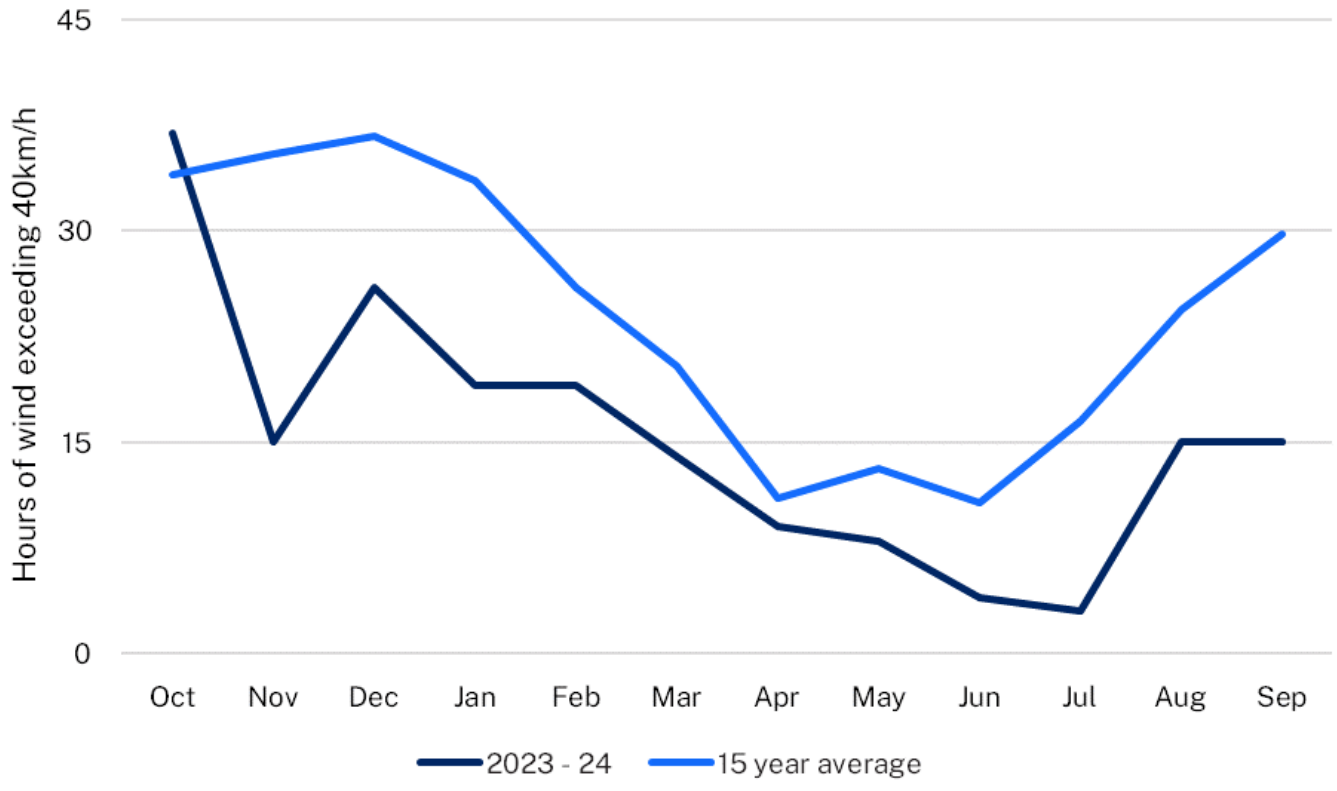

Figure 1 **Hours of wind exceeding 40km/h – average across all sites**

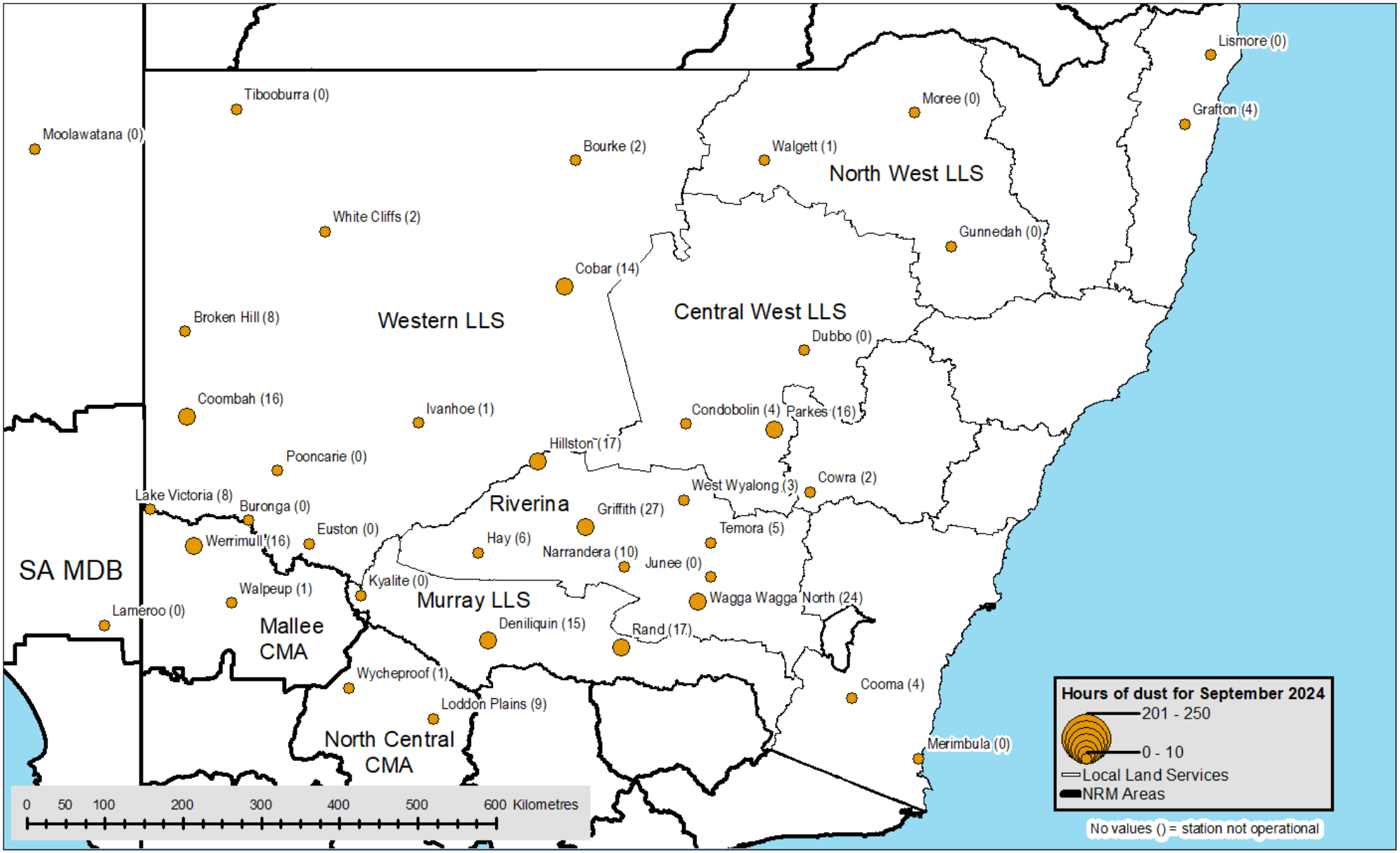

Figure 2 **Hours of dust activity (number in brackets) at each DustWatch site in September 2024**

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has reduced across the rangelands in the Western Local Land Services region and around Lake Frome and Lake Callabonna in South Australia (Table 1 and Figure 3), with an increase in orange and red in Figure 3 indicating reduced groundcover. Groundcover has also been reduced along the Darling River Corridor from east of Bourke into South Australia and in the North West Local Land Services region. Elsewhere, the groundcover remains relatively stable.

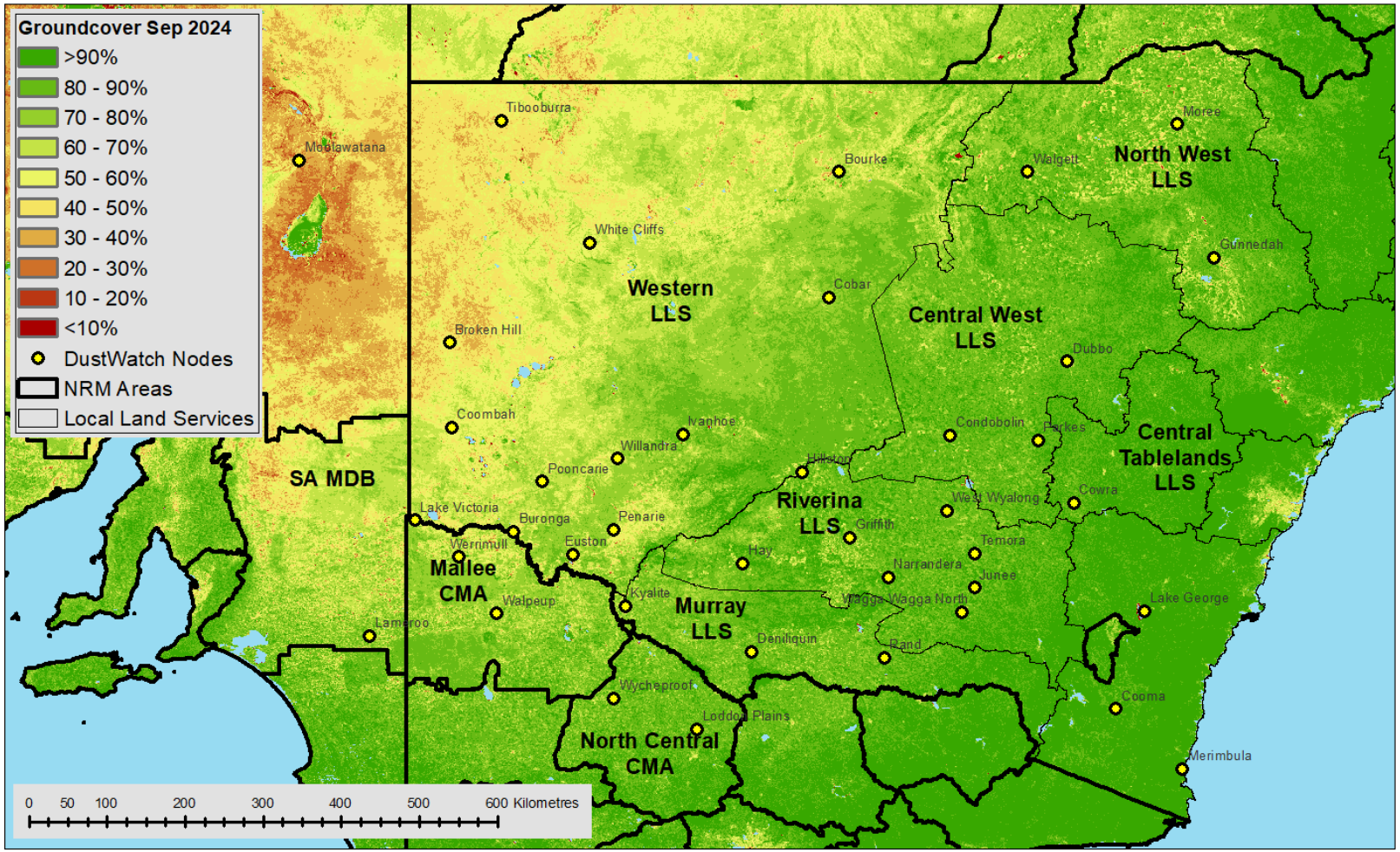

Figure 3 Groundcover for September 2024 as determined from MODIS by CSIRO

Table 1 Percentage of each NRM with cover >50% for October 2023 to September 2024

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Oct 2023	98	99	100	100	95	100	92	71	100
Nov 2023	98	99	100	100	96	100	92	71	100
Dec 2023	96	95	100	100	94	99	81	64	100
Jan 2024	97	90	99	100	93	99	81	66	100
Feb 2024	96	92	99	100	93	98	81	73	100
Mar 2024	95	94	99	100	93	97	87	77	100
Apr 2024	96	94	98	100	95	98	89	78	100
May 2024	99	97	99	100	97	100	93	88	100
Jun 2024	100	98	100	100	98	100	95	91	100
Jul 2024	100	98	100	100	99	100	96	93	100
Aug 2024	100	99	100	100	99	100	95	90	100
Sep 2024	100	98	100	100	99	100	88	84	100

Groundcover change

Reduction in groundcover (red and orange colours in Figure 4) is visible across wheat/sheep belt, although reductions are most visible in the Mallee Catchment Management Authority and South Australian Murray-Darling Basin regions.

Reductions also occurred around Moolawatana, east of Tibooburra and in isolated areas throughout the Western Local Land Services region, including along the Darling River Corridor.

Increases in groundcover (green colours in Figure 4) are prominent in the North West and Murray Local Land Services regions in particular. These groundcover changes are likely due to average to above average rainfall in parts of northern New South Wales and below to very much below average rainfall in southern and western parts of New South Wales, both in September 2024 and in the 3 months to the end of September 2024 (Figure 7a, 7b).

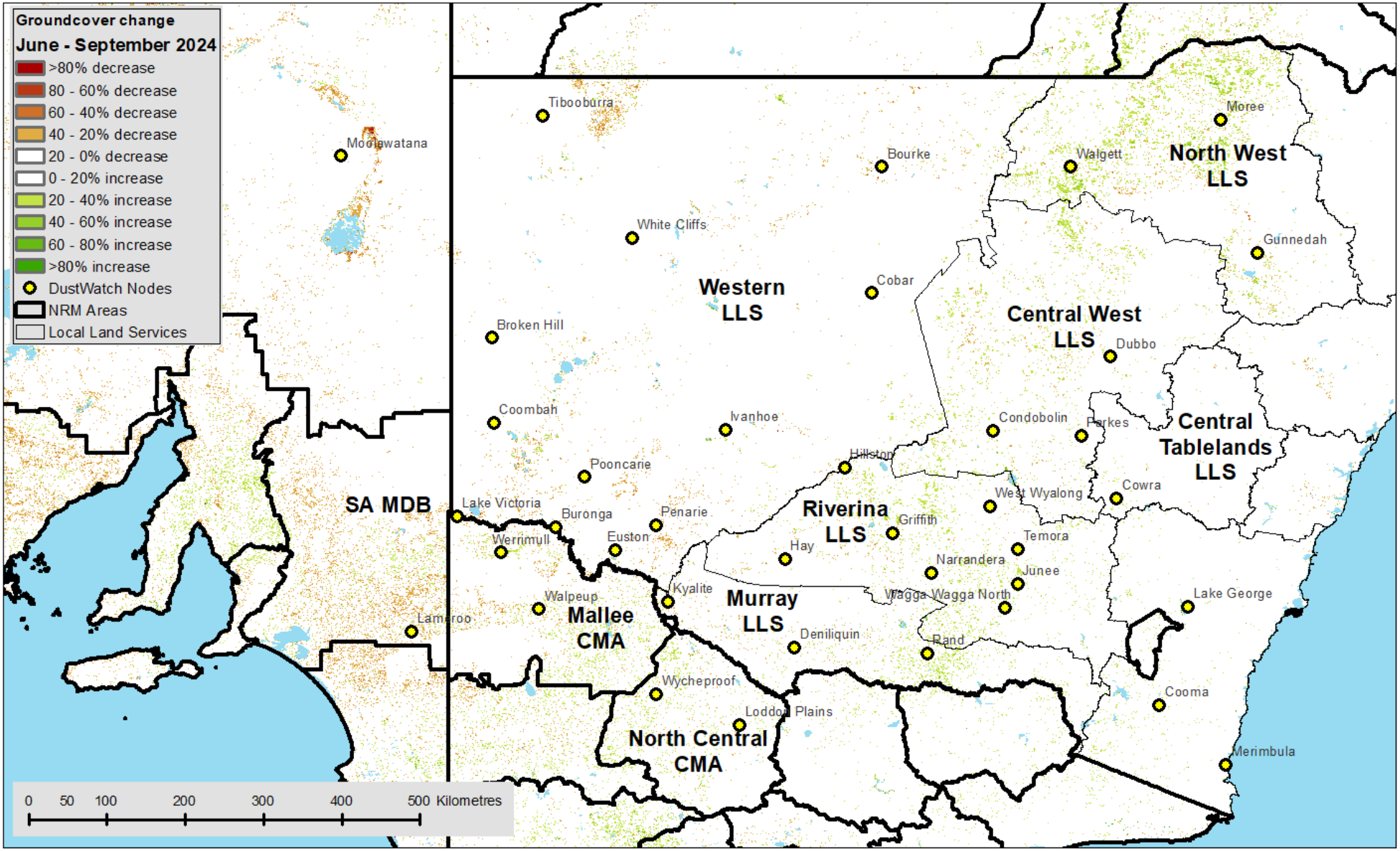

Figure 4 Groundcover difference between June 2024 and September 2024

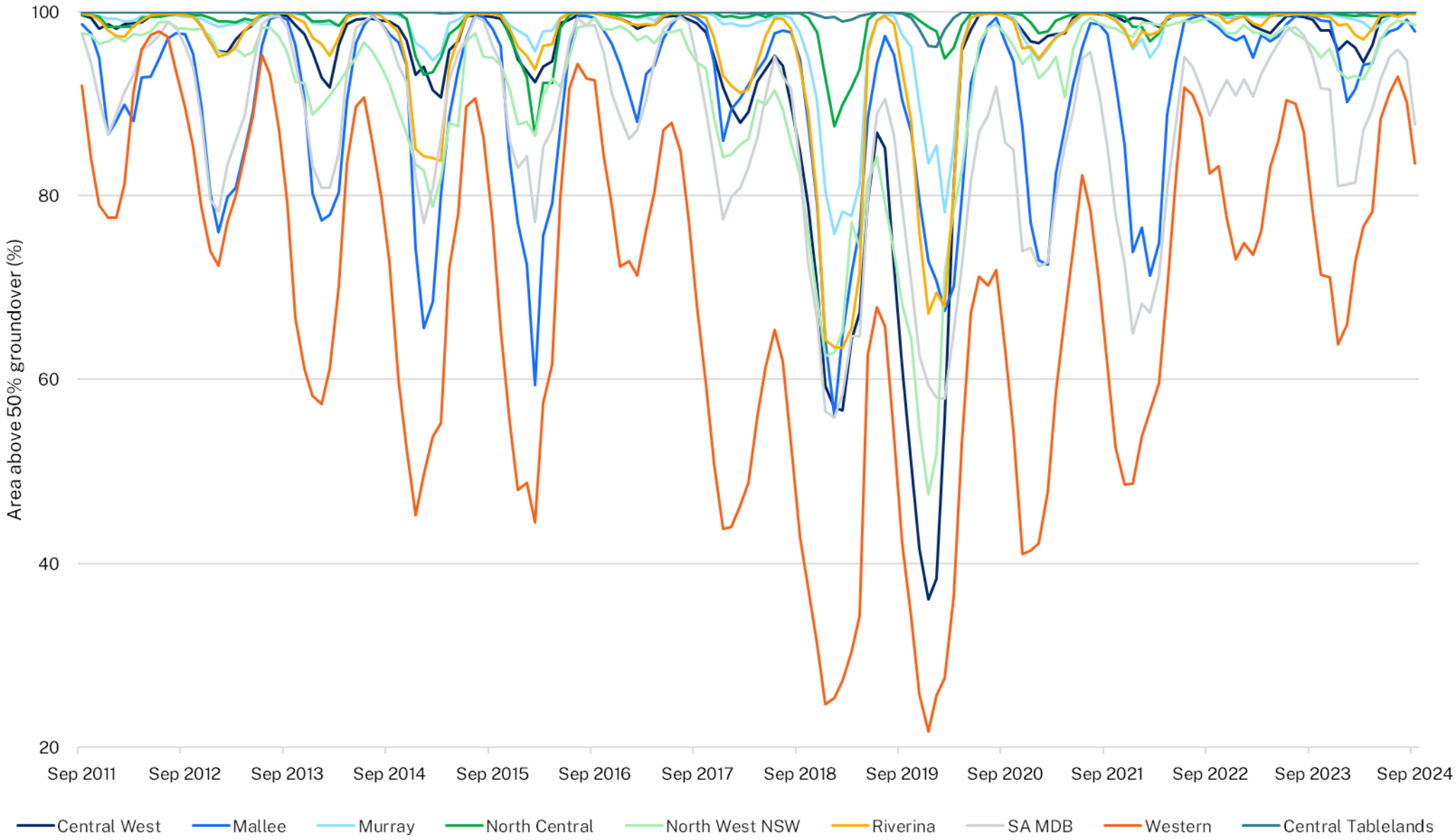

Figure 5 Area (%) of NRM with more than 50% cover since September 2011

Rainfall

Rainfall totals in September 2024 ranged from 1 to 200 mm across much of the state (Figure 6). Compared to August, further reductions in total rainfall are visible throughout the rangelands and wheat belt west of the Great Dividing Range. Most of the state had average to below-average rainfall, with some areas experiencing extremely low rainfall (Figure 7a). Rainfall was above to very much above-average on the north coast (Figure 7a).

From July to September 2024, most of the state had average to below-average rainfall, except for a strip along the NSW/Queensland border and the north coast, which had above-average rainfall coast (Figure 7b).

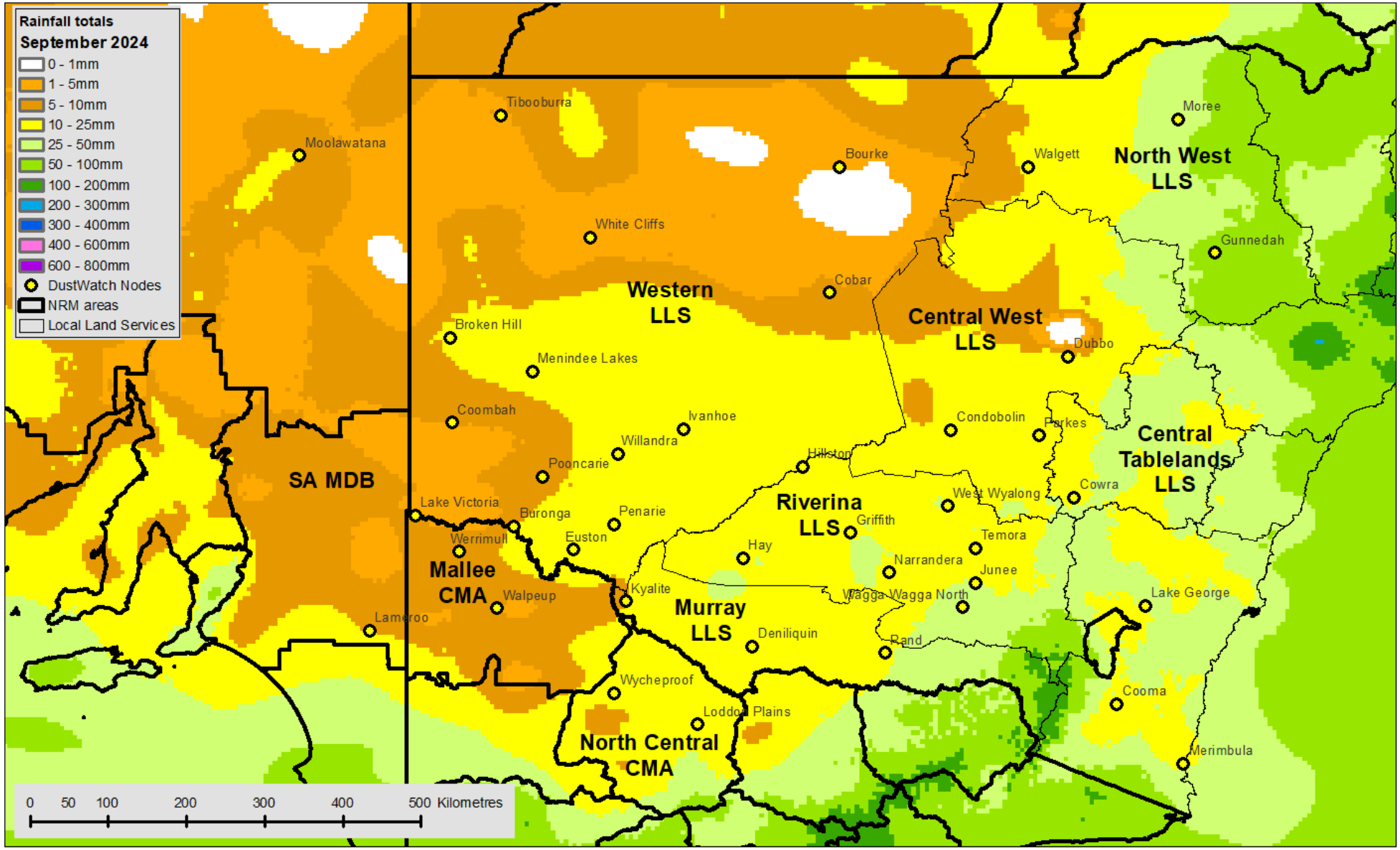

Figure 6 **Rainfall totals for September 2024 (source: Bureau of Meteorology)**

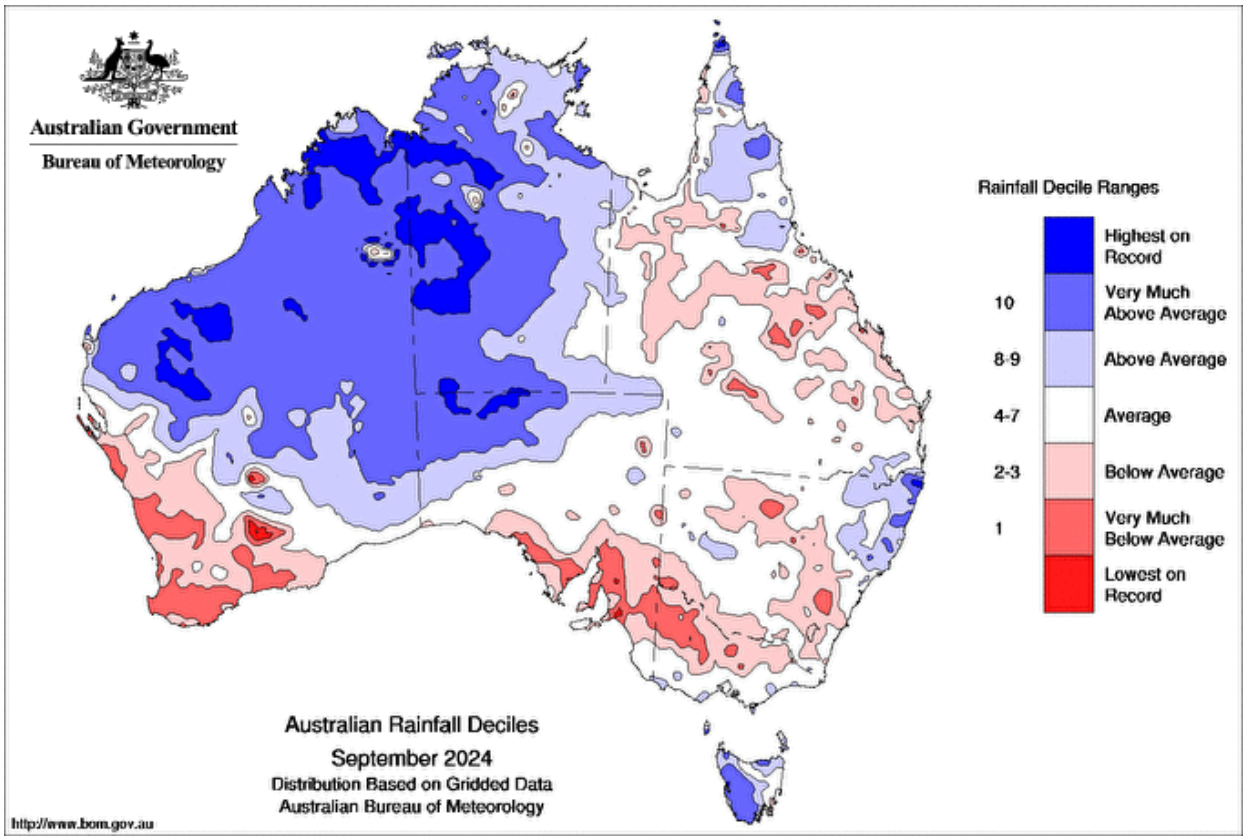

Figure 7(a) Rainfall deciles for September 2024

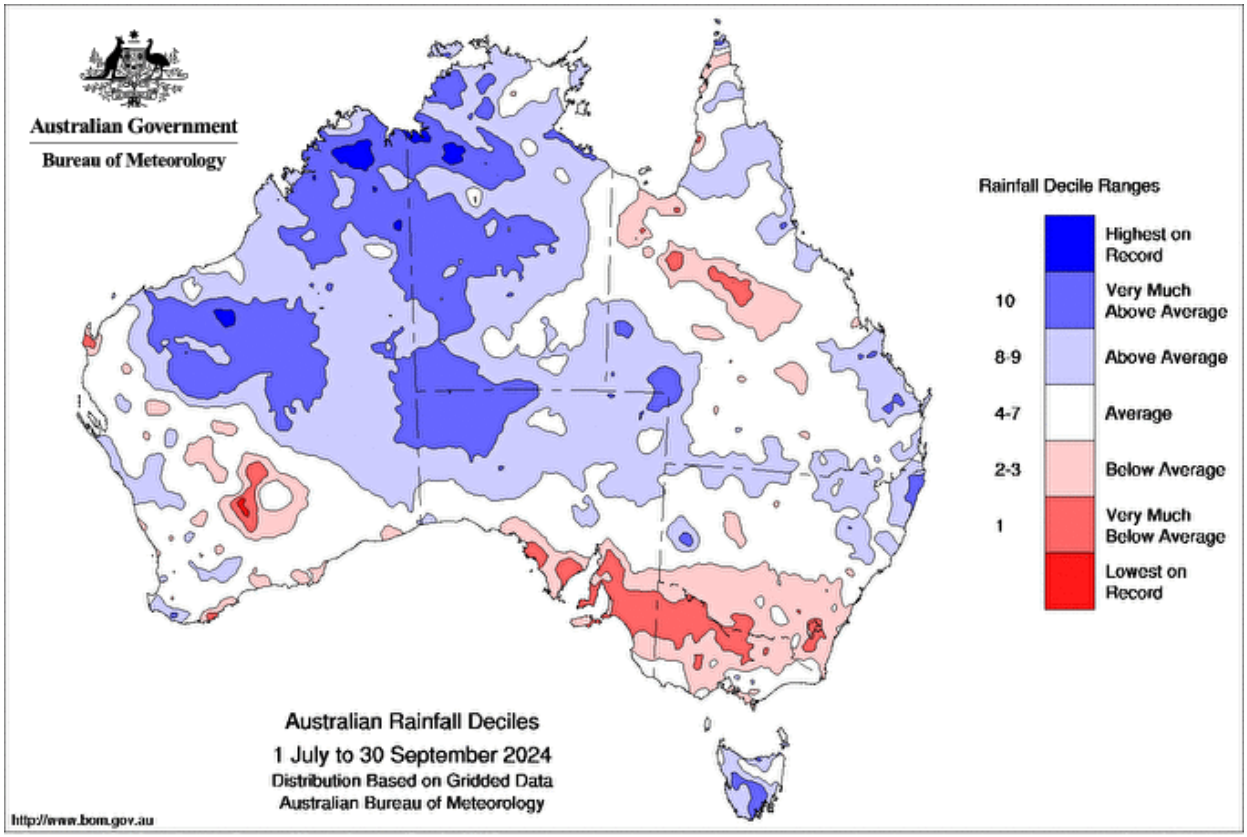

Figure 7(b) Rainfall deciles for 1 June 2024 to 30 September 2024

VIIRS fires and satellite image

Haze from smoke and dust is difficult to separate. We use satellite imagery to manually classify every measurement into dust or smoke.

The satellite detected 2,840 hot spots (375 m pixel with temperature anomalies) in September 2024 (Figures 8 and 9), a 24% increase from the 2,299 hot spots detected in August 2024.

Note: The number of hot spots is not equal to the number of fires. Large fires have multiple hot spots thereby, increasing the number of detections. Cloud or fog can obscure hot spots thereby, reducing the number of detections.

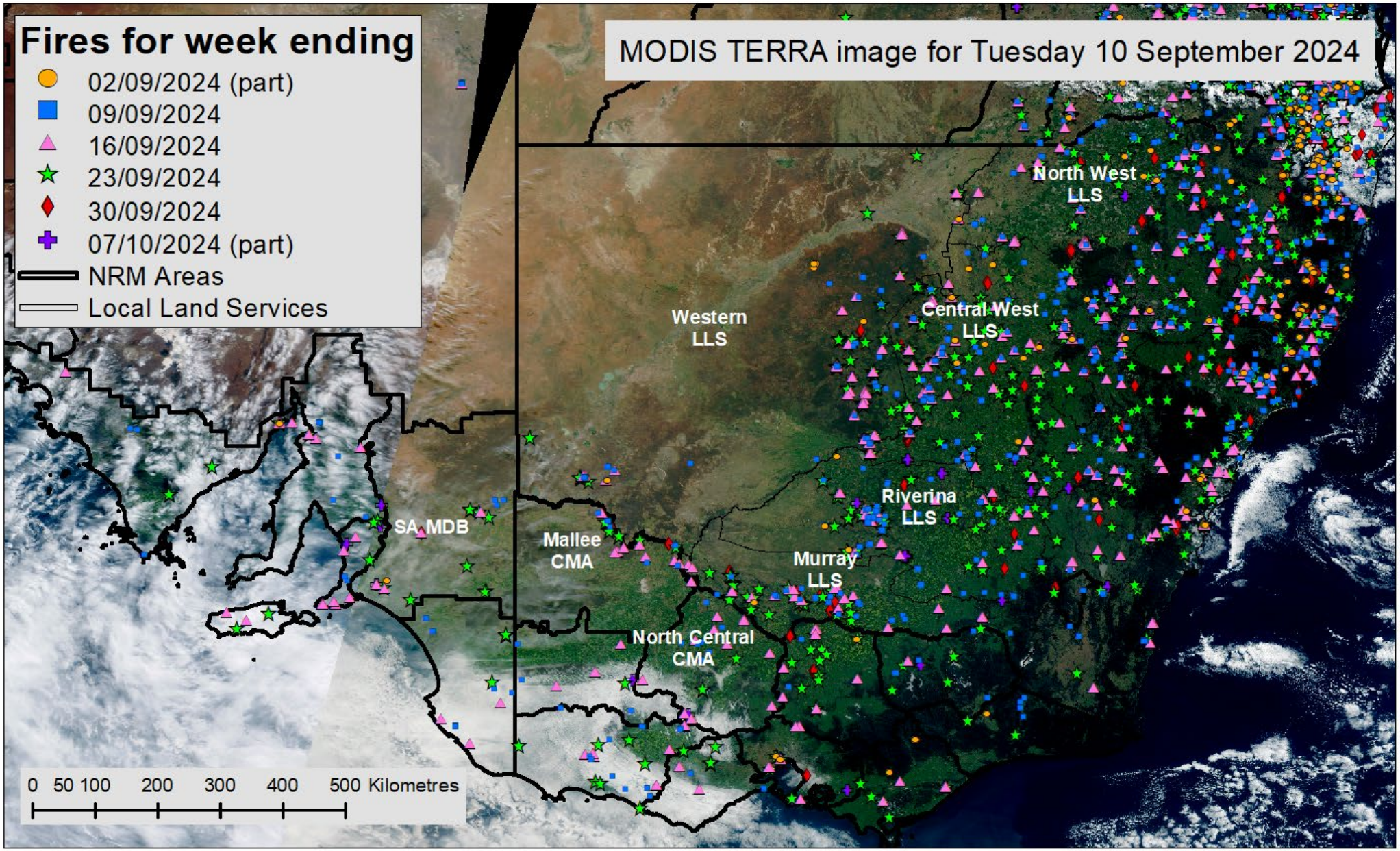

Figure 8 **Pixels (375 m) with active burning fires in September 2024 as determined from VIIRS satellite**

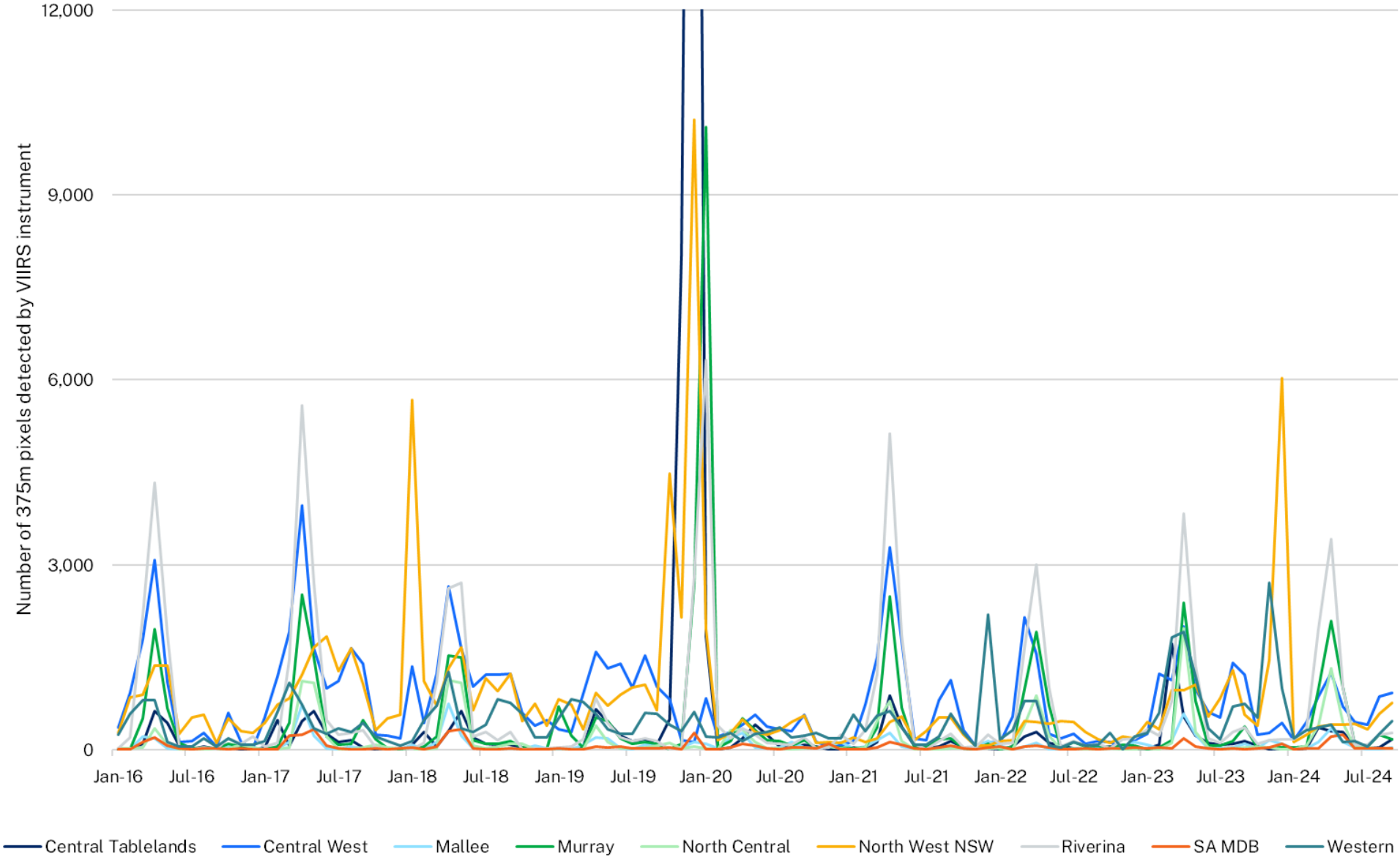

Figure 9 **Number of 375 m pixels with active burning fires between January 2016 and September 2024**

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Dust data is supplied by the Department of Climate Change, Energy, the Environment and Water's Rural Air Quality Monitoring Network. The MODIS image is courtesy of MODIS Rapid Response Project at NASA/GSFC; the VIIRS fire data is courtesy of the Fire Information for Resource Management System (FIRMS), and the rainfall maps are from the Australian Bureau of Meteorology. This project would not be possible without funding or in-kind contributions from: Western and Murray Local Land Services (LLS) in NSW; the Mallee and North Central catchment management authorities in Victoria and Murray-Darling Basin NRM in South Australian, CSIRO and the Australian National University. We particularly thank our many DustWatch volunteers who provide observations and help maintain the instruments.

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