

Community-based wind erosion monitoring across Australia

Dust activity	Increase in dust; average for December
Wind strength	Increased from November, below long-term average
Groundcover	Decrease in groundcover, particularly in the west
Rainfall	Decreased from November, average to above average

Dust activity

Dust activity increased from November at long-term sites to 10.7 hours. High dust hours shifted to the Western Local Land Services in December and remained elevated in the Murray and in the Riverina Local Land Services (Figure 2), though lower than November. This is likely due to drier-than-average conditions in the Western Local Land Services (Figure 7a) and a late harvest through the wheat belt, reducing groundcover (Figure 4). Below-average winds may have hindered dust transport (Figure 1).

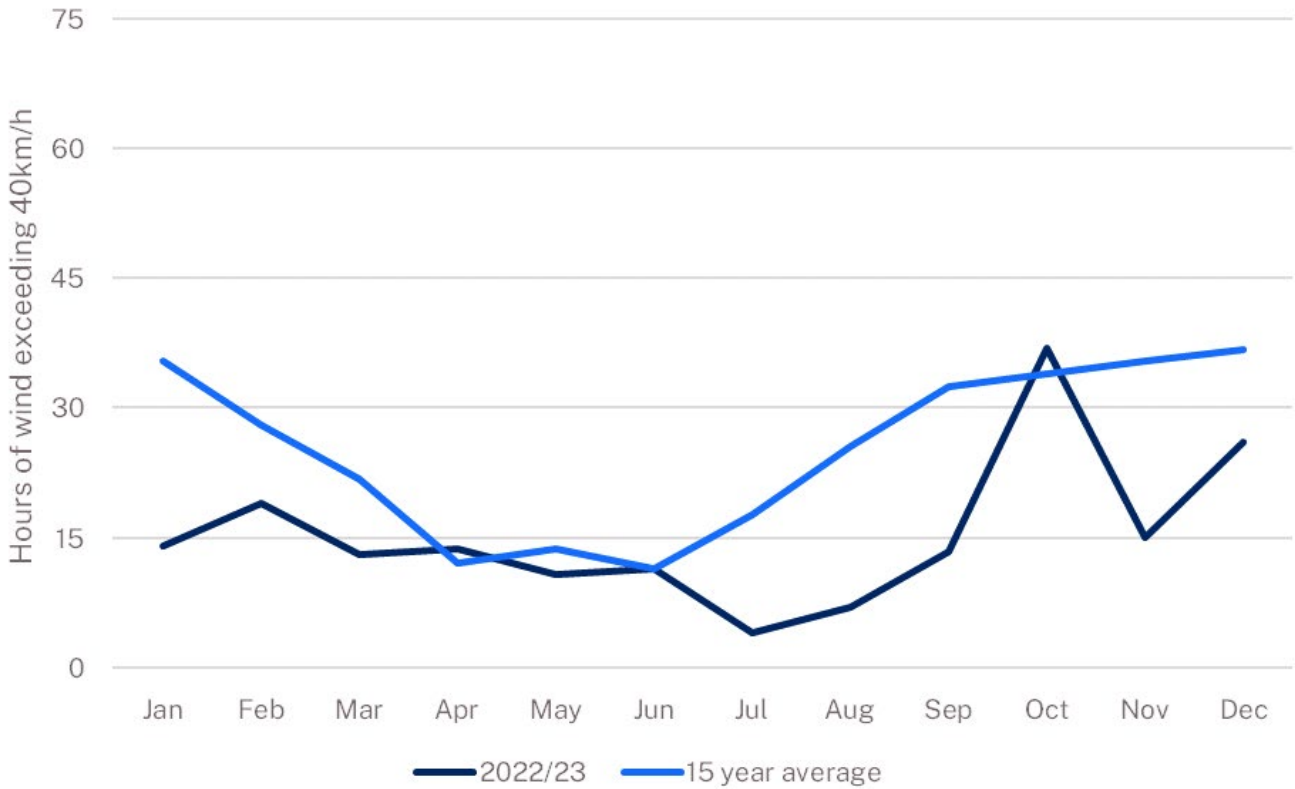


Figure 1 Hours of wind exceeding 40km/h - average across all sites

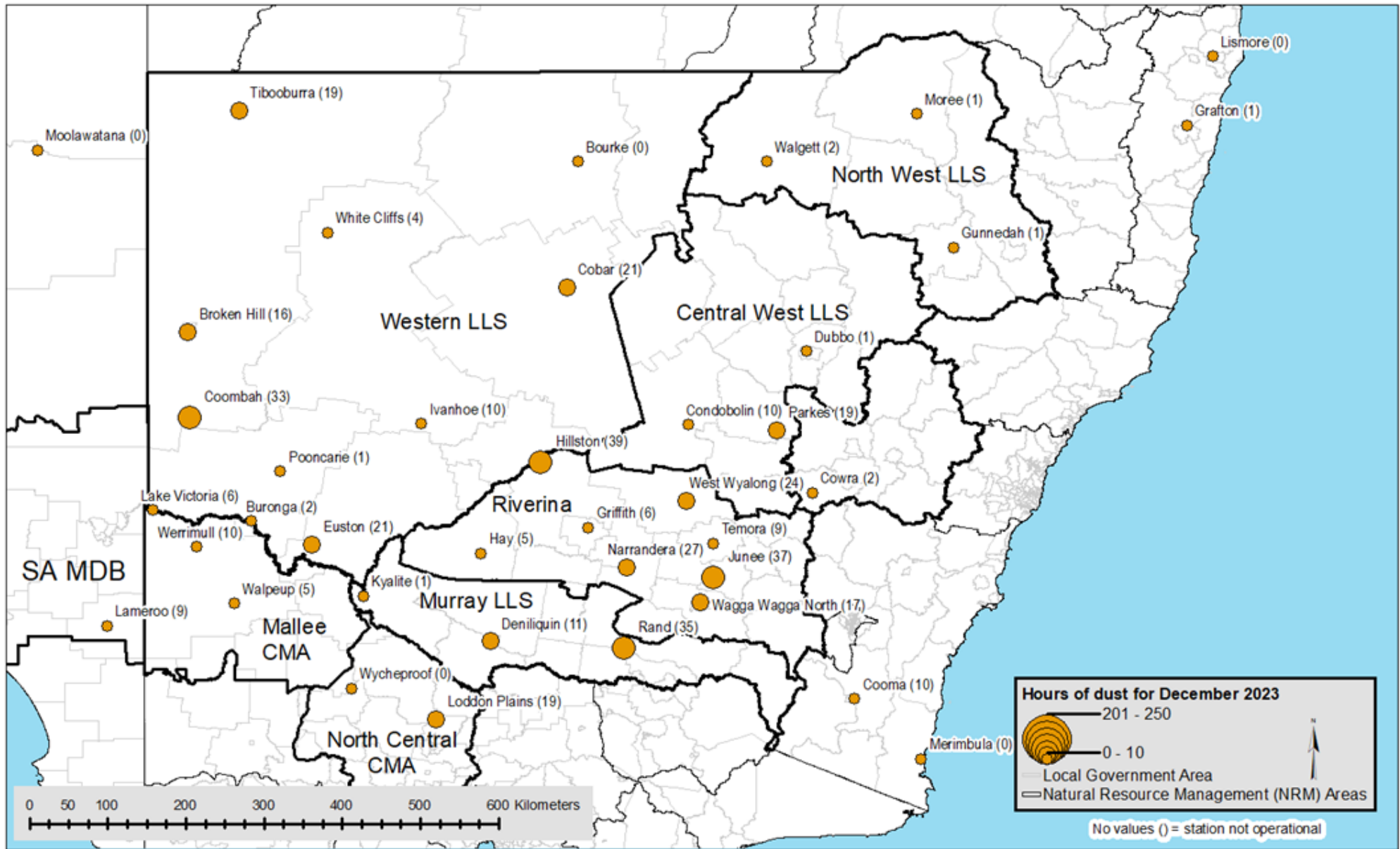


Figure 2 Hours of dust activity (number in brackets) at each DustWatch site in December 2023

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has reduced compared to November, particularly in the Western, South Australian Murray–Darling Basin and Mallee catchment management authority regions. Groundcover in the Central Tablelands and Murray regions remained unchanged (Table 1). The groundcover has decreased because there has been very little rainfall in the Western Local Land Services area (Figure 7a), and the wheat harvest was delayed due to heavy rainfall in previous months (Figure 7b).

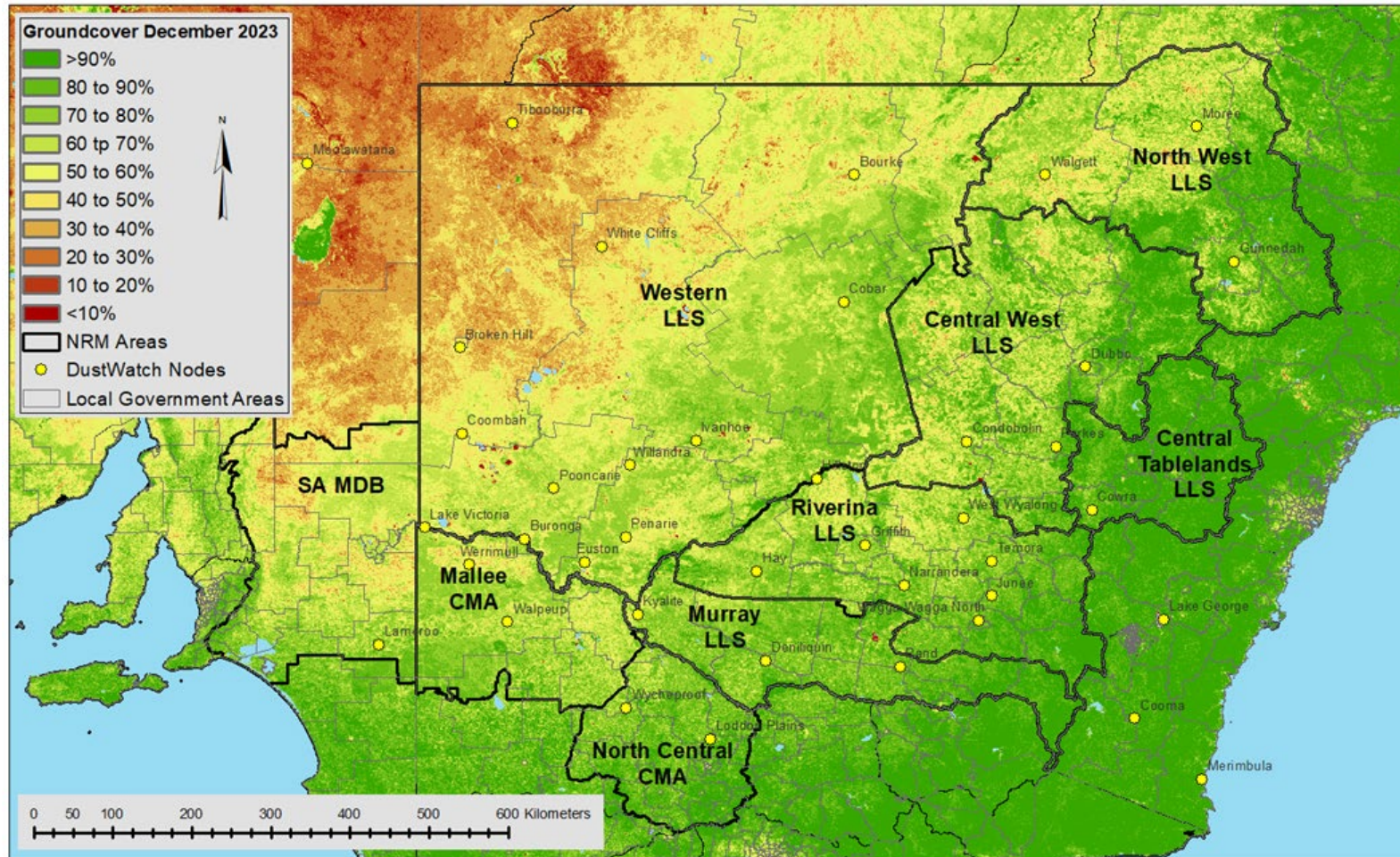


Figure 3 Groundcover for December 2023 as determined from MODIS by CSIRO

Table 1 Percentage of each NRM with cover >50% for January 2023 to December 2023

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Jan 2023	100	97	100	100	99	100	93	75	100
Feb 2023	99	95	100	100	98	99	91	74	100
Mar 2023	98	98	99	100	98	99	93	76	100
Apr 2023	98	97	100	100	97	100	95	83	100
May 2023	99	97	100	100	98	100	97	86	100
Jun 2023	100	99	100	100	99	100	98	90	100
Jul 2023	100	100	100	100	98	100	98	90	100
Aug 2023	99	100	100	100	97	100	97	87	100
Sep 2023	99	100	100	100	96	100	95	78	100
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

Groundcover change

Groundcover reductions (red and orange colours in Figure 4) are visible throughout the wheat belt, particularly the Riverina, Central West, Mallee and South Australian Murray–Darling Basin regions, as well as the Darling (Barka) River Corridor. More patchy reductions are visible in the north-west and North Central catchment management authorities regions, while groundcover increases continued at Lake Frome, south of Moolawatana.

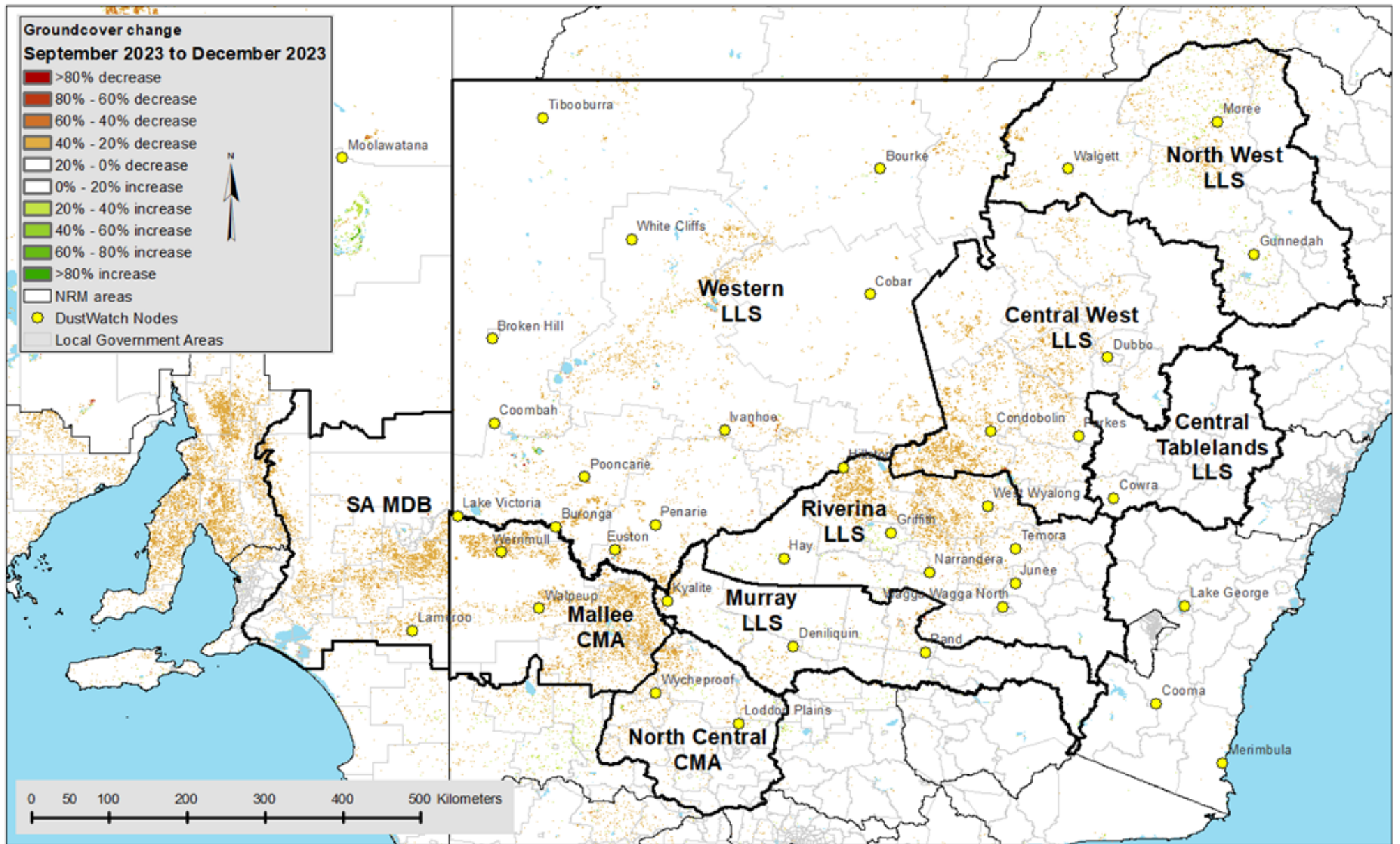


Figure 4 Groundcover difference between September 2023 and December 2023

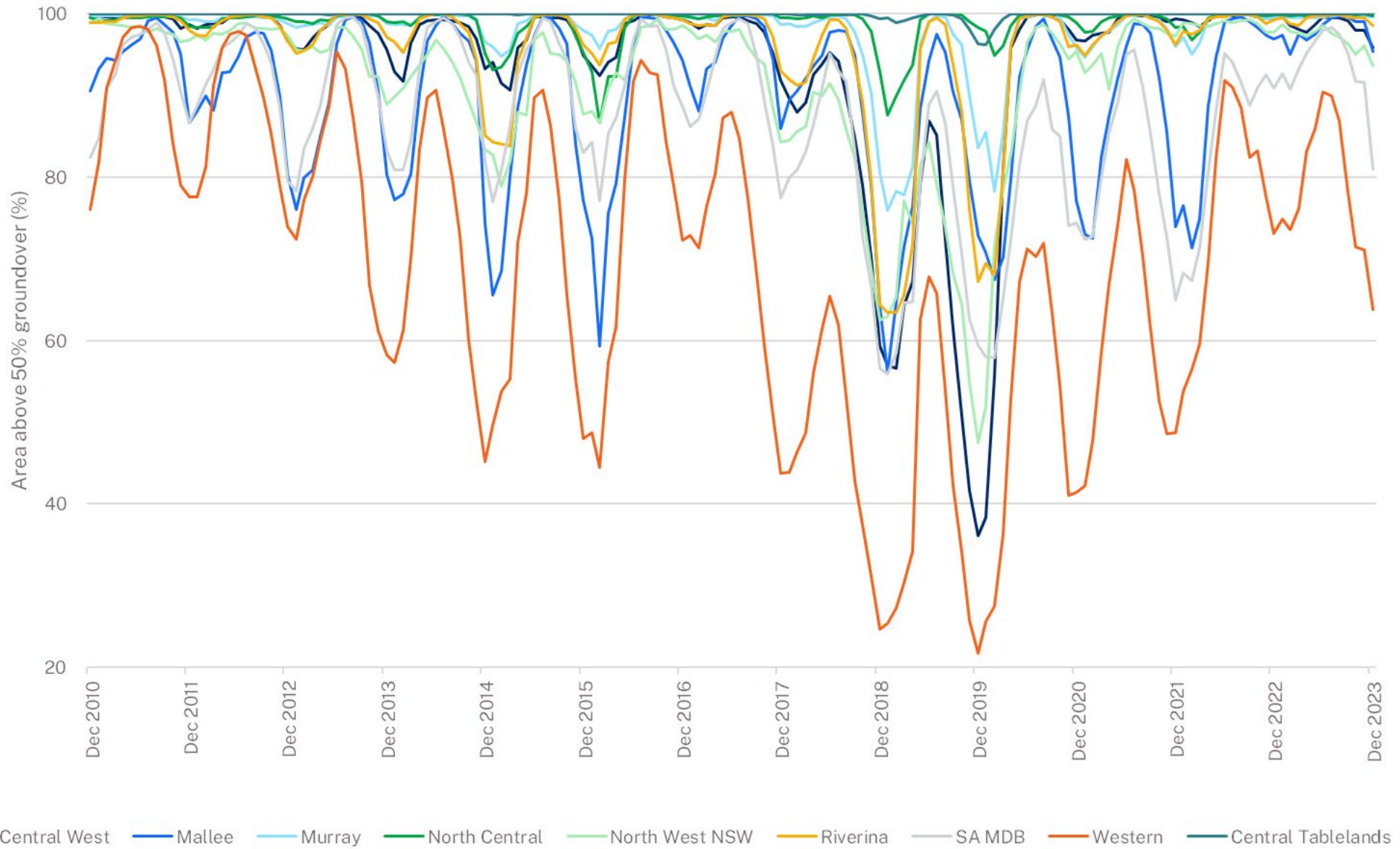


Figure 5 Area (%) of NRM with more than 50% cover since December 2010

Rainfall

Total rainfall in December ranged between 50 to 400 mm east of the Great Dividing Range. Totals graded from 200 mm in the north-west and Central Tablelands to no rainfall in parts of the Western Local Land Services. Rainfall was approximately average for much of the state, with above-average falls in the south and far north-west and far less than average rainfall in central parts of the Western Local Land Services (Figure 7a). Overall, rainfall deciles in the 3 months to the end of December show generally average to above-average totals.

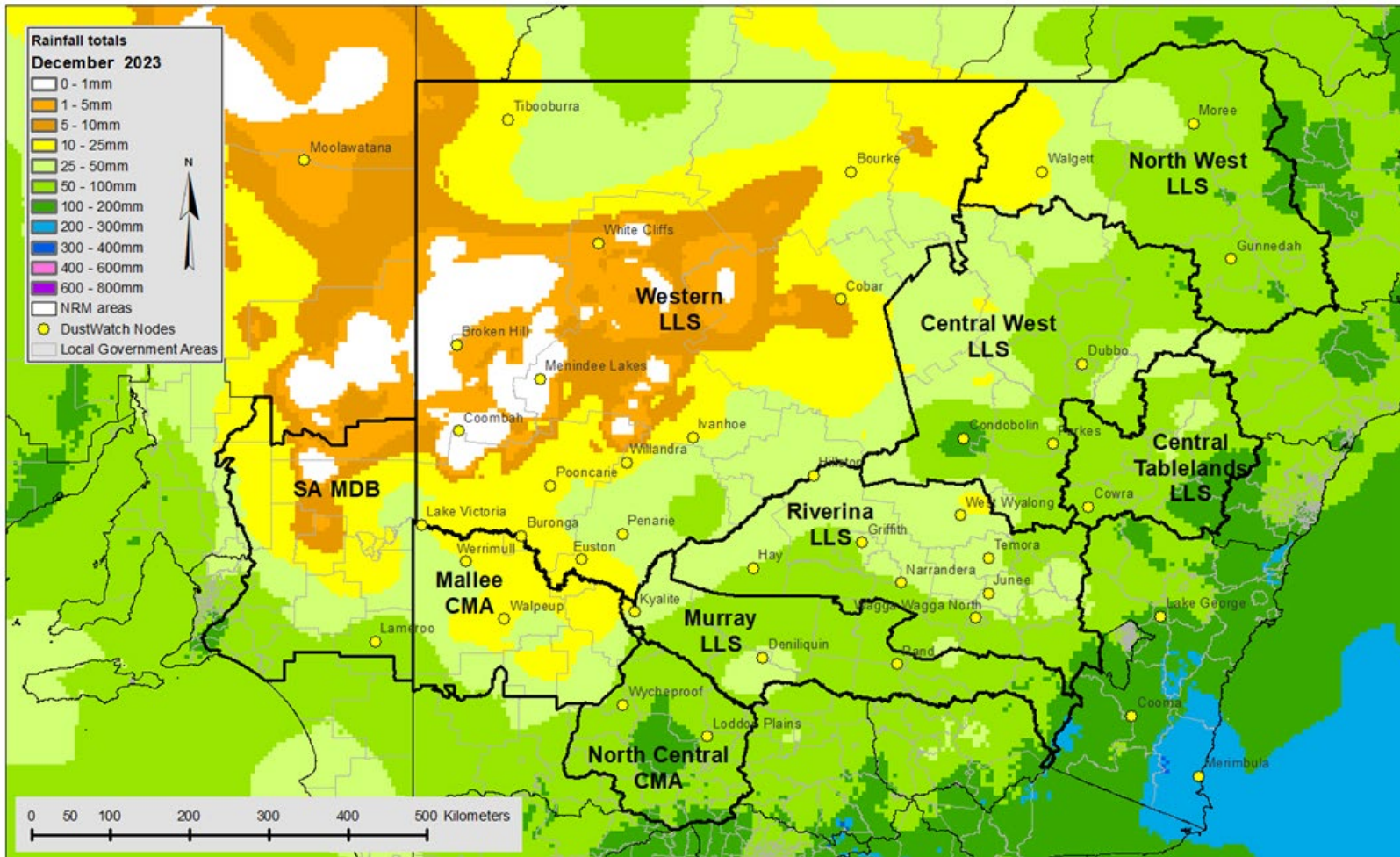


Figure 6 Rainfall totals for December 2023 (source: Bureau of Meteorology)

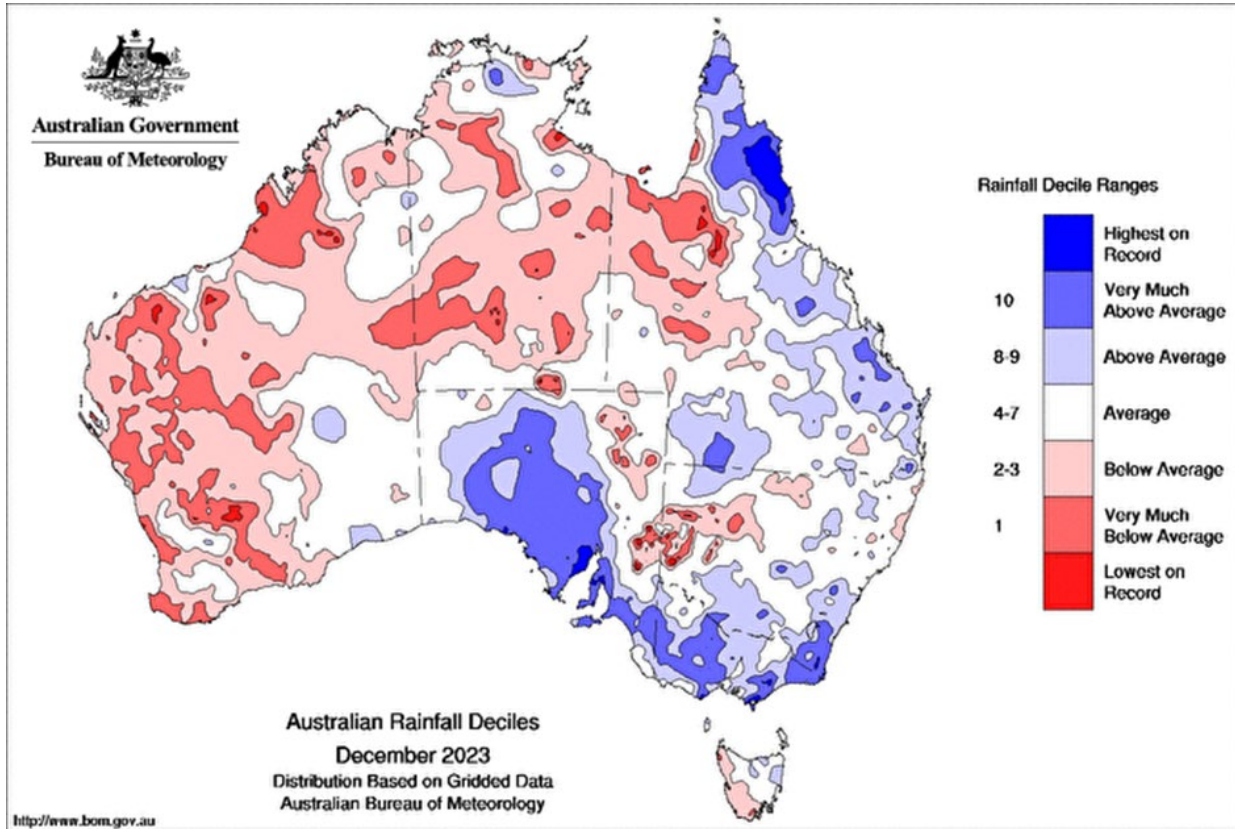


Figure 7(a) Rainfall deciles for December 2023

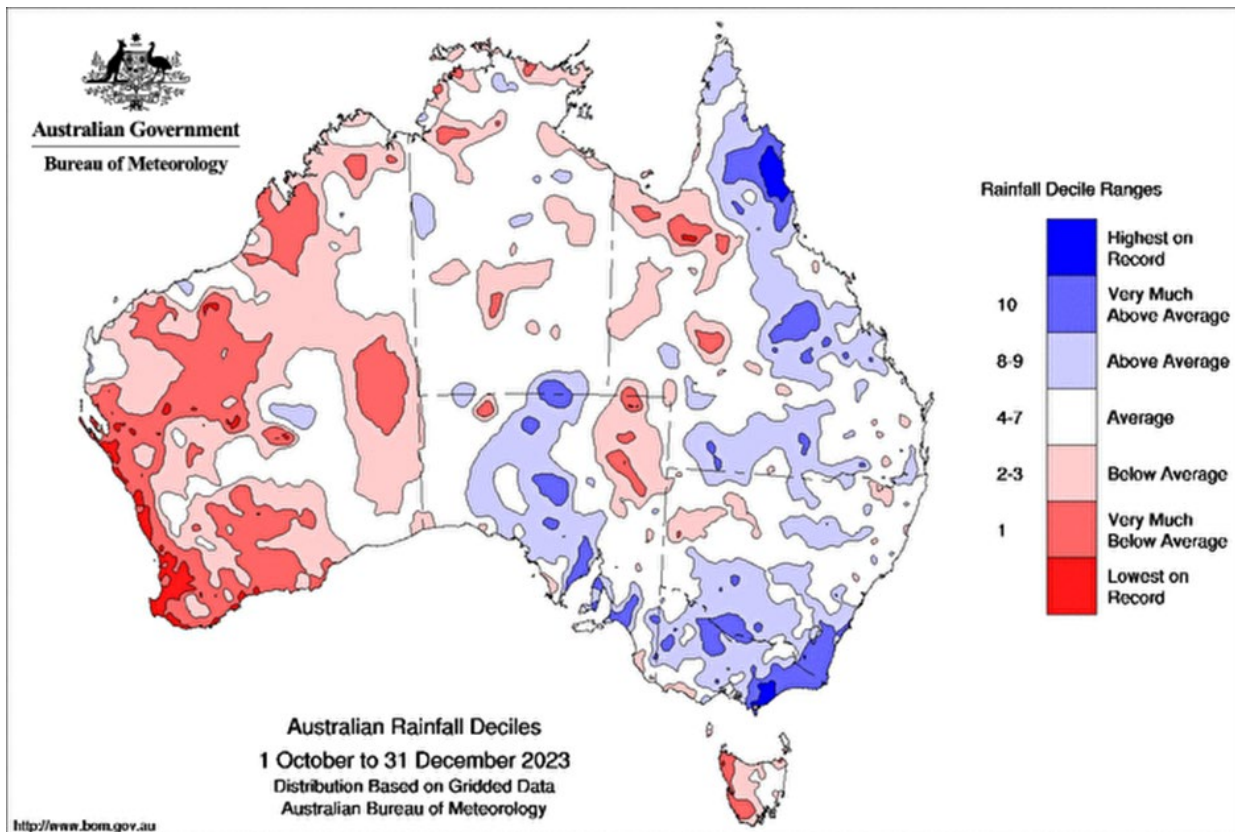


Figure 7(b) Rainfall deciles for 1 October 2023 to 31 December 2023

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 7,889 hot spots (375 m pixel with temperature anomalies) in December 2023 (Figures 8 and 9), a 62% increase from the 4,858 hot spots detected in November 2023.

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

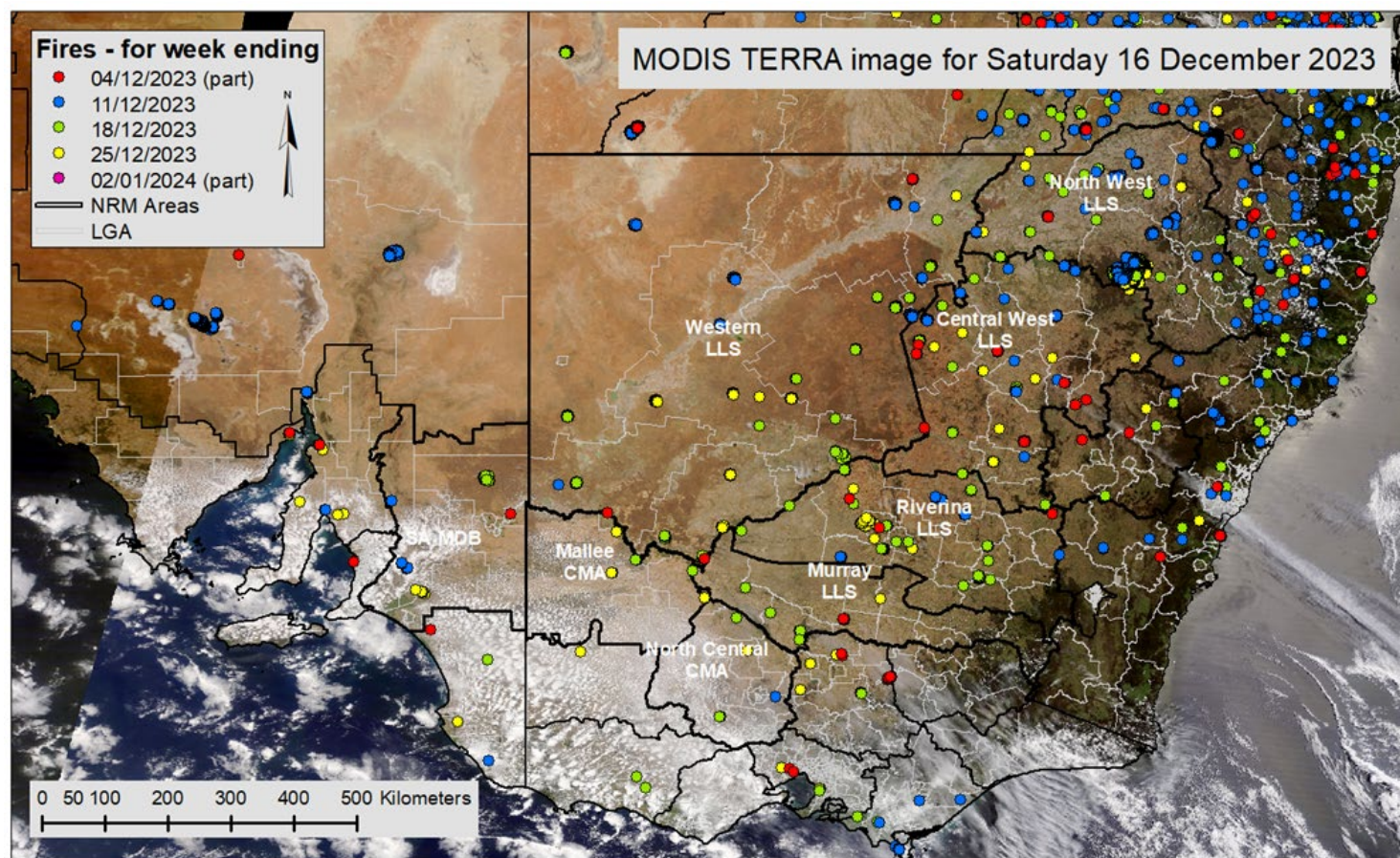


Figure 8 Pixels (375m) with active burning fires in December 2023 as determined from VIIRS satellite

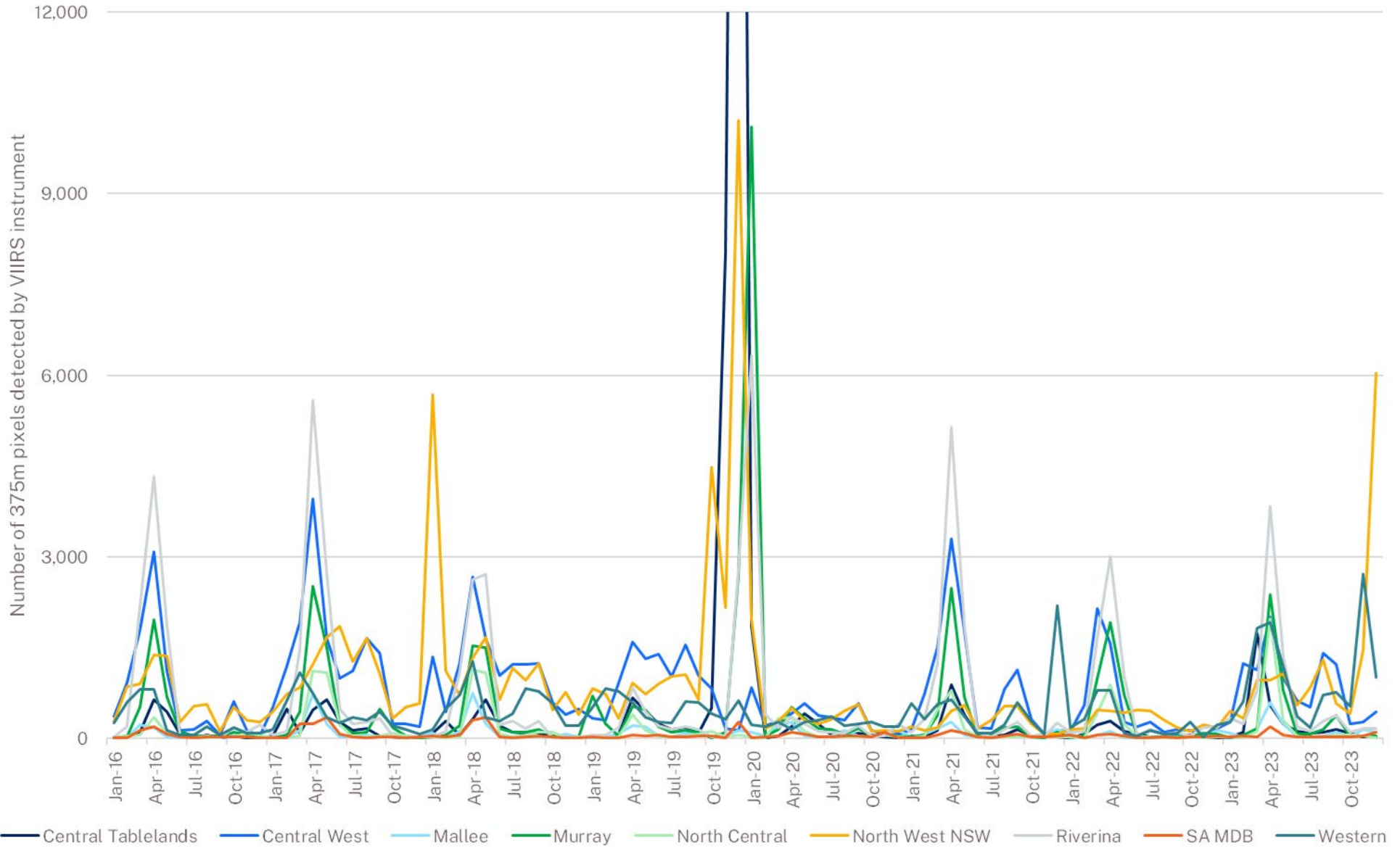


Figure 9 Number of 375 m pixels with active burning fires between January 2016 and December 2023

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