

Community-based wind erosion monitoring across Australia

Dust activity	Lower than October 2023; below average for November
Wind strength	Decrease from October; much below long-term average
Groundcover	Slight increase in the north; unchanged elsewhere
Rainfall	Average to very much above average for November

Dust activity

Since October 2023, dust activity at long-term sites has decreased to 8.3 hours. This is mainly because of the heavy rainfall in November across the state (Figure 7a). However, dust activity increased in the Riverina, Murray and Mallee regions (Figure 2) despite minimal changes in groundcover (Figure 4) and higher than average rainfall in these areas (Figure 7a). Lower than average wind speeds made transporting dust emissions less likely (Figure 1).

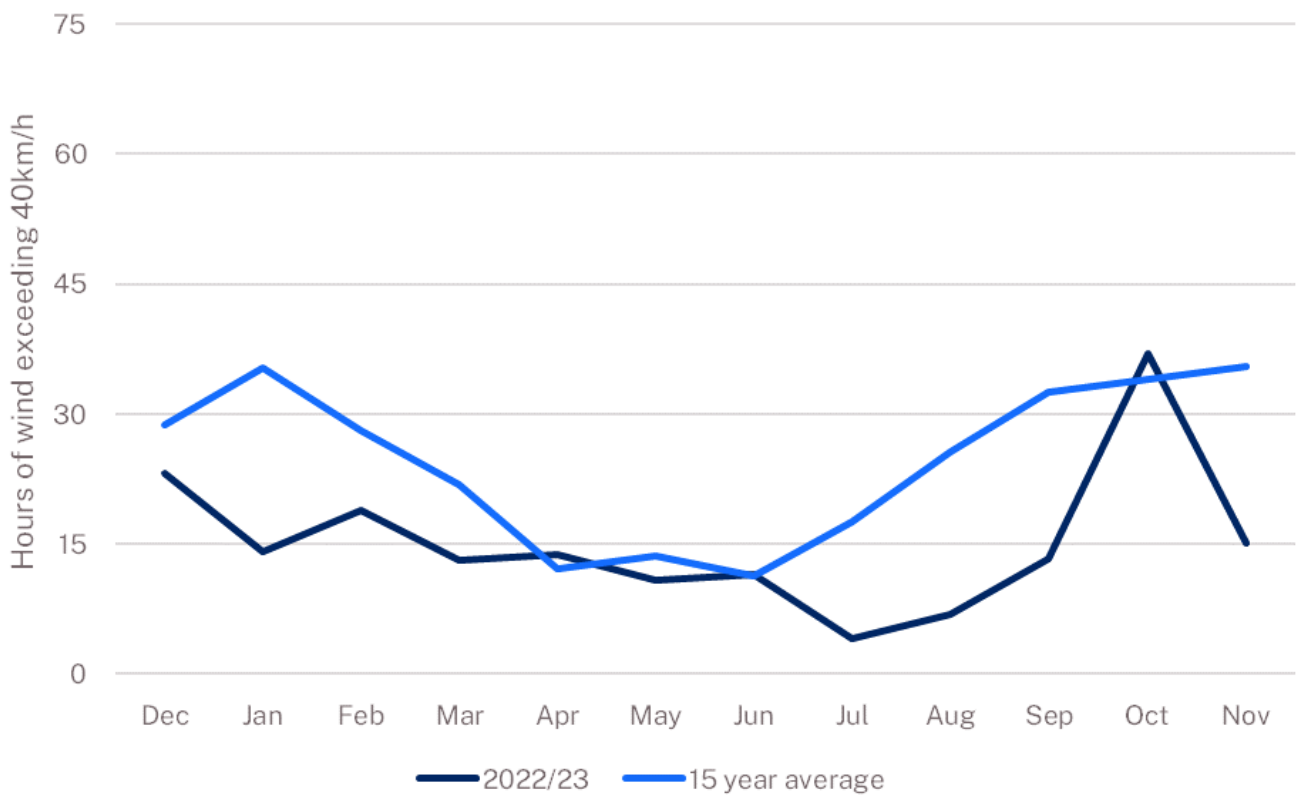


Figure 1 Hours of wind exceeding 40km/h - average across all sites

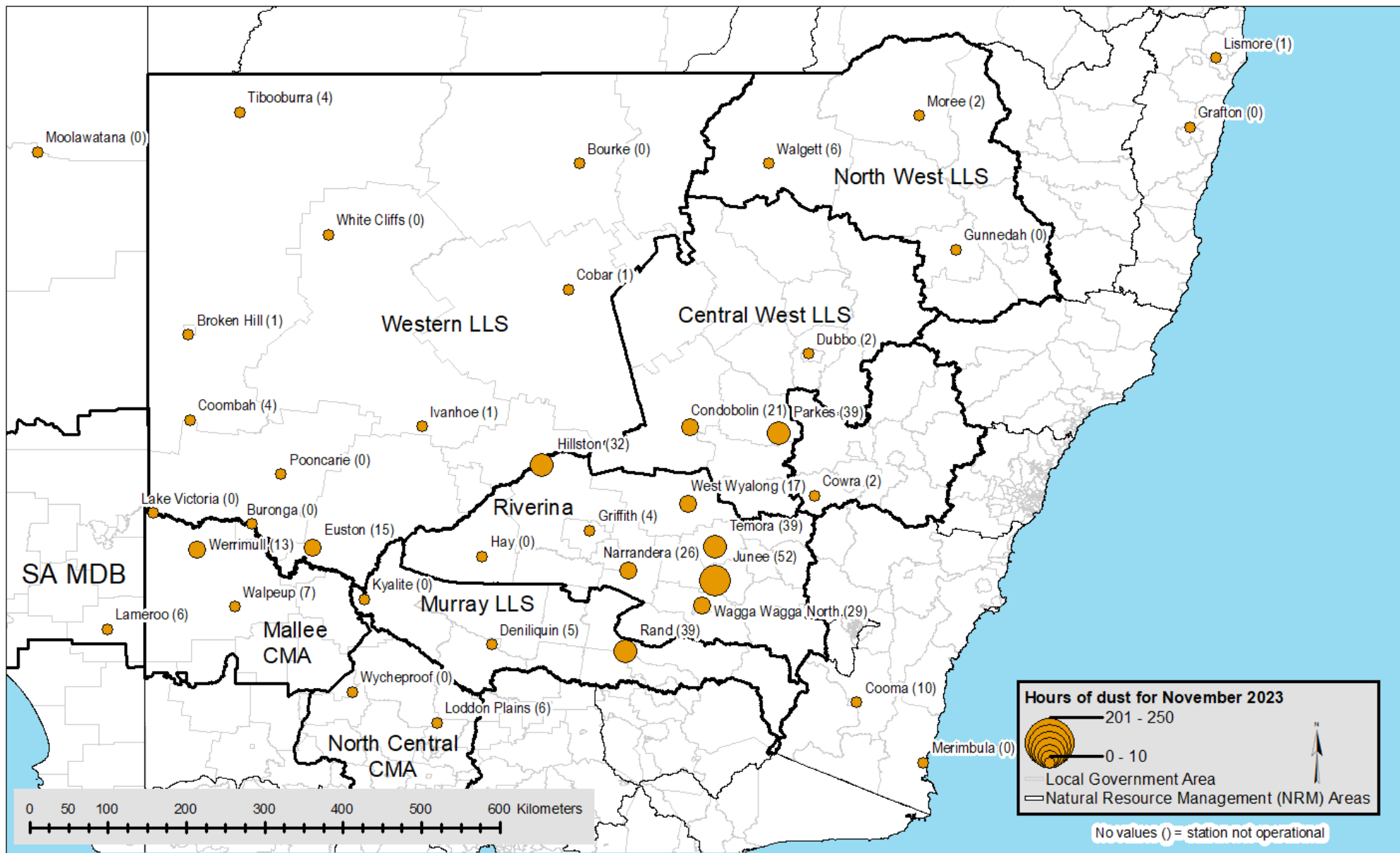


Figure 2 Hours of dust activity (number in brackets) at each DustWatch site in November 2023

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has remained largely unchanged from October (Table 1) due to above to very much above average rainfall experienced across most of the state. Table 1 shows that the North West Local Land Services was the only region to record a groundcover change, which increased by 1% to 96% for November 2023.

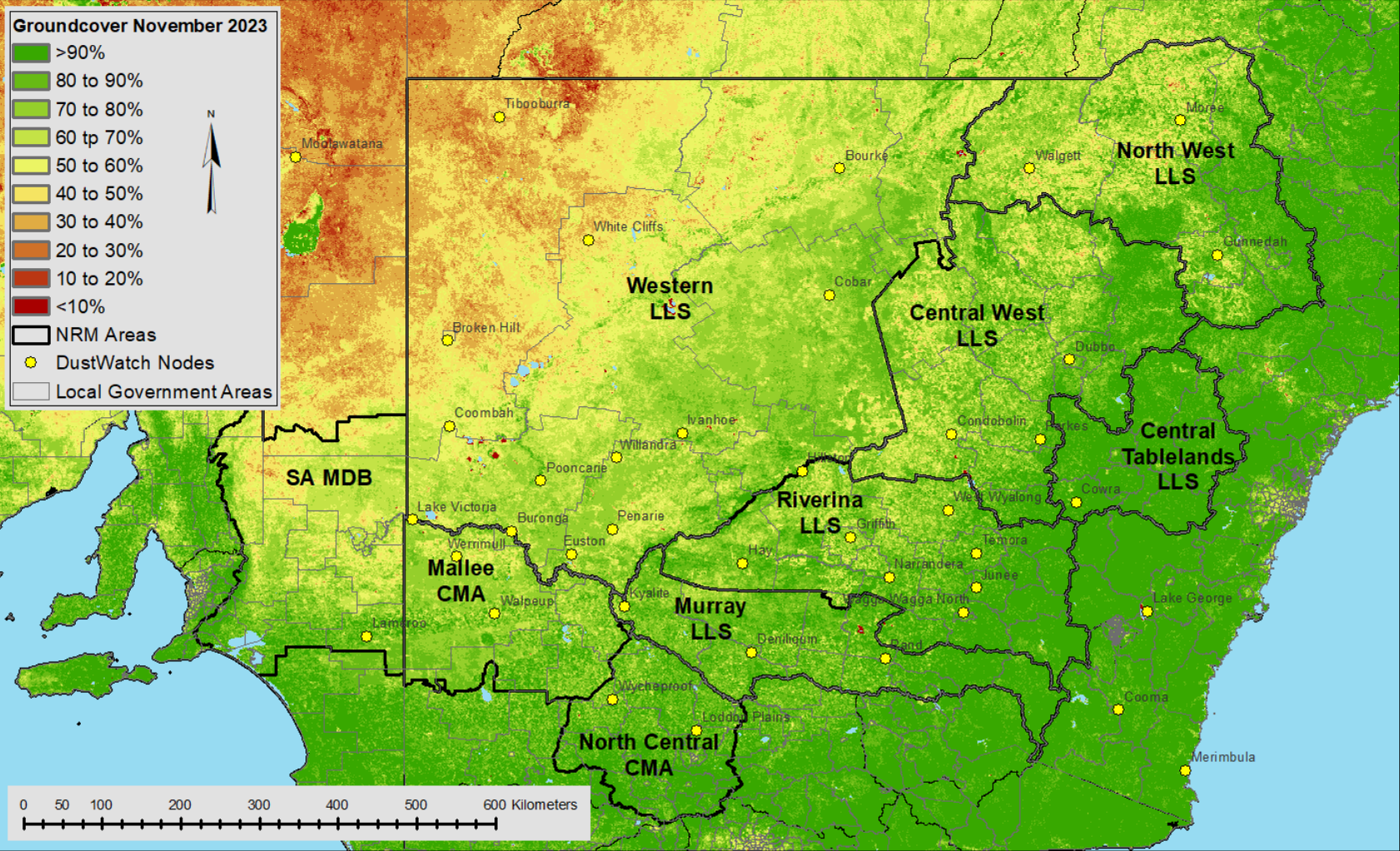


Figure 3 Groundcover for November 2023 as determined from MODIS by CSIRO

Table 1 Percentage of each NRM with cover >50% for December 2022 to November 2023

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Dec 2022	100	97	99	100	98	99	91	73	100
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

Groundcover change

Groundcover across the state is largely unchanged from October 2023. The red and orange colours in Figure 4 show patchy groundcover reductions in parts of the Central West, Riverina, Murray and Mallee regions. The green colours in Figure 4 shows patchy/isolated improvements south of Moolawatana at Lake Frome and lakes along the Great Darling Anabranch. This marginal improvement in groundcover is likely due to above to very much above average rainfall across much of the state in October (Figure 7a).

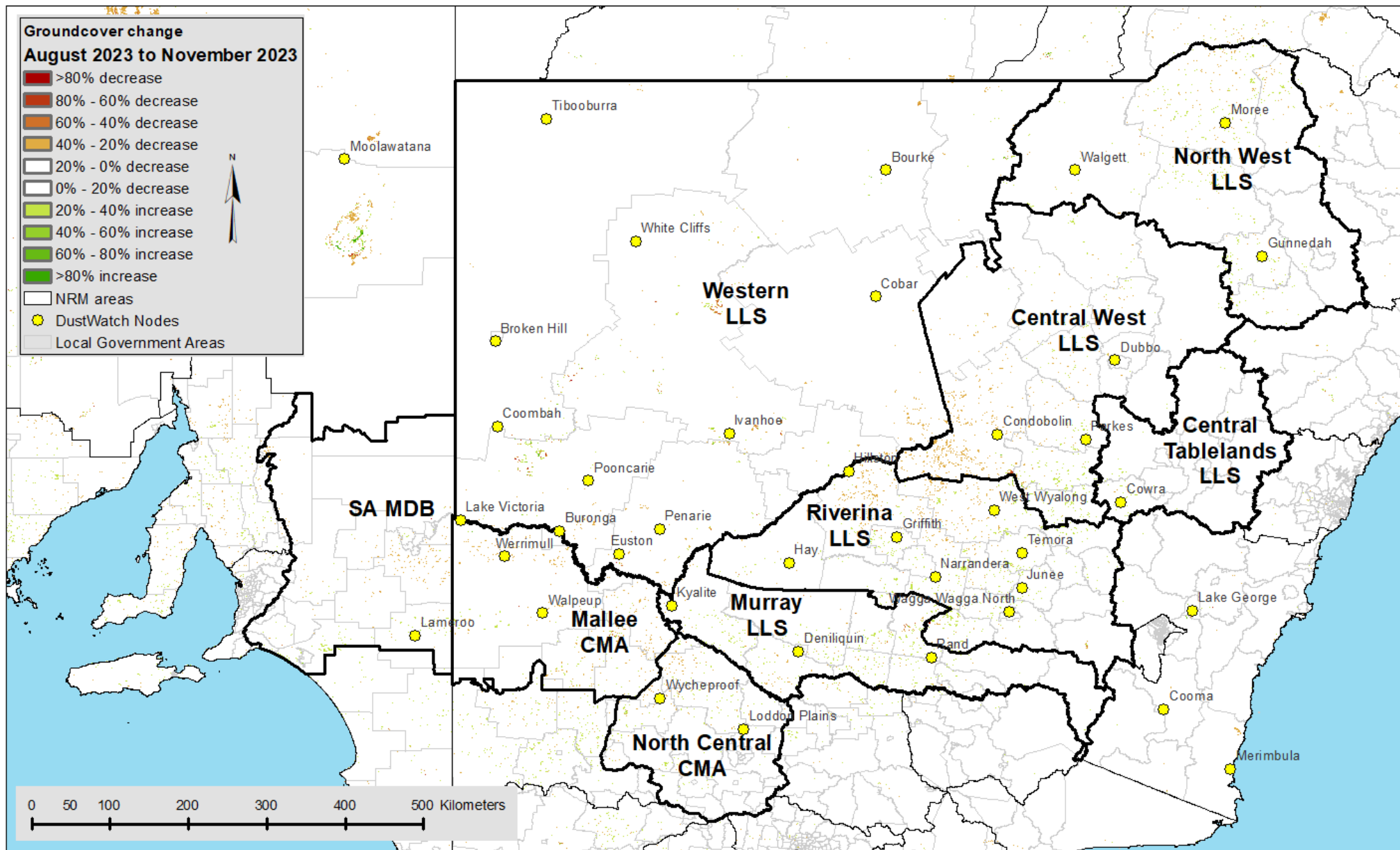


Figure 4 Groundcover difference between August 2023 and November 2023

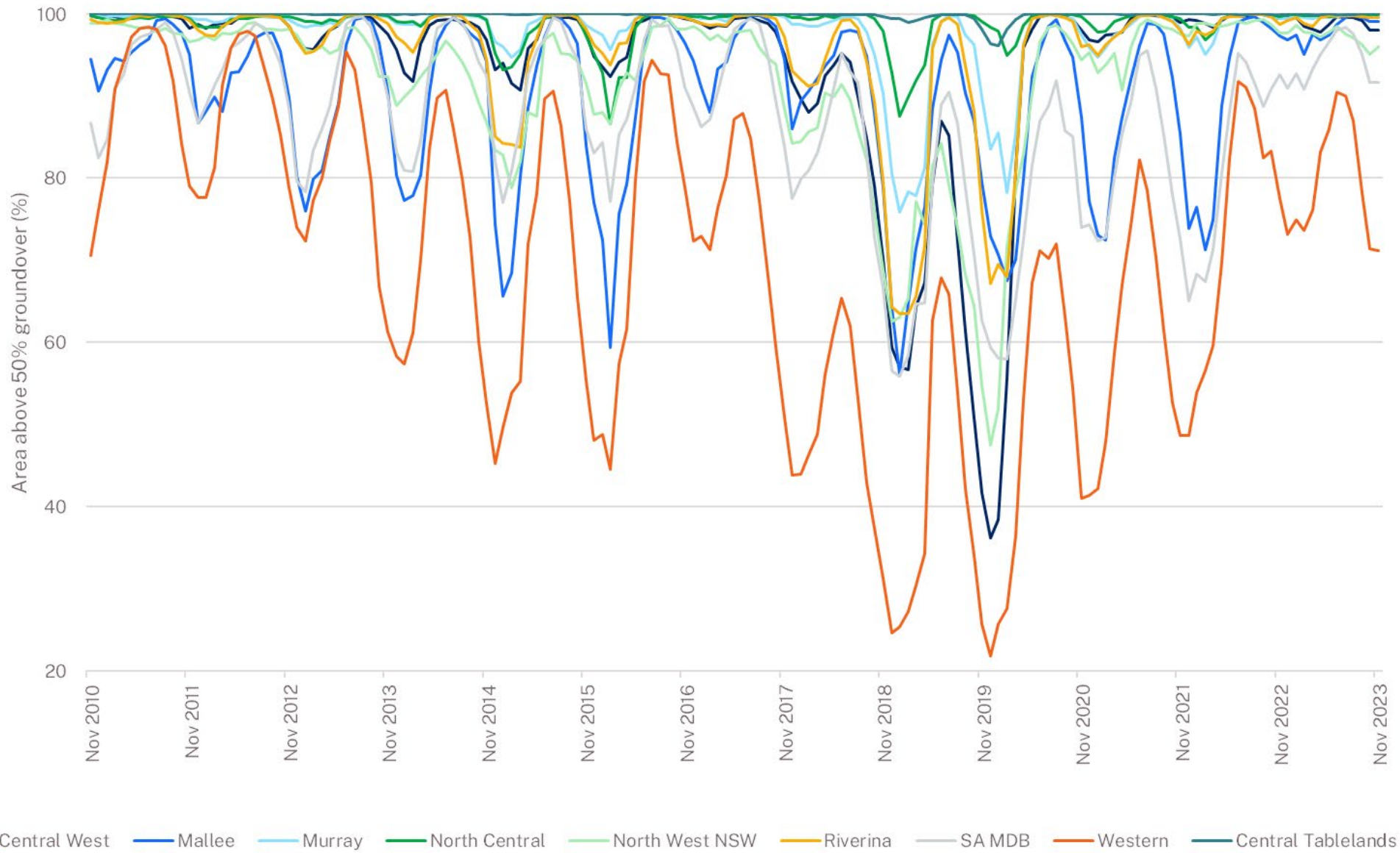


Figure 5 Area (%) of NRM with more than 50% cover since November 2010

Rainfall

Total rainfall has improved significantly from October across much of the state, with totals on and east of the Great Dividing Range generally ranging from 50 mm to 200 mm (Figure 6). The northwest area of the state in the Western Local Land Services region shows the least improvement with total rainfall less than 25 mm, which is average for this time of year (Figure 7a). Despite the November rainfall totals, 3 months rainfall deciles are average for much of the state and below average in the north-east and far west areas of the state (Figure 7b).

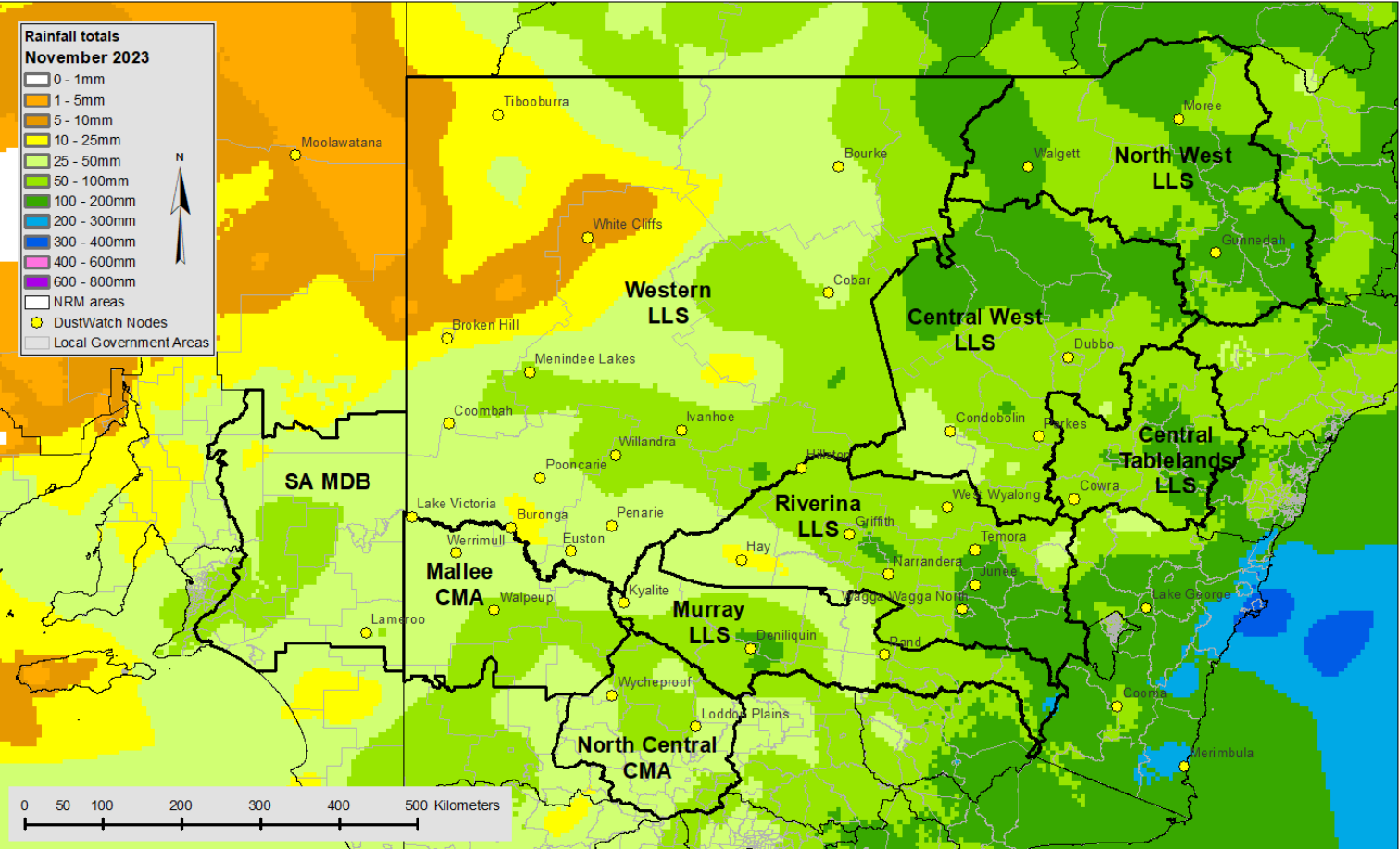


Figure 6 Rainfall totals for November 2023 (source: Bureau of Meteorology)

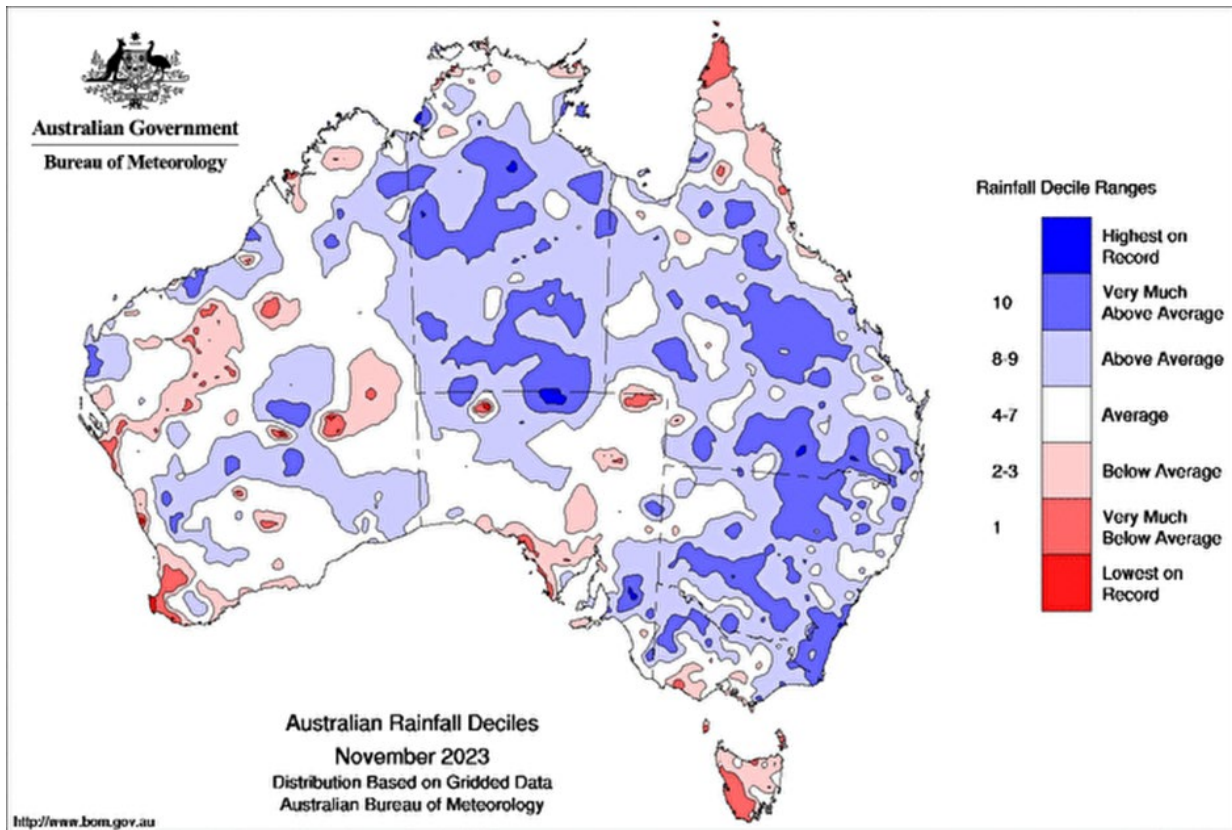


Figure 7(a) Rainfall deciles for November 2023

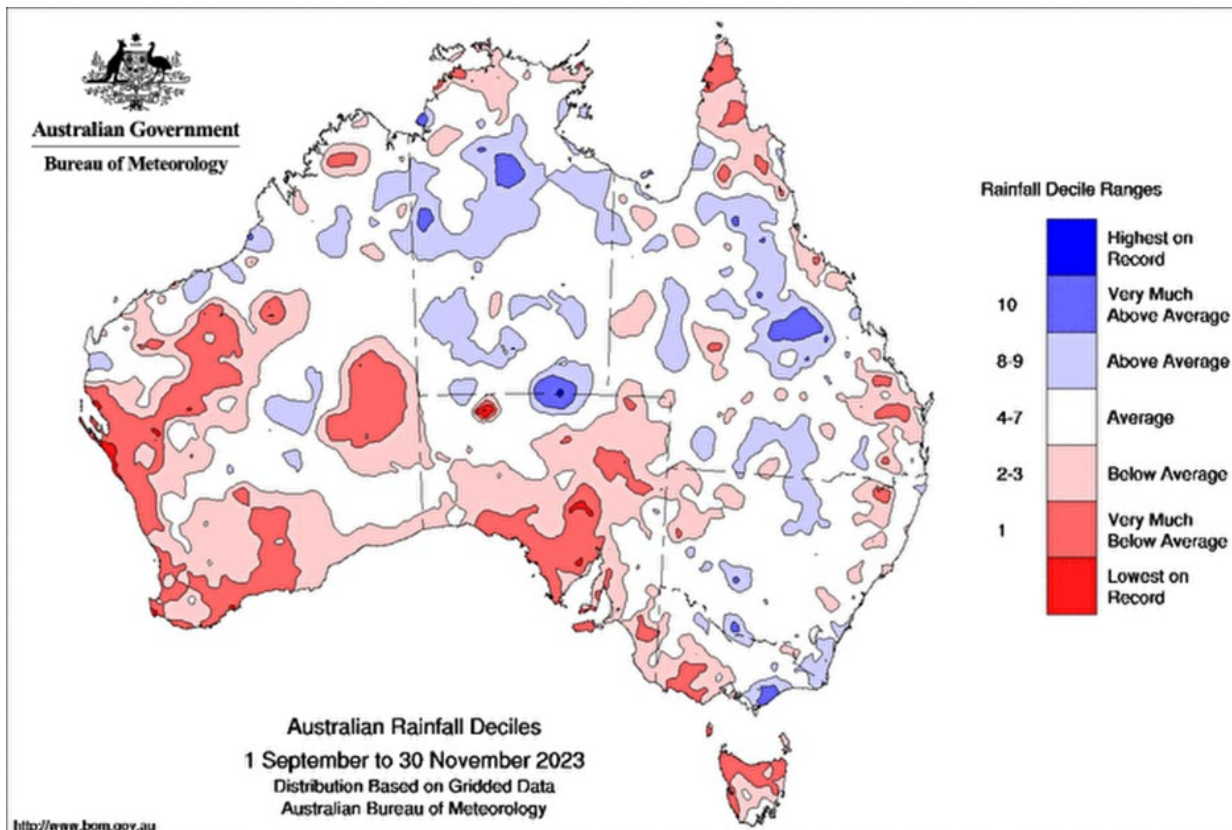


Figure 7(b) Rainfall deciles for 1 September 2023 to 31 November 2023

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 4,858 hot spots (375 m pixel with temperature anomalies) in November 2023 (Figures 8 and 9), a 235% increase from the 1,451 hot spots detected in October 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.

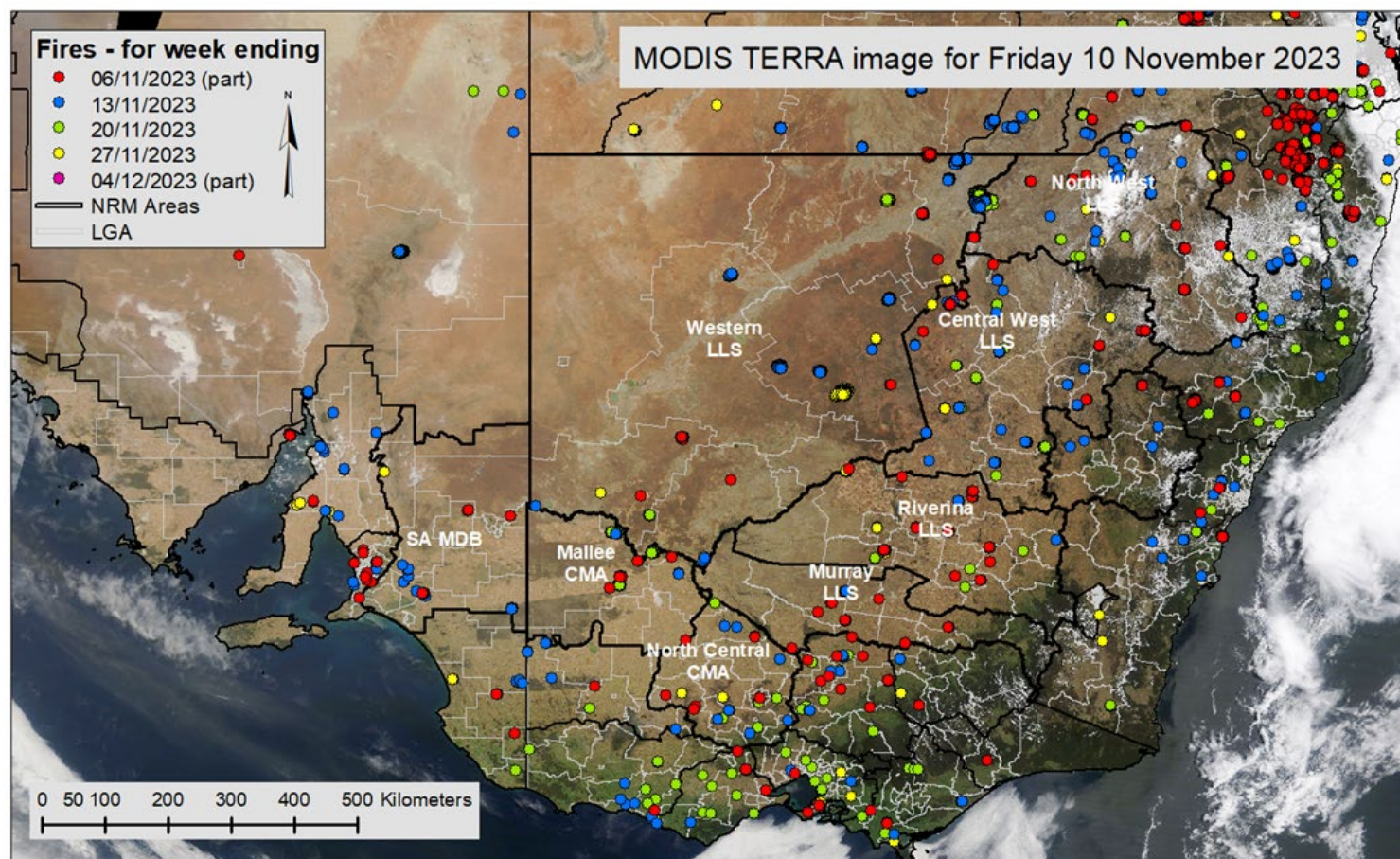


Figure 8 Pixels (375 m) with active burning fires in November 2023 as determined from VIIRS satellite

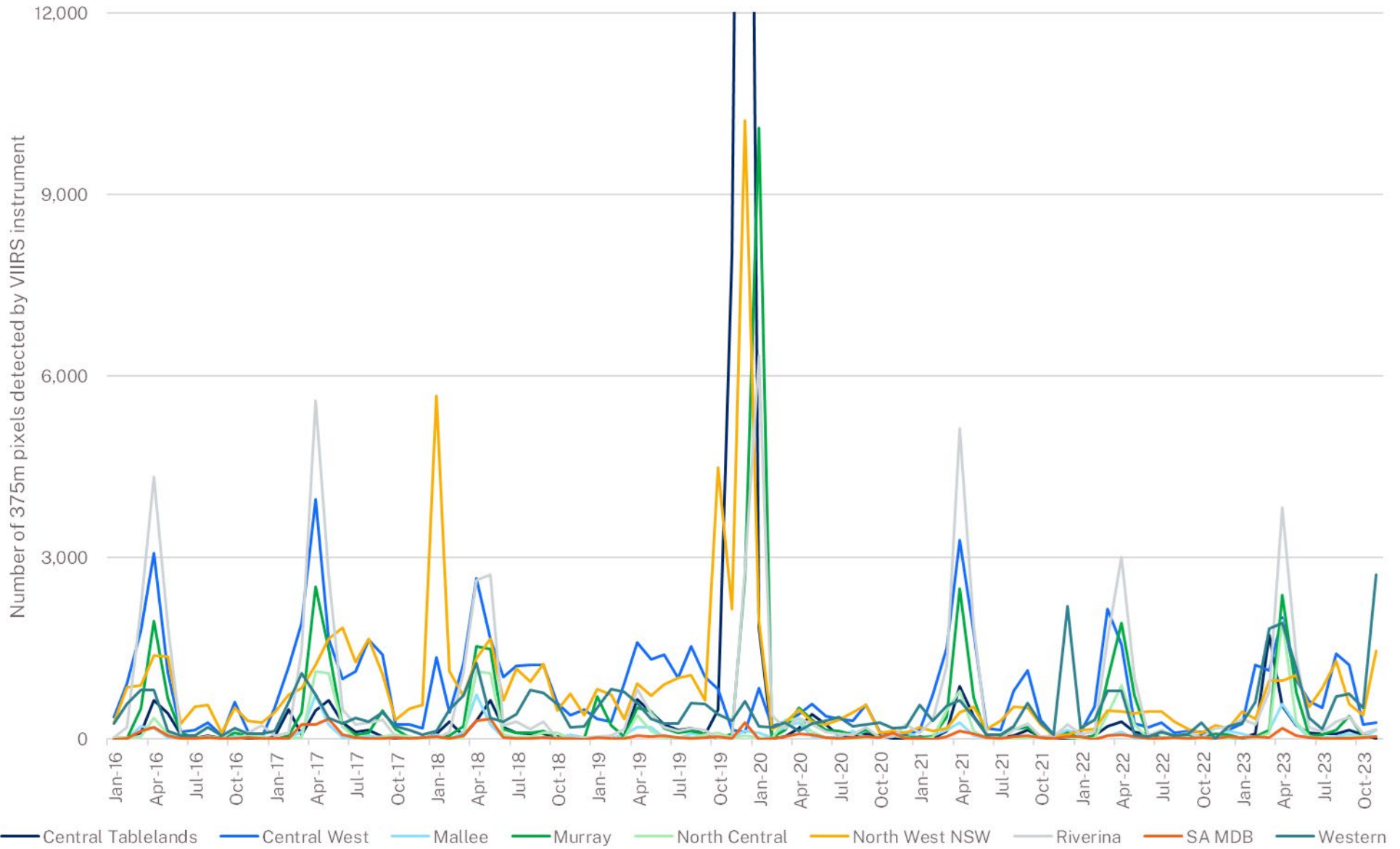


Figure 9 Number of 375 m pixels with active burning fires between January 2016 and November 2023

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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.

ISSN 2206-3161 EH 2023/0011 October 2024