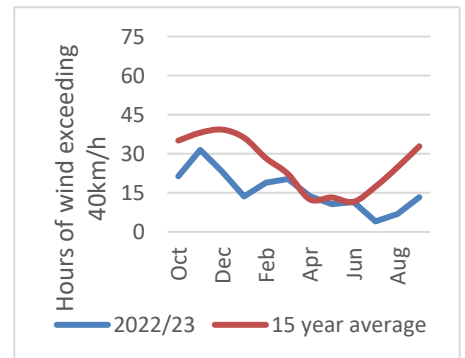


<b>Dust activity</b>	Substantial increase in dust; average for September
<b>Wind strength</b>	Increase from August; much below long-term average
<b>Groundcover</b>	Decrease in the west; unchanged elsewhere
<b>Rainfall</b>	Very little rainfall; much below average

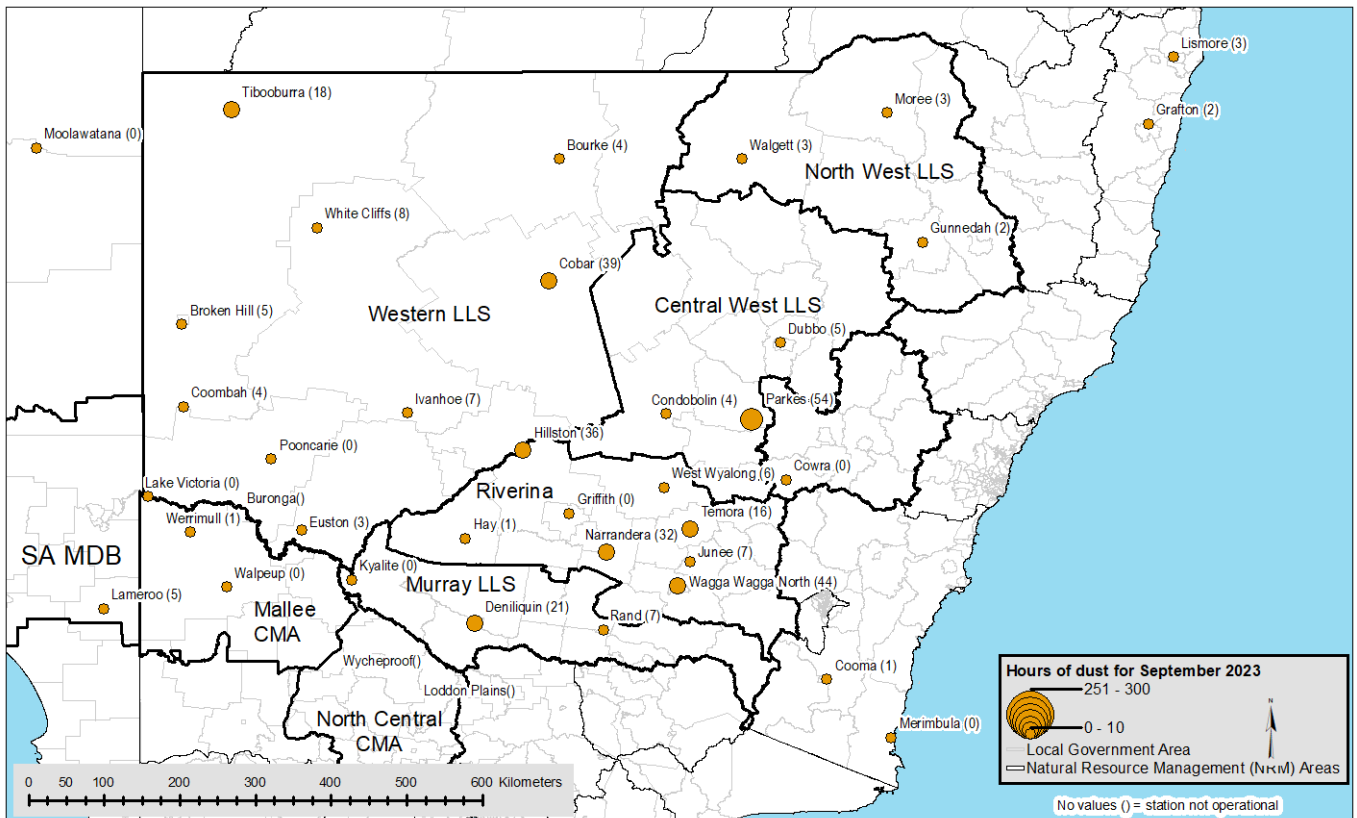
## Dust activity

Dust activity increased substantially from August 2023, with the long-term sites recording an average of 10 h of dust activity for the month compared to 2 h in the previous month (Figure 2). This is mostly due to the very dry conditions prevailing across the state (Figure 6), leading to a reduction in groundcover in the wheat/sheep belt (Figure 4). Strong winds made the dust transport possible (Figure 1).



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

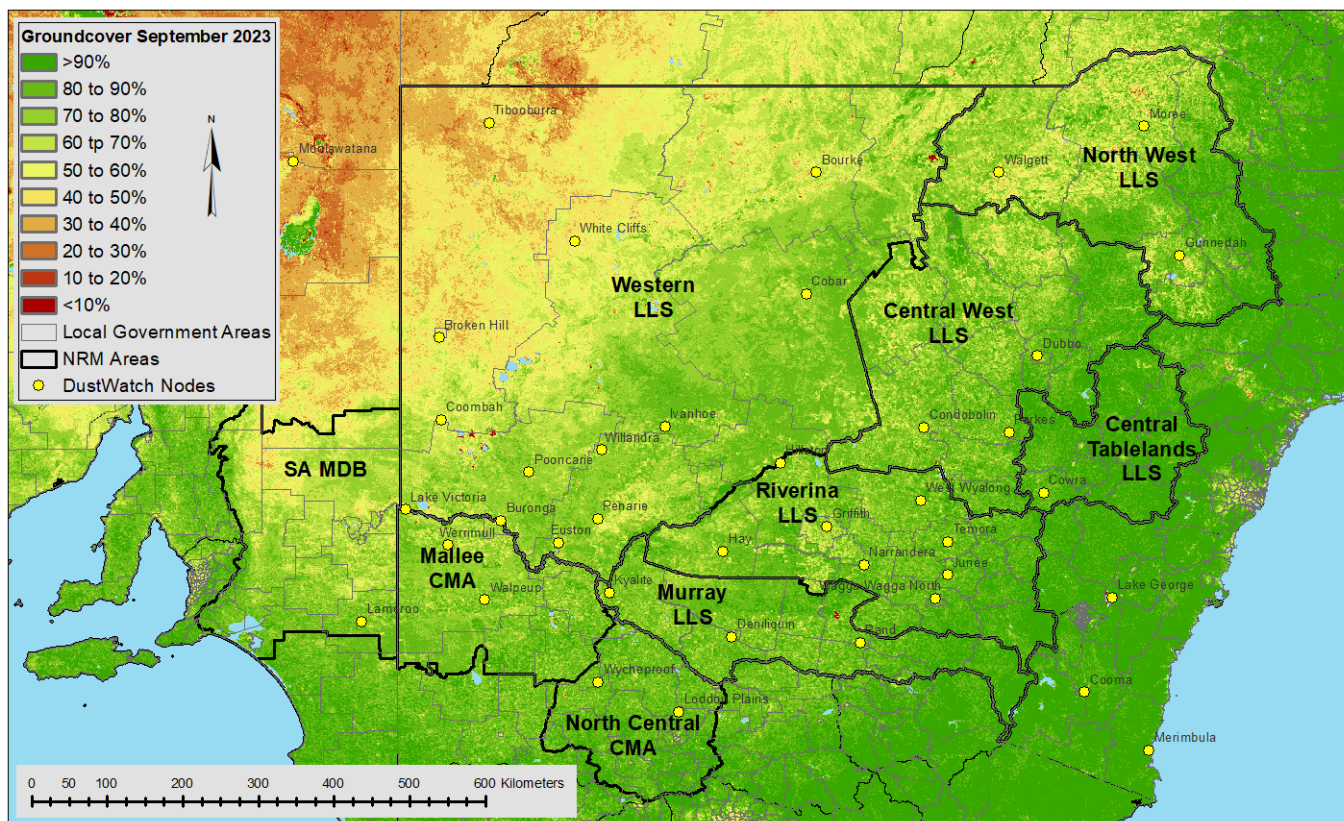
Note: Real time dust measurements from all our monitoring sites are at: Rural air quality network – live data



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

# Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has reduced in the Local Land Services Western Region, mainly east of Tibooburra and along the Darling (Barka) River Corridor (Table 1 and Figure 4). This groundcover reduction is due to the very dry conditions experienced throughout New South Wales.



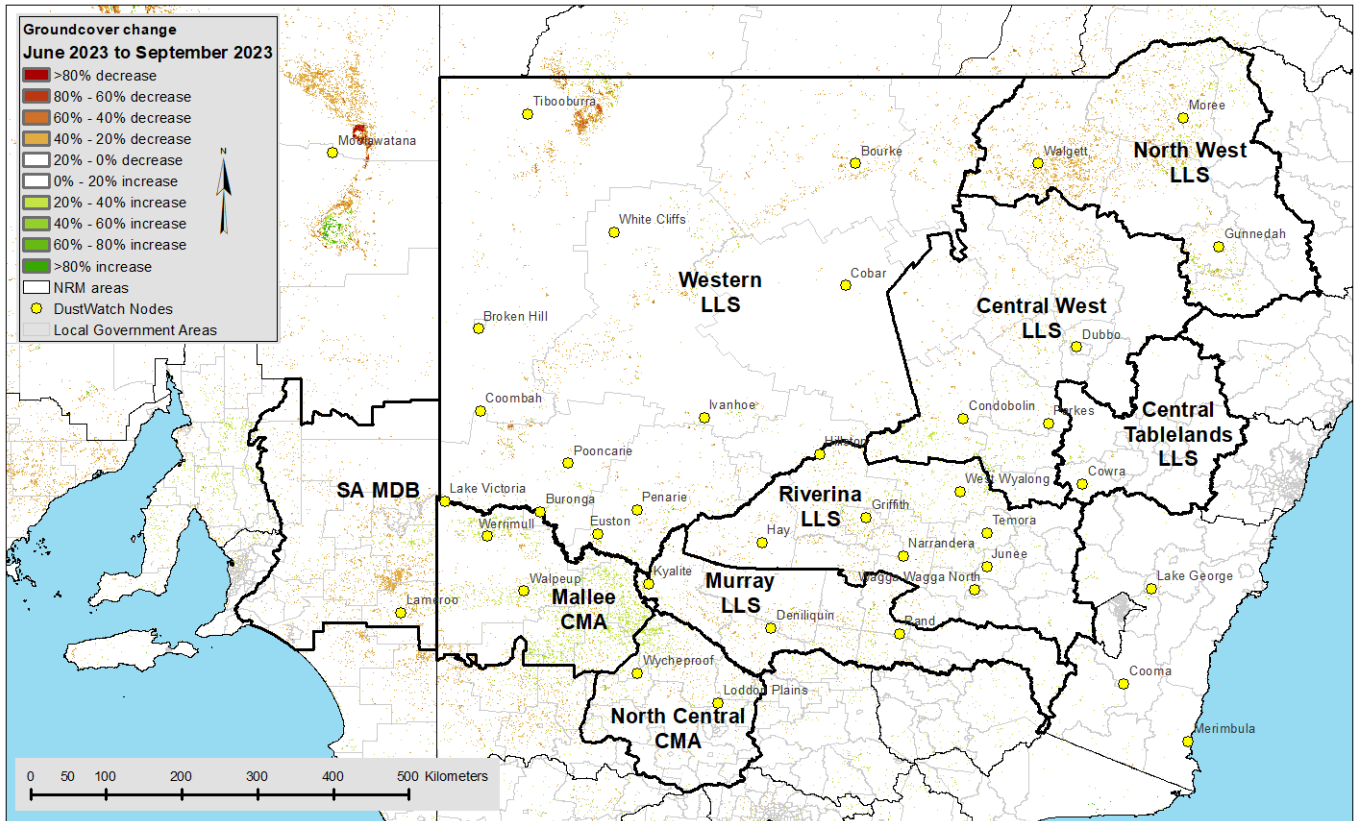
**Figure 3** Groundcover for September 2023 as determined from MODIS by CSIRO

**Table 1** Percentage of each NRM with cover >50% for September 2022 to September 2023

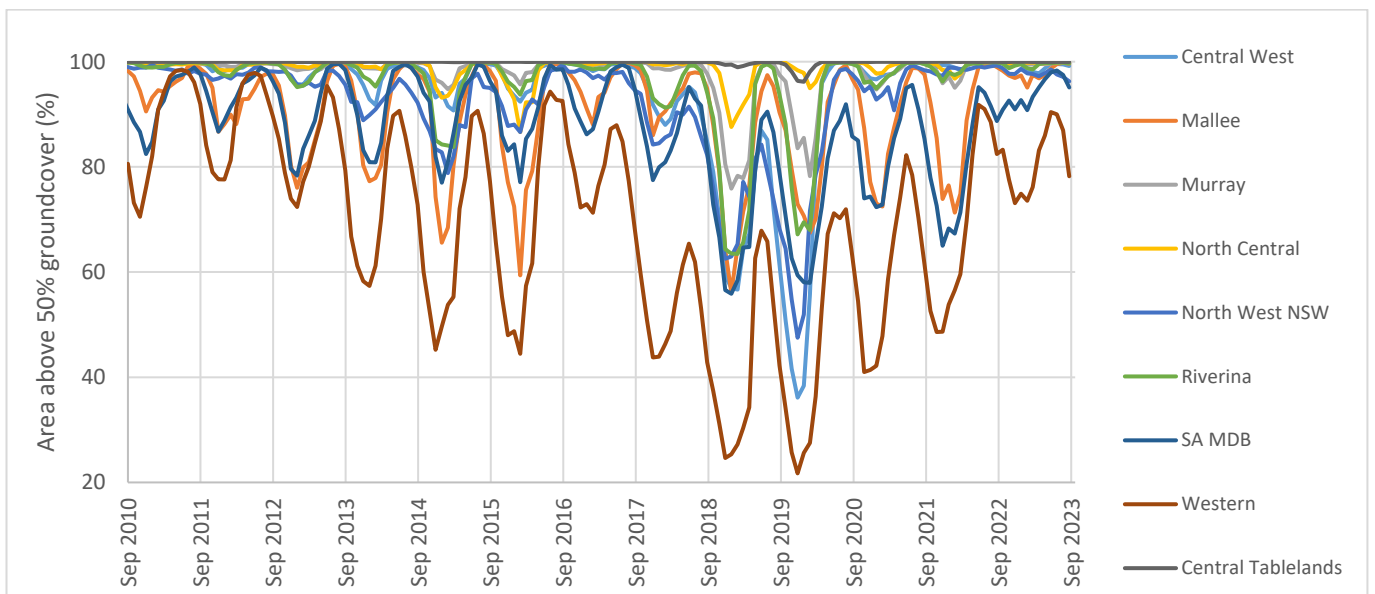
Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Sep 2022	100	99	100	100	99	100	89	82	100
Oct 2022	100	98	100	100	99	100	91	83	100
Nov 2022	99	97	99	100	98	99	93	78	100
Dec 2022	100	97	99	100	98	99	91	73	100
Jan 2023	100	97	100	100	99	100	93	75	100
Feb 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

# Groundcover change

Groundcover reductions (red and orange colours in Figure 4) are visible around Moolawatana in South Australia, east of Tibooburra and in isolated paddocks in the Local Land Services North West Region. This reduction is expected for this time of the year (Figure 5). Some groundcover improvements (green colours in Figure 4) are visible in the eastern part of the Mallee Region.



**Figure 4** Groundcover difference between June 2023 and September 2023



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



# Rainfall

Total rainfall was much below average for September, with most of the state in the driest 10% of rainfall records (Figure 7a). Rainfall west of the Great Dividing Range remained below 5 mm for most areas, with no rainfall recorded for a big proportion of the Local Land Services Western Region (Figure 6). This continues the pattern from the previous months, and large parts of New South Wales are now in the driest 10% of rainfall records for the last 3 months (Figure 7b).

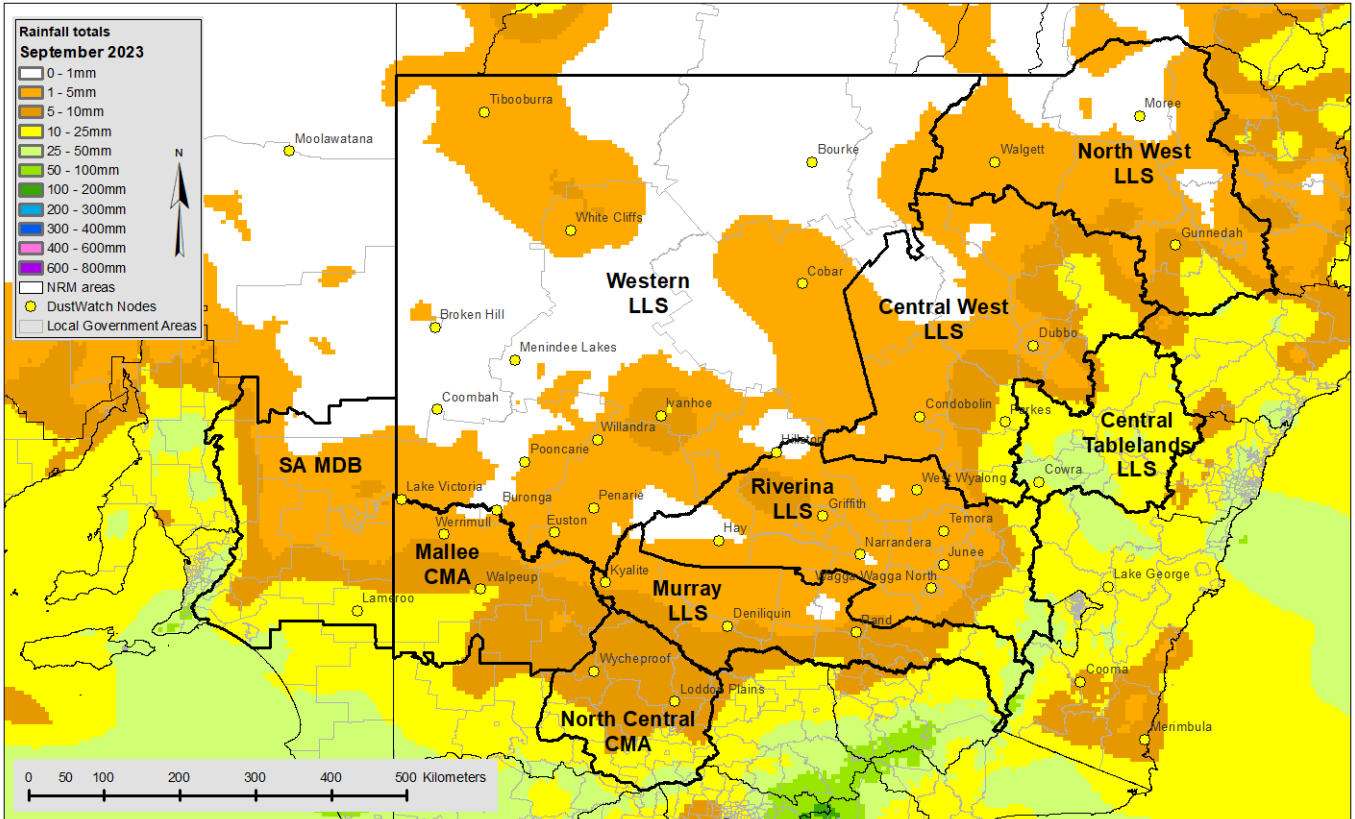


Figure 6 Rainfall totals for September 2023 (source: Bureau of Meteorology)

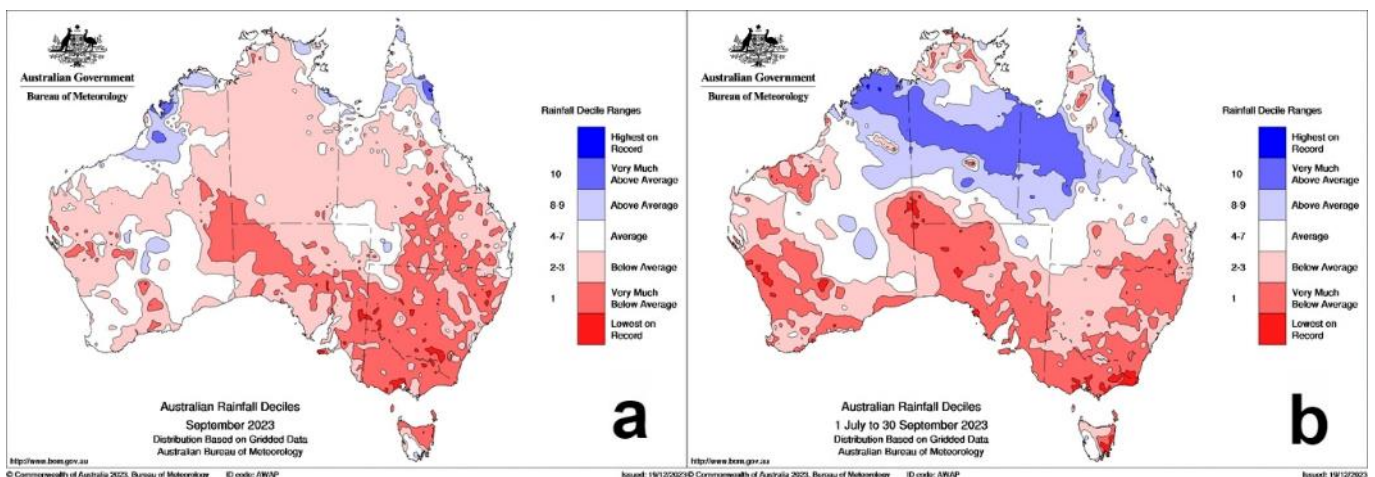
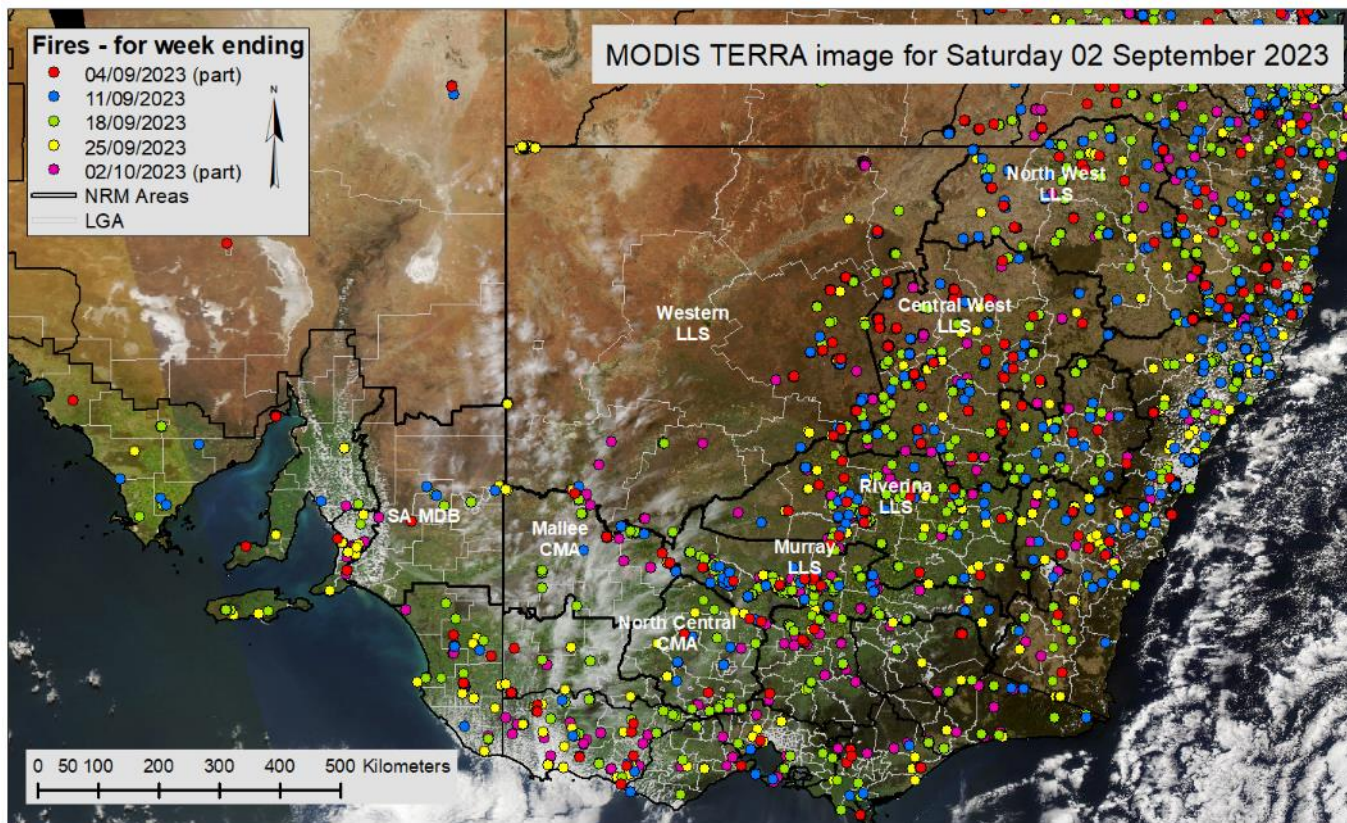


Figure 7 Rainfall deciles for September 2023 (a) and 1 July 2023 to 30 September 2023 (b)

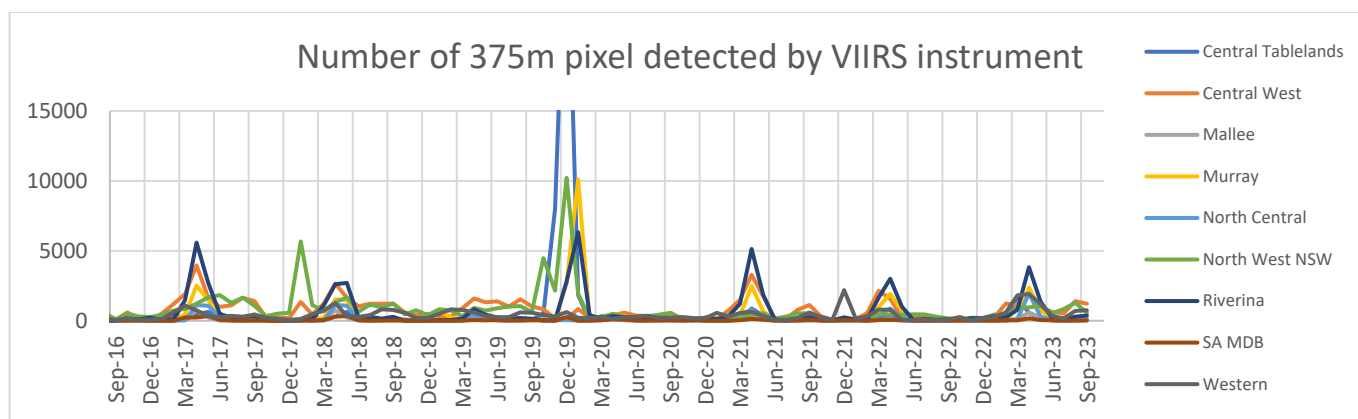
# VIIRS fires and satellite image

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 3,581 hot spots (375 m pixel with temperature anomalies) in September 2023 (Figures 8 and 9), a small reduction from the 3,988 hot spots detected in August 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 September 2023 as determined from VIIRS satellite



**Figure 9** Number of 375m pixels with active burning fires between September 2016 and September 2023

The DustWatch team

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Data is supplied by the Department of Planning and Environment 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 New South Wales; the Mallee and North Central CMAs in Victoria and Murray Darling Basin NRM in South Australia; CSIRO and the Australian National University. We particularly thank our many DustWatch volunteers who provide observations and help maintain the instruments.