DustWatch Report

August 2023

Dust activity	Significant increase in dust in central New South Wales
Wind strength	Very few hours of strong winds; below 15-year average
Groundcover	Groundcover steady; reducing in the west
Rainfall	Dry in the north and west; wet on the Central Coast

Dust activity

Dust activity increased in central New South Wales in August 2023, in particular at the Cobar (17 h) and Hillston (12 h) sites (Figure 2). This is despite the hours of strong winds remaining almost unchanged from July 2023, which is very low compared to the long-term average (Figure 1). Dryer than average conditions (Figure 7a) explain the increase in dust in those areas.

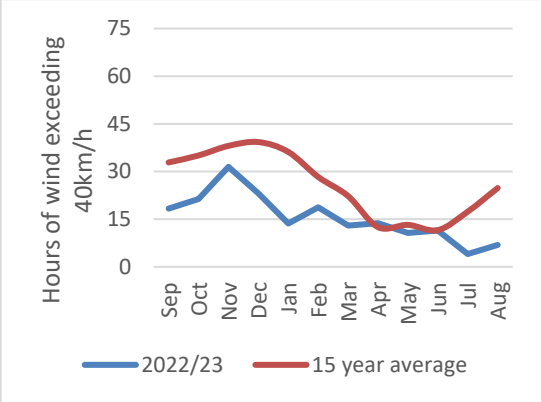

Figure 1 **Hours of wind exceeding 40km/h – average across all sites**

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

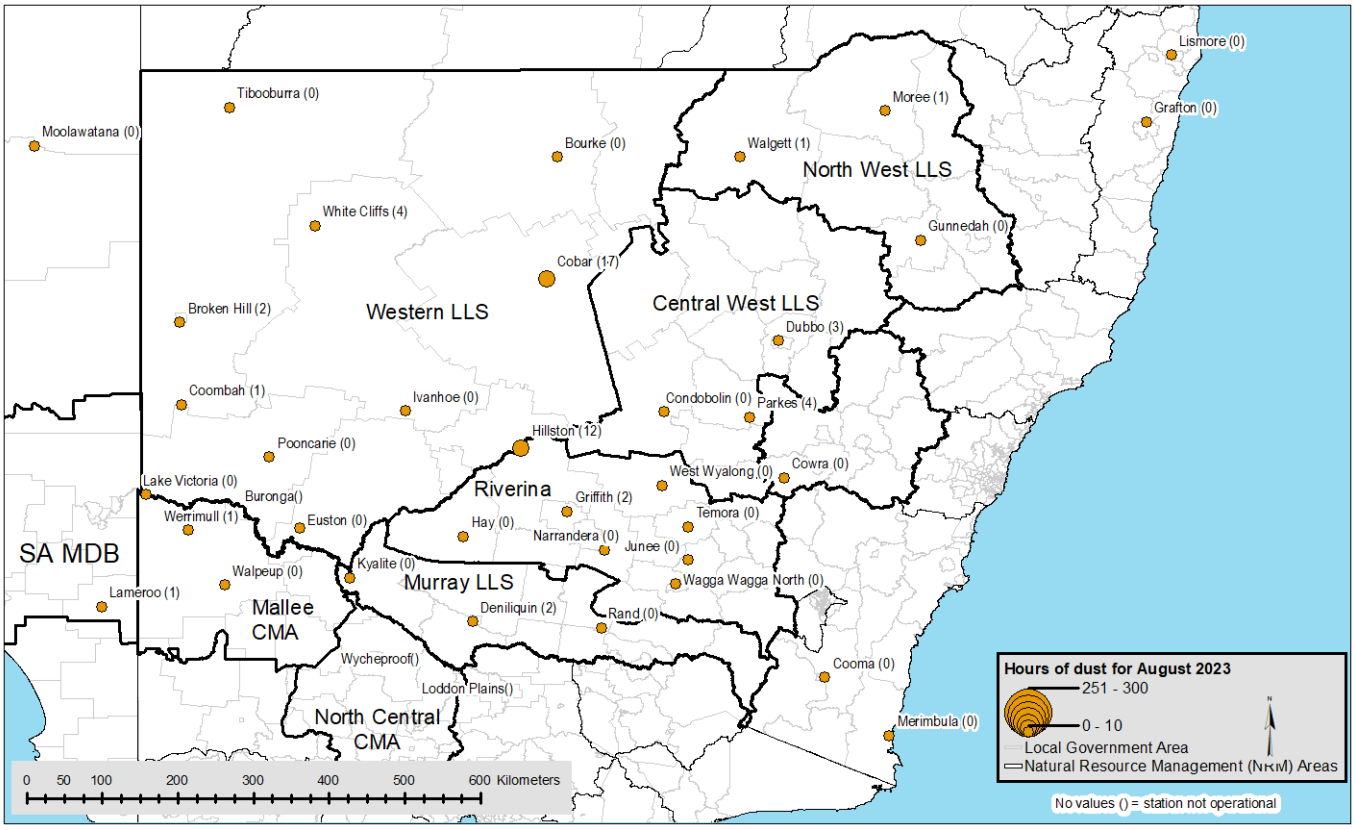

Figure 2 **Hours of dust activity (number in brackets) at each DustWatch site in August 2023**

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has remained almost unchanged from July 2023 (Figure 3), with only the Local Land Services Western Region seeing a small reduction from 90% of the area to 87% of the area (Table 1). This is due to the much below-average rainfall in July and August 2023 (Figure 6 and 7a).

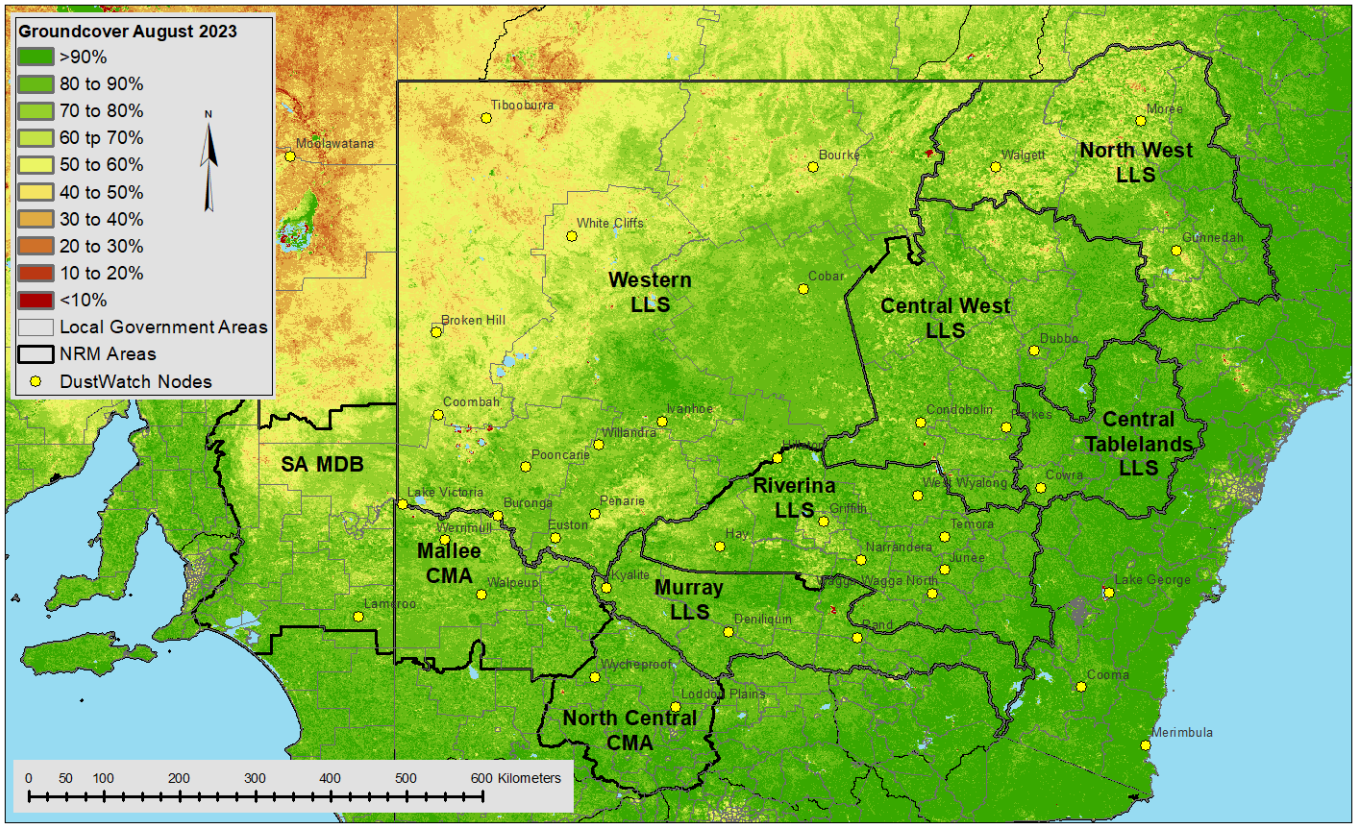

Figure 3 Groundcover for August 2023 as determined from MODIS by CSIRO

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

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Aug 2022	100	100	100	100	99	100	92	89	100
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

Groundcover change

Groundcover reductions occurred along the Darling River corridor (Barka or Baaka in the local Paakantyi language), along the Lake Systems in eastern South Australia and in the cropping areas of the Local Land Services North West Region around Moree and Walgett (Figure 5). Much below-average rainfall for July and August is the main reason for the reduction in groundcover in late winter 2023.

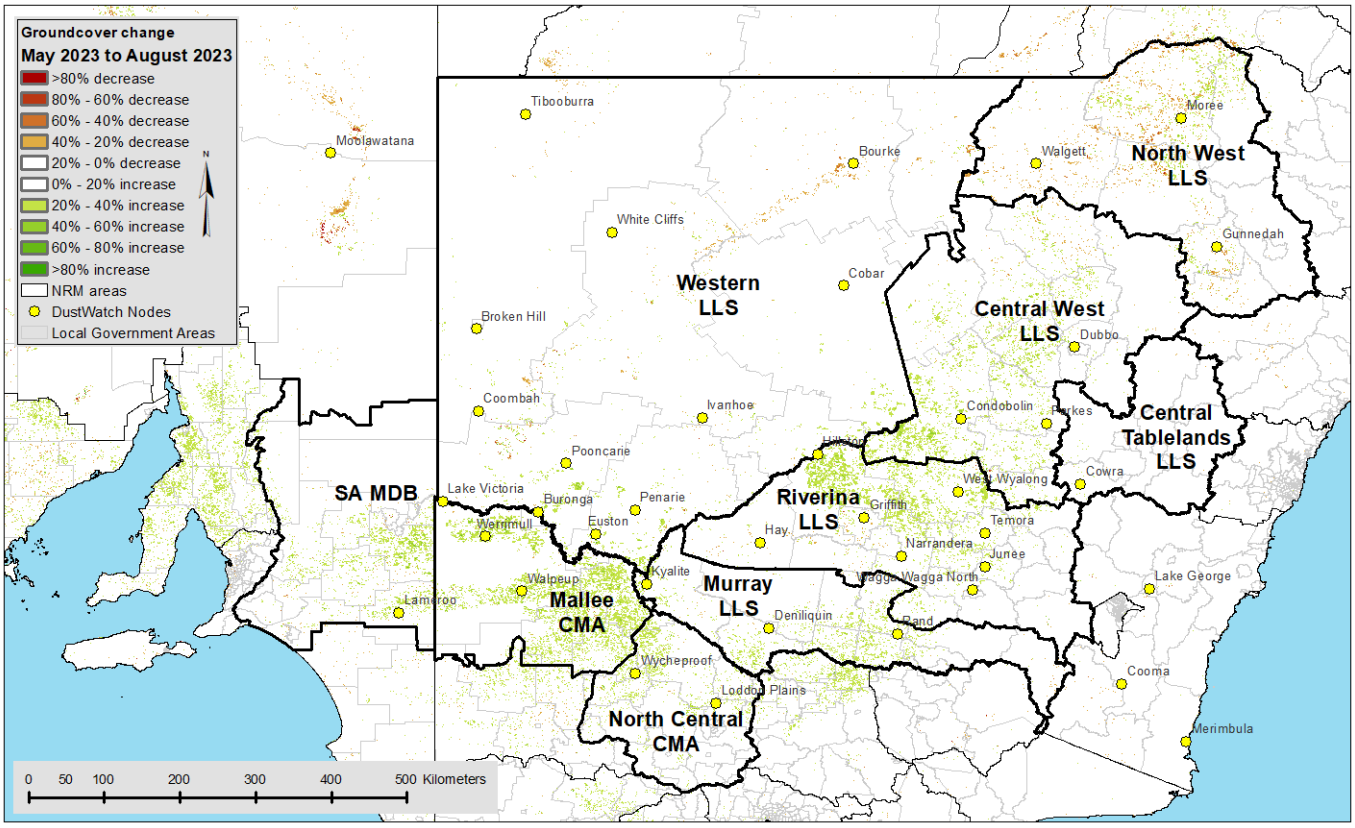

Figure 4 Groundcover difference between May 2023 and August 2023

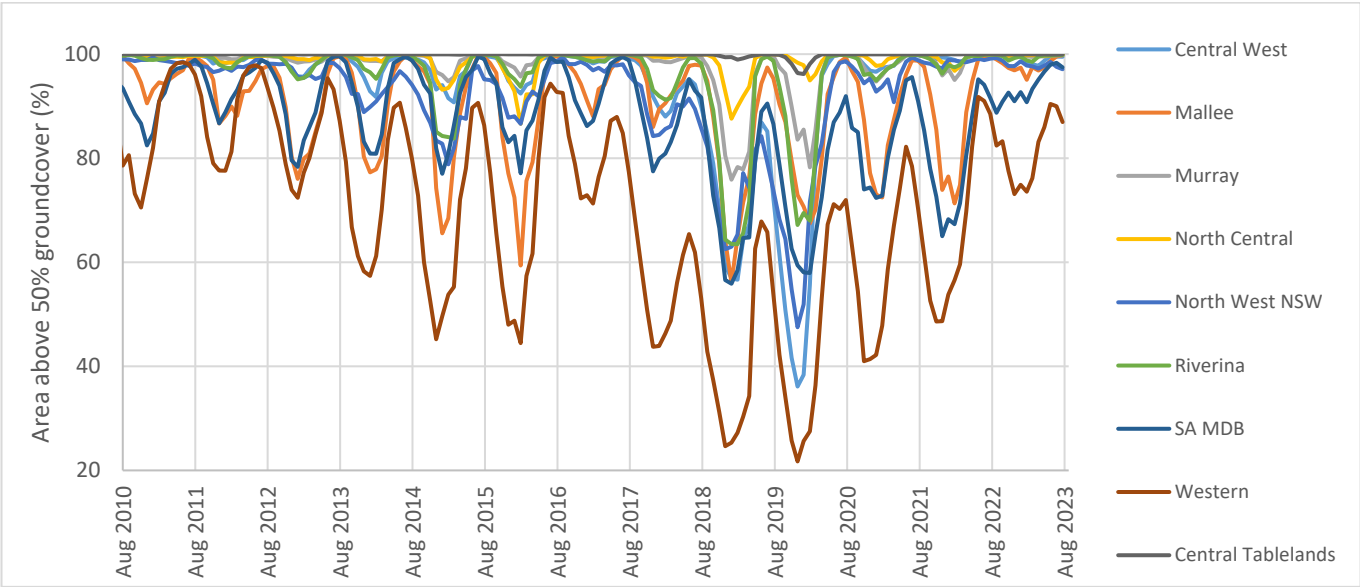

Figure 5 Area (%) of NRM with more than 50% cover since August 2010

Rainfall

Total rainfall in August 2023 was below 25 mm for most of western New South Wales, with large areas in the north-west of the state not receiving any rain at all (Figure 6). This low rainfall is unusual for August, with some areas in the west of the state in the dries 10% of rainfall records (Figure 7a).

This lower-than-average rainfall has pushed most central and eastern New South Wales into much drier than average conditions when looking at the 3 monthly deciles map, with the coastal areas in the driest 10% of records and the far south coast in the driest on record (Figure 7b).

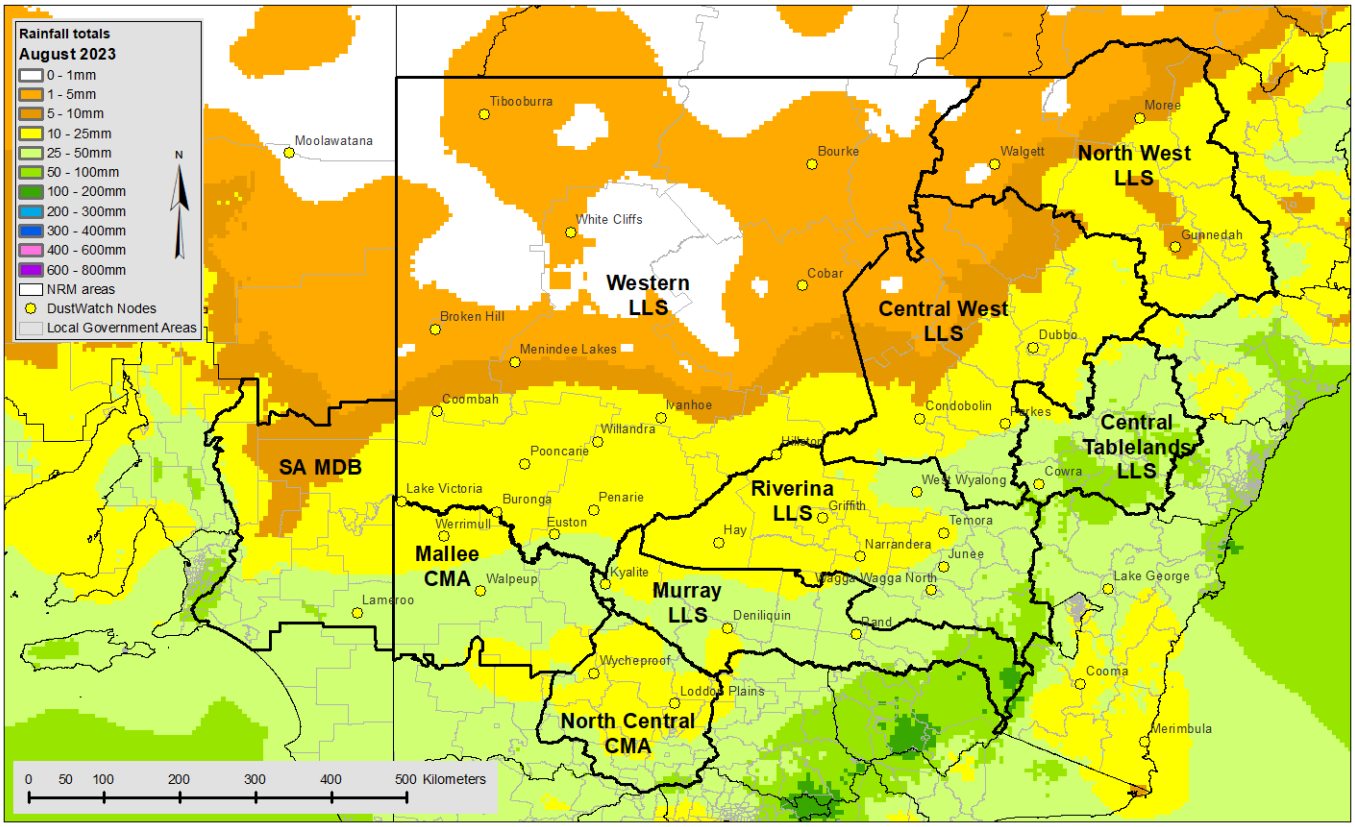

Figure 6 Rainfall totals for August 2023 (source: Bureau of Meteorology)

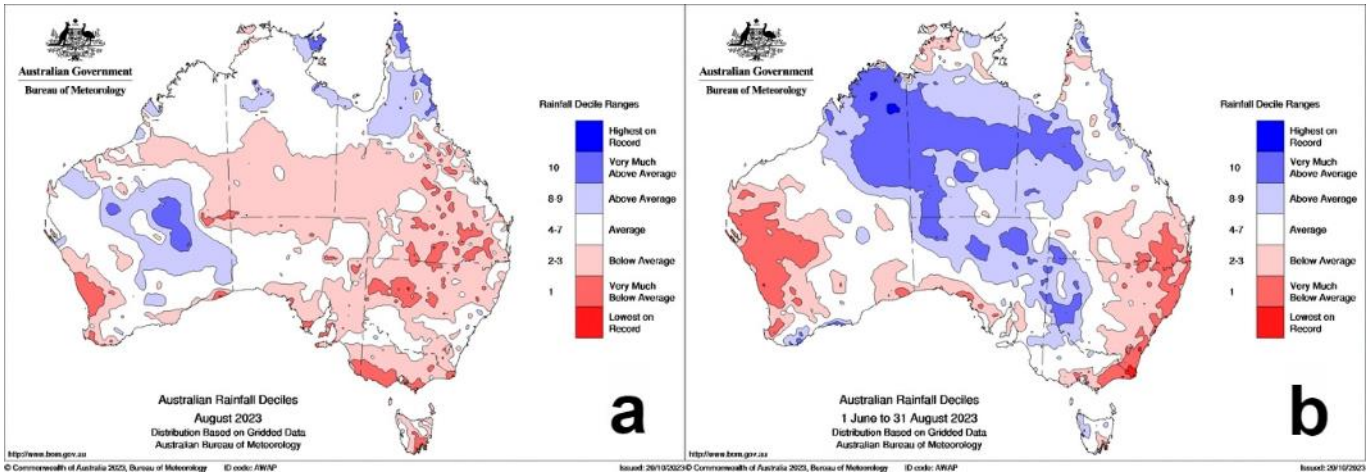

Figure 7 Rainfall deciles for August 2023 (a) and 1 June 2023 to 31 August 2023 (b)

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 3,988 hot spots (375 m pixel with temperature anomalies) in August 2023 (Figures 8 and 9), more than double the 1,830 hot spots detected in July 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.

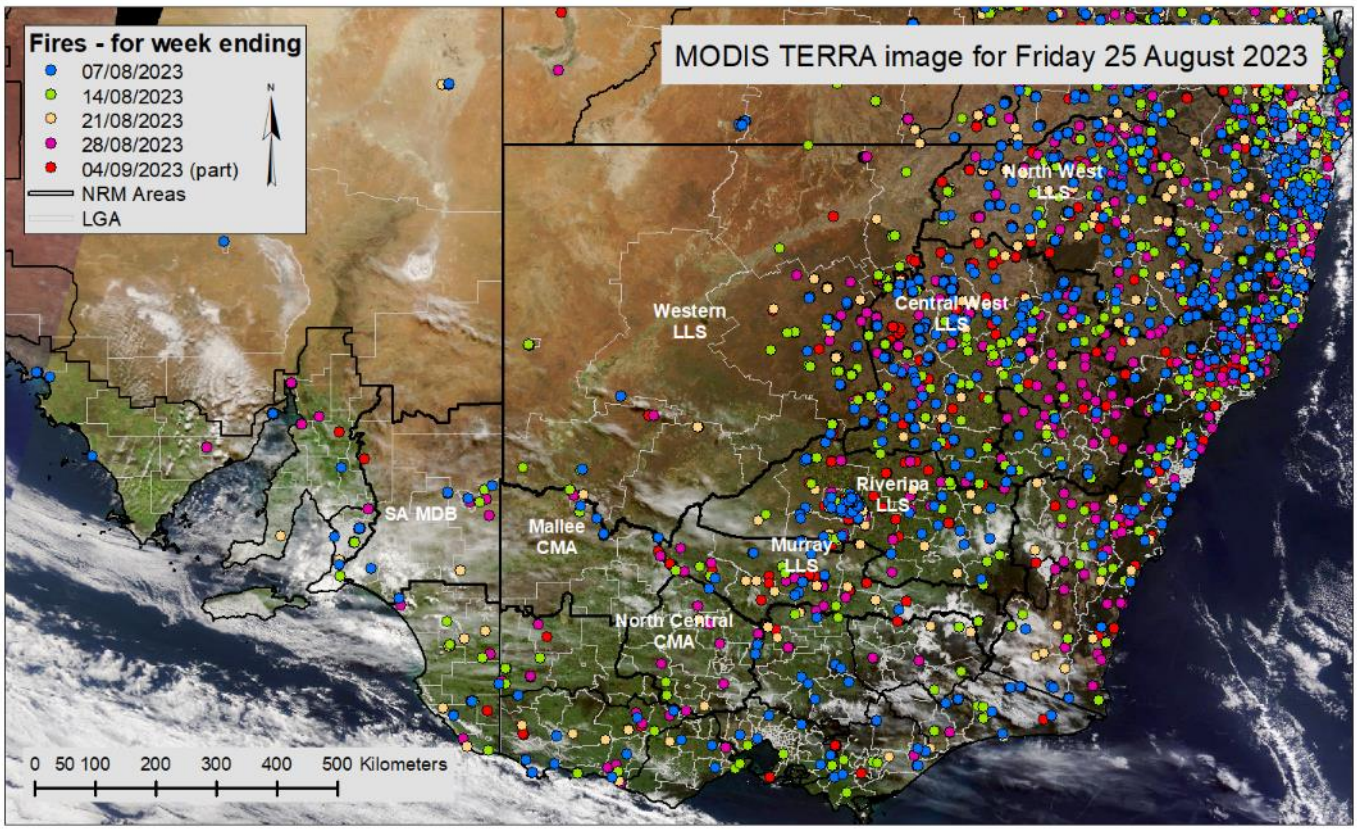

Figure 8 Pixels (375m) with active burning fires in August 2023 as determined from VIIRS satellite

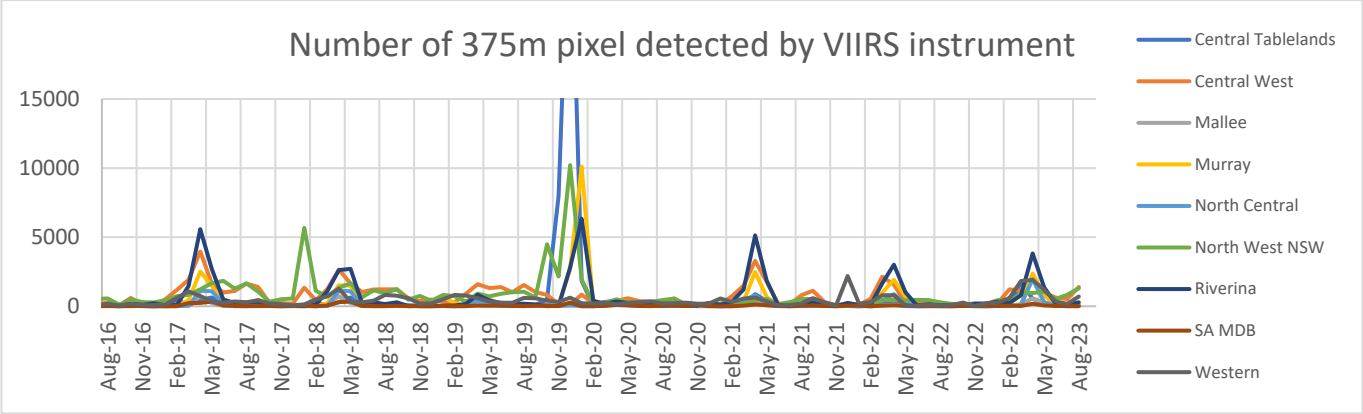

Figure 9 Monthly number of 375m pixels with active burning fires between August 2016 and August 2023

The DustWatch team Contact us at dustwatch@environment.nsw.gov.au

Dust 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 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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