DustWatch Report

May 2023

Dust activity	Doubled from April 2023; increased to March 2023 level
Wind strength	Similar to April 2023; average for the month of May
Groundcover	Steady or slightly improving
Rainfall	Driest 10% of records for large parts of the state

Dust activity

Average dust activity for May 2023 (9.6 hours – Figure 2) was almost double the value recorded in April 2023 (5.5 hours) and close to the high value recorded in March 2023. Wind strength was similar to April 2023 (Figure 1), and groundcover was steady or improving (Table 1). The very dry soil surface conditions (Figure 7a) are the main reason for the heightened dust values in May 2023.

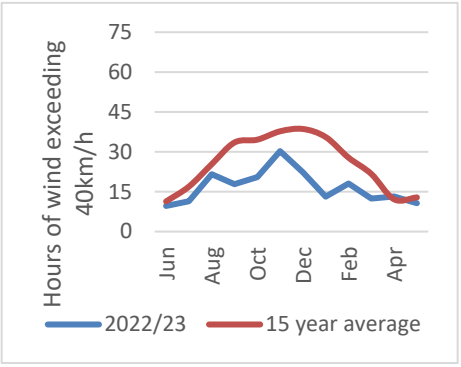

Figure 1 **Hours of wind exceeding 40km/h – average across all sites**

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

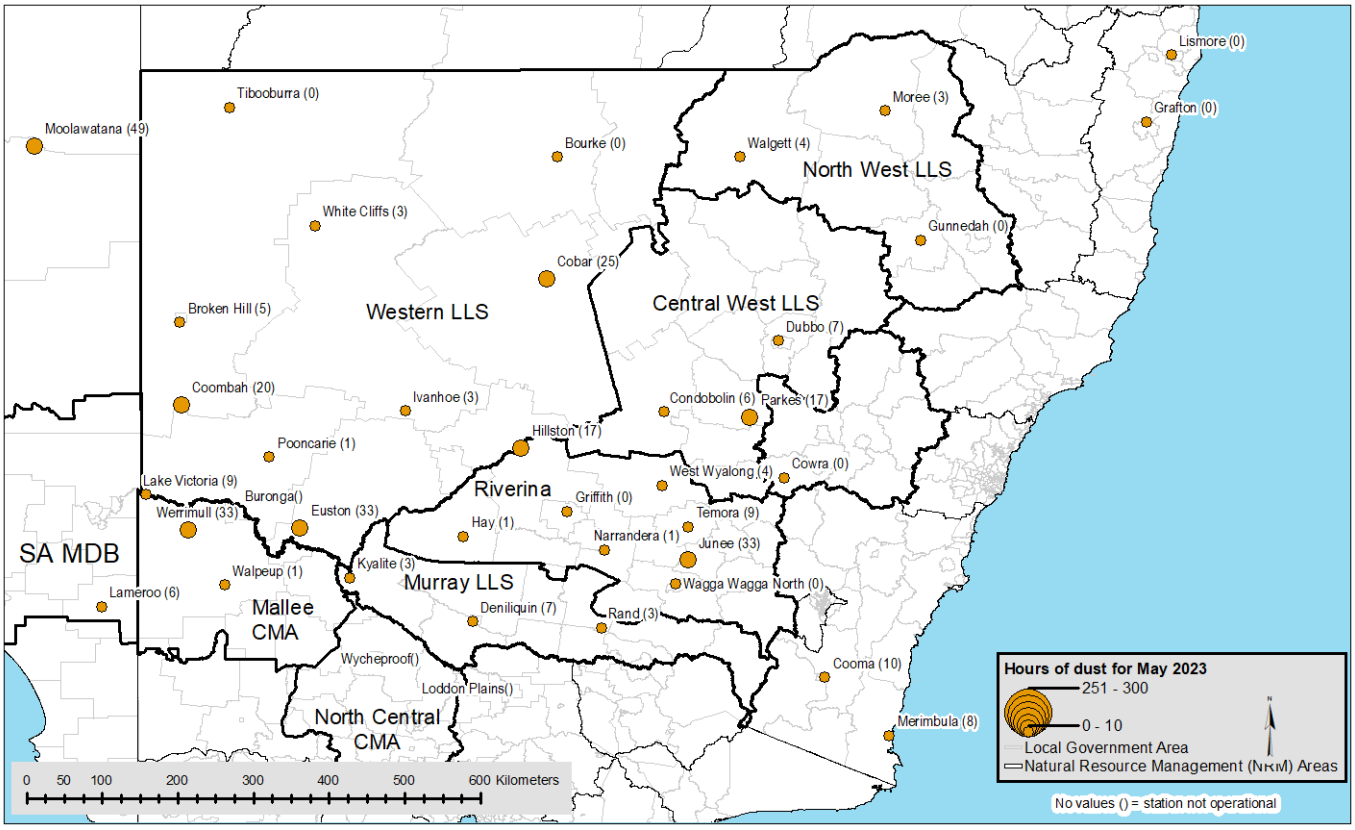

Figure 2 **Hours of dust activity (number in brackets) at each DustWatch site in May 2023**

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has remained almost unchanged from April 2023, with only the Local Land Services Western Region improving from 83% in April 2023 to 86% in May 2023 (Table 1). This change occurred mainly along the Darling River corridor (green colours in Figure 4). Only the far north-west of the state has some larger areas below 50% groundcover; in all other areas, these are individual and isolated paddocks.

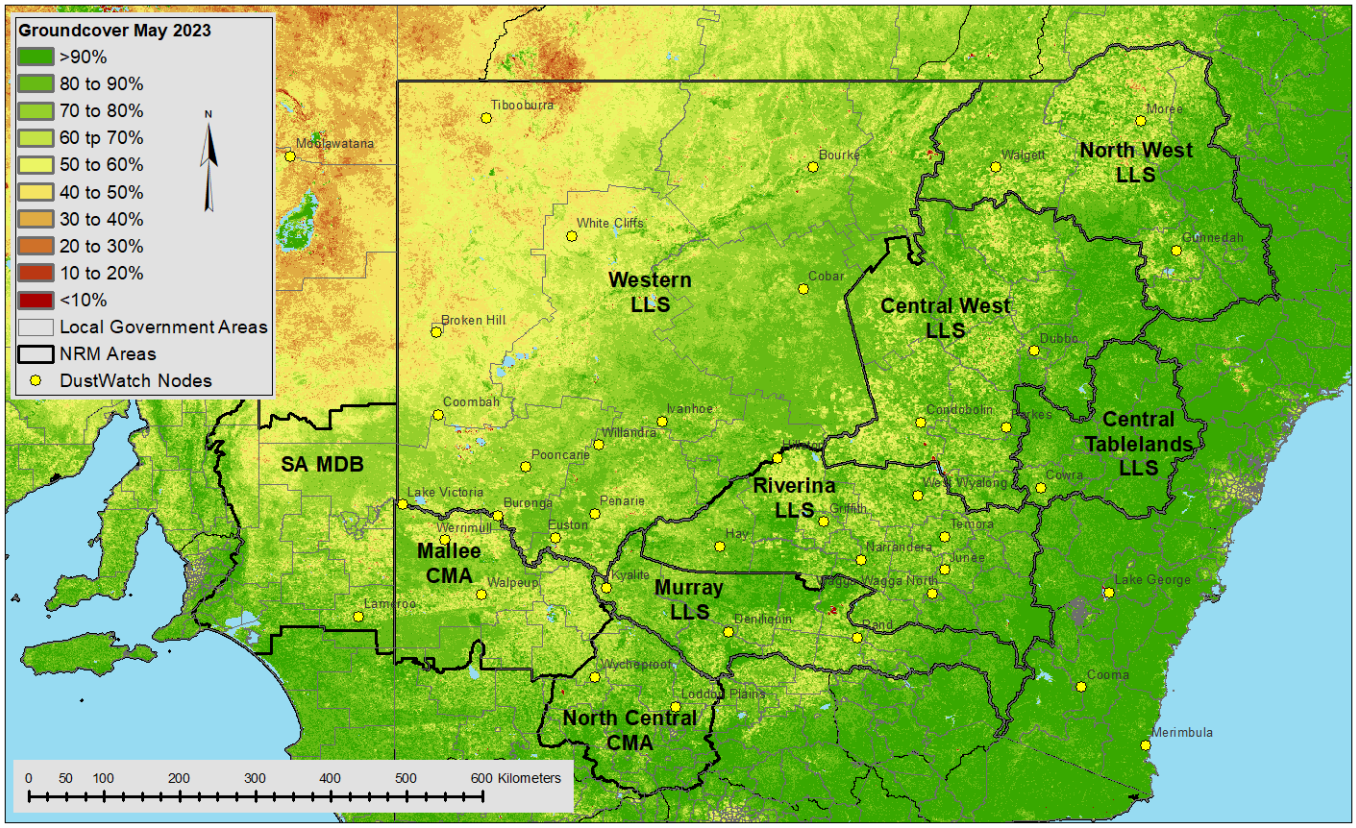

Figure 3 **Groundcover for May 2023 as determined from MODIS by CSIRO**

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

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
May 2022	100	95	100	100	99	100	88	82	100
Jun 2022	100	99	100	100	99	100	95	92	100
Jul 2022	100	99	100	100	99	100	94	91	100
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

Groundcover change

Groundcover has remained almost unchanged between February 2023 and May 2023 (Table 1 and Figure 4). Groundcover has improved along the Darling River corridor between Bourke and Mildura and north of Moolawatana station in South Australia (green colours in Figure 4). Groundcover reductions are visible in individual paddocks throughout the NSW wheat/sheep belt and more so across the border into Victoria south of the Mallee (orange colours in Figure 4). The overall winter recovery remains very subdued, with the Local Land Services Western Region only improving by 13% since the summer low in October 2022 (Table 1).

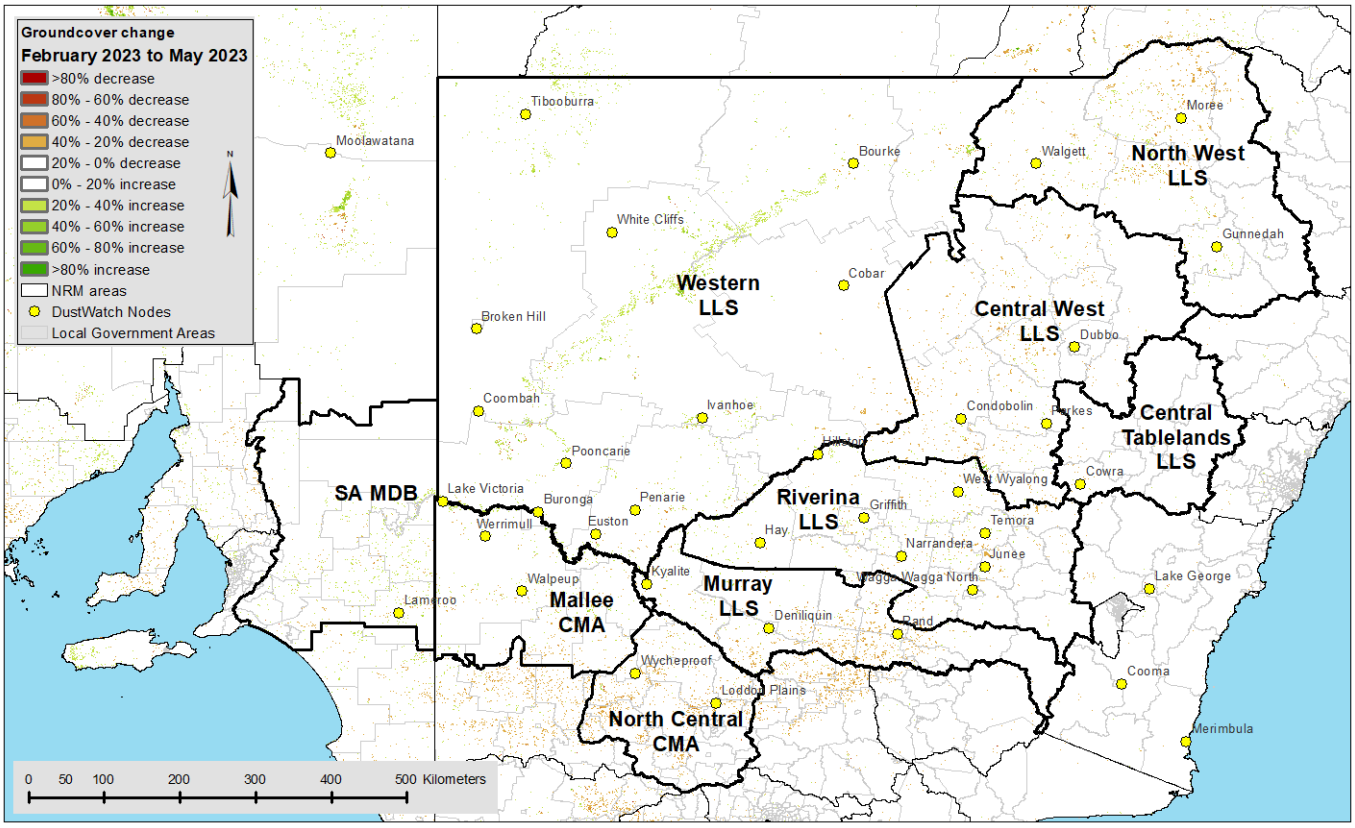

Figure 4 Groundcover difference between February 2023 and May 2023

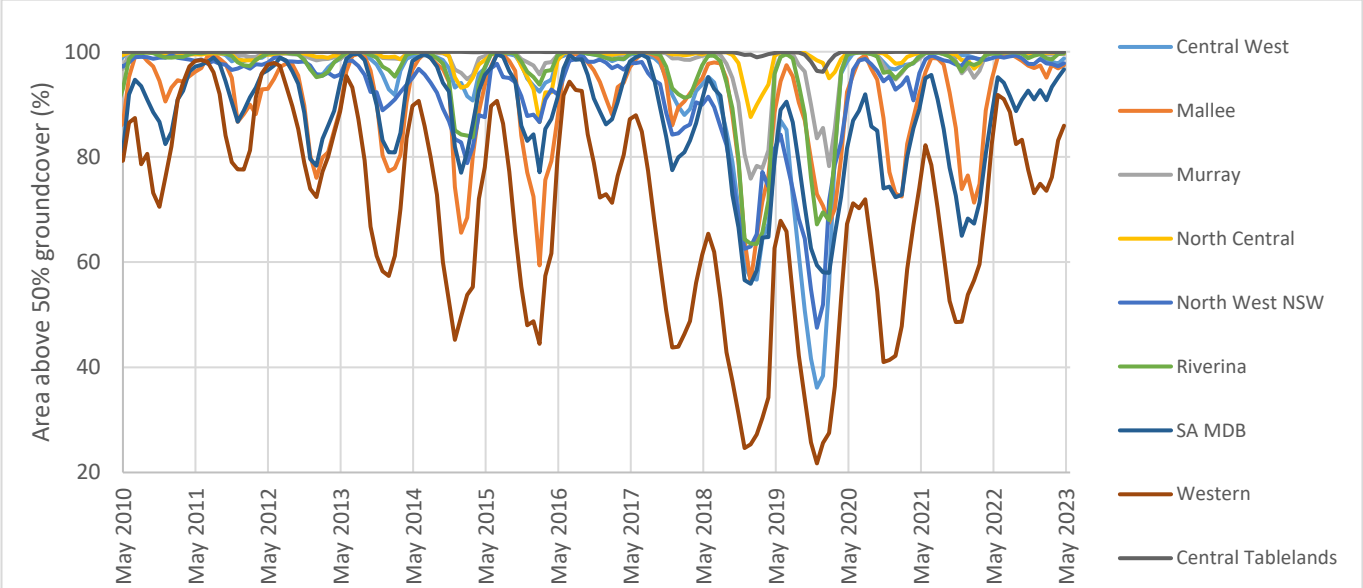

Figure 5 Area (%) of NRM with more than 50% cover since May 2010

Rainfall

No significant rain was recorded in May 2023 throughout large parts of western New South Wales west of a line from Moree to Hay (Figure 6). The only exception is an area between Walgett and Bourke where up to 50 mm fell.

This low rainfall is very unusual for May, and records are in the driest 10% of Bureau of Meteorology data (Figure 7a). The low May 2023 rainfall has pushed north-western New South Wales back into drier-than-average rainfall conditions for the past 3 months (Figure 7b).

The outlook from the Bureau of Meteorology for the next 3 months is for below-average rainfall, worsening the already dry conditions (www.bom.gov.au/climate/ahead/outlooks).

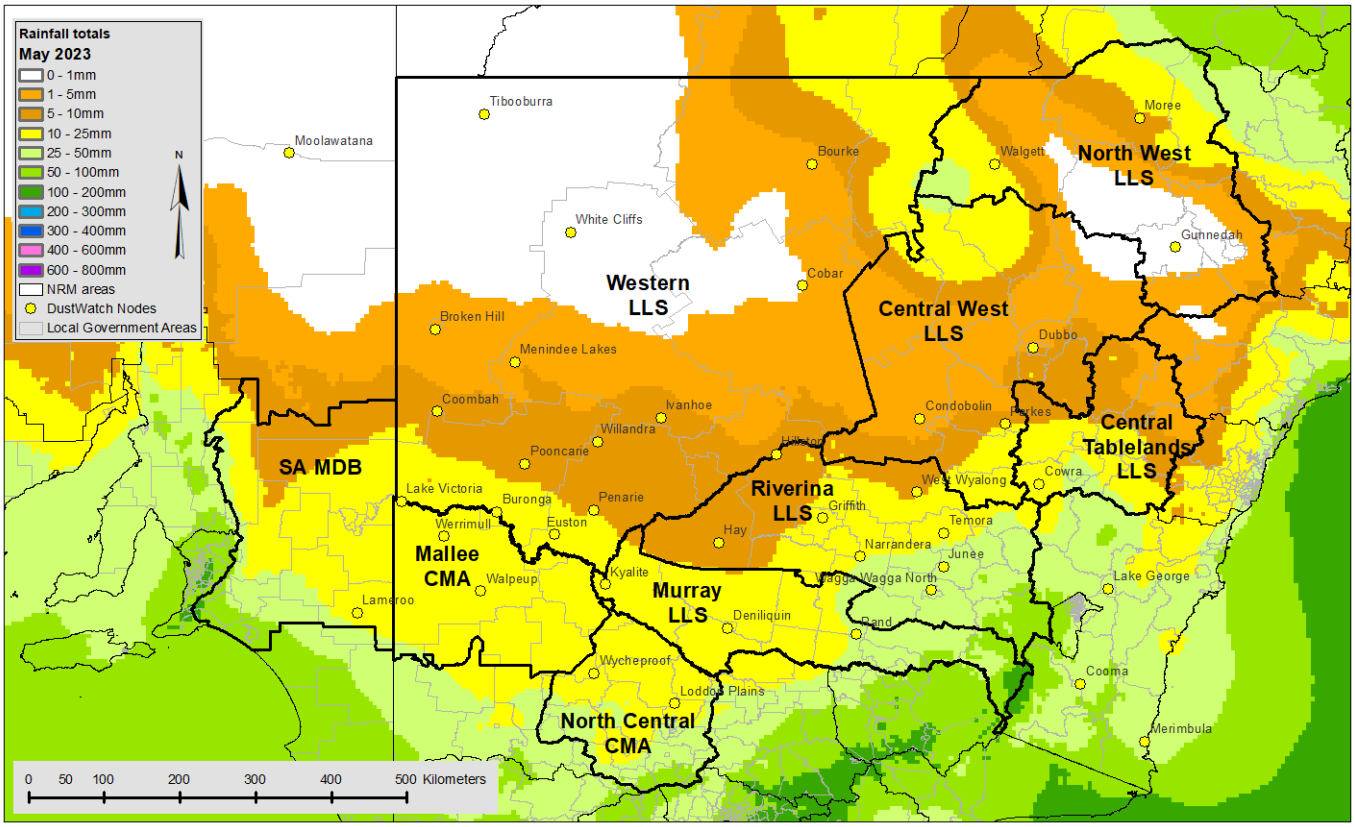

Figure 6 **Rainfall totals for May 2023 (source: Bureau of Meteorology)**

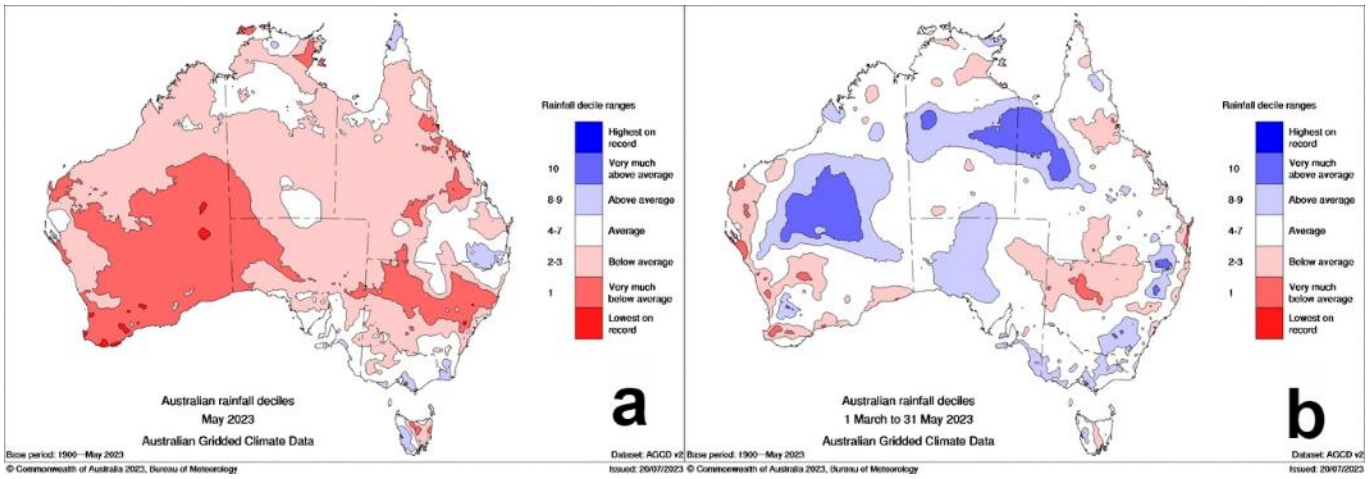

Figure 7 **Rainfall deciles for May 2023 (a) and 1 March 2023 to 31 May 2023 (b)**

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 6,173 hot spots (375 m pixel with temperature anomalies) in May 2023 (Figures 8 and 9), less than half the 14,344 hot spots detected in April 2023. Stubble burning remains the predominant cause of the fires.

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.

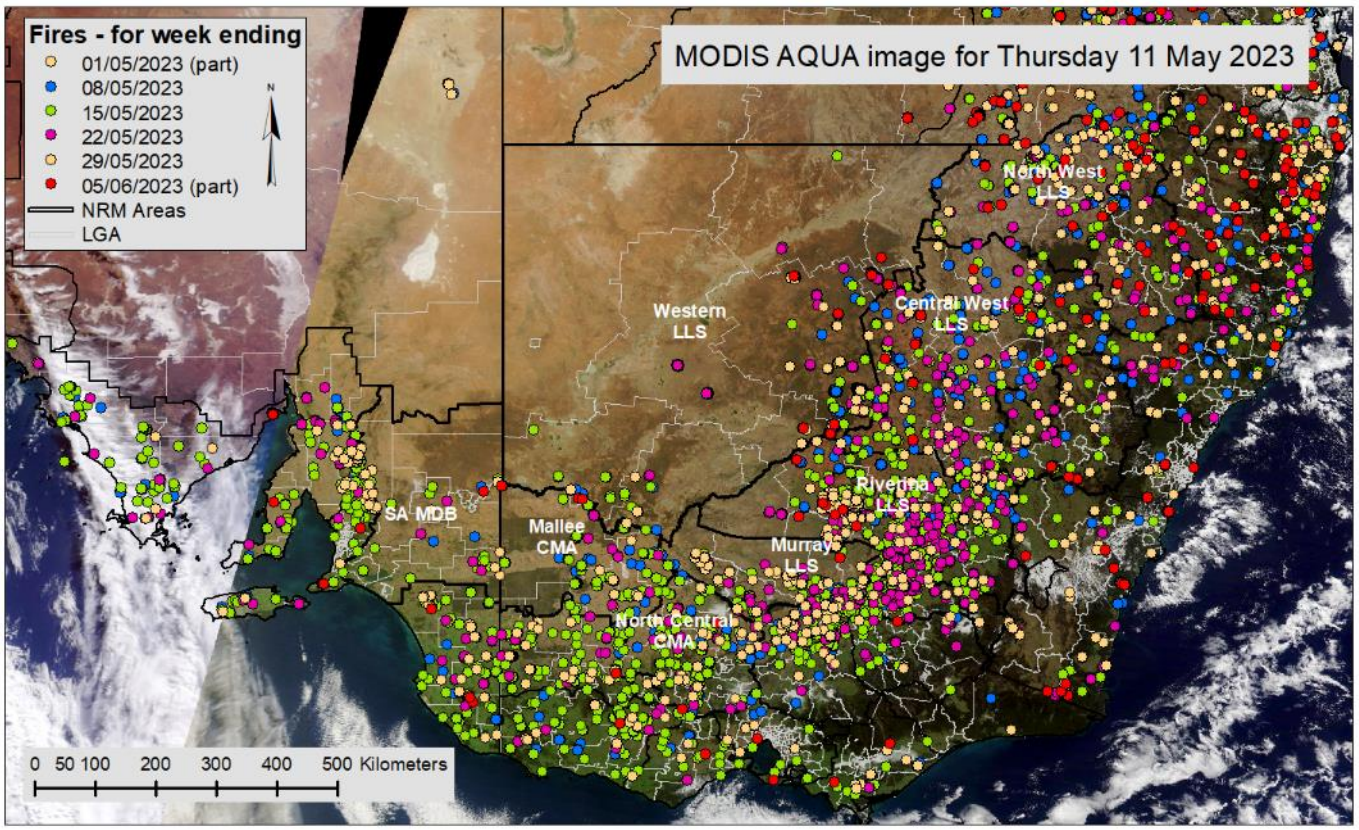

Figure 8 **Pixels (375m) with active burning fires in May 2023 as determined from VIIRS satellite**

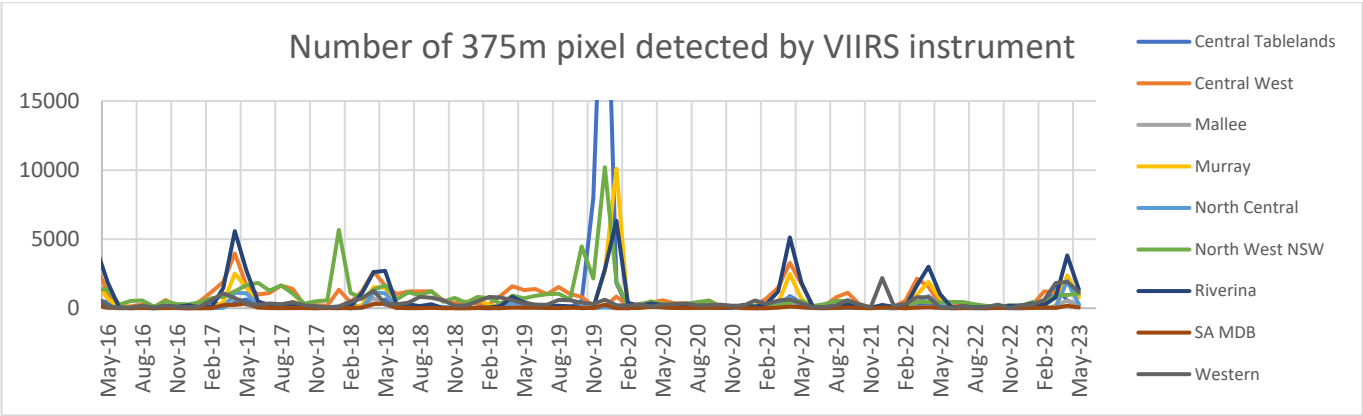

Figure 9 **Monthly number of 375m pixels with active burning fires between May 2016 and May 2023**

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 NSW; 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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