DustWatch Report

March 2023

Dust activity	Increased from February; below long-term average
Wind strength	Decreased from February; below long-term average
Groundcover	Winter recovery stalled in the west due to low rainfall
Rainfall	Above average in the east; below average in the west

Dust activity

Average dust activity (Figure 2) increased from February 2023 and is back at December 2022 level despite the hours of strong winds (> 40km/h) decreasing from February 2023 (Figure 1). The much below-average rainfall in the state's west (Figures 6 and 7) and bare paddocks in the wheat/sheep belt (Figure 4) are the reason for the increased dust activity.

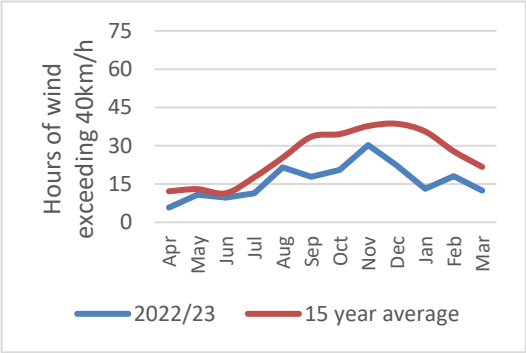

Figure 1 **Hours of wind exceeding 40km/h – average across all sites**

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

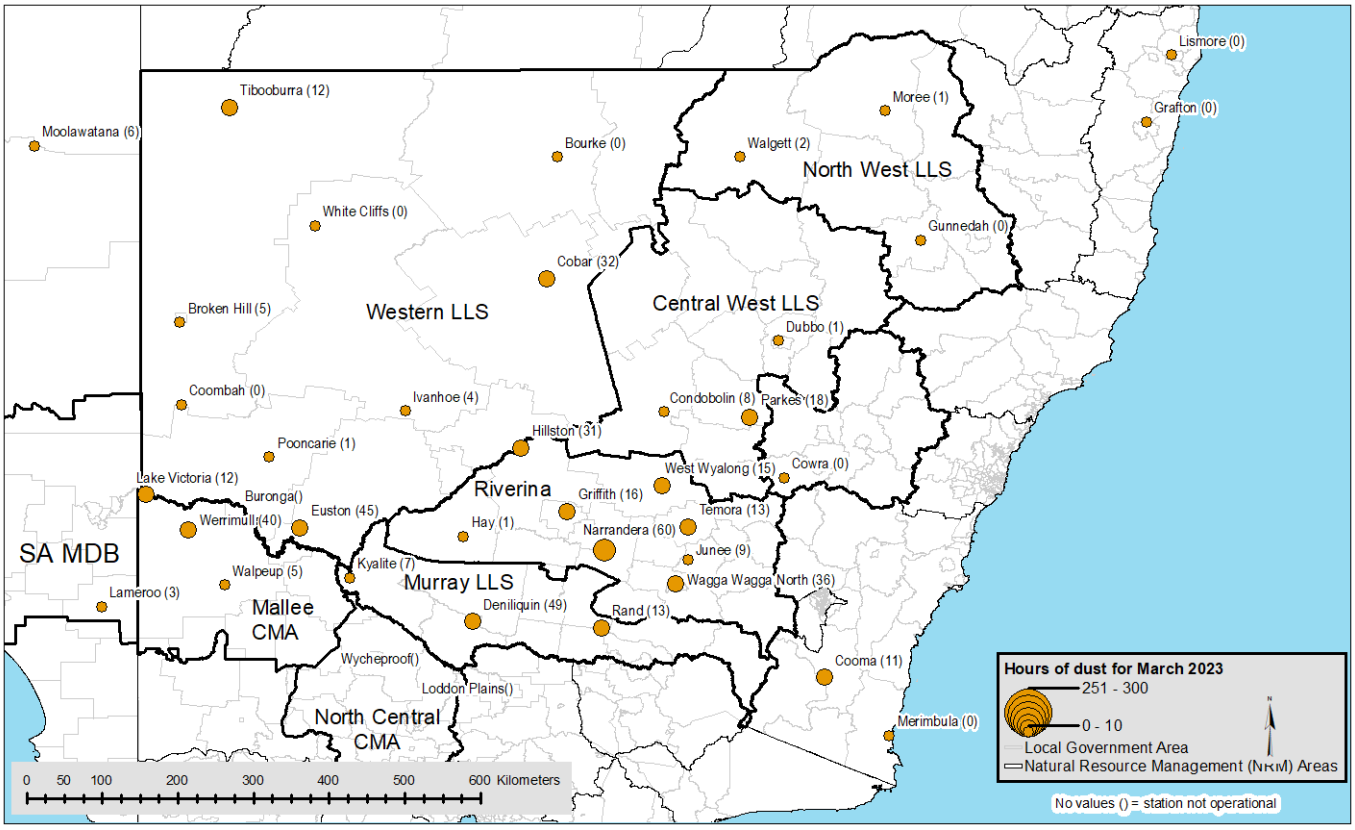

Figure 2 **Hours of dust activity (number in brackets) at each DustWatch site in March 2023**

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has remained almost unchanged from February 2022 (Table 1), which is very unusual for this time of the year when winter recovery should be taking place. Local Land Services Western Region has its lowest cover generally in December and the highest cover in June (Figure 5). In the 2022–23 season, the value has remained almost unchanged between December 2022 and March 2023.

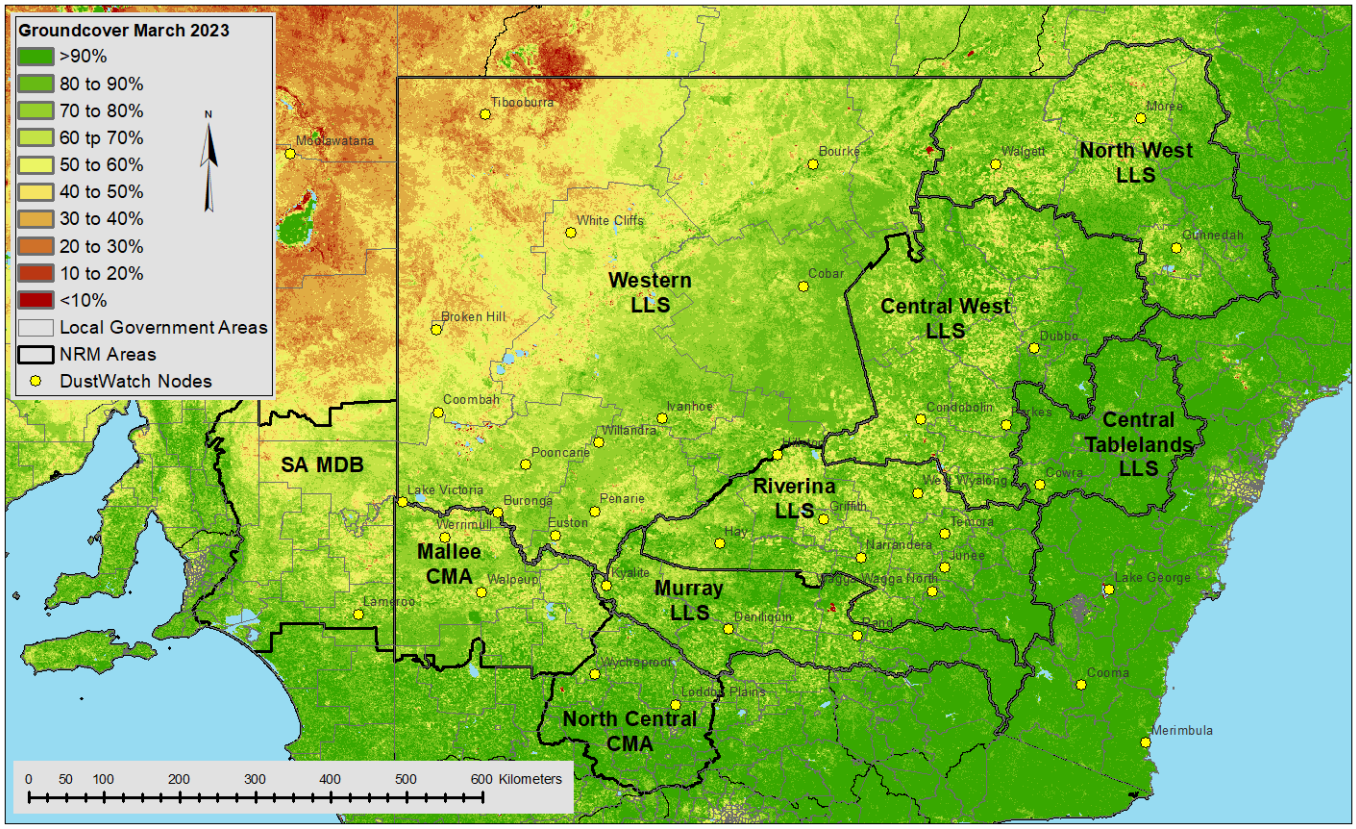

Figure 3 Groundcover for March 2023 as determined from MODIS by CSIRO

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

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Mar 2022	98	75	96	98	99	98	71	60	100
Apr 2022	99	89	99	99	98	99	81	70	100
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

Groundcover change

Groundcover reductions between December 2022 and March 2023 (orange and red colours in Figure 4) occurred predominantly in the NSW wheat/sheep belt and across the border in the Victorian Murray and Mallee regions. Good rainfall between Hay and Ivanhoe (Figure 6) saw some cover increases (green colours in Figure 4). Also improved has the groundcover along the Darling River corridor downstream of Bourke.

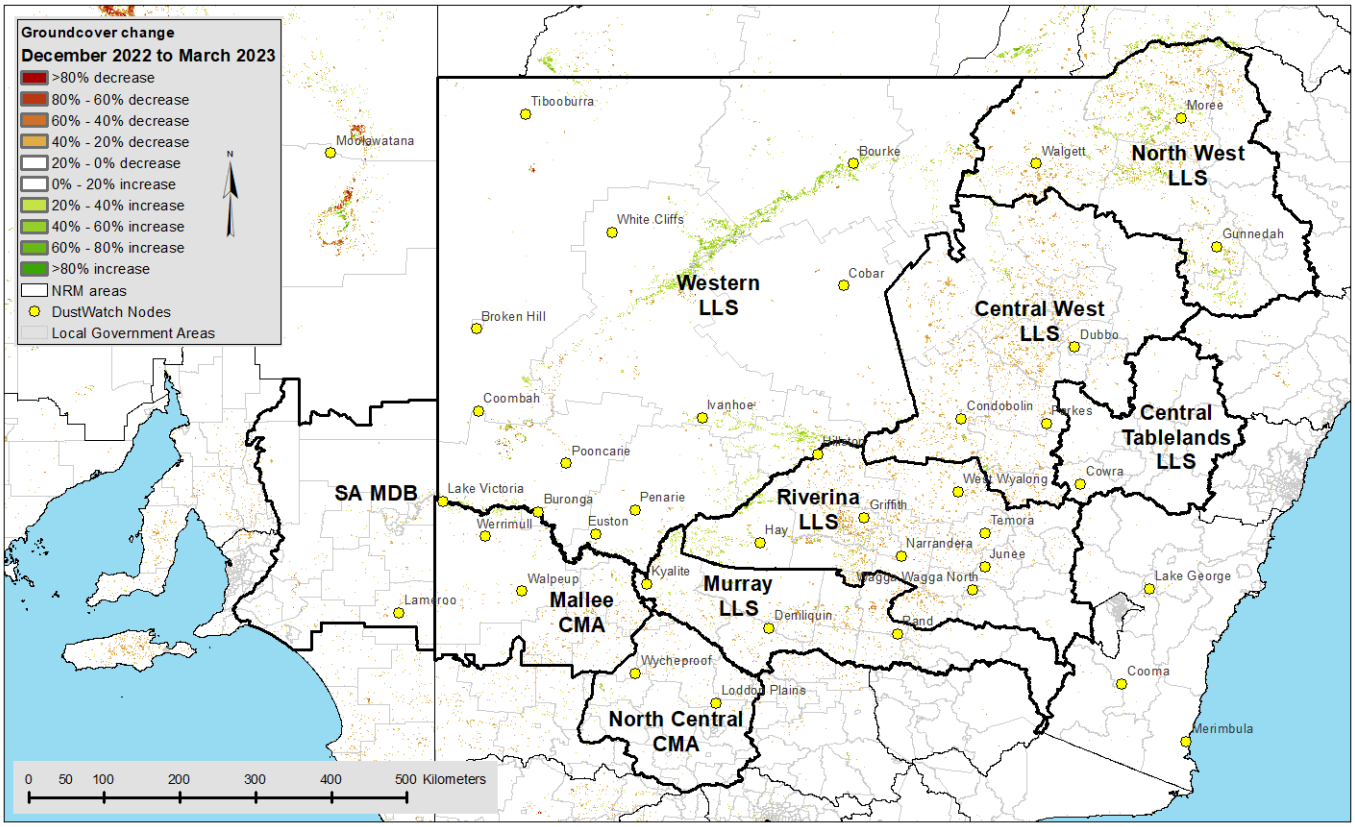

Figure 4 Groundcover difference between December 2022 and March 2023

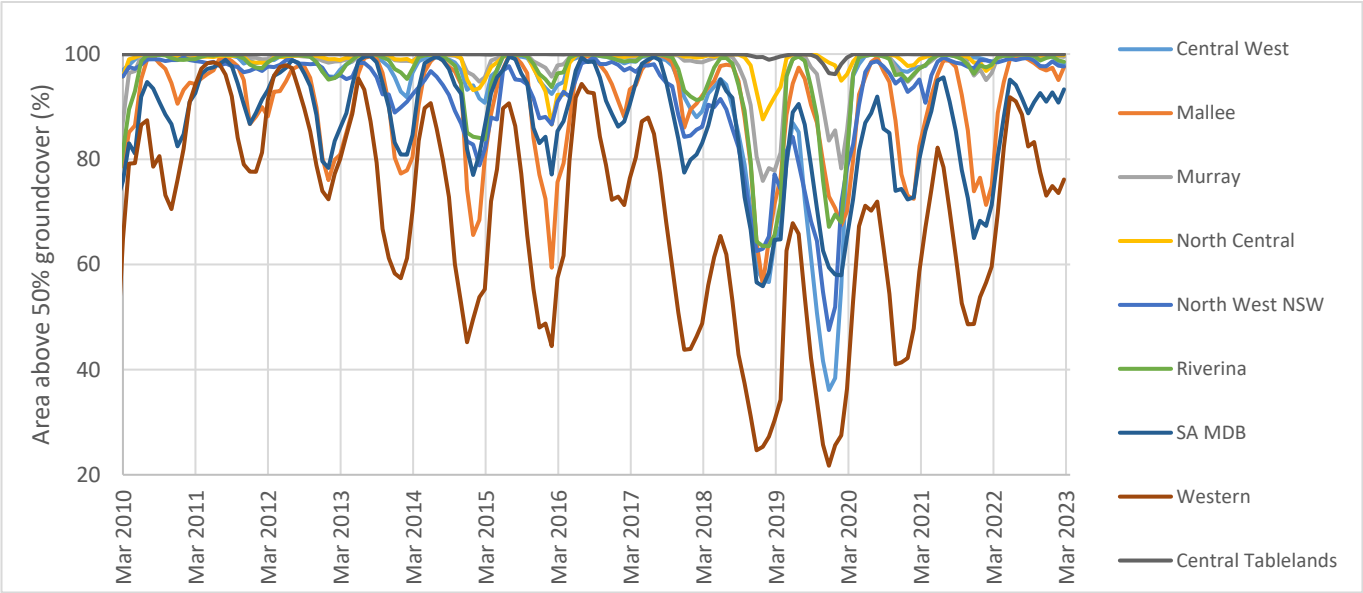

Figure 5 Area (%) of NRM with more than 50% cover since March 2010

Rainfall

Very little rain was recorded in the gauges west of a line from Walgett to Euston, with the majority recording below 10 mm (Figure 6). Good falls up to 200 mm were recorded east of this line, with some areas east of Gunnedah exceeding 200 mm.

These falls were in the lowest 10% of records in parts of the west and the highest 10% in parts of the east (Figure 7a). The 3 monthly decile map (Figure 7b) is not as extreme but still shows a divide between lower than average rainfall in the north and west and above-average in the south east.

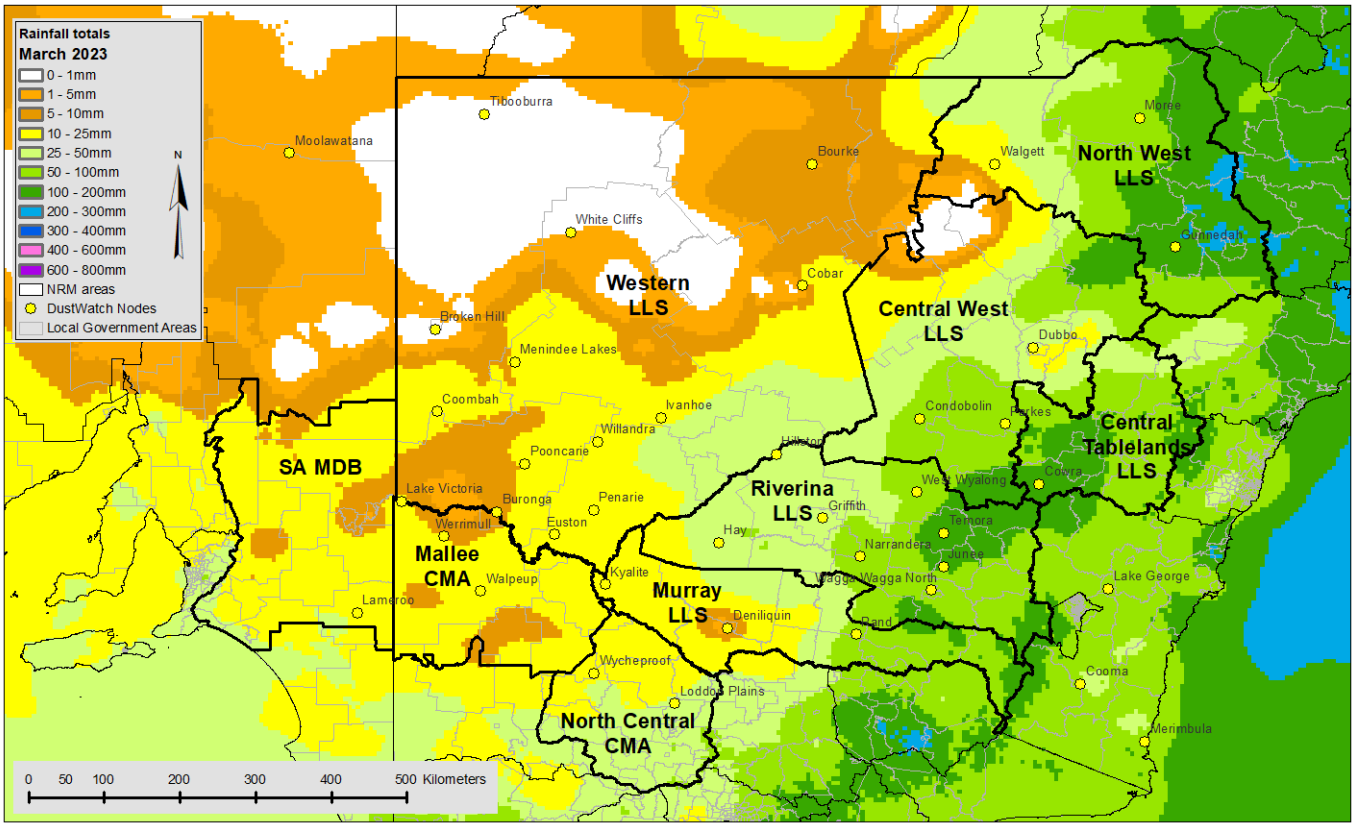

Figure 6 **Rainfall totals for March 2023 (source: Bureau of Meteorology)**

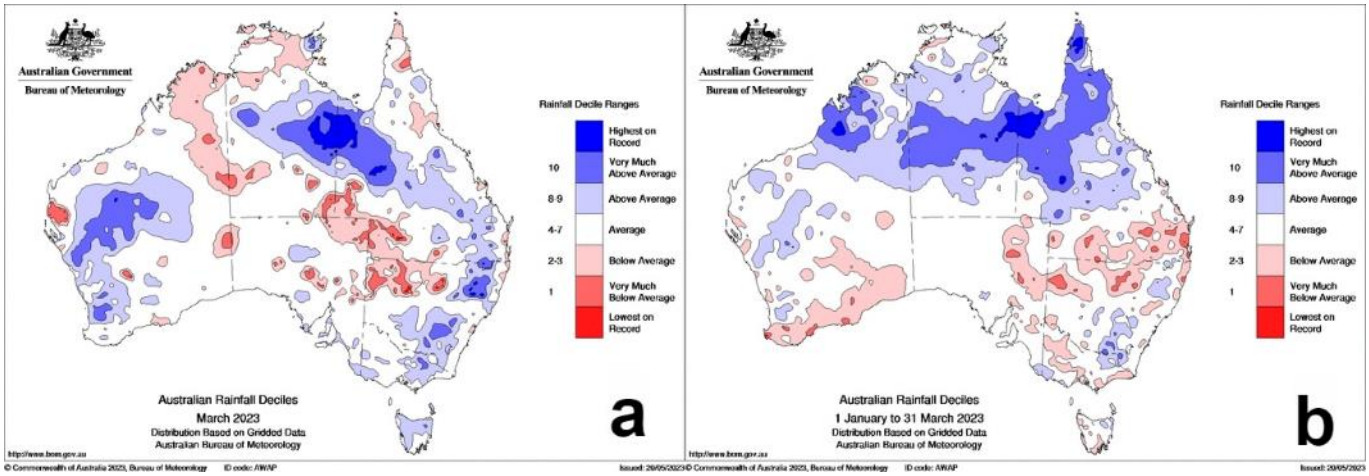

Figure 7 **Rainfall deciles for March 2023 (a) and 1 January 2023 to 28 March 2023 (b)**

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 6,860 hot spots (375 m pixel with temperature anomalies) in March 2023 (Figures 8 and 9), more than double the 2,598 hot spots detected in February 2023. Early stubble burning is the likely cause of the increased 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.

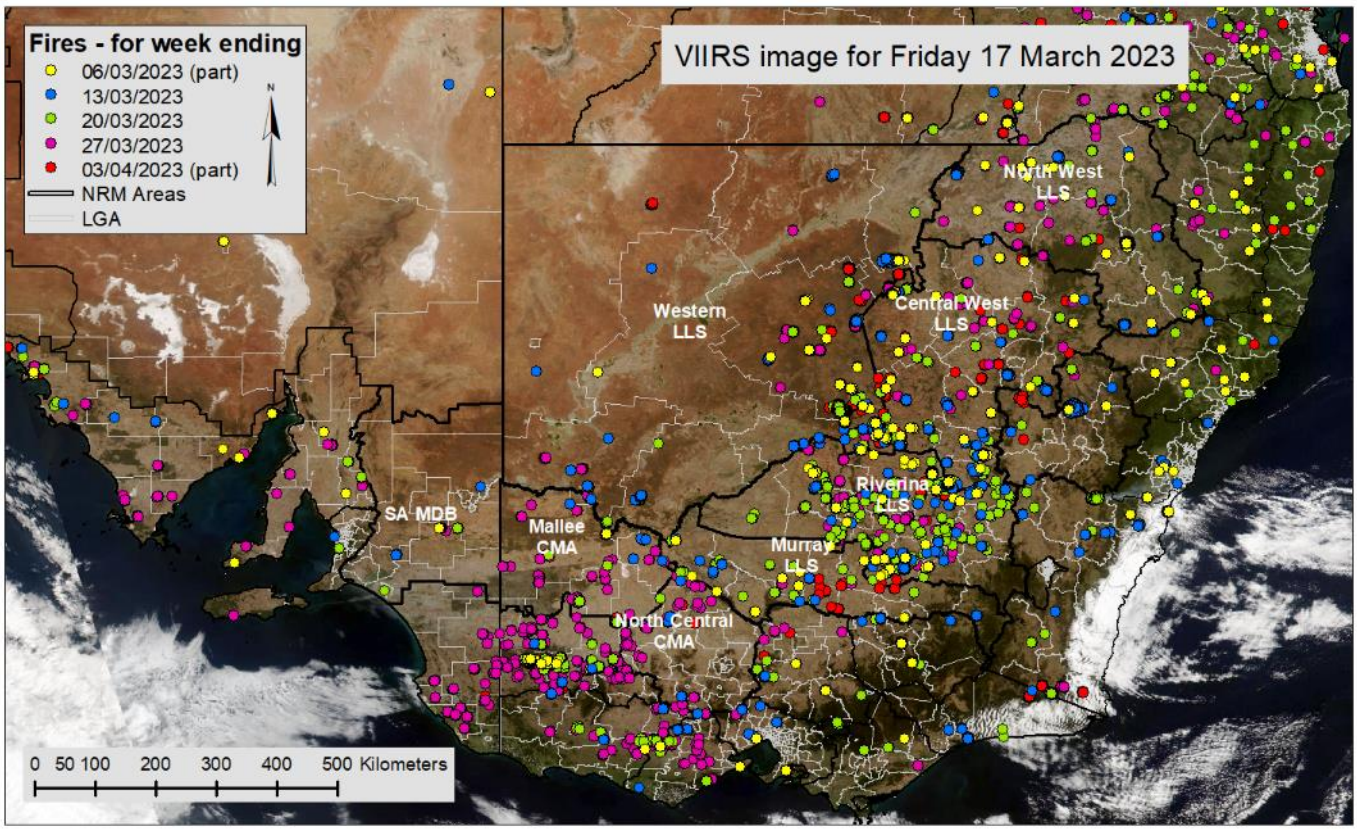

Figure 8 **Pixels (375m) with active burning fires in March 2023 as determined from VIIRS satellite**

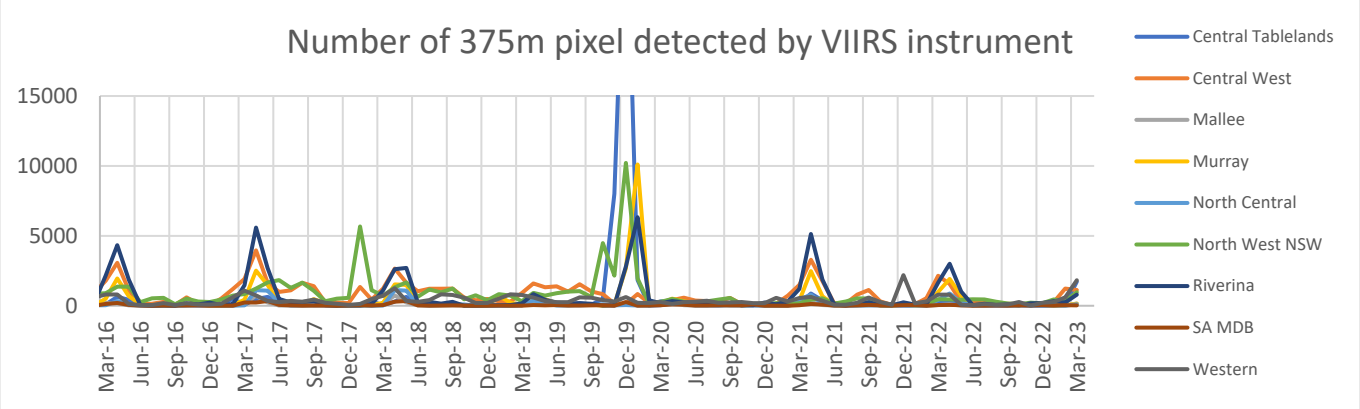

Figure 9 **Number of 375m pixels with active burning fires between March 2016 and March 2023**

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

Dust data supplied by the Department of Planning and Environment Rural Air Quality 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 from: The National Landcare Program, Western and Murray Local Land Services (LLS) in NSW; the NSW EPA, the Mallee and North Central CMAs in Victoria and Murray Darling Basin NRM in South Australian, CSIRO, TERN and the Australian National University. We particularly thank our many DustWatch volunteers who provide observations and help maintain the instruments.

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