

Dust activity	Half of March 2023; average for April
Wind strength	Similar to March 2023; average for April
Groundcover	Very good groundcover, but winter recovery is very slow
Rainfall	Average or above average for April

Dust activity

Average dust activity in April 2023 was 5.5 h, less than half of the 11.6 h recorded in March 2023 (Figure 2). Good groundcover (Figure 3) and wetter-than-average conditions in April 2023 (Figure 7a) are the main reasons for the below-average dust. The hours of strong winds (>40km/h) were on par with the long-term average (Figure 1).

Substantial stubble burning activity was detected in April 2023 (Figure 8), making dust classification challenging for the month.

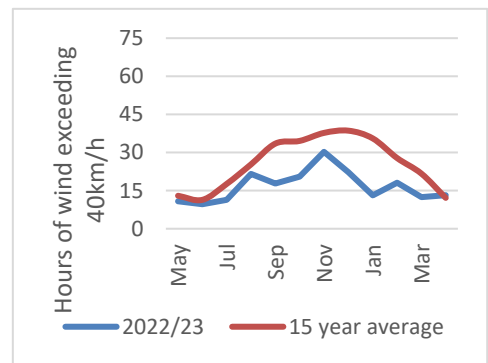


Figure 1 Hours of wind exceeding 40km/h – average across all sites

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

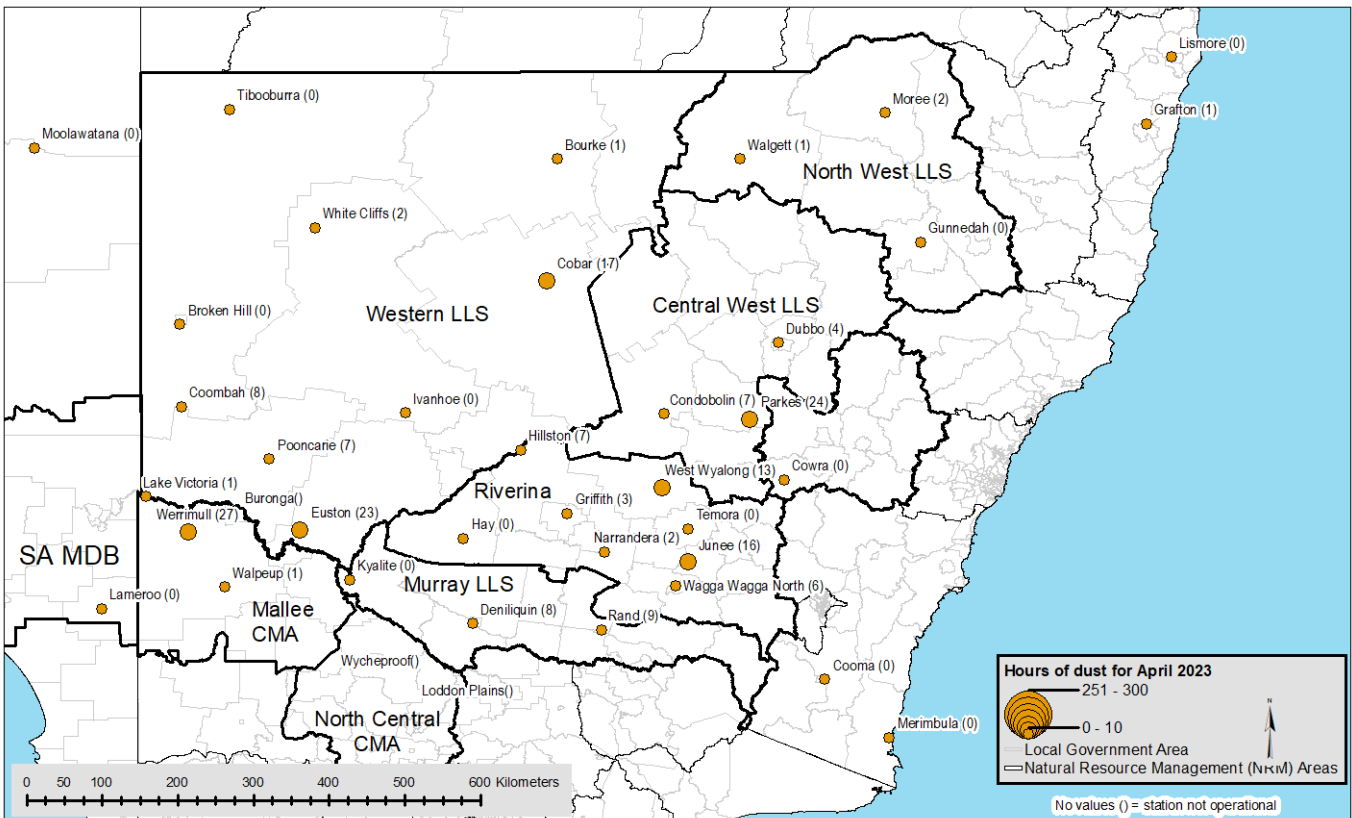


Figure 2 Hours of dust activity (number in brackets) at each DustWatch site in April 2023
Community-based wind erosion monitoring across Australia

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) is widespread. It has remained almost unchanged from March 2023 except for the Local Land Services Western Region where the area improved from 76% in March 2023 to 83% in April 2023 (Table 1). Improvement occurred mostly along the Darling River corridor downstream from Bourke (Figure 4).

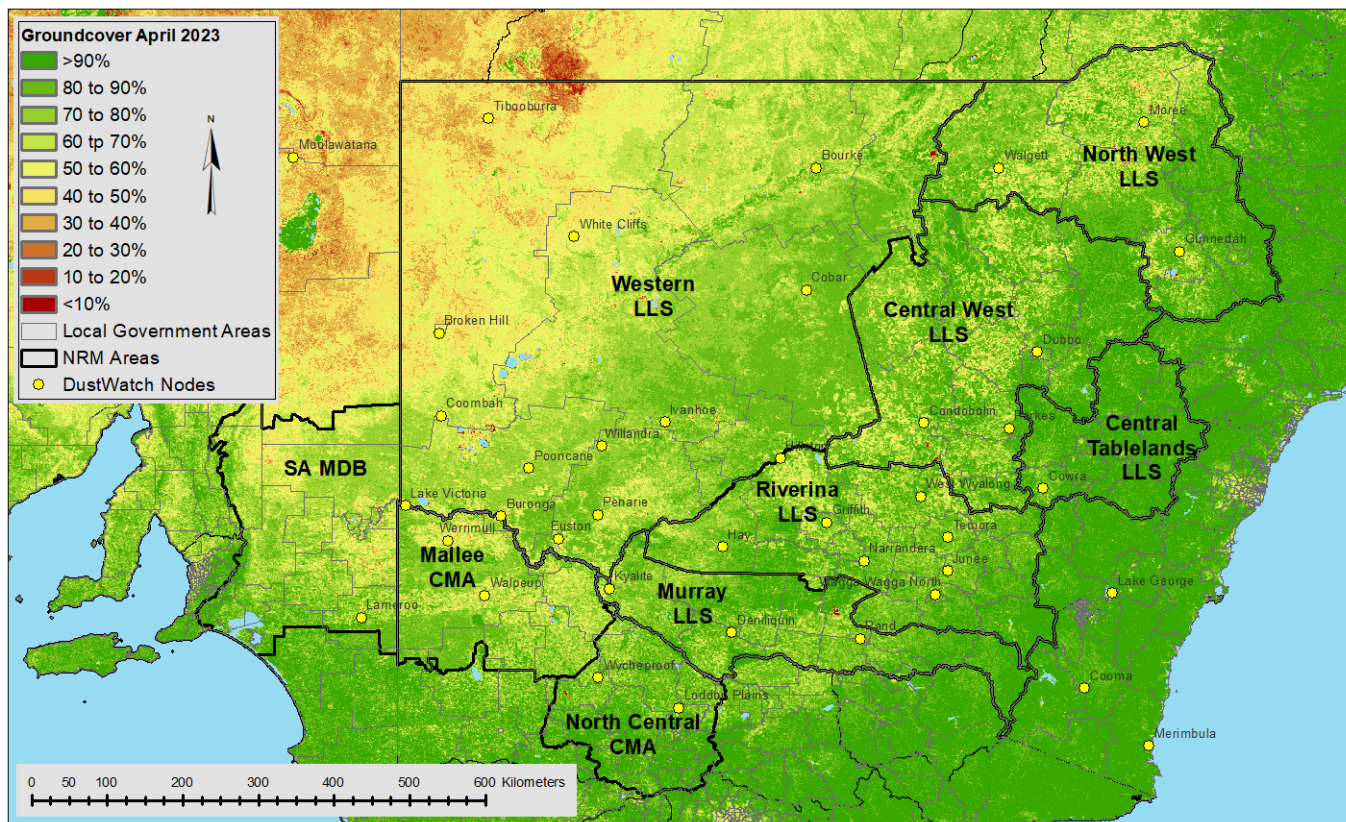


Figure 3 Groundcover for April 2023 as determined from MODIS by CSIRO

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

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
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
Apr 2023	98	97	100	100	97	100	95	83	100

Groundcover change

Groundcover improvements between January 2023 and April 2023 are visible along the Darling River downstream of Bourke and in remote eastern South Australia, north and south of Moolawatana station (green colours in Figure 4). Groundcover reductions occurred in the NSW wheat/sheep belt (orange colours in Figure 4).

Adverse autumn rainfall conditions (Figure 7b), particularly in the Local Land Services Western Region, caused a slow winter recovery this year, similar to 2017 (Figure 5). If the dryer-than-average conditions continue for the next 3 months (www.bom.gov.au/climate/outlooks/#/overview/summary) as forecast by the Bureau of Meteorology, this could be seen as an early warning sign to prepare for the possibility of drought and associated dust storms in 2024.

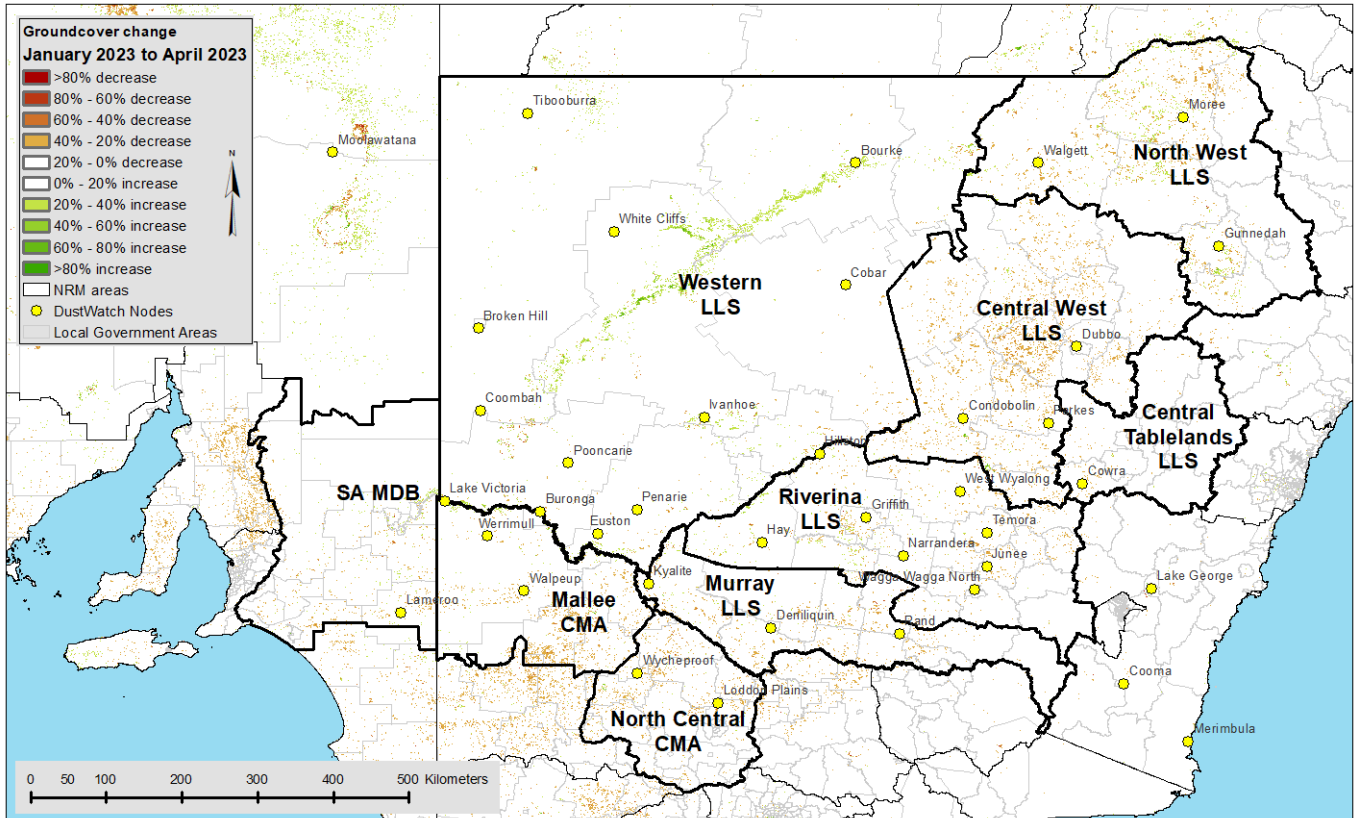


Figure 4 Groundcover difference between January 2023 and April 2023

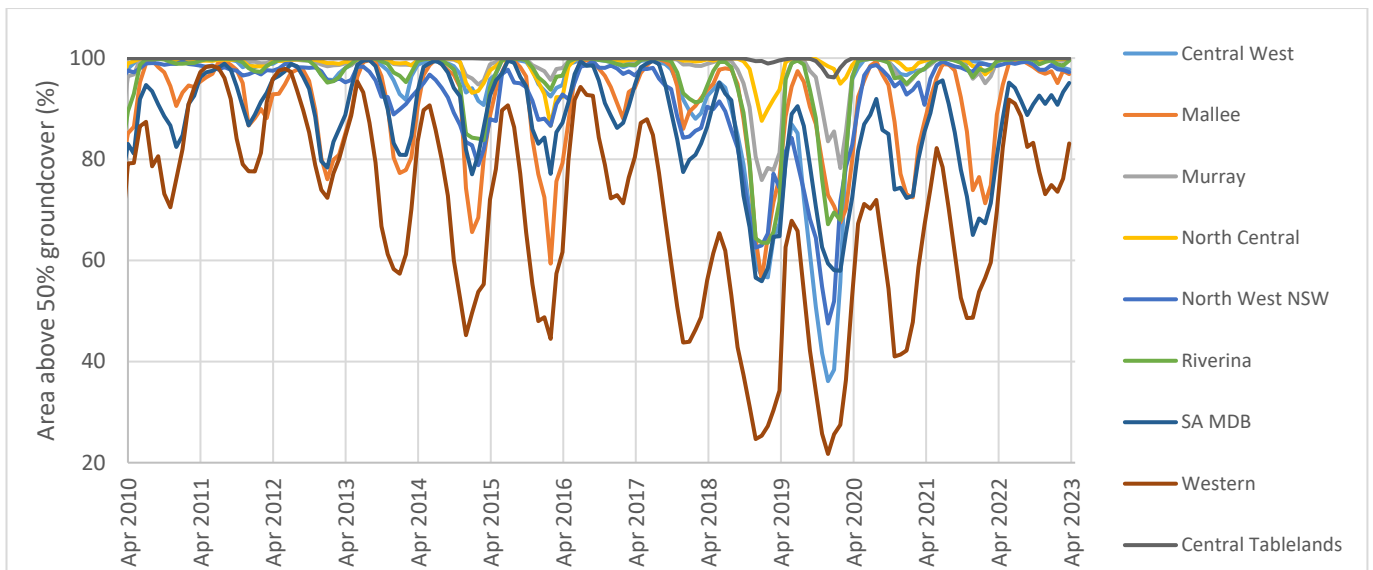


Figure 5 Area (%) of NRM with more than 50% cover since April 2010

Rainfall

Very little rainfall was recorded west of a line from Moree to Hay, with most areas receiving less than 10mm (Figure 6). This is normal for this time of the year, with the March 2023 deciles map mostly in the average category (Figure 7a).

The very low rainfall in the north-west of the state in the previous months still shows up in the 3 month deciles map, with some areas in the dries 10% of records (Figure 7b). This is the reason for the slower-than-expected winter recovery this year.

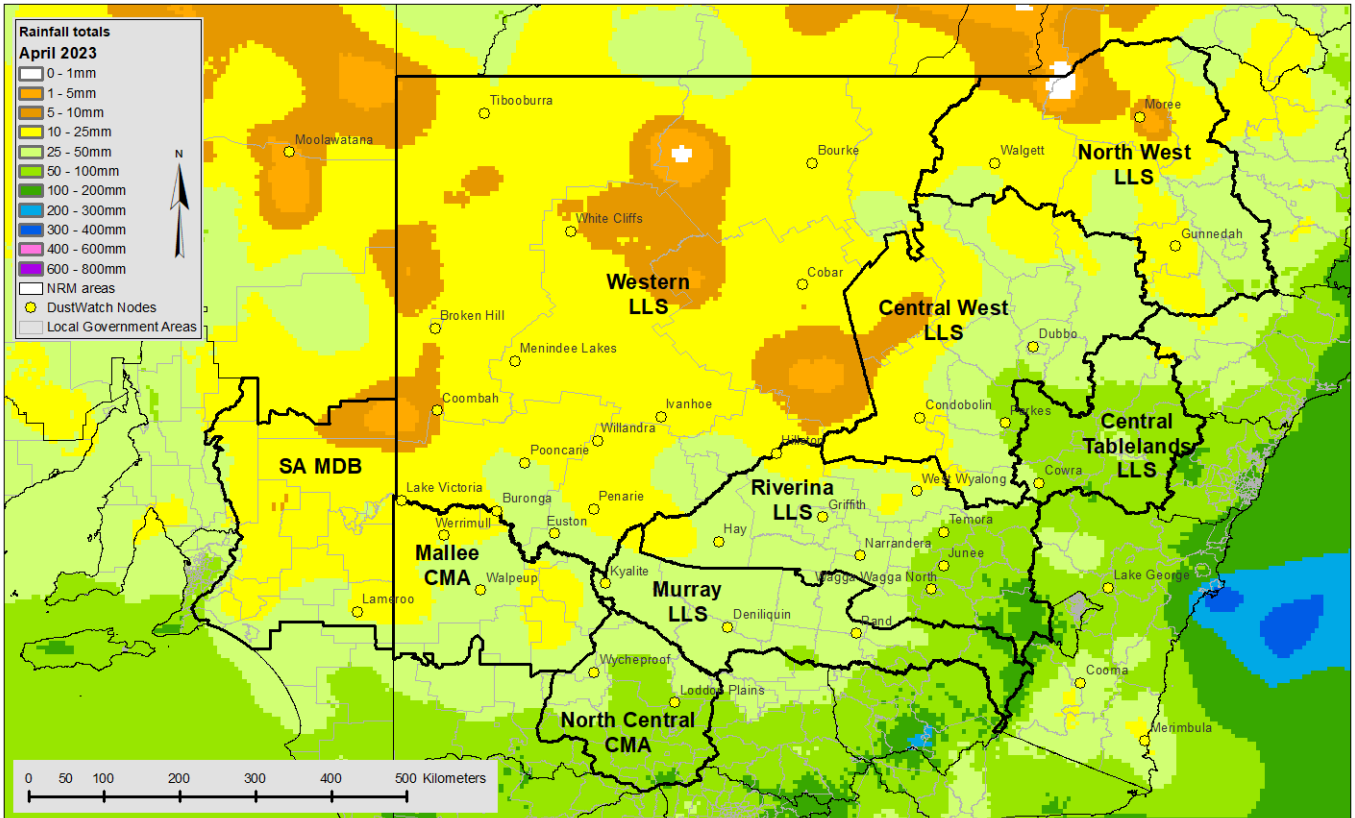


Figure 6 Rainfall totals for April 2023 (source: Bureau of Meteorology)

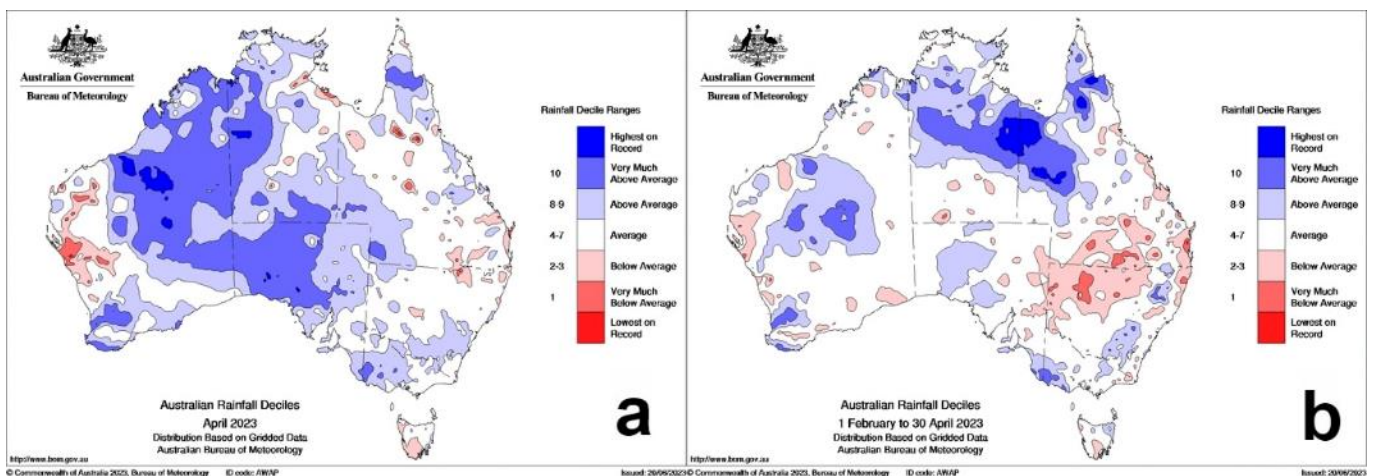


Figure 7 Rainfall deciles for April 2023 (a) and 1 February 2023 to 30 April 2023 (b)

VIIRS fires and satellite image

Haze from smoke and dust is difficult to separate. We use satellite imagery to classify every measurement into dust or smoke manually. The satellite detected 14,344 hot spots (375 m pixel with temperature anomalies) in April 2023 (Figures 8 and 9), more than double the 6,860 hot spots detected in March 2023 and very similar to the 14,045 detected in April 2021. Stubble burning is the 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.

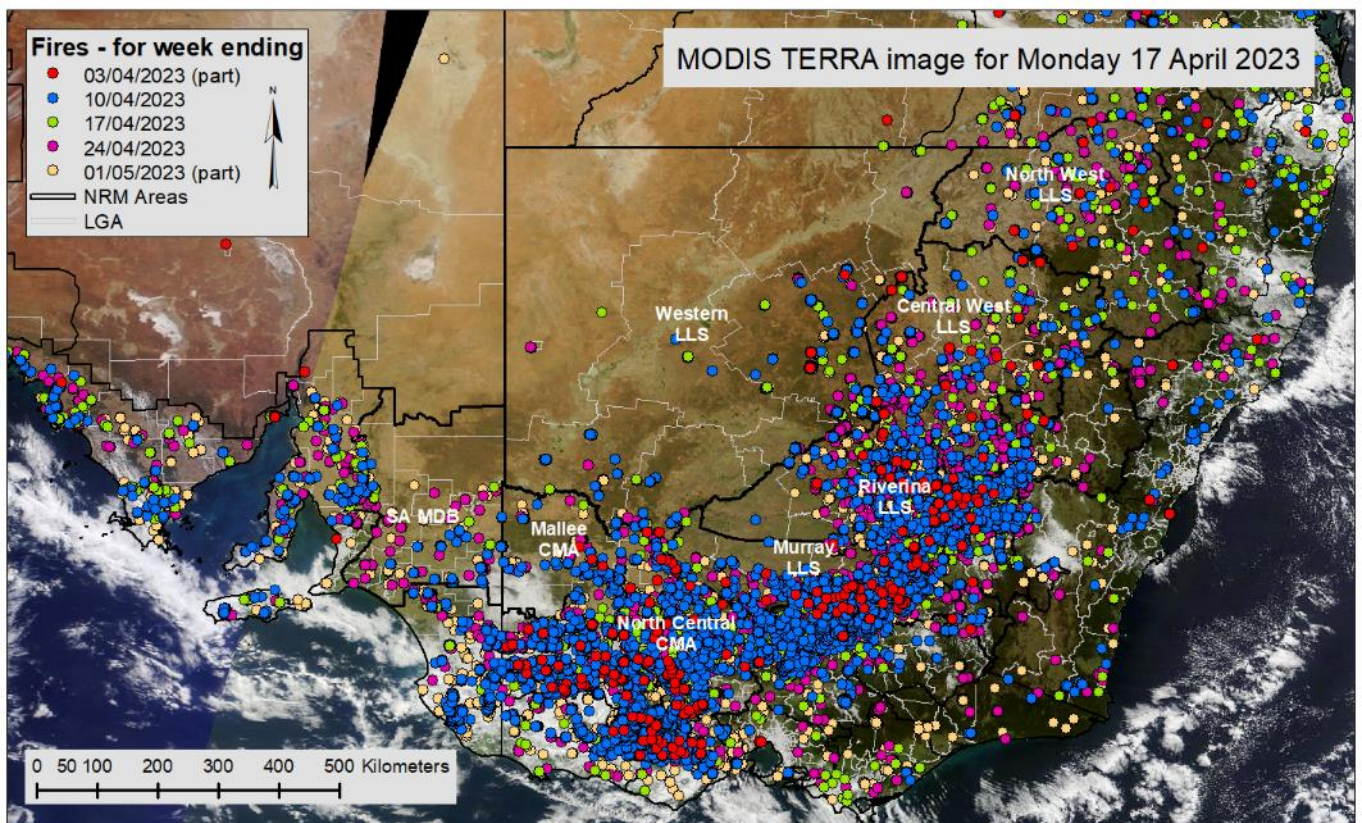


Figure 8 Pixels (375m) with active burning fires in April 2023 as determined from VIIRS satellite

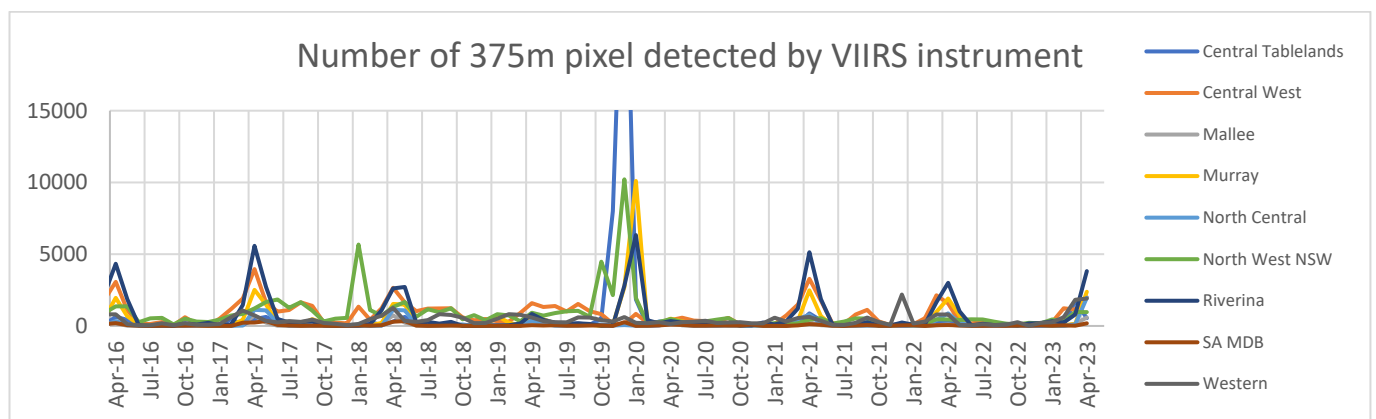


Figure 9 Monthly number of 375m pixels with active burning fires between April 2016 and April 2023

The DustWatch team

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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 Australia, 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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