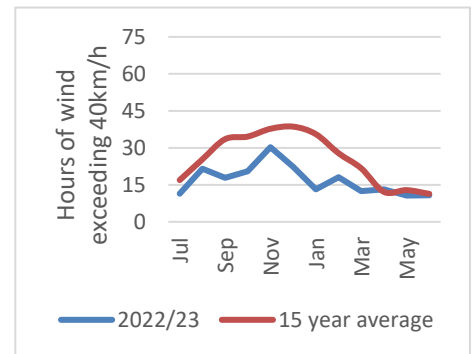


|                      |   |
|----------------------|---|
| <b>Dust activity</b> | Low across the network; on par with long term average |
| <b>Wind strength</b> | Very low; on par with long term average               |
| <b>Groundcover</b>   | Unchanged or improving                                |
| <b>Rainfall</b>      | Unusual high rainfall in the west; dry in the east    |

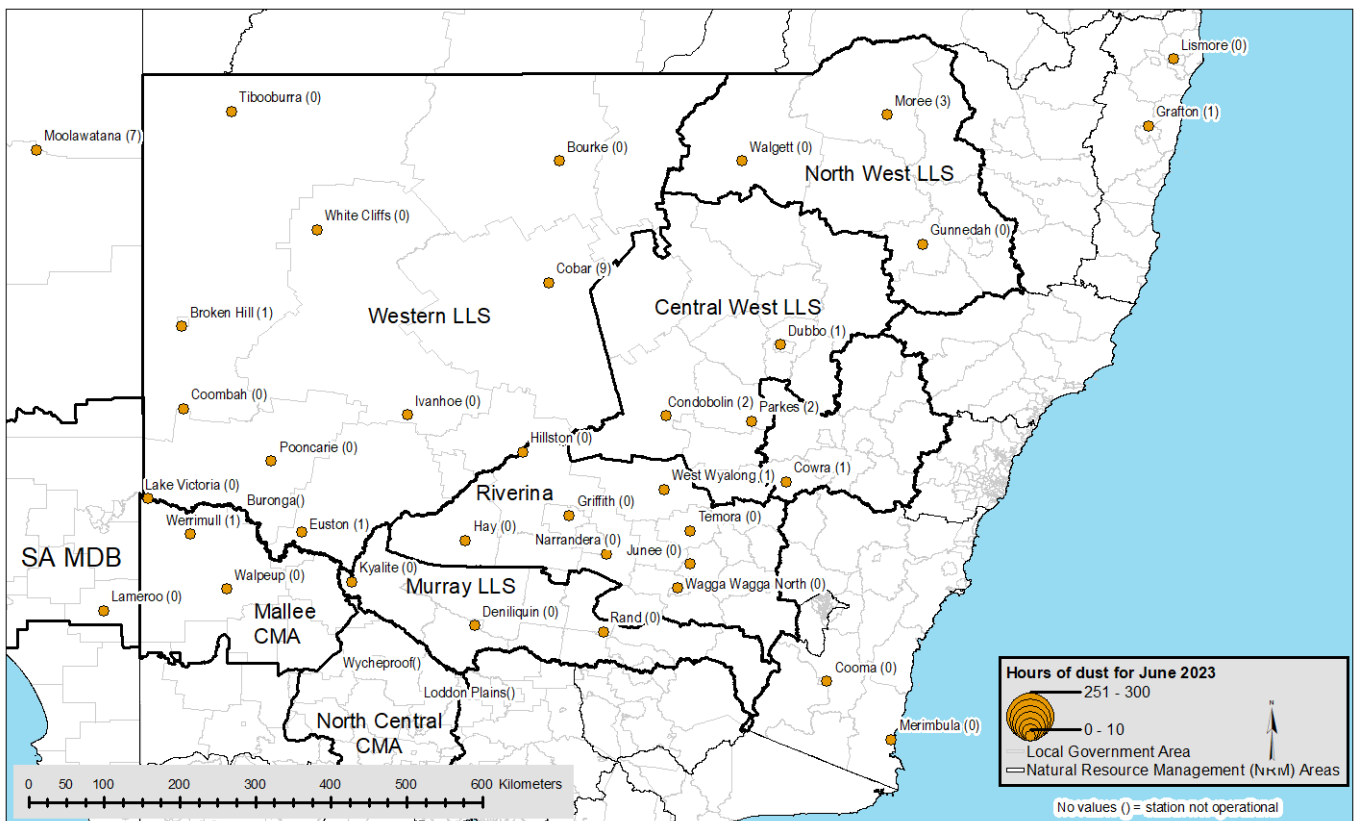
## Dust activity

Average dust activity for June 2023 was very low, with an average of 1.1 hours recorded across the network (Figure 2). This is typical for this time of the year. Exceptionally high rainfall across central Australia (Figures 6 and 7a) and very low hours of strong winds exceeding 40 km/h (Figure 1) reduced the dust emissions across the network. The unusually high rainfall in the state's west will hopefully trigger some welcome plant growth this spring and prolong fodder availability and protective groundcover into summer.



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

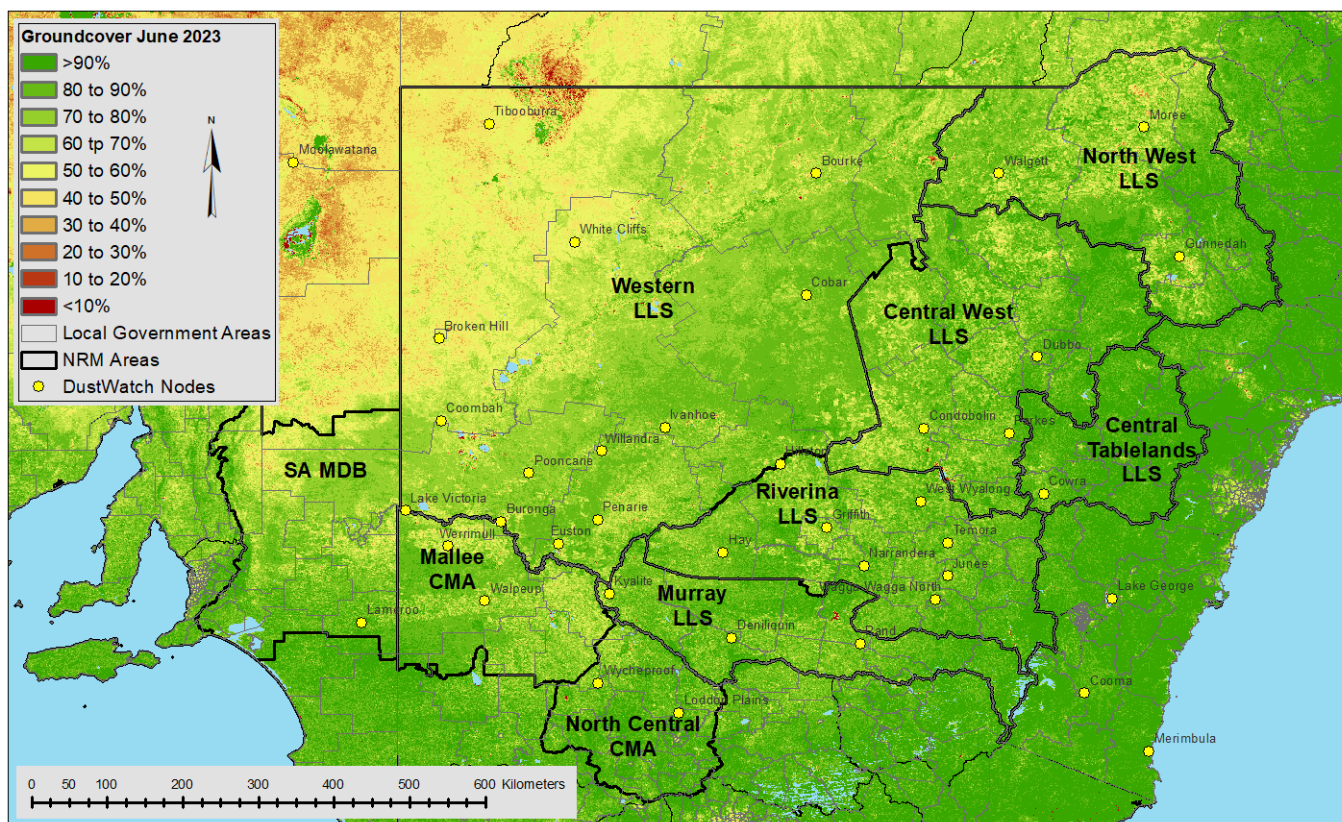
Note: Real time dust measurements from all our monitoring sites are at: Rural air quality network – live data



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

# Groundcover

The area with greater than 50% groundcover (green and yellow in Figure 3) has remained almost unchanged from May 2023, with only the far northwest of the state showing areas below 50% groundcover, in particular the Bulloo Plains northeast of Tibooburra (red and orange in Figure 3). The only exception is the Local Land Services Western region, where the area with >50% groundcover improved from 86% to 90% (Table 1).



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

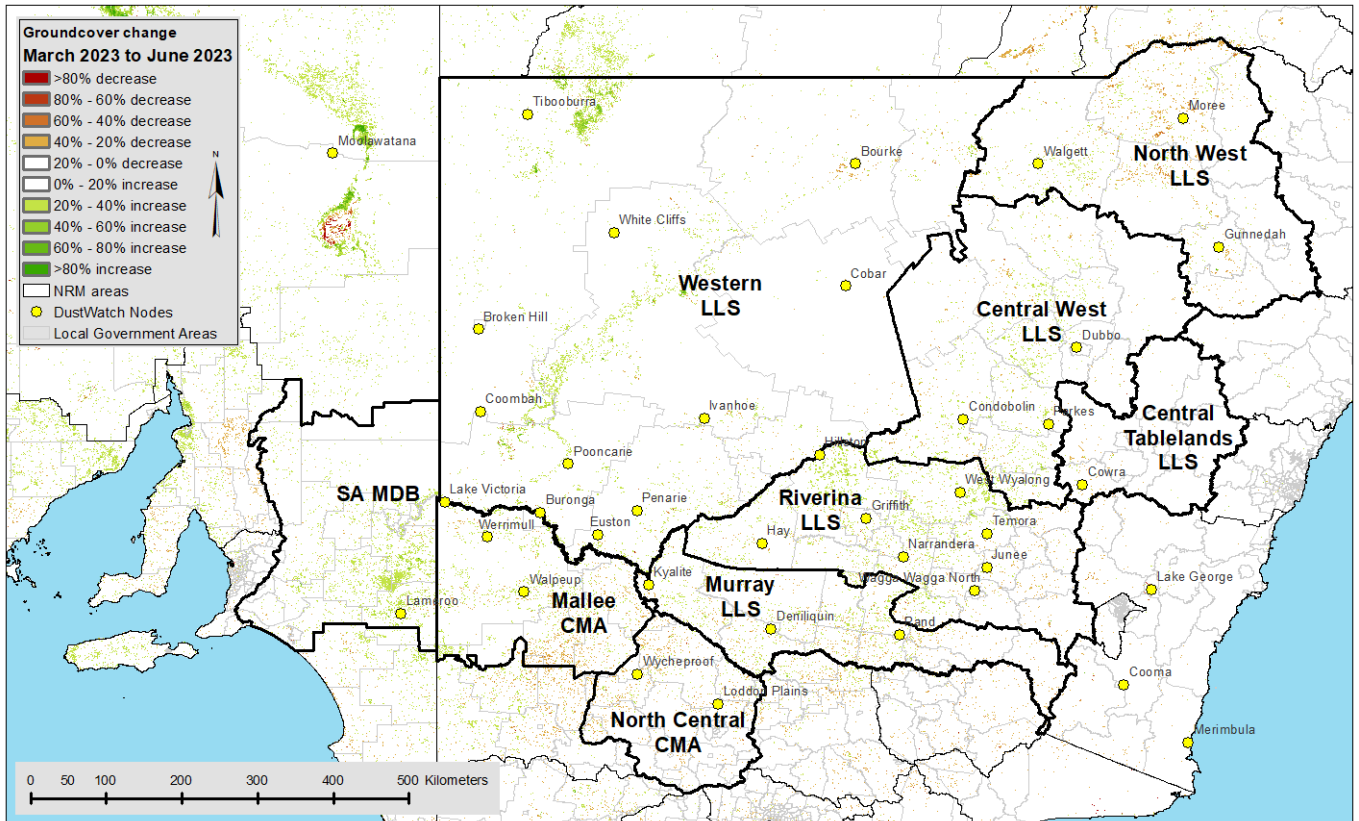
**Table 1** Percentage of each NRM with cover >50% for June 2022 to June 2023

| Date     | Central West | Mallee | Murray | North Central | North West | Riverina | SA MDB | Western | Central Tablelands |
|----------|--------------|--------|--------|---------------|------------|----------|--------|---------|--------------------|
| 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                |
| Jun 2023 | 100          | 99     | 100    | 100           | 99         | 100      | 98     | 90      | 100                |

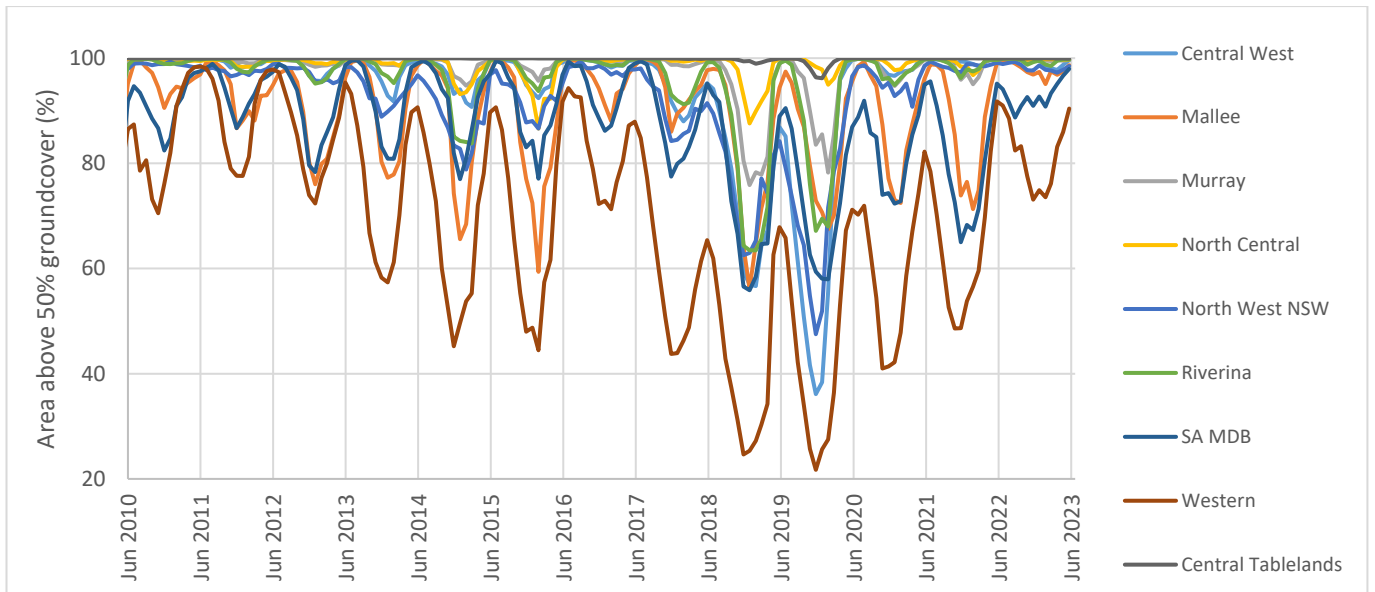
# Groundcover change

Groundcover has improved across the board with significant improvements (green in Figure 4) visible on the Bulloo Plains northeast of Tibooburra, along the Darling River corridor and in the wheat/sheep belt of New South Wales. Groundcover reductions (orange in Figure 4) are visible in the Local Land Services North West region and Victorian Mallee.

The good rainfall recorded in late June 2023 (Figure 6) will have an impact on groundcover in western New South Wales and across the border into South Australia, but this is not showing up on the June image as vegetation did not have enough time to respond.



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



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



# Rainfall

Rainfall in June 2023 was the opposite of what is expected for the month of June with very little rainfall recorded on the New South Wales coast and very high falls above 100 mm recorded in parts of the west of the state (Figure 6). This rainband stretched across the Australian continent and provided very welcome rain to inland Australia ([www.bom.gov.au/climate/current/statement\\_archives.shtml](http://www.bom.gov.au/climate/current/statement_archives.shtml))

This rainfall in late June 2023 was very unusual, and a large band across inland Australia is in the wettest 10% of rainfall records, whereas coastal New South Wales is in the driest 10% (Figure 7a). Looking at the last 3 months, New South Wales is divided into wetter than average rainfall in the west and drier than average rainfall in the east (Figure 7b).

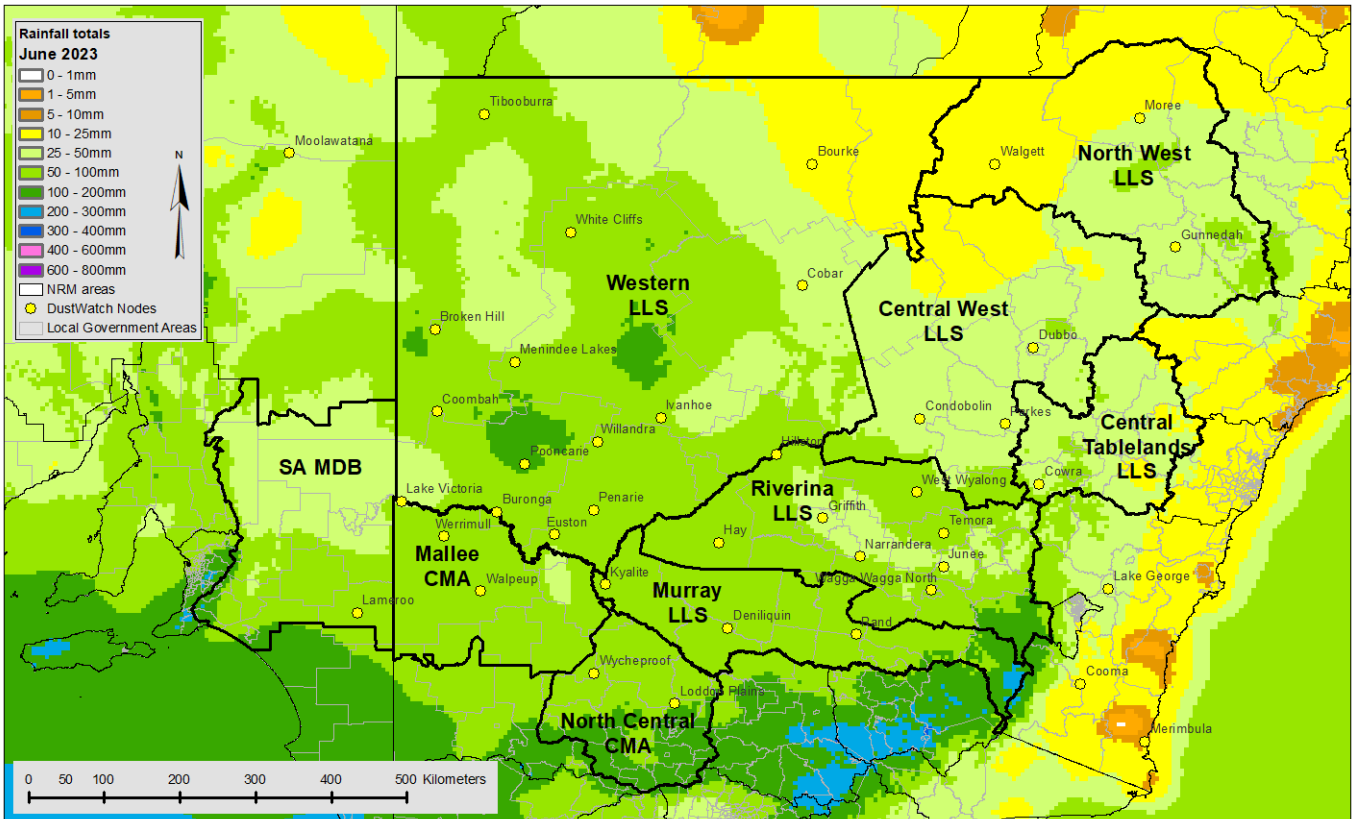


Figure 6 Rainfall totals for June 2023 (source: Bureau of Meteorology)

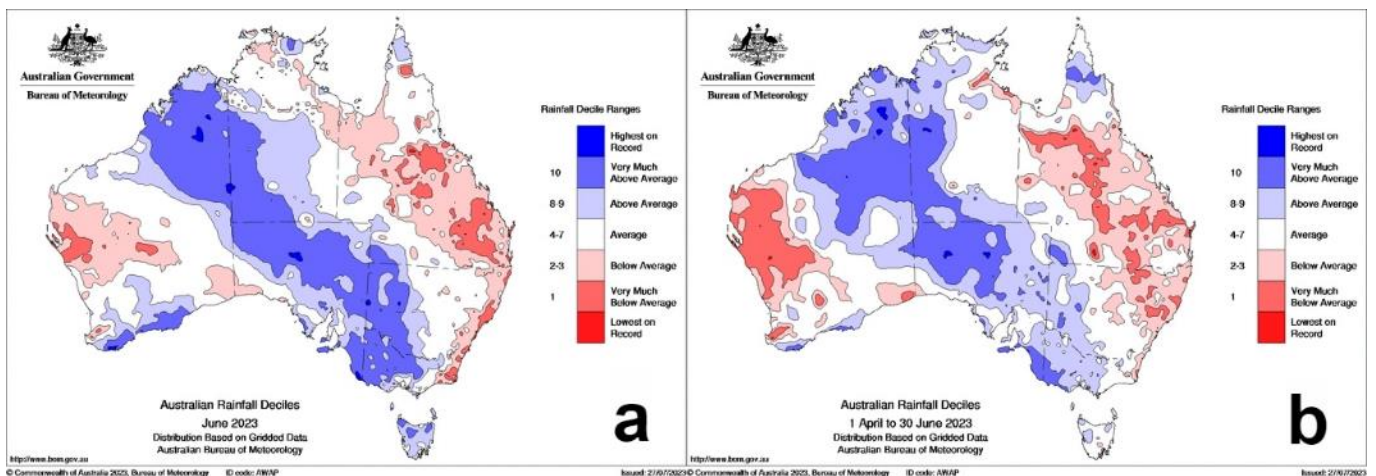
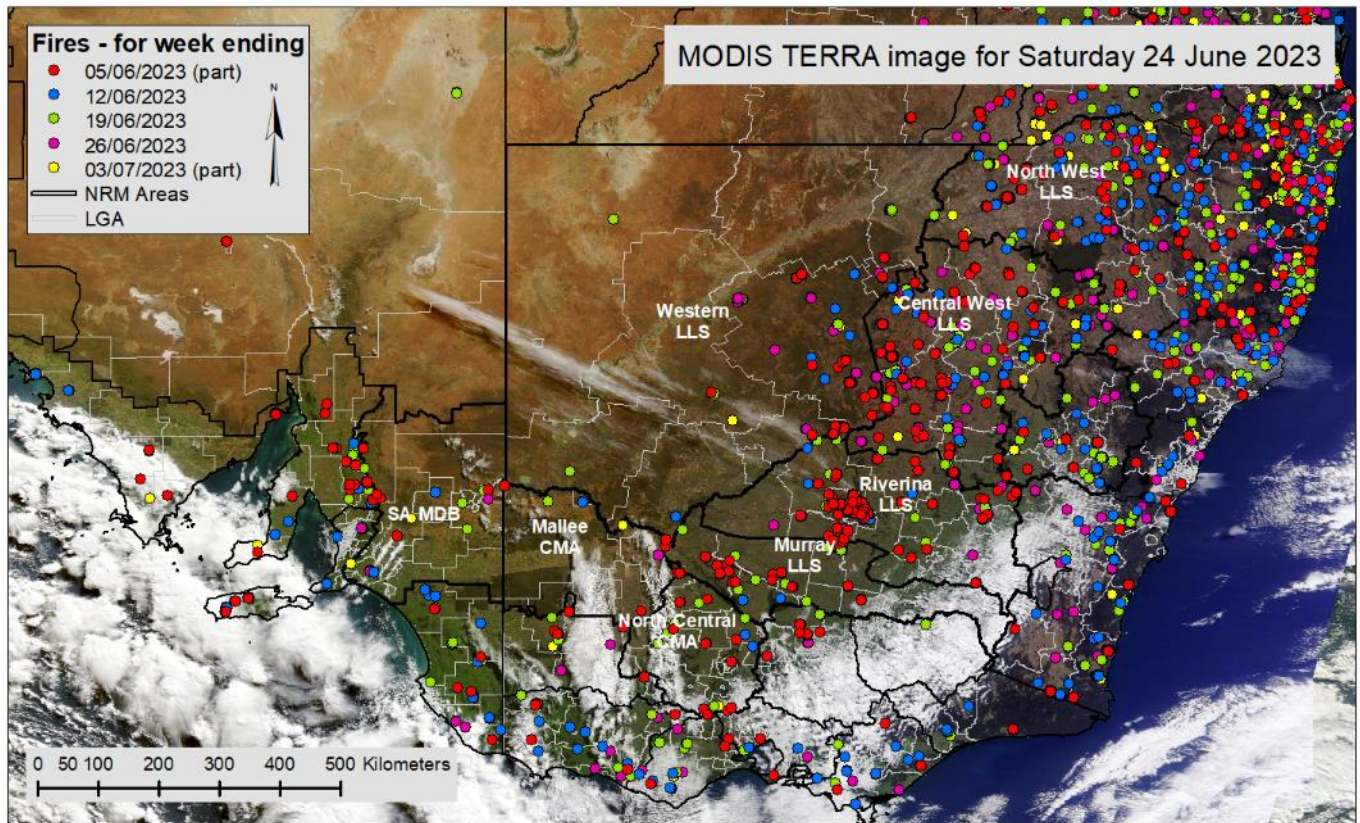


Figure 7 Rainfall deciles for June 2023 (a) and 1 April 2023 to 30 June 2023 (b)

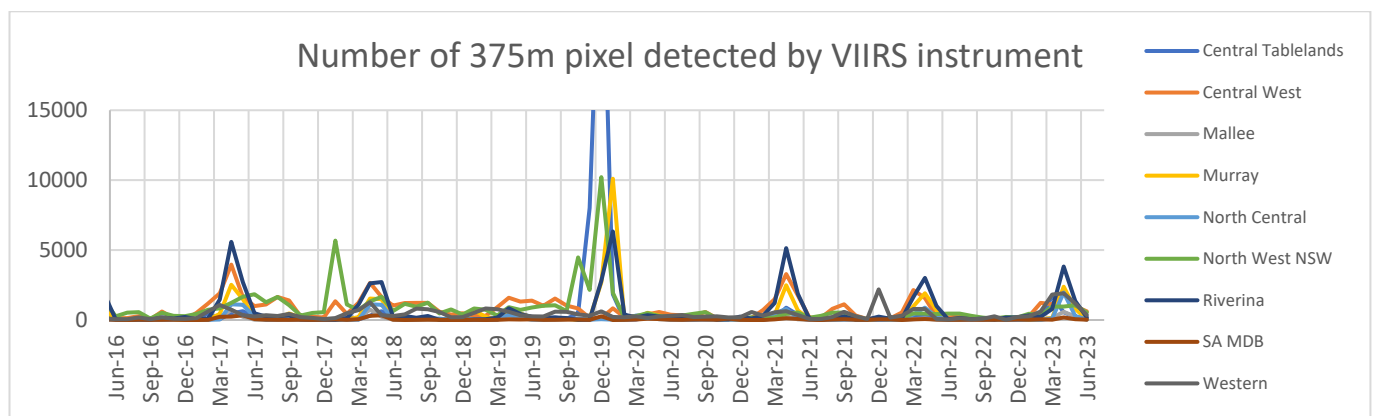
# VIIRS fires and satellite image

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 1935 hot spots (375m pixel with temperature anomalies) in June 2023 (Figures 8 and 9), less than 1/3 of the 6173 hot spots detected in May 2023. A mix of hazard reduction and stubble burning is 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 June 2023 as determined from VIIRS satellite



**Figure 9** Monthly number of 375m pixels with active burning fires between June 2016 and June 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 NSW; 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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