

Dust activity	Below average but tripled from November 2022
Wind strength	Much below average for December
Groundcover	Very good groundcover; reducing in the far west
Rainfall	Average for December; dry on the coast

Dust activity

The average hours of dust in December 2022 (10.8 h) have tripled from November 2022 (3.2 h). Increases were widespread (Figure 2) but most noticeable in the south at Euston (55 h) and Narrandera (51 h).

Average to below-average rainfall (Figure 7a) contributed to the reduction in groundcover seen across Western NSW (Figure 4).

This is an increase in dust despite the below-average hours of strong winds (Figure 1).

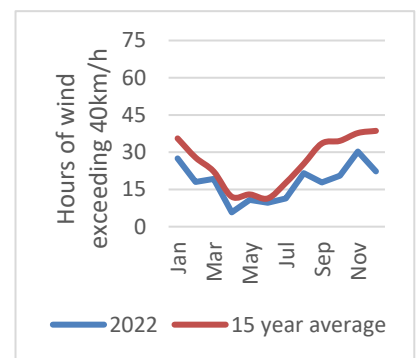


Figure 1 Hours of wind exceeding 40km/h – average across all sites

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

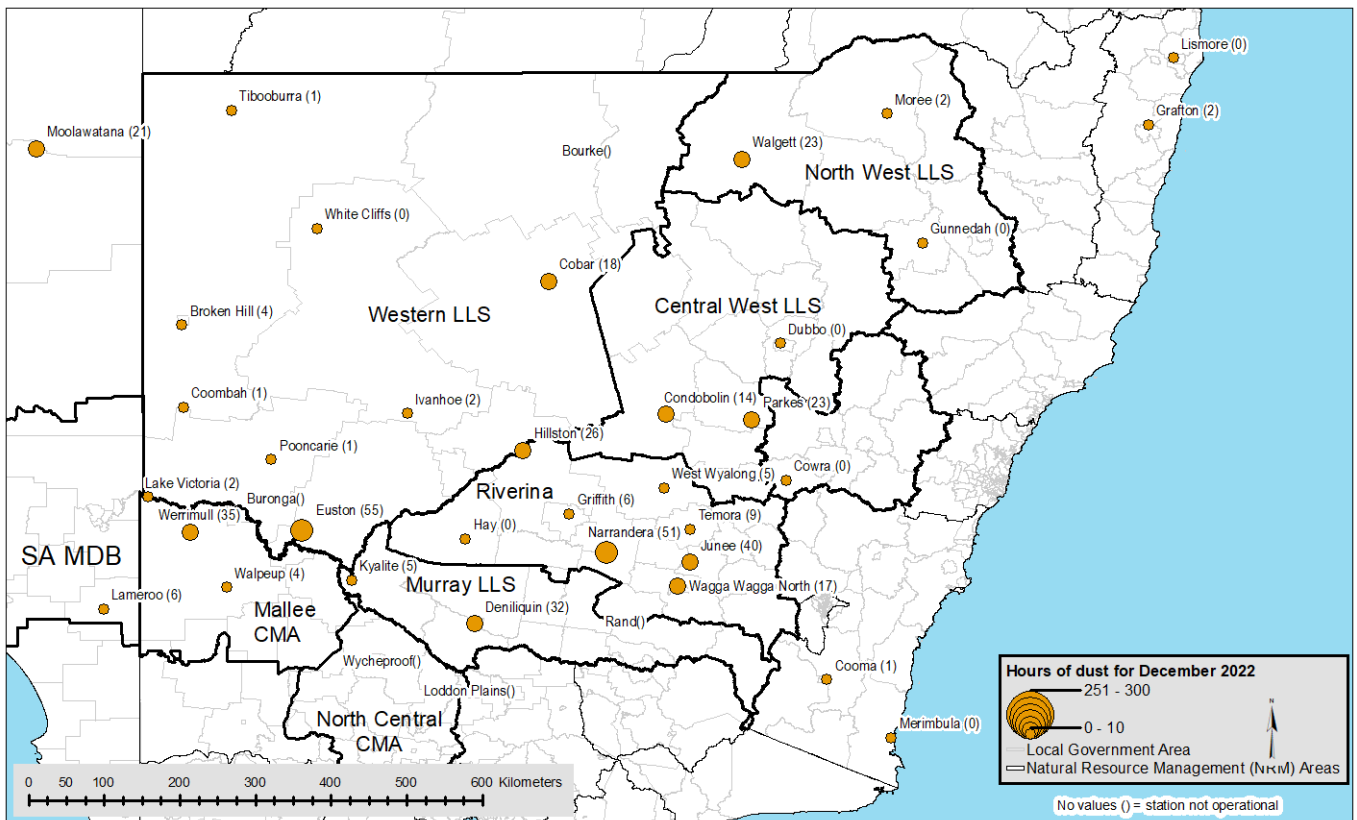


Figure 2 Hours of dust activity (number in brackets) at each DustWatch site in December 2022

Groundcover

The area with greater than 50% groundcover (green and yellow colours in Figure 3) has decreased in the Local Land Services Western Region along the Darling River corridor and in the incorporated areas north of White Cliffs and Broken Hill.

These groundcover reductions are typical for this time of the year, albeit from much higher groundcover values than the previous 5 years (Table 1 and Figure 5).

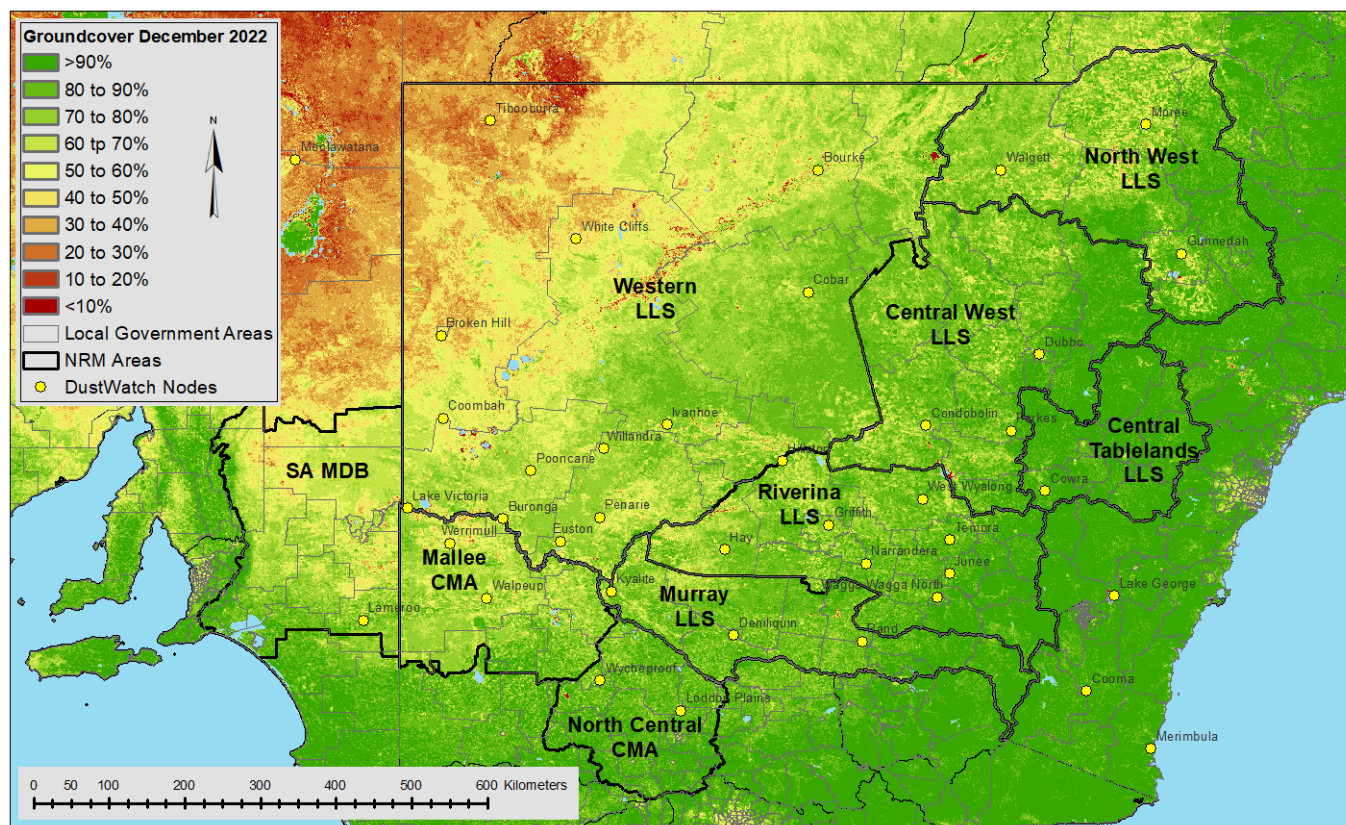


Figure 3 Groundcover for December 2022 as determined from MODIS by CSIRO

Table 1 Percentage of each NRM with cover >50% for December 2021 to December 2022

Date	Central West	Mallee	Murray	North Central	North West	Riverina	SA MDB	Western	Central Tablelands
Dec 2021	99	74	96	98	97	96	65	49	100
Jan 2022	99	76	97	98	99	98	68	54	100
Feb 2022	99	71	95	97	99	97	67	57	100
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	98	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

Groundcover change

Groundcover reductions between September 2022 and December 2022 occurred predominantly in the Local Land Services Western and North West Regions and the Mallee Catchment Management Authority Region (red and orange colours in Figure 4).

In the Local Land Services Western Region, this drop included areas falling below 50% groundcover, causing a drop in the area above 50% cover from 78% to 73%. In other areas, the reduction in groundcover was from a higher starting point and therefore did not include falls below 50% groundcover (Figure 3 and Table 1).

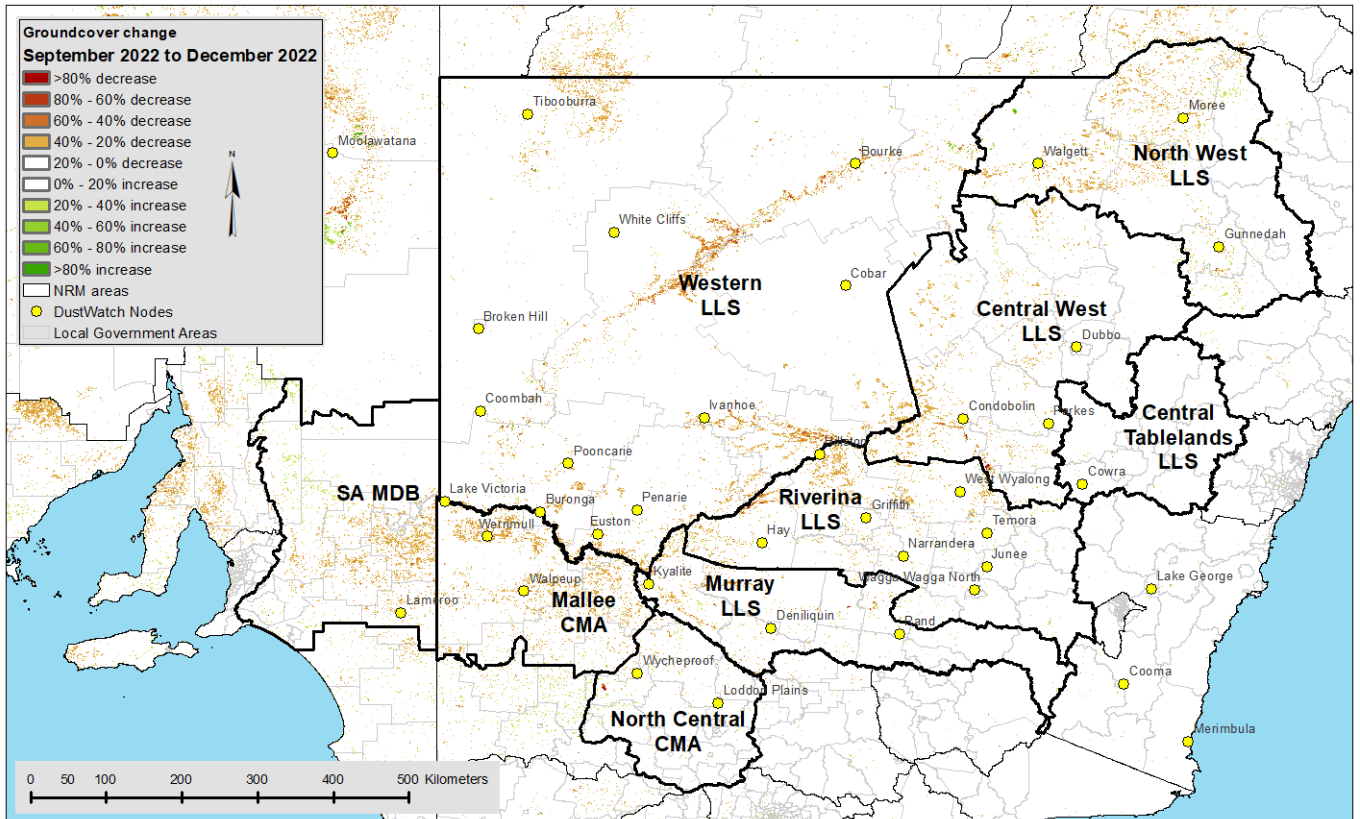


Figure 4 Groundcover difference between September 2022 and December 2022

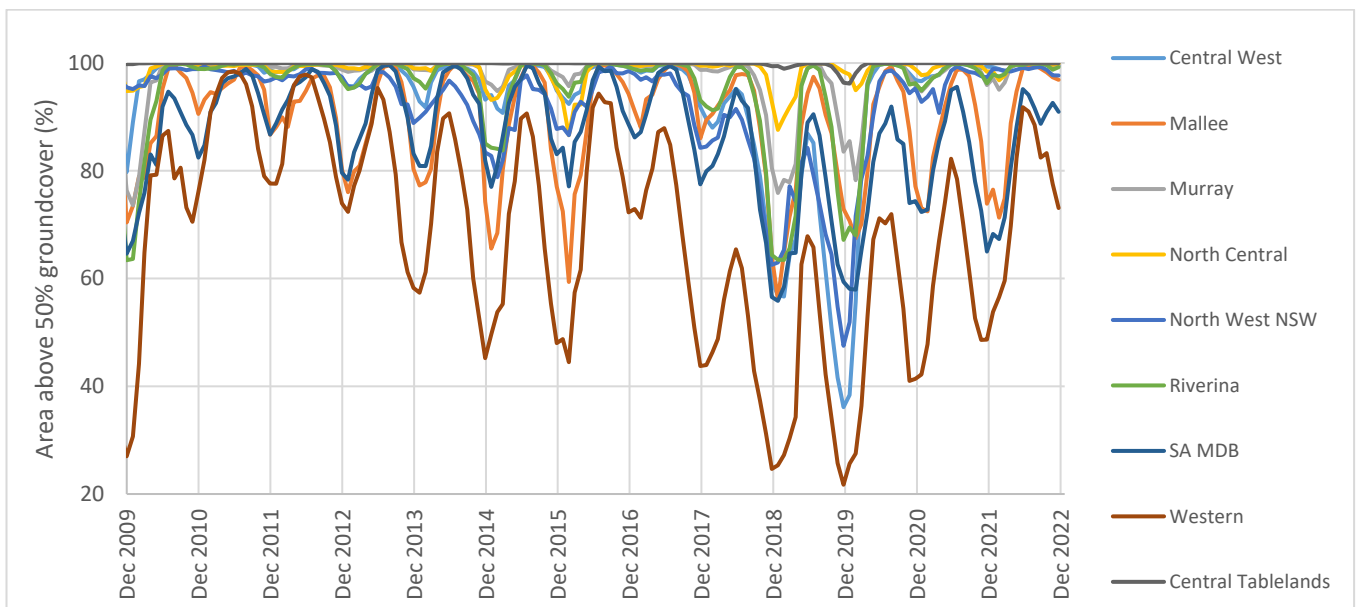


Figure 5 Area (%) of NRM with more than 50% cover since December 2009

Rainfall

Rainfall for most of western NSW remained below 25 mm, with isolated areas north of Broken Hill and around Coombah and Cobar exceeding that amount (Figure 6).

These figures were much dryer than normal for December, with most of New South Wales at or below average rainfall (Figure 7a).

Some small areas on the NSW north coast have been below average for the last 3 months. The remainder of the state is mostly in the wettest 10% of Bureau of Metrology records (Figure 7b), due to exceptionally high falls in October 2022 and November 2022.

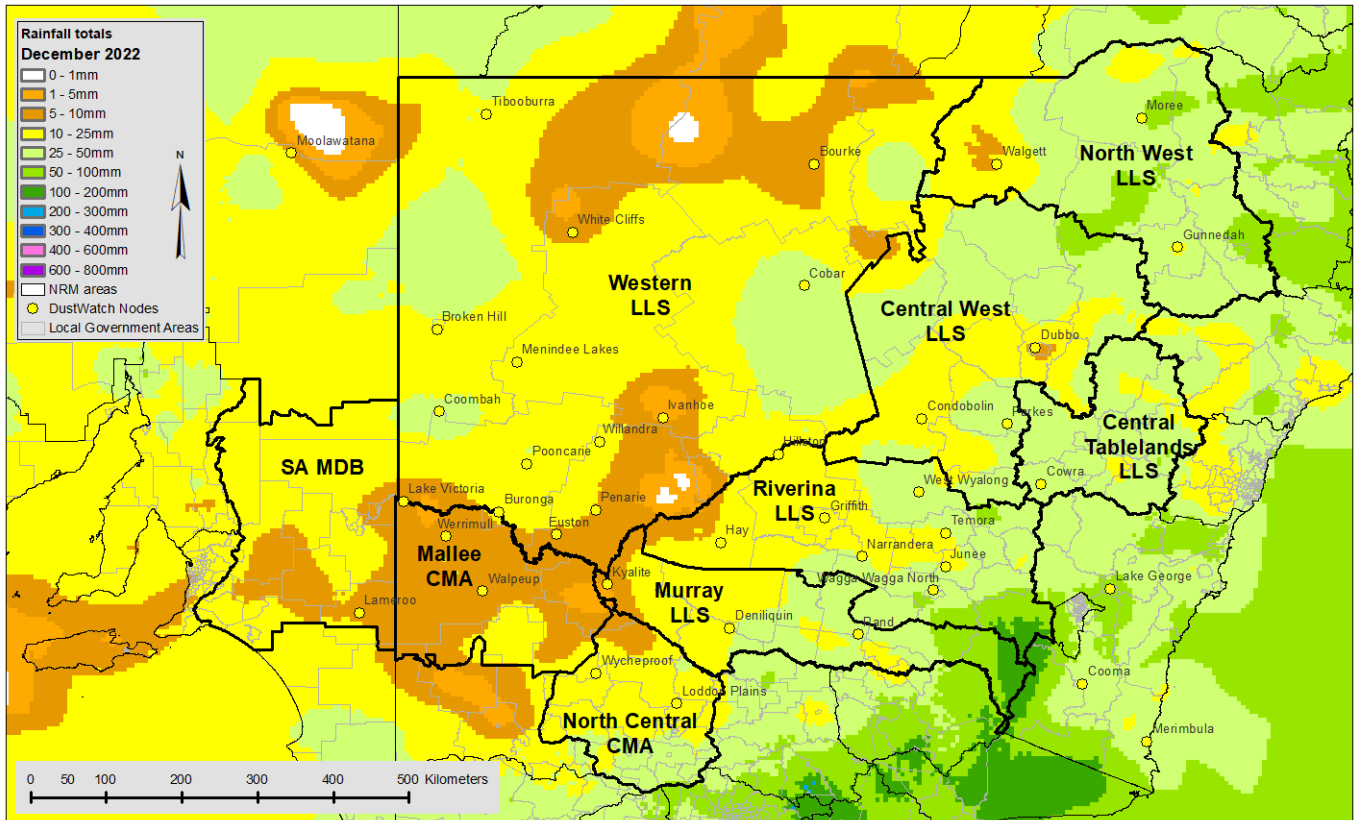


Figure 6 Rainfall totals for December 2022 (source: Bureau of Meteorology)

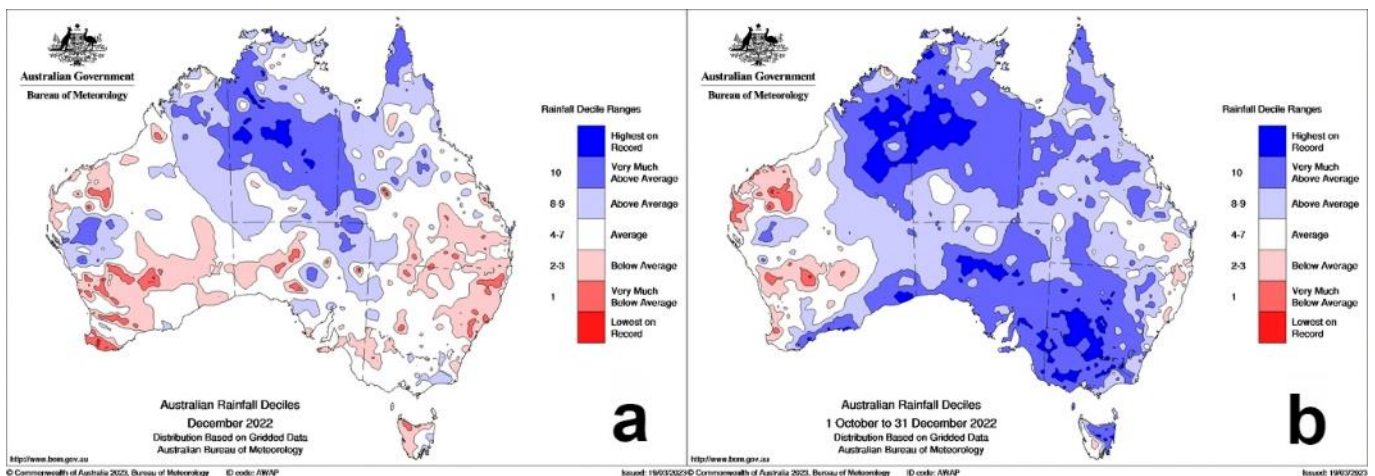


Figure 7 Rainfall deciles for December 2022 (a) and 1 October 2022 to 31 December 2022 (b)

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 978 hot spots (375 m pixel with temperature anomalies) in December 2022 (Figures 8 and 9), a 41% increase from the 579 hot spots detected in November 2022. Fires occurred mostly in north-eastern NSW and the Riverina.

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.

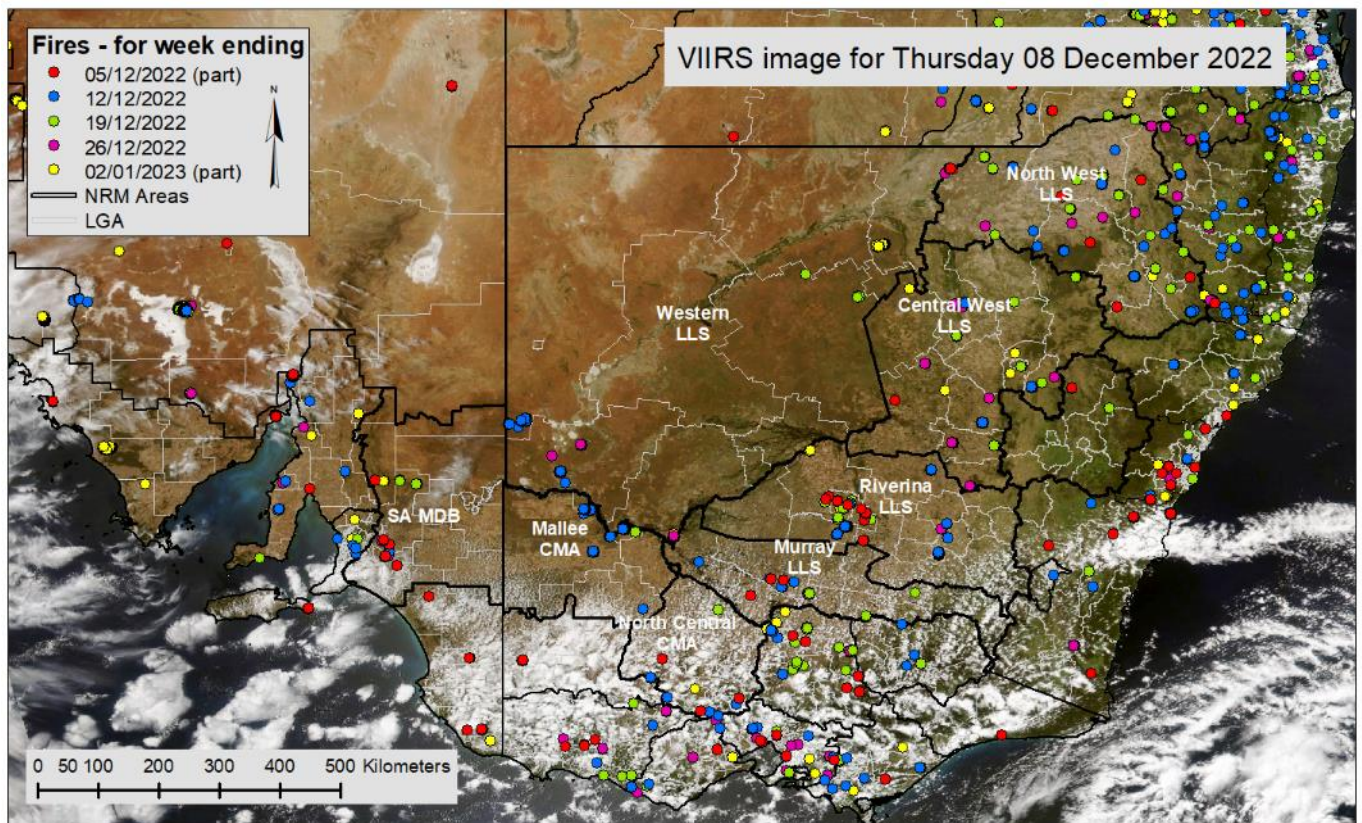


Figure 8 Pixels (375m) with active burning fires in December 2022 as determined from VIIRS satellite

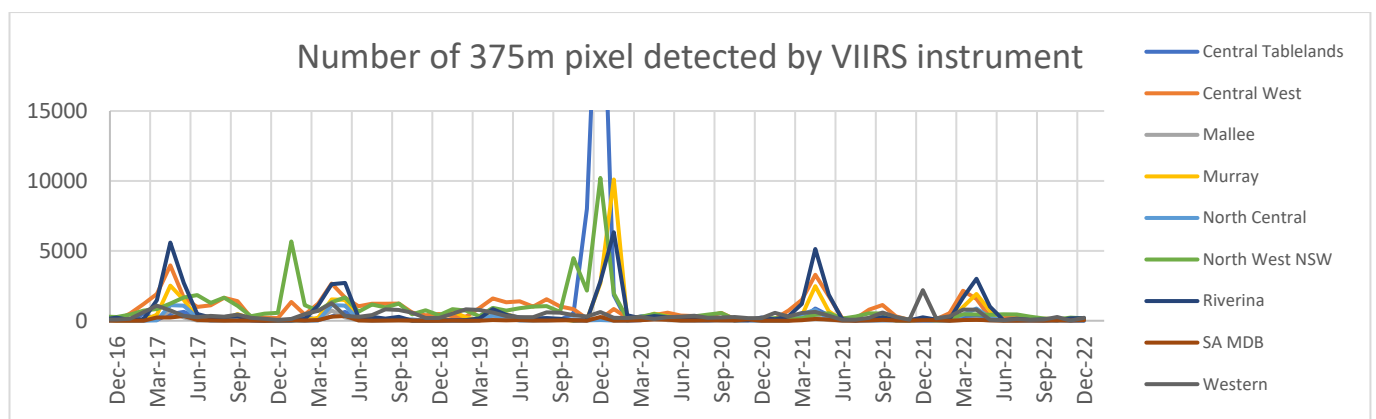


Figure 9 Number of 375m pixels with active burning fires between December 2016 and December 2022

The DustWatch team

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 Programme, 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 Australia; CSIRO, TERN and the Australian National University. We particularly thank our many DustWatch volunteers who provide observations and help maintain the instruments.

ISSN – 2206-3161
EHG 2022/0012

Community-based wind erosion monitoring across Australia

Contact us at dustwatch@environment.nsw.gov.au

