

Dust Activity

Western Australia had considerable dust activity in the later part of October 2013 with dust detected at Mullewa on 23 October and Merredin on 26 October 2013 (Figure 1). Local DustWatchers suggested cropping paddocks were the likely source areas. The paddocks are visible on the groundcover image (Figure 2) and on the groundcover difference image (Figure 3).

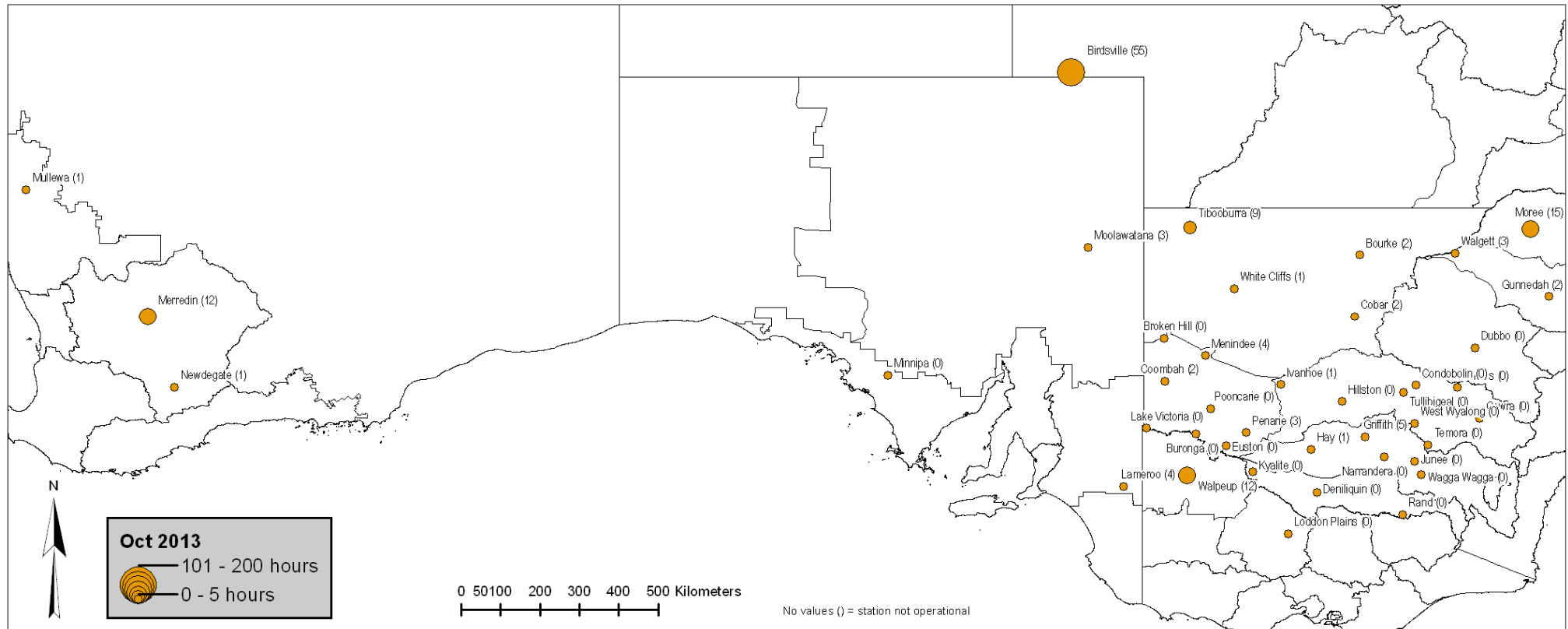
The **South Australian** Arid Lands had a substantial dust storm on 10 October 2013 in the Lake Eyre area. The event was visible on the MODIS images (Figure 6). The dust storm travelled east on the prevailing winds and was detected at Gunnedah and Moree late on 10 October. The drying lake beds of Lake Eyre have large amounts of loose sediment and are prime source areas for natural wind erosion.

The northern half of **New South Wales** had dust from South Australia on 10 October 2013. In addition, some locally raised dust associated with strong winds was detected on several days around Griffith, Penarie, Menindee, Coombah, Ivanhoe and Moree. These areas have shown a reduction in groundcover over the past three months (Figure 3).

The Birdsville DustWatch station in **Queensland** recorded dust in every week of October resulting in a total of 55 hours. Very strong winds and large bare areas to the north west of the Station are the likely cause of this dust.

Local cropping activity is the likely source of the dust around the **Victorian** Walpeup site. It had dust activity on 20 and 22 October 2013.

Figure 1. Hours of dust with visibility less than 10 km recorded at each DustWatch Node in October 2013.



Groundcover

The October 2013 groundcover image shows increasing bare areas in inland Australia. Some cropping areas around Gunnedah and Moree, and between Moree and Walgett, have a 20% to 40% reduction in groundcover (Figure 2 and Figure 3).

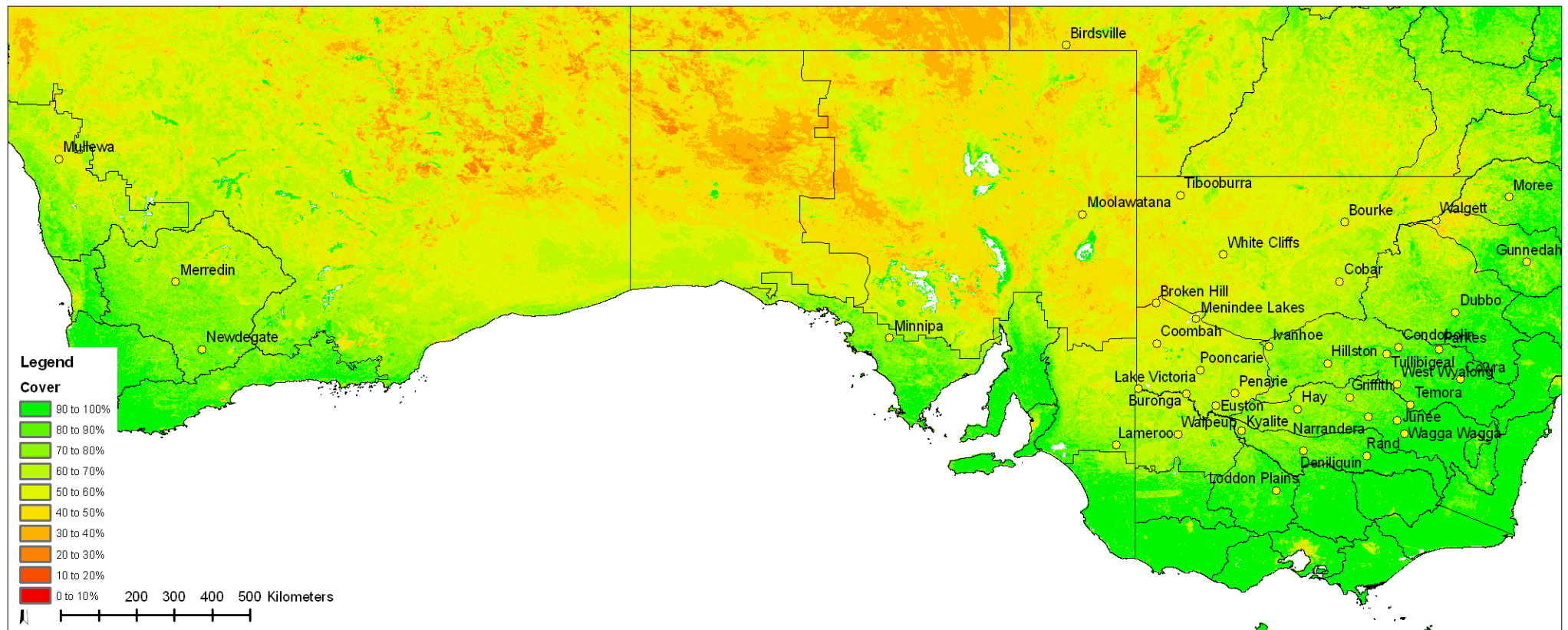
Areas in western Victoria and south eastern South Australia have reduced groundcover by 40% to 60%.

Large bare areas to the north west of Birdsville are the likely source of the dust measured in the town in October 2013. These areas have gradually declined in annual

groundcover over the past 6 months and are now well below the 50% threshold for wind erosion. Old fire scars from early 2011 are still contributing to the low groundcover.

The groundcover around the South Australian Minnipa site is still high (Figure 2), but groundcover in that area has reduced (Figure 3) since July. If this trend continues the area to the north of Minnipa could become a dust source during summer.

Figure 2. Percentage groundcover for October 2013 as determined from MODIS data using the method of Guerschman et al (2009).



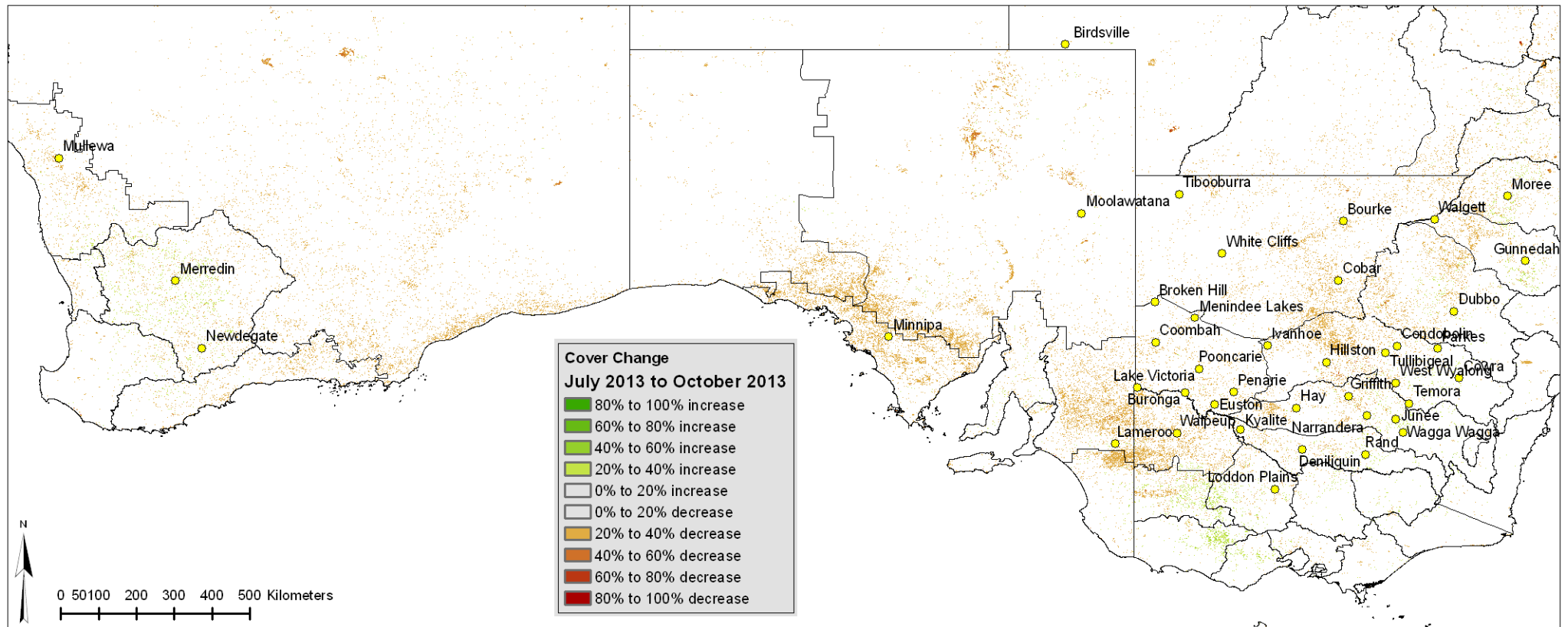
Groundcover change

Figure 3 shows the change in groundcover from July 2013 to October 2013. Groundcover changes of less than $\pm 20\%$ have been coloured white to highlight the areas of change greater than $\pm 20\%$.

Reductions in groundcover are widespread across all states and not limited to either cropping or grazing land uses. The spring break, which generally leads to increasing groundcover in the southern rangelands, has not occurred this year in most areas. The resulting groundcover reductions may lead to increasing dust during the coming summer.

The Bureau of Meteorology is predicting a hotter than average summer in NSW (http://www.bom.gov.au/climate/ahead/temps_ahead.shtml) which will further reduce groundcover in the rangelands if total grazing pressure is not adequately controlled.

Figure 3. Percentage groundcover change from July 2013 to October 2013 as determined from MODIS data using the method of Guerschman et al (2009).

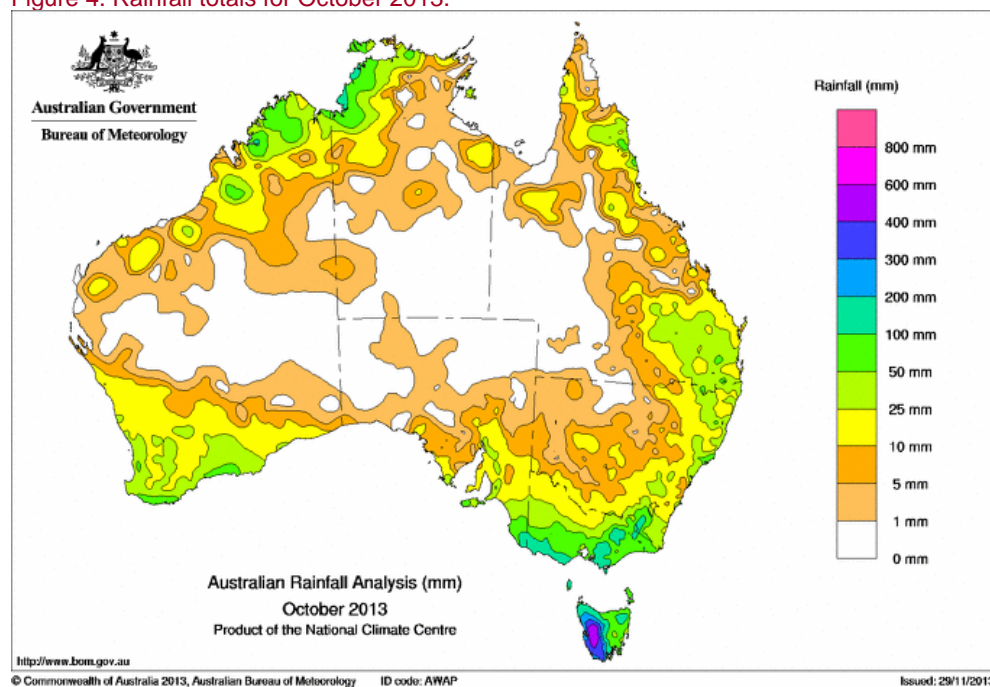


Rainfall totals

The rainfall totals for October 2013 (Figure 4) were only above 25mm for coastal areas of Victoria, southern and far northern Western Australia and parts of southern South Australia.

Inland Australia had no rain or minor falls of less than 10mm. With the ongoing warmer than average temperatures, these falls would have evaporated very quickly without affecting vegetation growth.

Figure 4. Rainfall totals for October 2013.

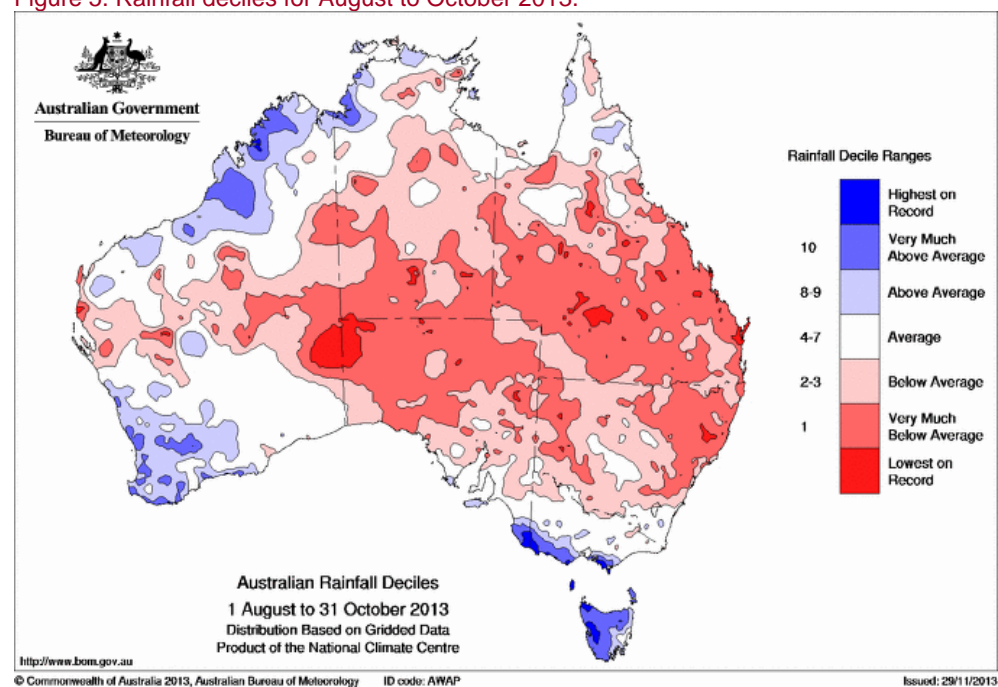


Rainfall Deciles

Most of South Australia, north eastern Western Australia, Queensland and a large proportion of New South Wales are in the **driest 10%** of records for the three month period of August to October 2013 (Figure 5). These areas have increased considerably from last months report. If the below average rainfall continues, dust emissions become more likely from these areas.

Southern Victoria, south eastern South Australia, and southern and northern Western Australia continue to receive above average rainfall.

Figure 5. Rainfall deciles for August to October 2013.



MODIS satellite image

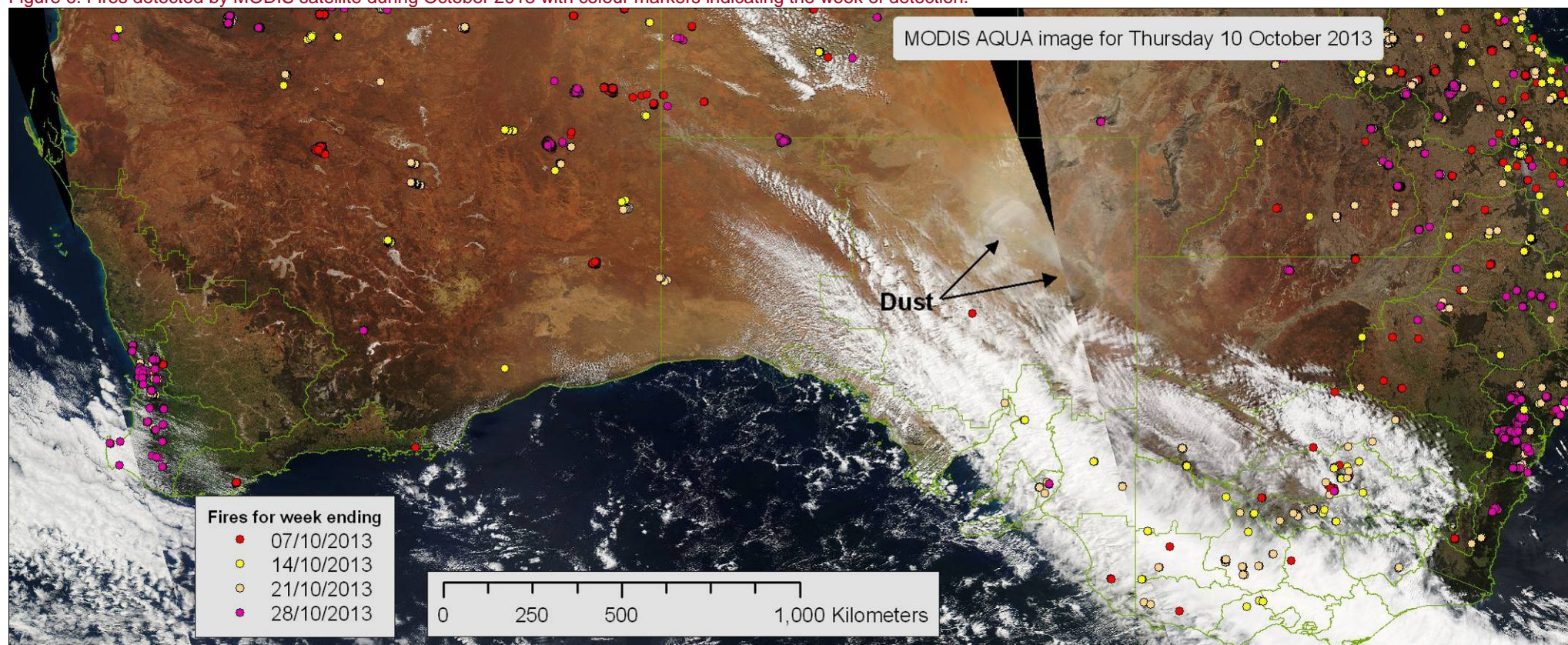
The number of fires across southern Australia (Figure 6) has increased slightly from September 2013. There was increased fire activity in south west Western Australia, central and eastern Queensland and eastern New South Wales in the last week of October.

This is expected due to the much drier conditions. Some fires presumably have been caused by lightning strike. Several fires were caused by harvesting

activities. A recent media release of the Victorian Country Fire Authority (CFA) indicated a spike in harvest related fires in Victoria.

Also visible on the MODIS image is a dust storm that occurred around Lake Eyre in the South Australian Arid Lands.

Figure 6. Fires detected by MODIS satellite during October 2013 with colour markers indicating the week of detection.



The DustWatch Team

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The MODIS image is courtesy of MODIS Rapid Response Project at NASA/GSFC, the fire data is courtesy of the Fire Information for Resource Management System (FIRMS) and the rainfall map is from the Australian Bureau of Meteorology. This project would not be possible without funding from: Caring for our Country; Lachlan, Murrumbidgee and Murray Catchment Management Authorities (CMAs) in NSW; the NSW EPA, the Mallee CMA and North Central CMAs in Victoria; Department of Agriculture and Food WA, Wheatbelt Natural Resource Management in West Australia; and in-kind contributions from: Gwydir and Western CMAs in NSW; Eyre Peninsula and Murray Darling Basin NRM in South Australia; and Griffith University in Queensland. We also gratefully acknowledge the contribution of volunteer DustWatchers who provide observations and help maintain the instruments.