

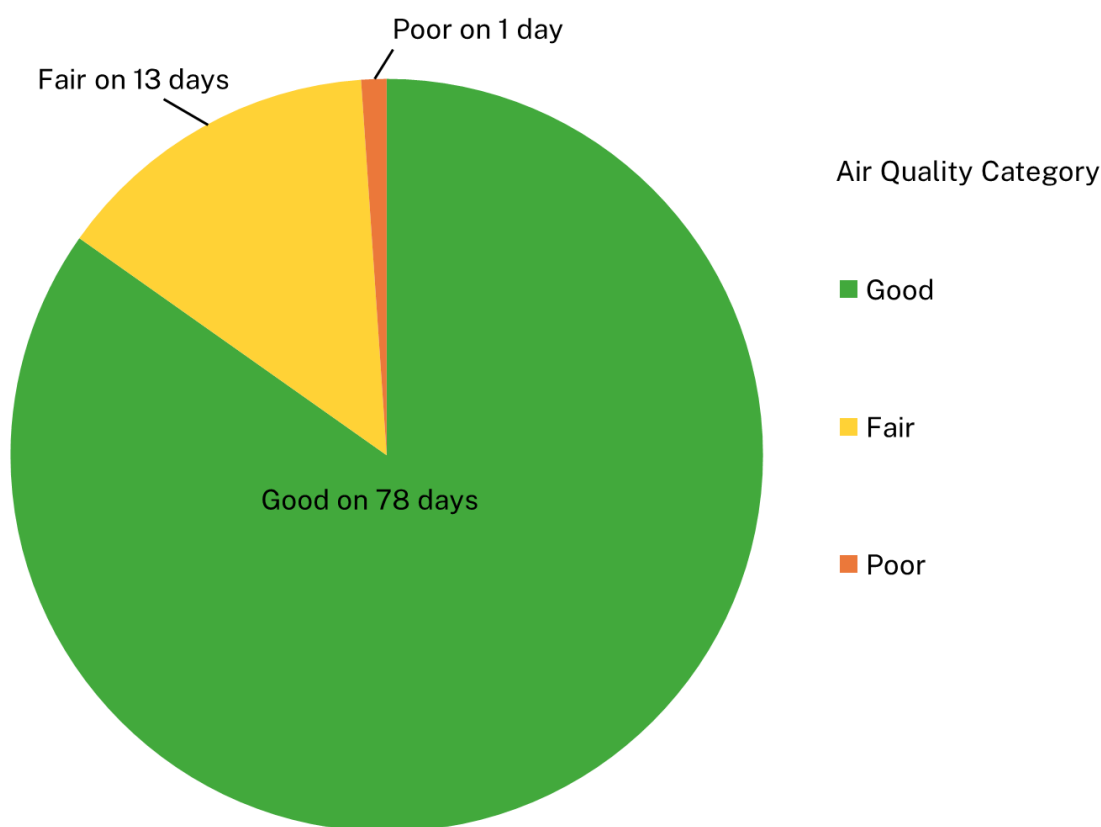
# Air quality monitoring network

## Namoi/North West Slopes Winter 2024

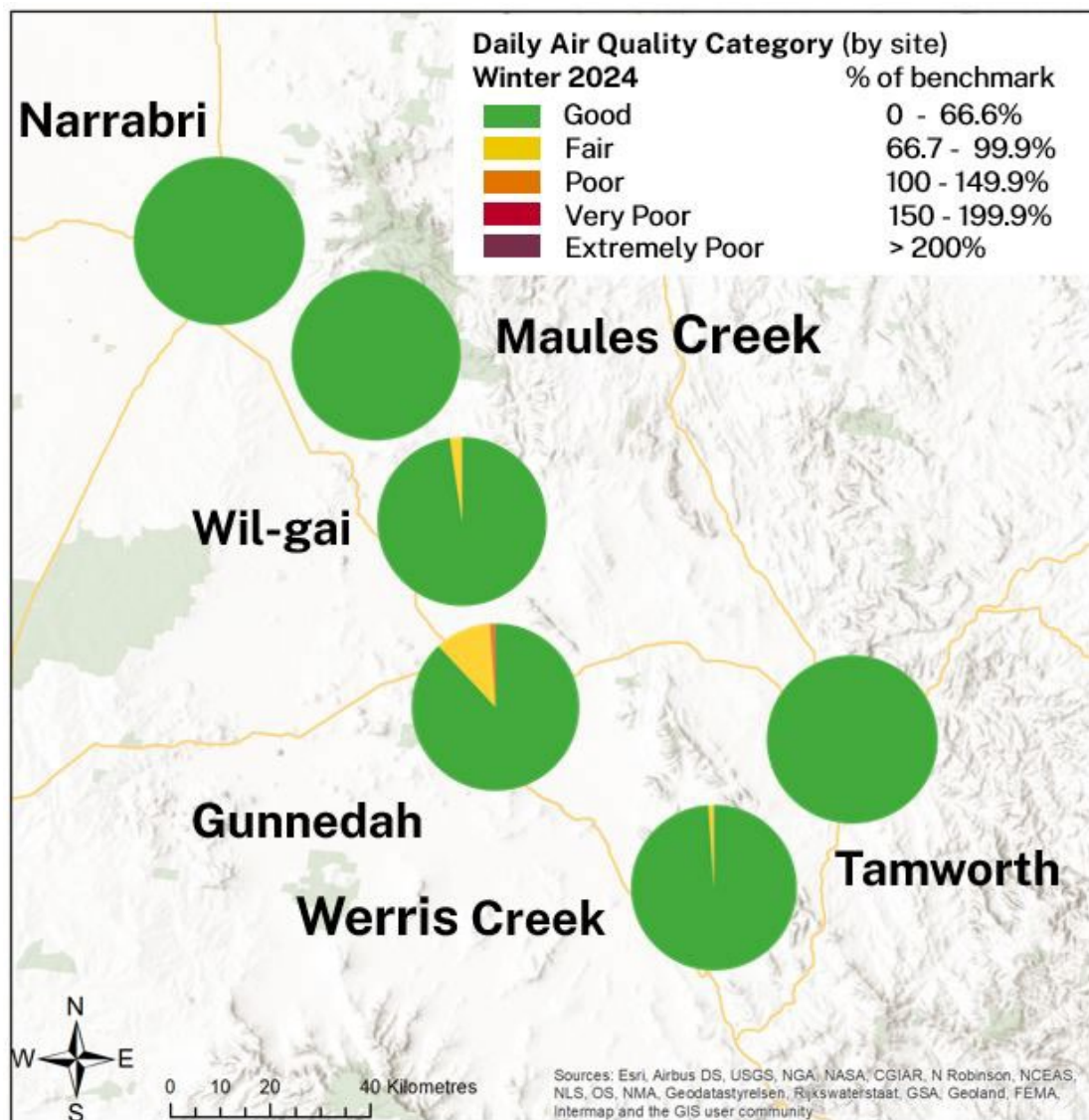
The Namoi/North West Slopes region<sup>1</sup> had good air quality<sup>2</sup> for 78 days (85% of the time) during winter 2024. Across the 6 monitoring stations operating in the region, pollutants met the national benchmarks<sup>3</sup> on 91 days (99% of the time, Figure 1).

- Daily PM<sub>10</sub><sup>4</sup> remained below the national benchmark every day during winter 2024.
- Daily PM<sub>2.5</sub> exceeded national benchmarks for one day in Gunnedah during winter 2024. All other sites remained below national benchmarks for the season.
- Ozone (O<sub>3</sub>) and nitrogen dioxide (NO<sub>2</sub>) met national benchmarks at Gunnedah and Tamworth.

The Namoi/North West Slopes region had average to above-average maximum temperatures during winter 2024. Minimum temperatures were much higher than average across the region. During winter 2024, the Namoi/North West Slopes region had higher than usual temperatures and more rainfall than average.



**Figure 1** Regional air quality categories for the Namoi/North West Slopes winter 2024



**Figure 2** Air quality categories at each monitoring station in the Namoi / North West Slopes region winter 2024

## Summary statistics: winter 2024

Gunnedah was the only Namoi/North West Slopes monitoring station to record levels above the national benchmarks in winter 2024 (Table 1). Gunnedah recorded a daily PM<sub>2.5</sub> average of 25.7  $\mu\text{g}/\text{m}^3$  on 24 July 2024, above the national benchmark of 25  $\mu\text{g}/\text{m}^3$ . This exceedance is likely due to smoke from domestic wood heaters.

Ozone and nitrogen dioxide levels stayed below national standards during winter 2024. Tamworth and Gunnedah stations did not record any instances where these levels exceeded the national standards.

**Table 1** Number of days above each benchmark, by station, for winter 2024

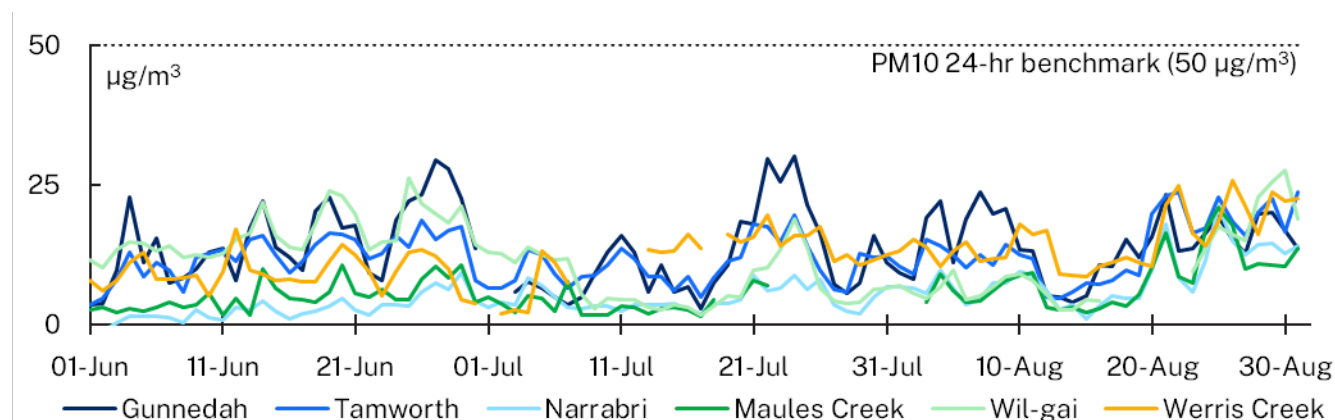
Station	PM <sub>10</sub> daily benchmark [50 $\mu\text{g}/\text{m}^3$ ]	PM <sub>2.5</sub> daily benchmark [25 $\mu\text{g}/\text{m}^3$ ]	NO <sub>2</sub> hourly benchmark <sup>5</sup> [8 pphm]	O <sub>3</sub> 8-hourly benchmark <sup>5</sup> [6.5 pphm]
Gunnedah	0	1	0	0
Narrabri	0	0	–	–
Tamworth	0	0	0	0

Station	PM10 daily benchmark [50 $\mu\text{g}/\text{m}^3$ ]	PM2.5 daily benchmark [25 $\mu\text{g}/\text{m}^3$ ]	NO <sub>2</sub> hourly benchmark <sup>5</sup> [8 pphm]	O <sub>3</sub> 8-hourly benchmark <sup>5</sup> [6.5 pphm]
Maules Creek	0	0	–	–
Werris Creek	0	0	–	–
Wil-gai	0	0	–	–

‘–’ not monitored

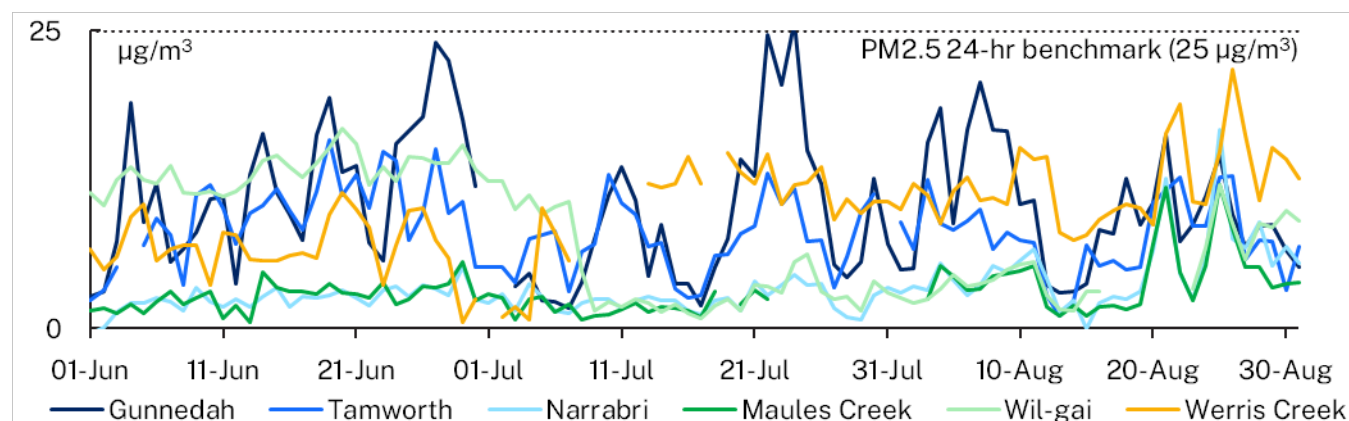
## Air quality: particle pollution winter 2024

PM10 particle levels remained below national benchmark levels at all monitoring stations during winter 2024 (Figure 3).



**Figure 3** Daily average PM10 in winter 2024<sup>6</sup>

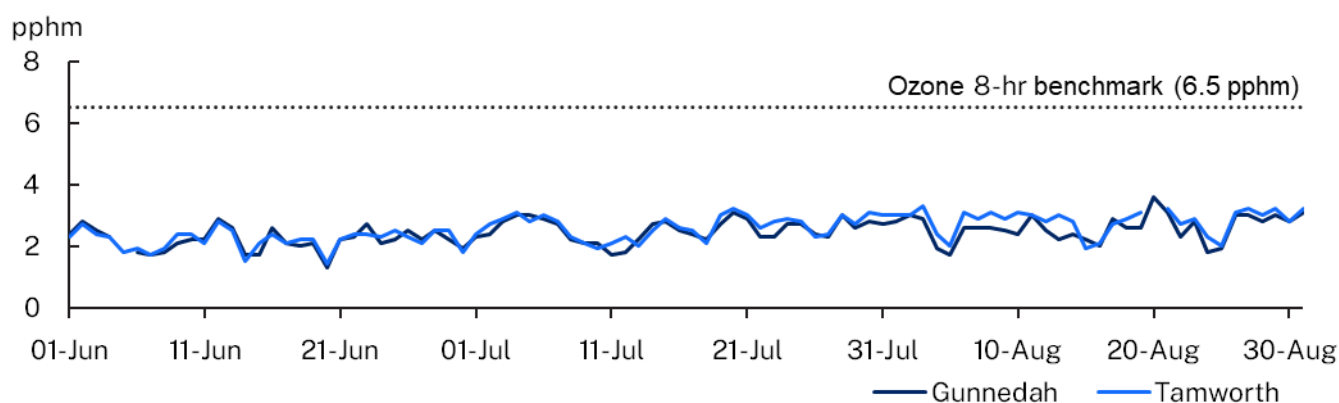
PM2.5 concentrations also remained below national benchmark levels most of the time during winter 2024 (Figure 4). An exceedance at Gunnedah on 24 July 2024 was likely due to smoke from domestic wood heaters.



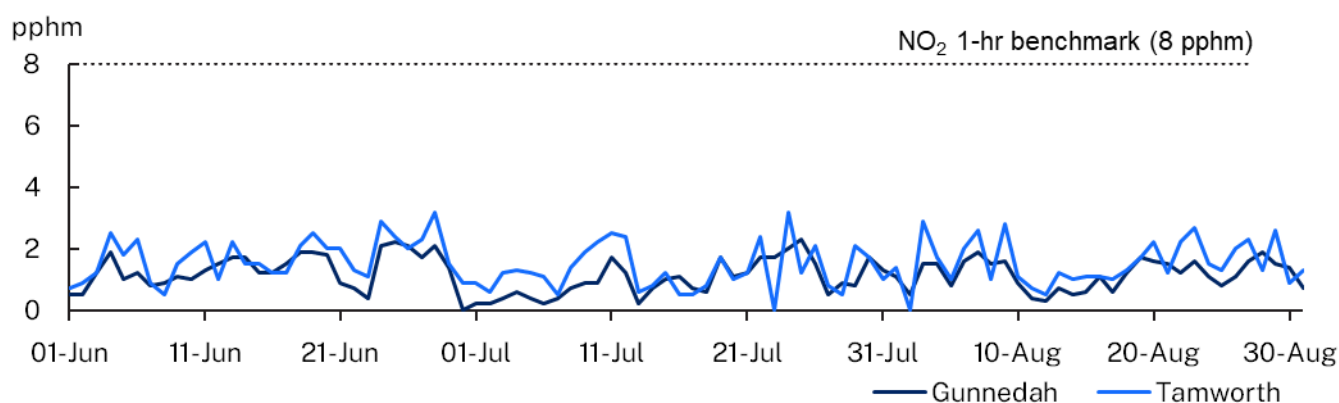
**Figure 4** Daily average PM2.5 in winter 2024<sup>6</sup>

## Air quality: gaseous pollution winter 2024

Figures 5 and 6 show the gaseous trends at the Gunnedah and Tamworth monitoring stations during winter 2024. Both ozone and nitrogen dioxide remained below national benchmarks throughout the season.



**Figure 5 Ozone daily maximum 8-hour average concentrations at Gunnedah and Tamworth, winter 2024<sup>5,6</sup>**



**Figure 6 Nitrogen dioxide daily maximum 1-hour average concentrations at Gunnedah and Tamworth, winter 2024<sup>6</sup>**

## Seasonal weather and climate

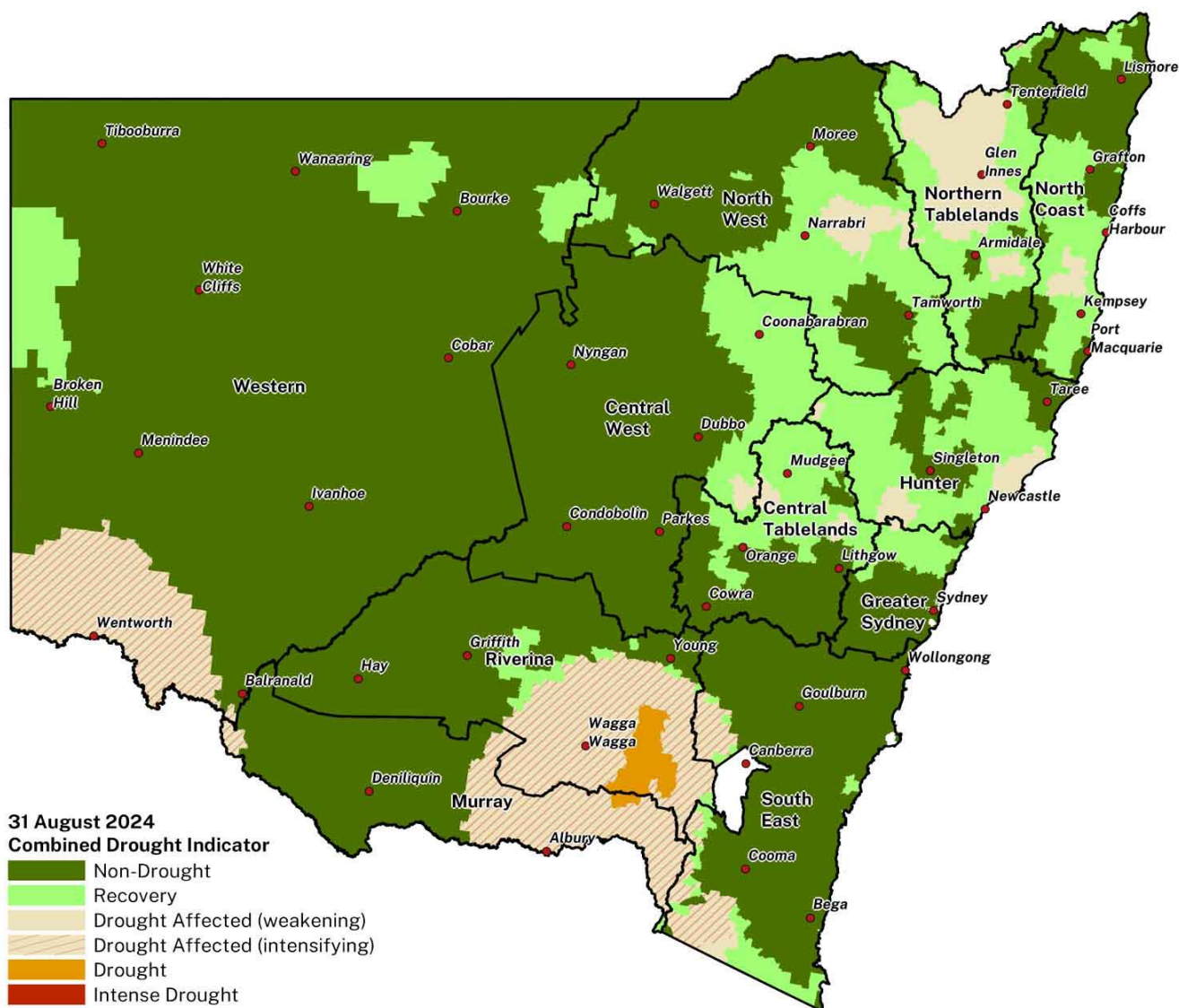
Although area-averaged rainfall across New South Wales was 2% below the 1961–1990 average for winter 2024, drought conditions improved, including in the Namoi/North West Slopes region<sup>7</sup>.

Statewide, daily average temperatures were 1.21 °C above the 1961–1990 average, making winter 2024 the fifth warmest on record, since records began in 1910.

### Drought conditions and dust activity

The NSW Department of Primary Industries and Regional Development (DPIRD) combined drought indicator (CDI) shows that 12% of New South Wales remained within one of the 4 drought categories at the end of August 2024, down from 34% at the end of autumn 2024 (Figure 7)<sup>8</sup>. This likely reduced the levels of raised dust during winter 2024.

DustWatch<sup>9</sup> reported a reduction in raised dust levels throughout the rural air quality network during winter 2024, largely due to increased groundcover across the state.



**Figure 7 NSW combined drought indicator – 12 months to 31 August 2024**

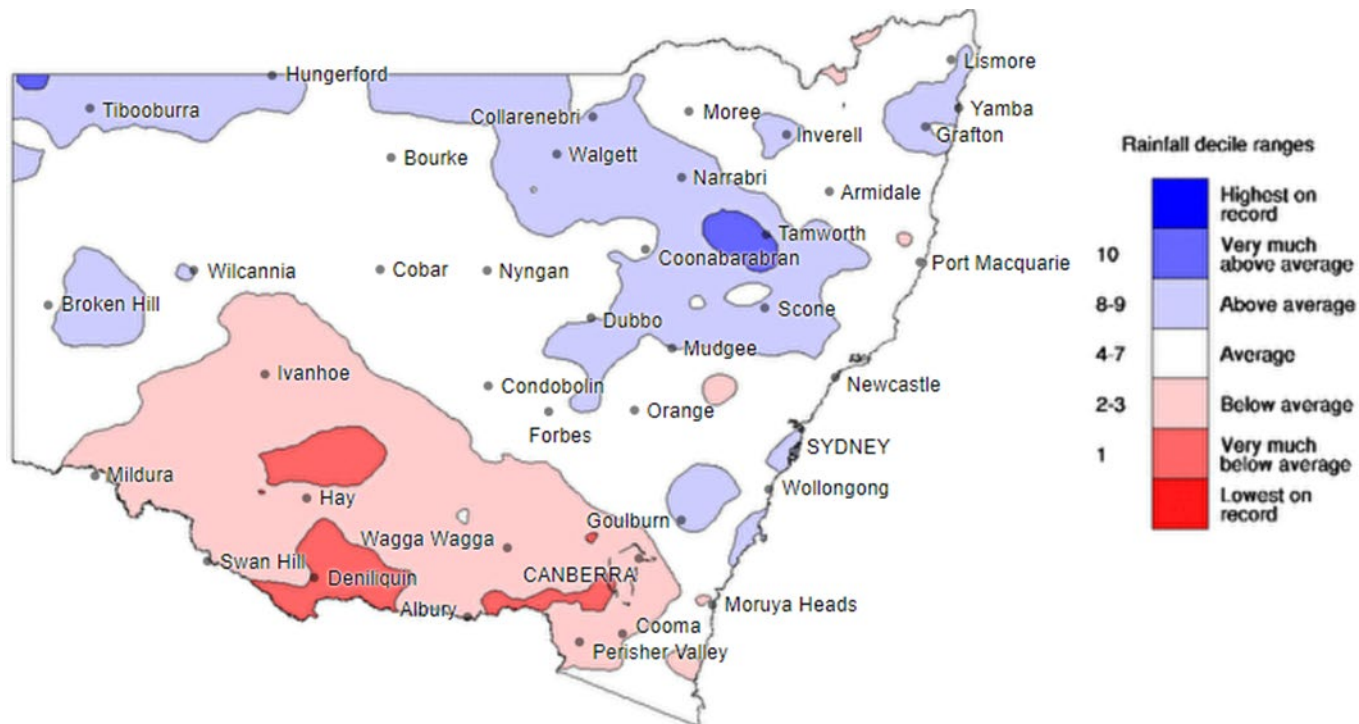
Credit: NSW Department of Primary Industries and Regional Development © State of New South Wales EDIS v2.2

## Rainfall

The Bureau of Meteorology (BoM) seasonal rainfall summary (Figure 8) shows above to very-much-above-average rainfall throughout the Namoi/North West Slopes region during winter 2024<sup>10</sup>. This was influenced by a series of low pressure troughs that crossed the state during the season, increasing the chances of rain.

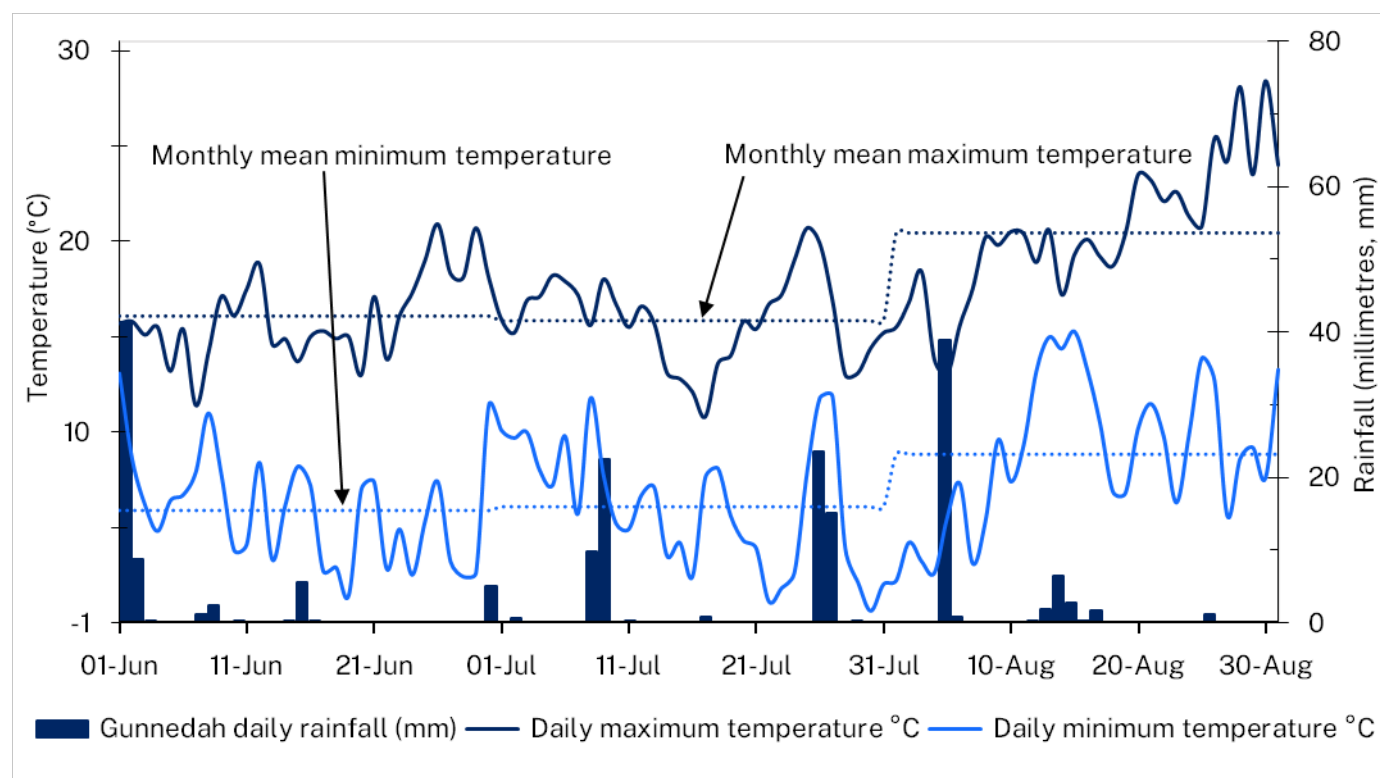
With 221.6 mm, the Gunnedah automatic weather station recorded its wettest winter on record, while Tamworth automatic weather station recorded 219.4 mm. Both were above their long-term average winter totals of 108.2 mm and 135.1 mm respectively<sup>10,11</sup>. The department's Gunnedah air quality monitoring station recorded 191.6 mm of rainfall (Figure 9), above the Gunnedah automatic weather station's long-term total for winter (108.2 mm).





**Figure 8 NSW rainfall deciles for winter 2024**

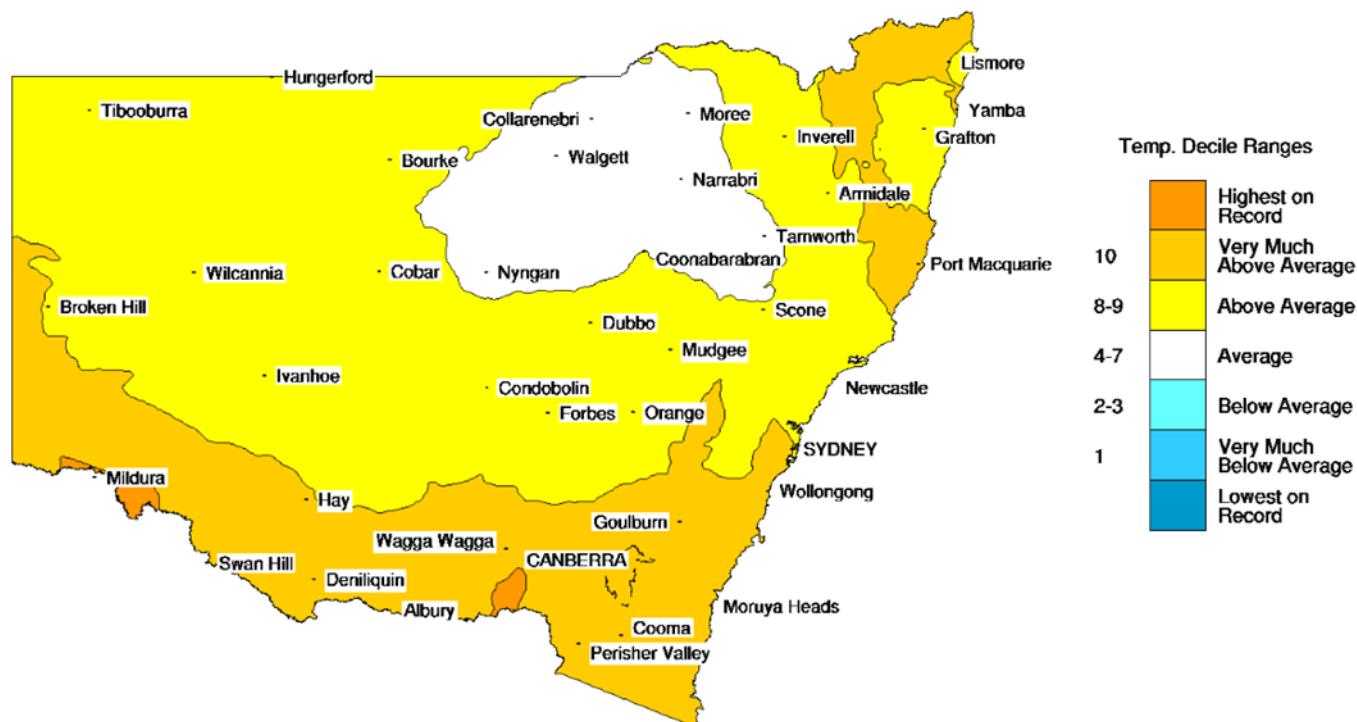
Credit: © Commonwealth of Australia 2024, Bureau of Meteorology Dataset: AGCD v2 Issued: 20/05/2025



**Figure 9 Daily maximum and minimum temperatures and daily rainfall totals at Gunnedah air quality monitoring station, winter 2024**

## Temperature

Maximum daytime temperatures across the Namoi/North West Slopes region were average to above average during winter 2024 (Figure 10). Minimum temperatures were very much above average throughout the season.



**Figure 10 NSW maximum temperature deciles for winter 2024**

Credit: © Commonwealth of Australia 2024, Bureau of Meteorology ID code: AWAP Issued: 26/02/2025

Winter maximum temperatures at Gunnedah AQM station ranged from 10.3 to 27.9 °C (dark blue line in Figure 9), with an average of 16.9 °C. This is 1.4 °C below the long-term winter maximum at the Gunnedah automatic weather station (18.3 °C).

Minimum temperatures at the Gunnedah air quality monitoring station ranged from 0.1 to 14.8°C (light blue line in Figure 9) with an average of 6.5 °C, which is 3.7 °C higher than the Gunnedah automatic weather station long-term average winter minimum (2.8 °C).

## Wind

The topography of the Namoi/North West Slopes region is characterised by highlands in the east and south, and to the west lies a broad floodplain. The Namoi River flows north-west through Gunnedah and Narrabri, and the Peel River flows north-west through Tamworth. Prevailing winds across the region generally align with direction of the Namoi and Peel river valleys, that is, along the south-east to north-west sector.

The wind rose map at Figure 11 shows wind direction and speed in the region, with the length of the bars showing the percentage of time wind blows from each direction, and colours along the bars indicating wind speed categories.

As is typical for the Namoi region during the winter months, prevailing winds during winter 2024 were generally light to moderate south-easterlies. However, some influence from other sectors was observed at all 3 stations.

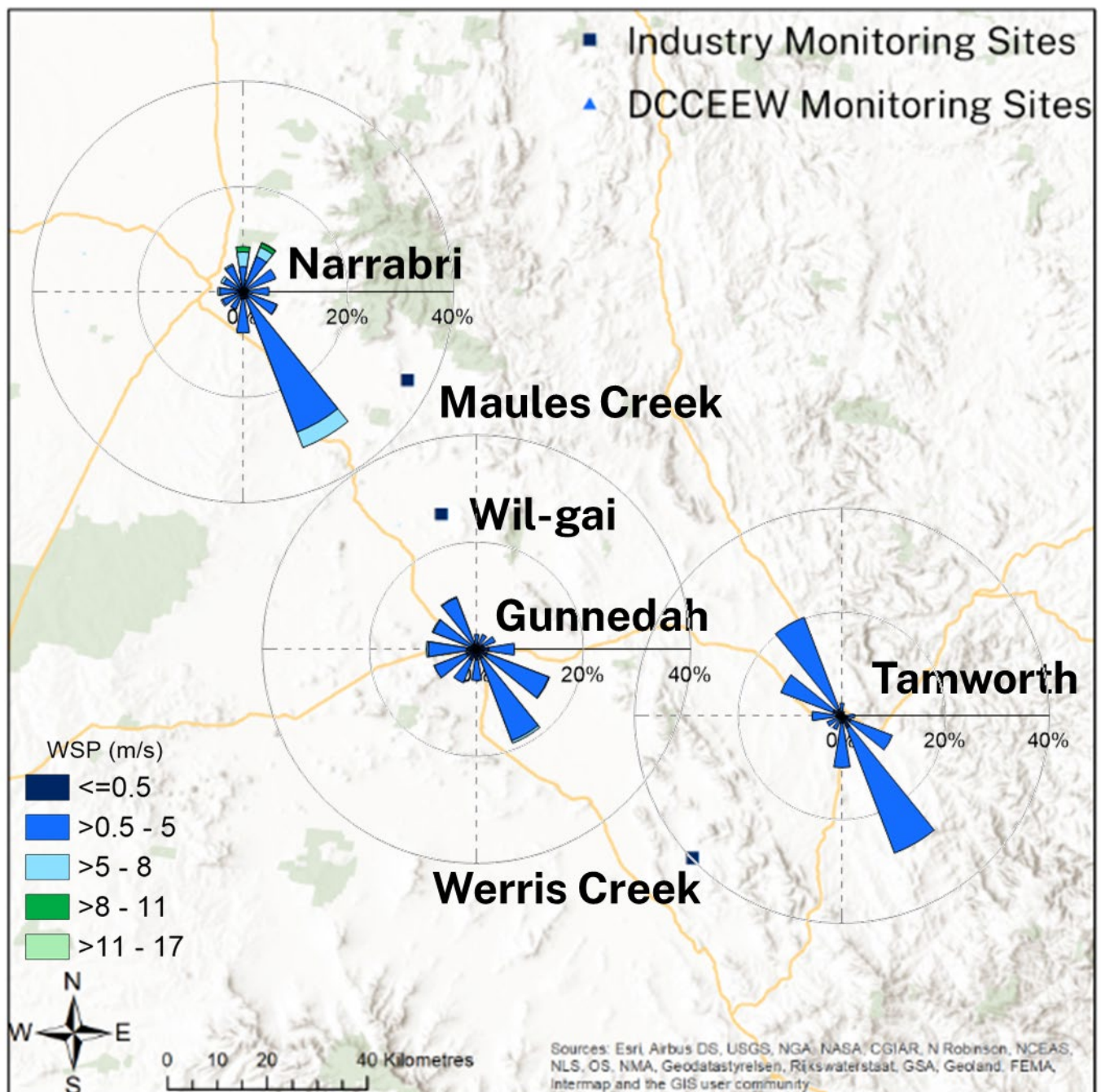


Figure 11 Wind rose map for the Namoi / North West Slopes winter 2024

## Pollution roses from hourly particle data

Pollution roses show the wind direction and particle levels at a location, with the length of each bar around the circle showing the percentage of time wind blows from each direction. The colours along the bars indicate the concentration of particle levels.

The seasonal pollution rose maps for winter 2024 (Figure 12 and Figure 13) show the hourly PM10 and PM2.5 particle concentrations recorded during the season for the 3 regional centres (Narrabri, Gunnedah and Tamworth). The highest concentrations of both hourly PM10 and PM2.5 were associated with south-easterly winds at Tamworth and south-westerly winds at Gunnedah.



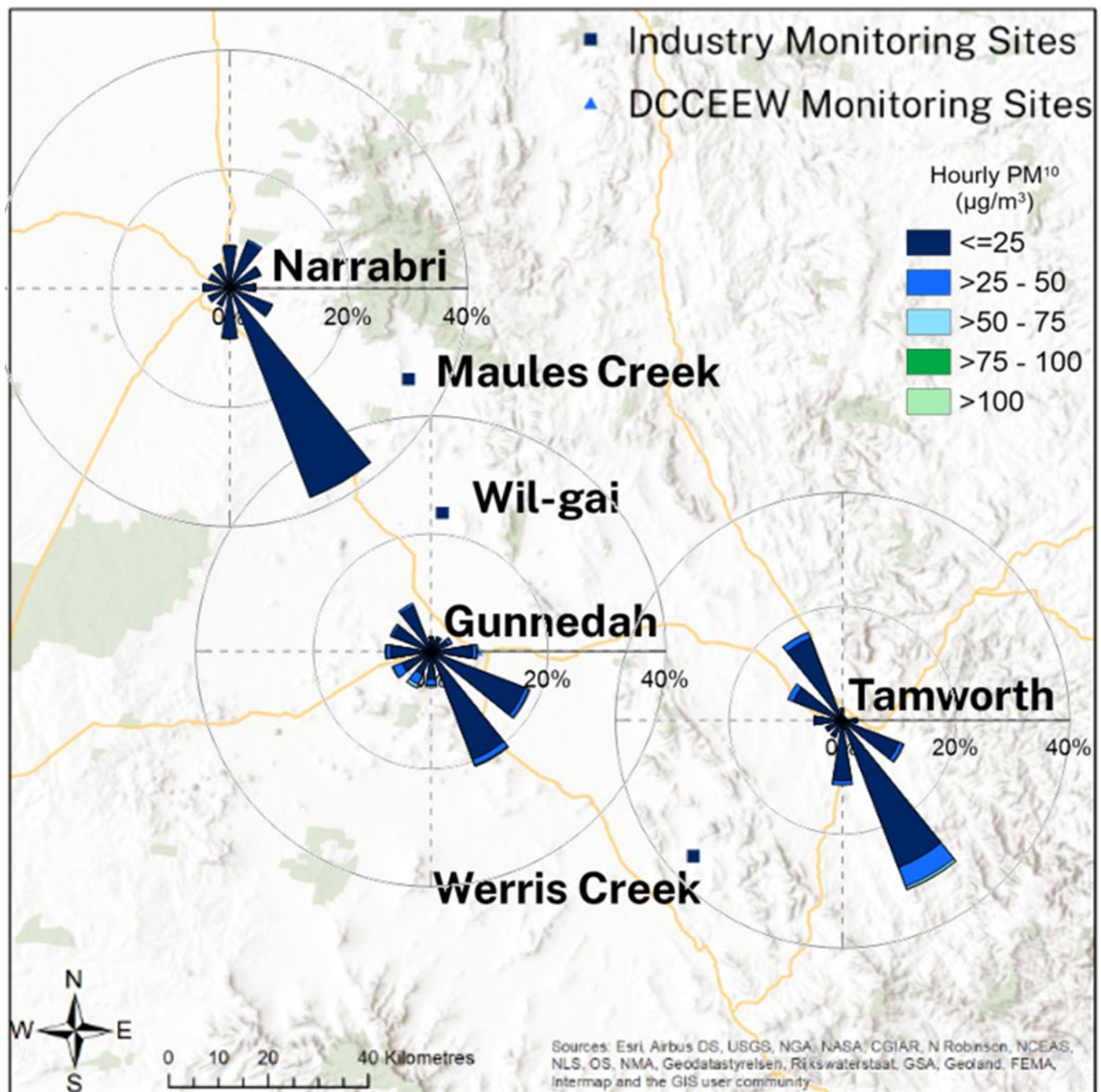


Figure 12 Pollution roses for hourly PM<sub>10</sub> winter 2024

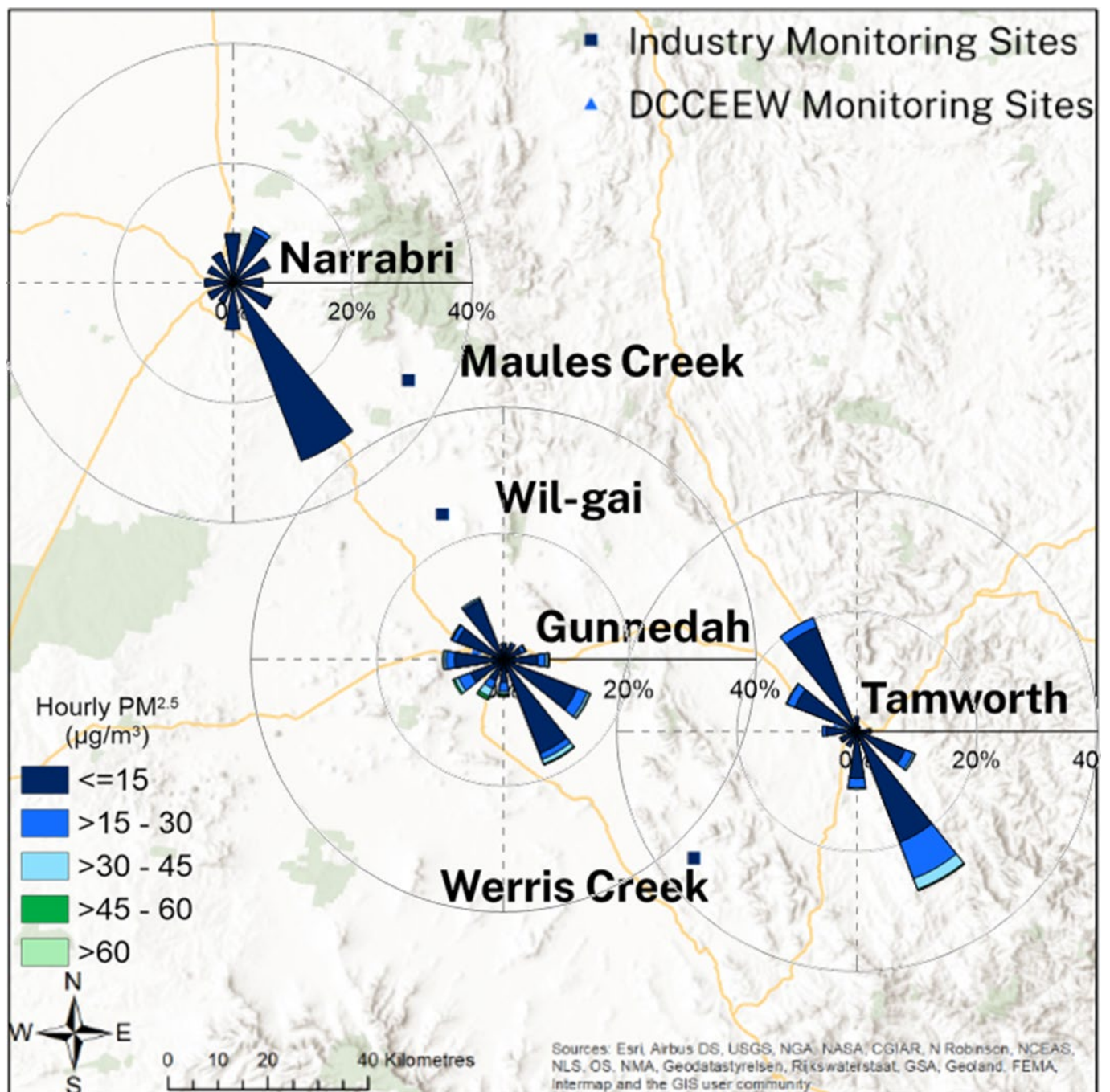


Figure 13 Pollution roses for hourly PM<sub>2.5</sub> winter 2024

# Online performance of monitoring stations

The target performance for air quality monitoring at the department’s monitoring stations is at least 95% data availability for all criteria pollutants and meteorological parameters. The maximum online time attainable for gases, NO<sub>2</sub> and O<sub>3</sub>, is 96% due to daily calibrations.

In winter 2024, online targets were met for PM10, PM2.5 and meteorological parameters at all the department’s stations (Table 2). Online performance targets were not met for either O<sub>3</sub> or NO<sub>2</sub> at Gunnedah or Tamworth.

**Table 2            Online performance (%) from 1 June 2024 to 31 August 2024**

Station	Particles PM10 daily	Particles PM2.5 daily	Gases NO <sub>2</sub> hourly	Gases O <sub>3</sub> hourly	Meteorology wind hourly
Gunnedah	100	100	94.2	95.2	100
Narrabri	97.8	97.8	–	–	100
Tamworth	100	97.8	93.6	95.2	100

‘– ’ = not monitored

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<sup>1</sup> The NSW Department of Climate Change, Energy, the Environment and Water operates air quality monitoring stations at Gunnedah, Tamworth and Narrabri. Local coal mining companies provide data from industrial air quality monitoring stations at Maules Creek, Wil-gai and Werris Creek on a weekly basis to the NSW Environment Protection Authority (EPA) as part of the Namoi Region Air Quality Monitoring Project (NRAQMP).

<sup>2</sup> Air quality categories

<sup>3</sup> NEPM standards can be found at National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) standards. Data provided by industry from the Maules Creek, Werris Creek and Wil-gai monitoring stations are not used for compliance purposes under the AAQ NEPM. Data from these stations may provide a useful comparison with the department's other stations across New South Wales. For this reason, AAQ NEPM standards are referred to as benchmarks in this document. There are no NEPM standards for hourly PM10 and PM2.5.

<sup>4</sup> PM10 and PM2.5 refer to airborne particles, less than or equal to 2.5 and 10 micrometres in diameter, respectively, measured in micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ). NO<sub>2</sub> refers to nitrogen dioxide and O<sub>3</sub> refers to ozone, both of which are measured in parts per hundred million by volume or parts of pollutant per hundred million parts of air (pphm).

<sup>5</sup> AAQ NEPM was amended in 2021. The 1-hour NO<sub>2</sub> standard decreased from 12 pphm to 8 pphm, while the 1-hour and 4-hour rolling ozone averages were replaced with an 8-hour rolling average ozone standard of 6.5 pphm.

<sup>6</sup> Data gaps at Namoi stations this season were predominantly due to data logger and communication issues. However, at some stations there were also some small periods of unavailable data due to calibration, maintenance checks or power outages.

<sup>7</sup> Bureau of Meteorology Seasonal Climate Summary for New South Wales in Winter 2024. Accessed November 2024.

<sup>8</sup> Department of Primary Industries State seasonal update – August 2024. Accessed November 2024.

<sup>9</sup> NSW Department of Climate Change, Energy, the Environment and Water DustWatch Reports: June 2024, July 2024, and August 2024, Department of Planning and Environment, accessed May 2025.

<sup>10</sup> Bureau of Meteorology temperature and rainfall decile maps and 1-year to 3-year rainfall difference maps for winter 2024. Accessed November 2024.

<sup>11</sup> Daily Weather Observations Gunnedah Airport (AWS), accessed July 2024.