



Fact sheet

Air quality monitoring in Geraldton

Purpose

The purpose of this fact sheet is to provide information on air quality monitoring undertaken by the Department of Water and Environmental Regulation (the department) in Geraldton.

Introduction

Air quality monitoring is undertaken by the department at selected regional and metropolitan locations in Western Australia (WA) in accordance with the [National Environment Protection \(Ambient Air Quality\) Measure](#) (AAQ NEPM).

We are responsible for the operation and maintenance of 15 air quality monitoring sites in WA, including Geraldton.

Geraldton’s air quality monitoring site was founded in 2006, primarily to monitor windblown crustal material from agricultural activities, smoke from bushfires, hazard reduction burns or stubble burning and wood-fired home heaters.

Key points - air quality in Geraldton

- Air quality in Geraldton is considered good on most days, although some poor air quality events occur in any given year.
- Poor air quality events have been primarily attributed to fire hazard reduction burns or bushfires.
- Monitoring will continue in accordance with the AAQ NEPM as the national standard.

What is monitored?

Particle matter has been monitored in Geraldton as PM₁₀ since 2006 and PM_{2.5} since 2018.

PM₁₀ is particulate matter found in air that is less than 10 micrometres in diameter while PM_{2.5} is less than 2.5 micrometres in diameter. These

small particles are harmful to humans and can be attributed to industrial activities as well as natural sources such as bushfires, dust storms, marine aerosols and pollen.

Air quality particle standards

The AAQ NEPM provides air quality standards for particles as shown in Table 1.

Table 1 Air quality particle standards

Pollutant	Averaging period	Maximum concentration*
Particulate matter as PM ₁₀	1 day	50 µg/m ³
	1 year	25 µg/m ³
Particulate matter as PM _{2.5}	1 day	25 µg/m ³
	1 year	8 µg/m ³

* µg/m³ = micrograms per cubic metre

All exceedances and events within the department network are identified and reported. If an authorised hazard reduction burn, bushfire or continental-scale dust event causes the one-day average particle concentration to exceed the standard, it is referred to as an exceptional event.

Particle levels in Geraldton

Geraldton has occasionally exceeded the daily (24-hour) standard of 50 µg/m³ for PM₁₀ and 25 µg/m³ for PM_{2.5} between 2017 and 2021, as shown in Figure 1.

The site experienced six PM₁₀ and two PM_{2.5} exceedances of the daily AAQ NEPM standards in 2021.

Five of the PM₁₀ exceedances were caused by windborne dust and one was from bushfire smoke.

The two PM_{2.5} exceedances were caused by smoke from prescribed burns and bushfires.

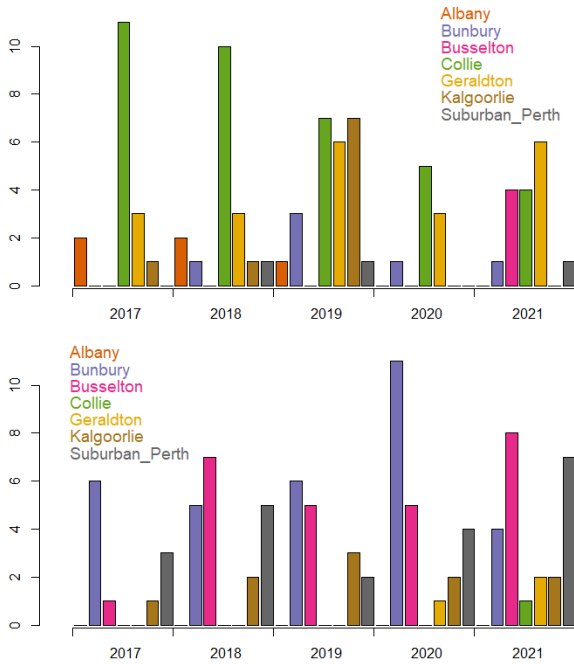


Figure 1 Number of times the NEPM 24-hour standard for PM₁₀ (upper) and PM_{2.5} (lower) was exceeded at a range of sites

Since particle monitoring started in 2006, Geraldton has not exceeded the AAQ NEPM annual standard for PM₁₀ size particles of 25 µg/m³ (Figure 2). In 2021, the annual average PM₁₀ concentration in Geraldton was 19.4 µg/m³.

Geraldton is prone to high winds, which are likely to increase particle concentrations. The average 3pm wind speed at Geraldton Airport is 24.2 km/h while at Perth Airport it is 18.7 km/h. The main sources of particles in towns such as Geraldton are from bushfires, fire hazard reduction burning and natural events such as windblown dust.

As Figure 3 shows, over the past five years elevated particle levels at Geraldton have occurred predominantly in afternoons and generally in drier summer and autumn months.

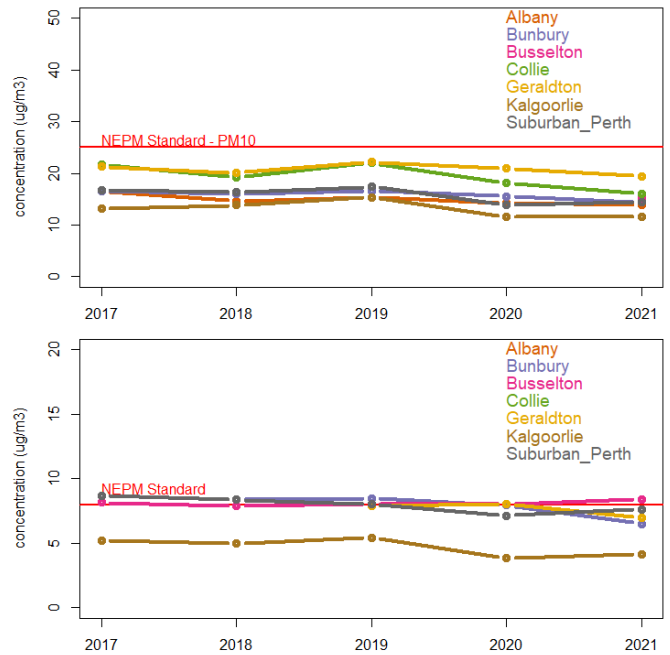


Figure 2 Annual average PM₁₀ (upper) and PM_{2.5} (lower) concentrations at a range of sites

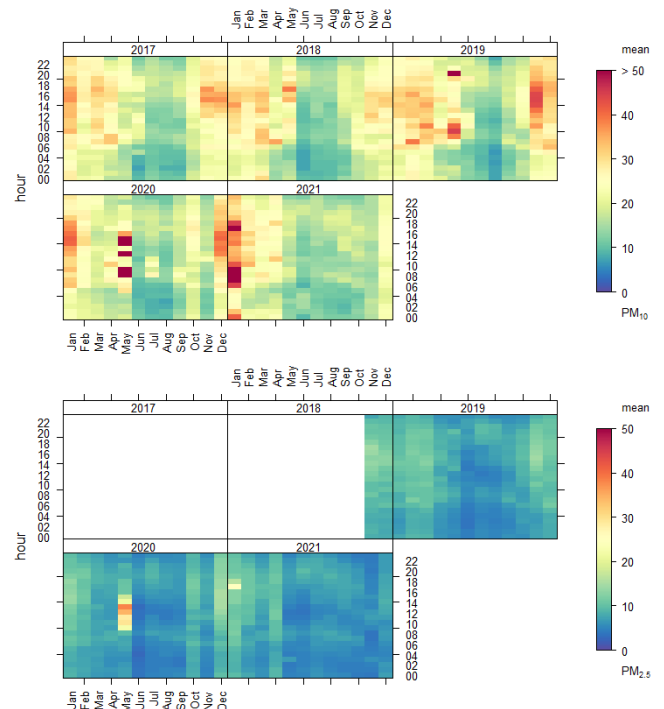


Figure 3 Average PM₁₀ (upper) and PM_{2.5} (lower) concentrations at Geraldton for each hour over the last five years

The main sources of particles in towns such as Geraldton are from bushfires, fire hazard reduction burning and wood heaters.

Monitoring data collected at the department sites are available on the department's [website](#).

Particles explained

Airborne particles are commonly classified by size in terms of their equivalent aerodynamic diameter (EAD). An EAD is the diameter of a spherical particle of density 1 gram per cubic centimetre (the same density as water) that exhibits the same aerodynamic behaviour as the particle in question. Particles are sampled and described on the basis of their EAD but are usually simply called the particle size.

PM₁₀ particles are any substances that have an EAD less than or equal to 10 micrometres in diameter. PM_{2.5} are any substances that have an EAD less than or equal to 2.5 micrometres in diameter. Particles in this size range make up a large portion of dust that can be drawn into the lungs. Larger particles tend to be trapped in the nose, mouth or throat.

The important thing to note is that PM₁₀ and PM_{2.5} is not one specific substance, but simply a classification of particle or dust size.

More information

For advice on air quality or related matters, please contact info@dwer.wa.gov.au.

Related documents

The [WA air monitoring reports](#) contain detailed air quality data for Geraldton.

Legislation

This document is provided for guidance only. It should not be relied on to address every aspect of the relevant legislation. Please refer to the Western Australian Legislation website at www.legislation.wa.gov.au for copies of the relevant legislation.