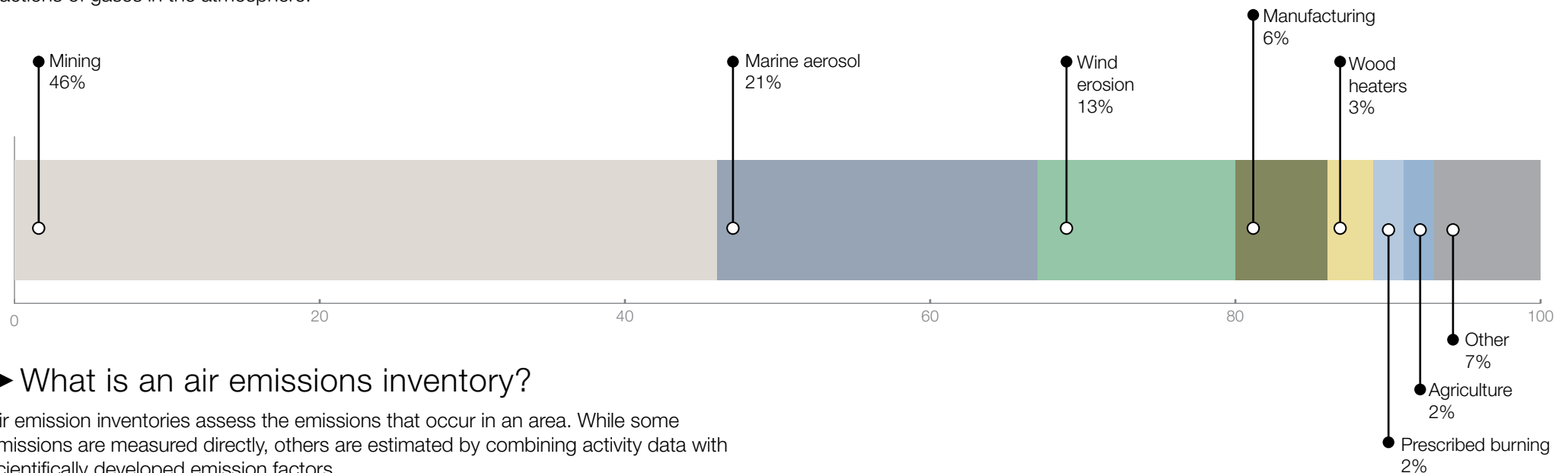




## Perth Air Emissions Study 2011–2012: Particulate matter $\leq 10 \mu\text{m}$ (PM<sub>10</sub>)

The Perth Air Emissions Study 2011–2012 estimated emissions from natural and man-made sources, and assessed the significance of these emissions. Emissions were also spatially allocated to identify major emission source areas.

Particulate matter  $\leq 10 \mu\text{m}$  (PM<sub>10</sub>) represents particles with an aerodynamic radius of 10 microns or less. For comparison, an average human hair is 100 microns wide. PM<sub>10</sub> is produced when burning fuel and waste, and from physical processes like handling of bulk materials (e.g. quarried rocks, sand) and wind erosion. It can also be generated through chemical reactions of gases in the atmosphere.



### ► What is an air emissions inventory?

Air emission inventories assess the emissions that occur in an area. While some emissions are measured directly, others are estimated by combining activity data with scientifically developed emission factors.

### ► Biggest particulate matter $\leq 10 \mu\text{m}$ source?

Commercial and industrial facilities produced 52% of all PM<sub>10</sub> emissions.

Mining and quarries outside of Perth were the most significant sources of PM<sub>10</sub> emissions.

Marine aerosol was the largest, non-industrial source of PM<sub>10</sub>. Marine aerosol can be described as the 'wind erosion of the sea'. Sea spray is picked up by the wind with the fine particles generated dispersing into the atmosphere. Marine aerosol mostly impacts coastal areas.

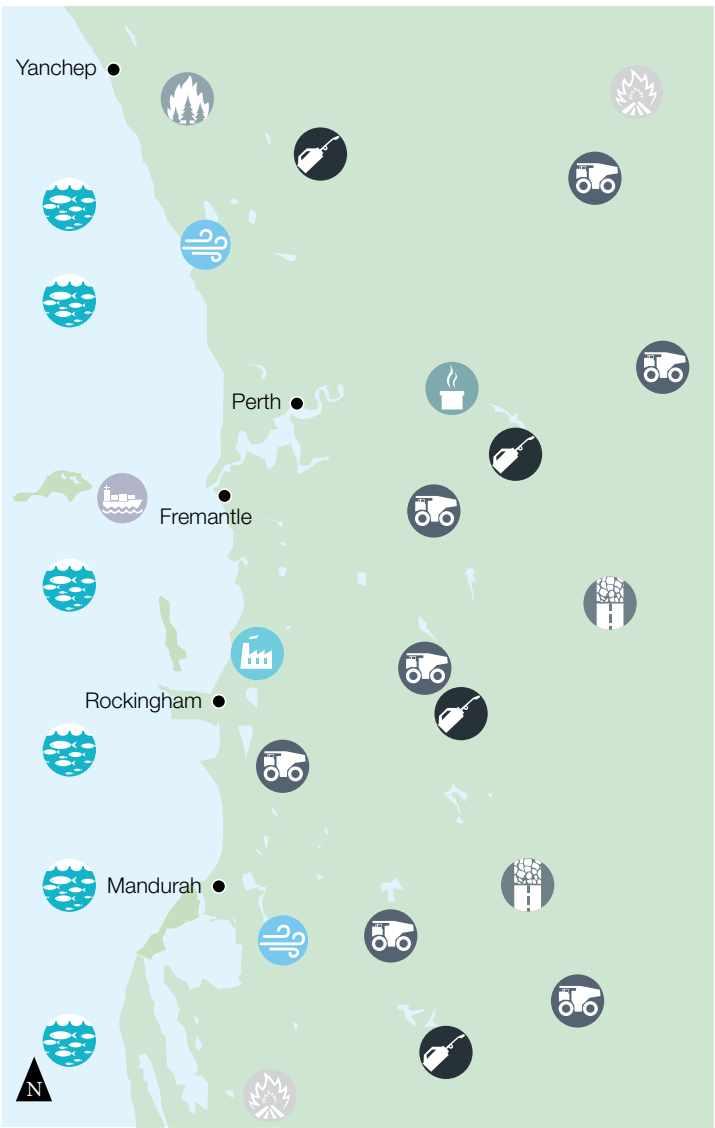
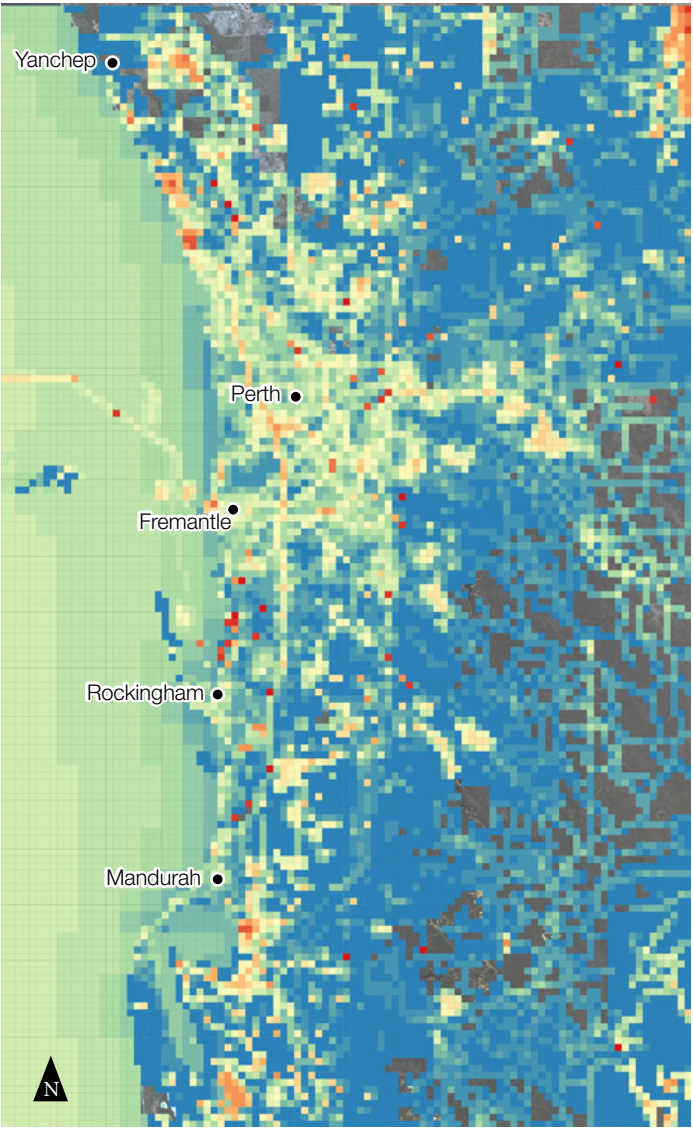
Wind erosion from unpaved roads and cleared open areas were significant sources of PM<sub>10</sub>. Unpaved roads exist all over Perth, producing widespread but comparatively small emissions, while cleared open areas are concentrated in agricultural area and land cleared for urban development.

### ► For more information

Visit: [www.der.wa.gov.au/our-work/programs](http://www.der.wa.gov.au/our-work/programs)

Contact: [npi@dwer.wa.gov.au](mailto:npi@dwer.wa.gov.au)

# Emission Hotspots



## Legend

- Bushfire event.
- Wind erosion from cleared land is a major source of PM<sub>10</sub>. Land clearing and site preparation for construction activities in the outer suburbs is a notable emission source.
- Mining emissions are the largest PM<sub>10</sub> emission sources, represented as single red dots along the north and south coast, and the eastern edge of the map
- The Kwinana Industrial Area contains several heavy industries reporting to the National Pollutant Inventory, which are major sources of PM<sub>10</sub>.
- Shipping emissions are concentrated into a single channel. Anchorage zones, where ships 'park' until a berth is available, can also be seen.
- Marine aerosol is one of the largest PM<sub>10</sub> sources in the area. Emissions are proportional to wind speed, which is higher in more open waters.
- Unpaved roads are a large source of PM<sub>10</sub> but are spread out over most of the area, resulting in relatively lower emissions compared to sources concentrated in one place (like fires).
- Prescribed burning emissions cover large areas.
- Agricultural activity results in large cleared areas of land exposed to wind erosion. Agricultural burning, as part of weed management practices, also produce PM<sub>10</sub> emissions.
- Wood smoke emissions are most notable from suburbs in the Perth Hills, where wood heater ownership is greater than other areas of Perth.

