Upper Hunter Mining Dialogue

Air Quality Monitoring Data Analysis Project

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Air Quality Monitoring Data Analysis Project

- Analysis of publically available environmental monitoring data:
  - Upper Hunter Air Quality Monitoring Network (UHAQMN)
  - NSW Regional Air Quality Monitoring Stations
  - Bureau of Meteorology (BoM).
- Project underway to be completed later this year / early 2020.
- Key points of investigation:
  1. *Has the air quality in the Upper Hunter changed since monitoring began?*
  2. *Is the air quality in the Upper Hunter measured at the monitoring stations different from air quality measured at other locations in NSW?*

Particulate Matter (PM)

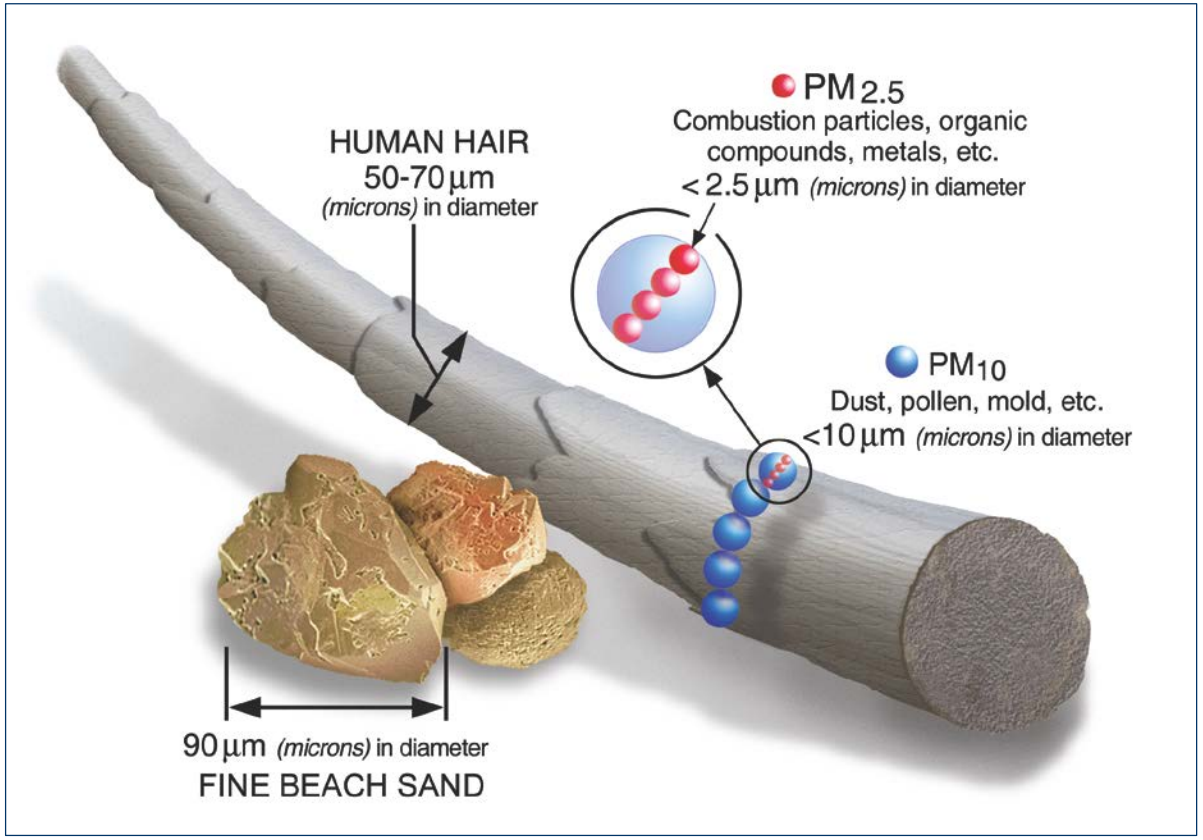
- National ambient air quality standards for specific size fractions and averaging periods:
  - PM_{10} and $PM_{2.5}$
  - 24 hour and annual averages.
- Analysis primarily focuses on:

  <u>PM_{10}</u>:

  Size fraction associated with mechanical processes (e.g. mining, wind erosion). Inclusive of $PM_{2.5}$.

  <u>Annual averages</u>:

  Allow analysis of overall trends and performance (removes ‘noise’).



Source: US Environmental Protection Agency

Air Quality Monitoring Stations

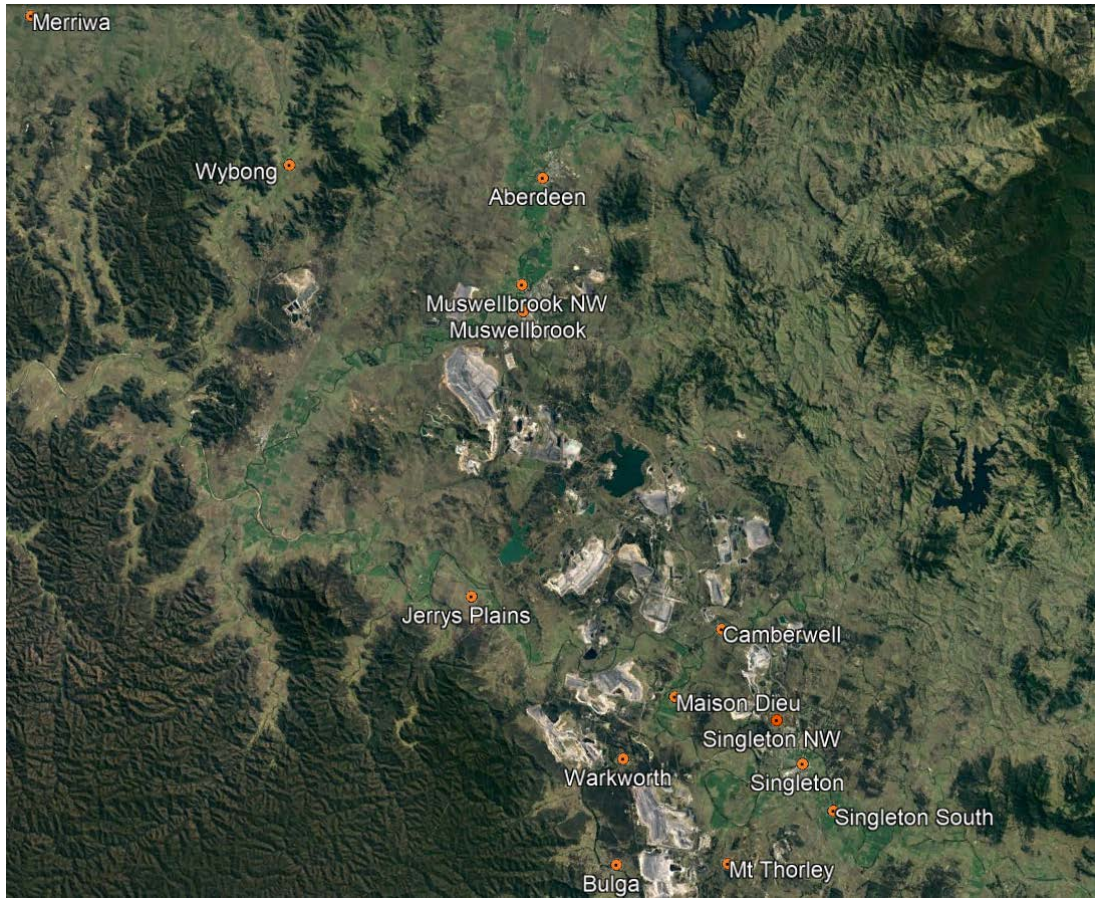
- Sydney – five locations
- Lower Hunter – six locations
- Upper Hunter – 14 locations
- Illawarra – three locations
- Other regional areas – four locations

Camberwell AQMS

Source (OEH, 2016)

Upper Hunter Air Quality Monitoring Network

The Upper Hunter Air Quality Monitoring Network was created by the Department of Planning, Industry and Environment, in partnership with the Upper Hunter coal and power industries, in response to community concern about the effect of coal mining on air quality in the region.



Population centres = Singleton, Muswellbrook and Aberdeen

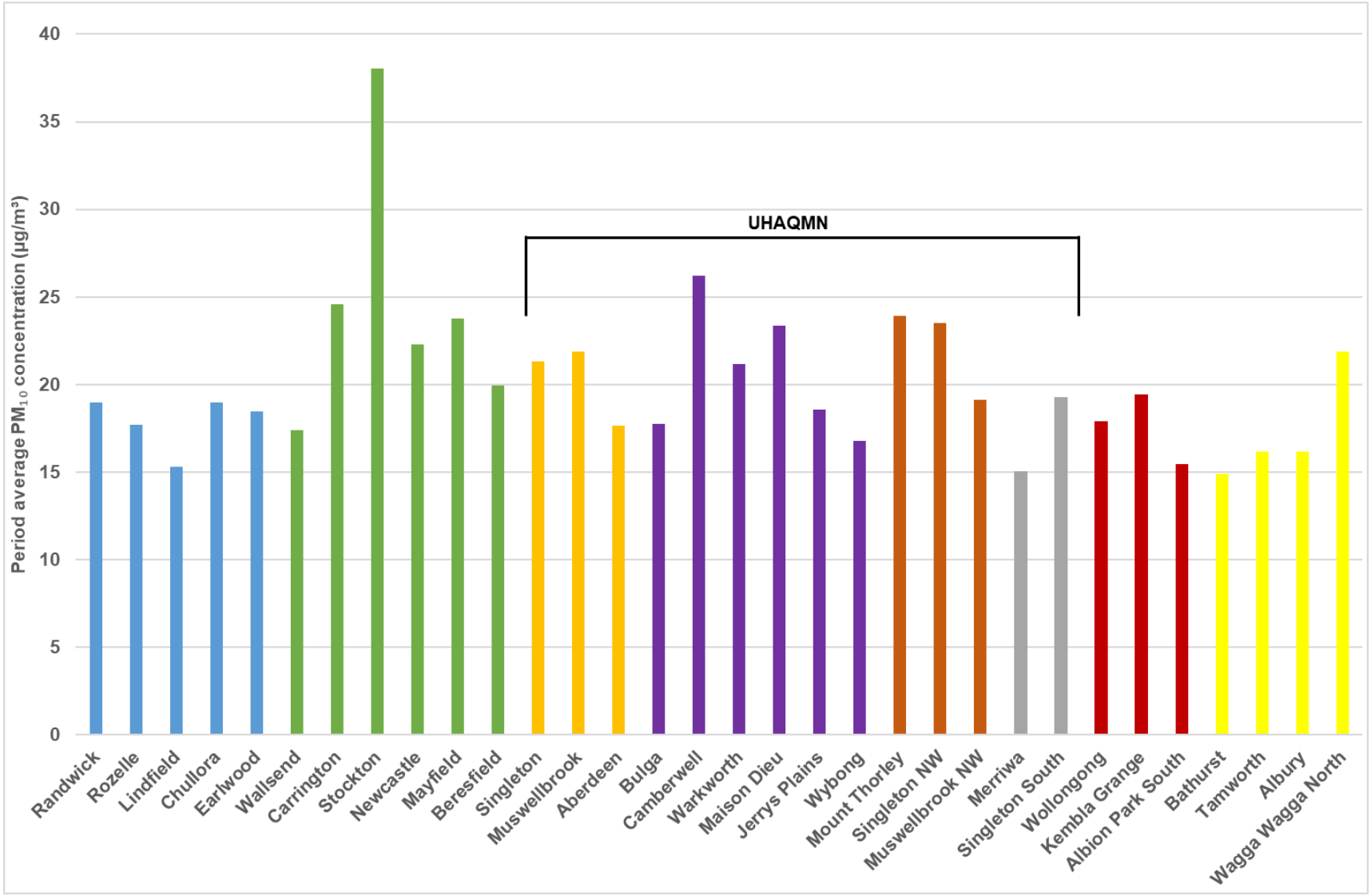
Smaller communities = Bulga, Camberwell, Warkworth, Maison Dieu, Jerry's Plains and Wybong

Diagnostic = Mount Thorley, Singleton NW, Muswellbrook NW

Background = Merriwa and Singleton South

Discussion of PM_{10} Concentrations

Comparison of period average PM_{10} concentrations



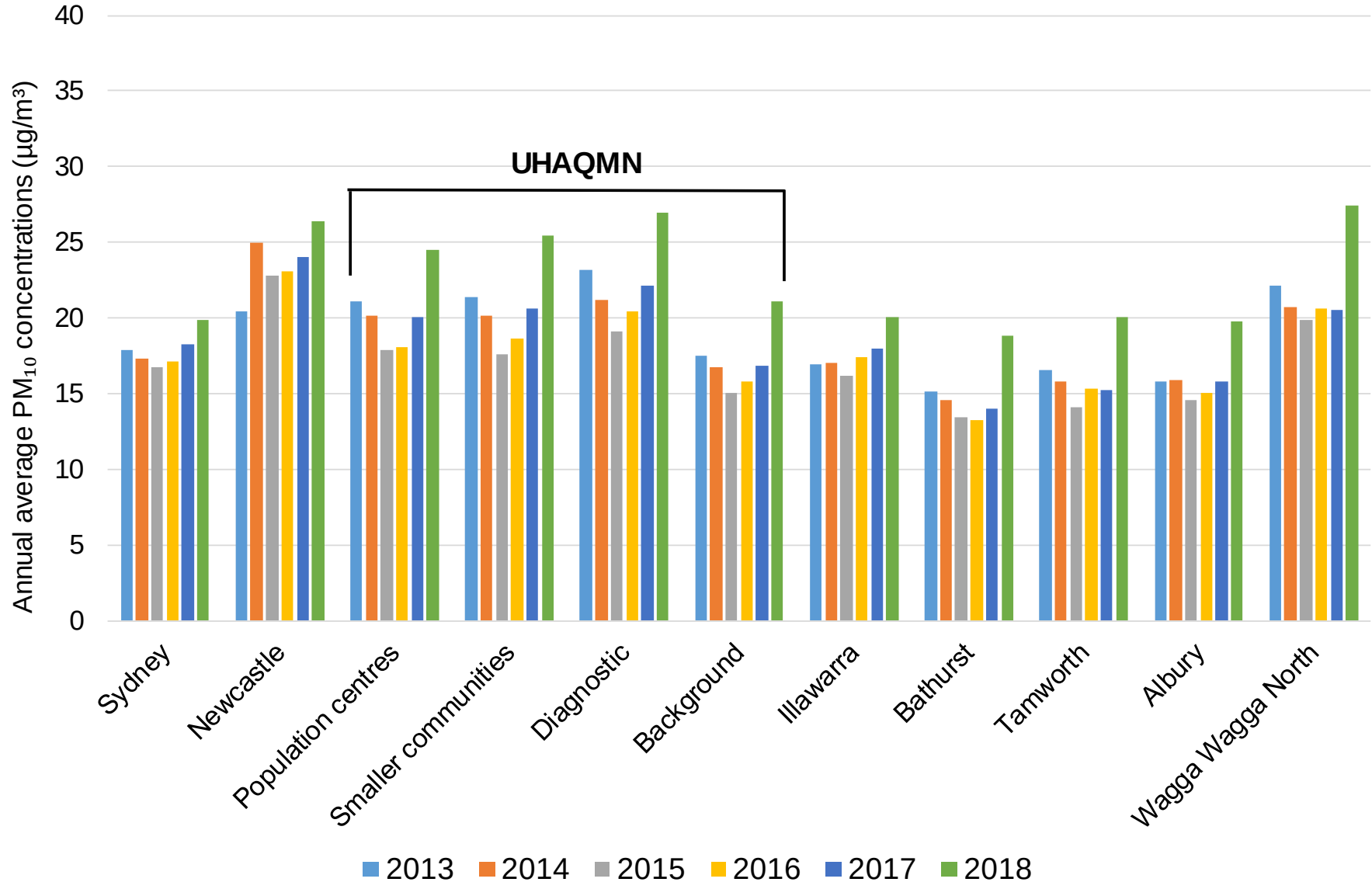
Monitoring locations

- Sydney
- Newcastle

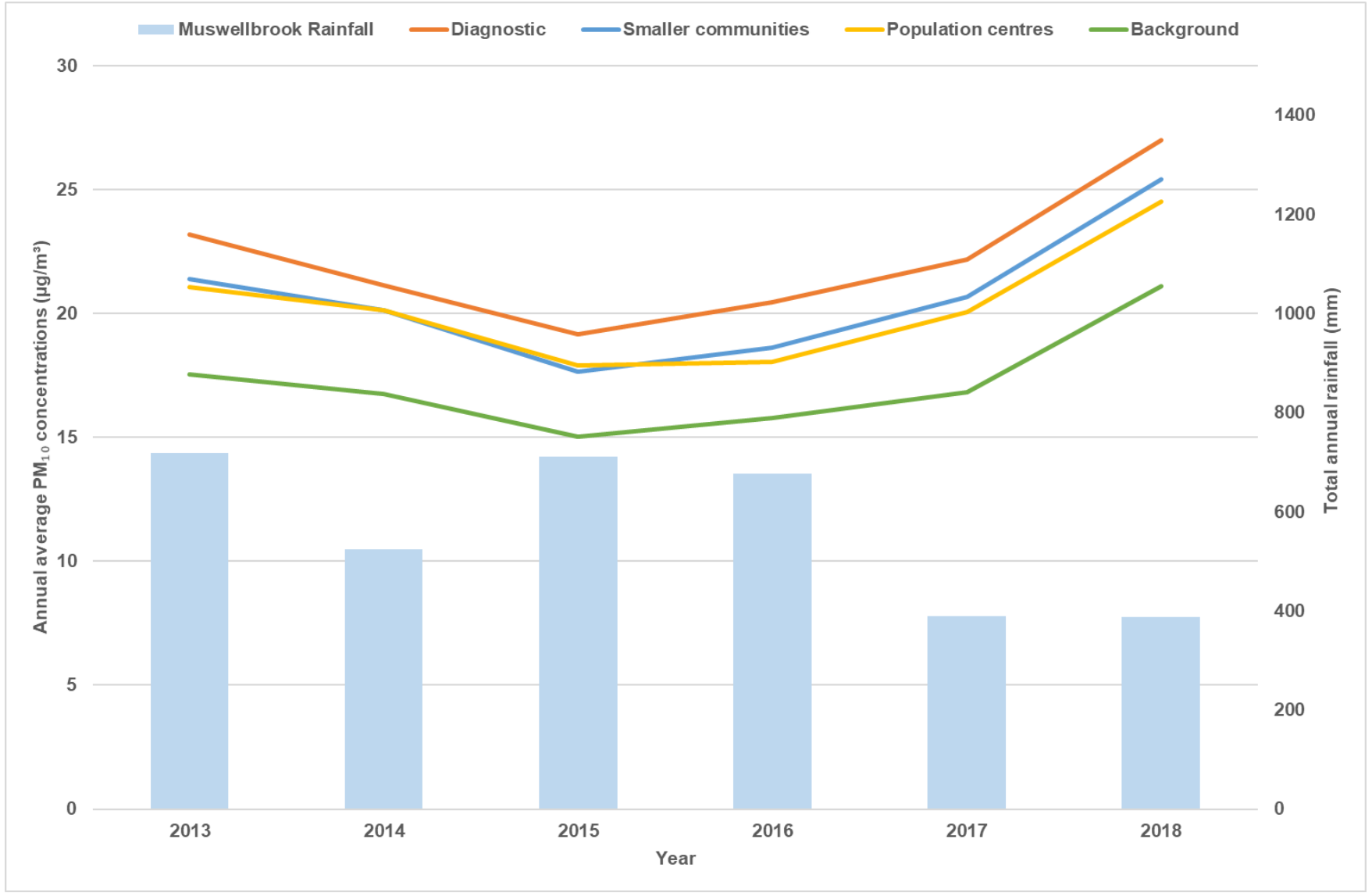
UHAQMN
- Population Centre
- Smaller Communities
- Diagnostic
- Background

- Illawarra
- Other regional areas

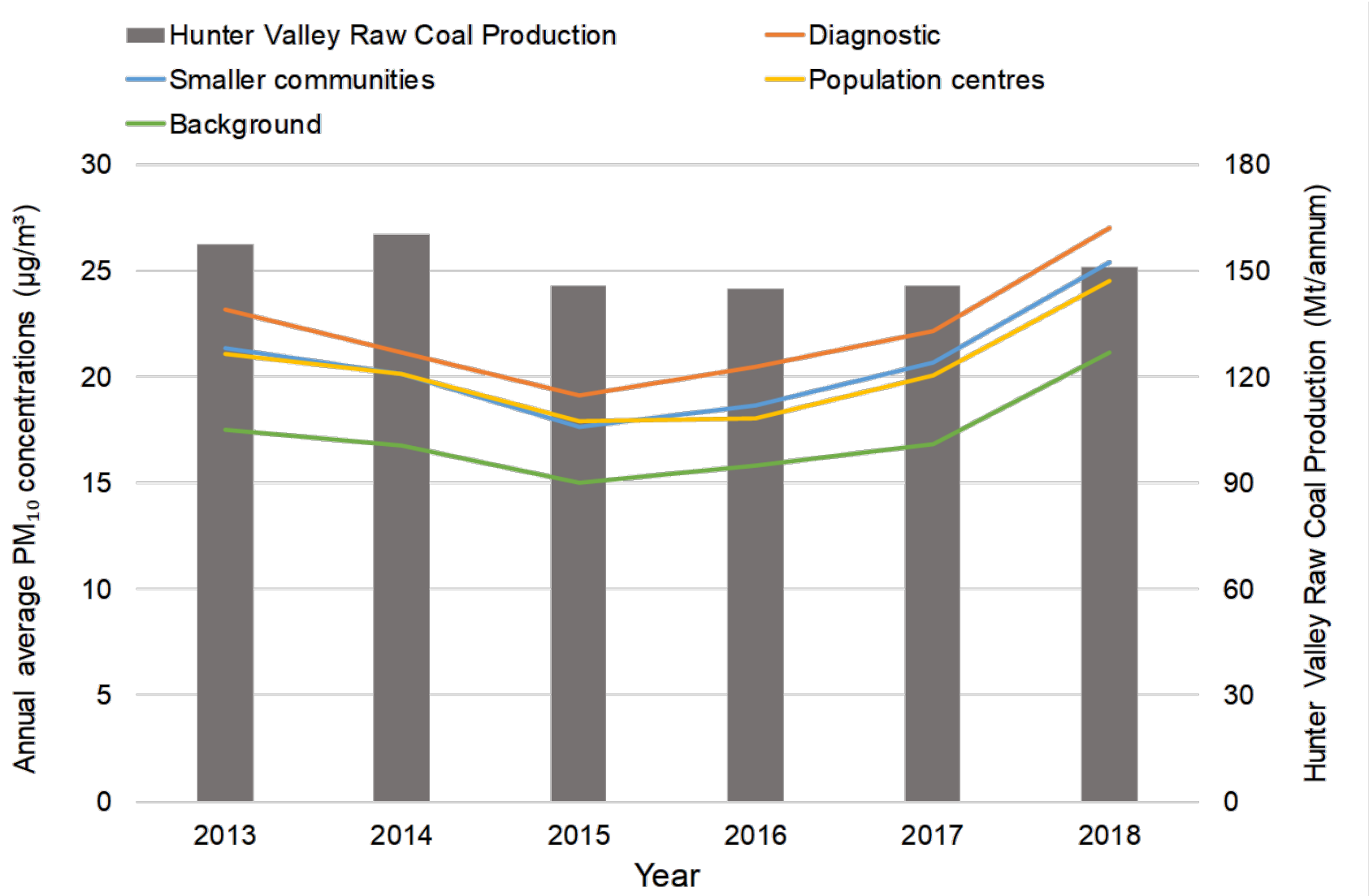
Comparison of annual average PM_{10} concentrations



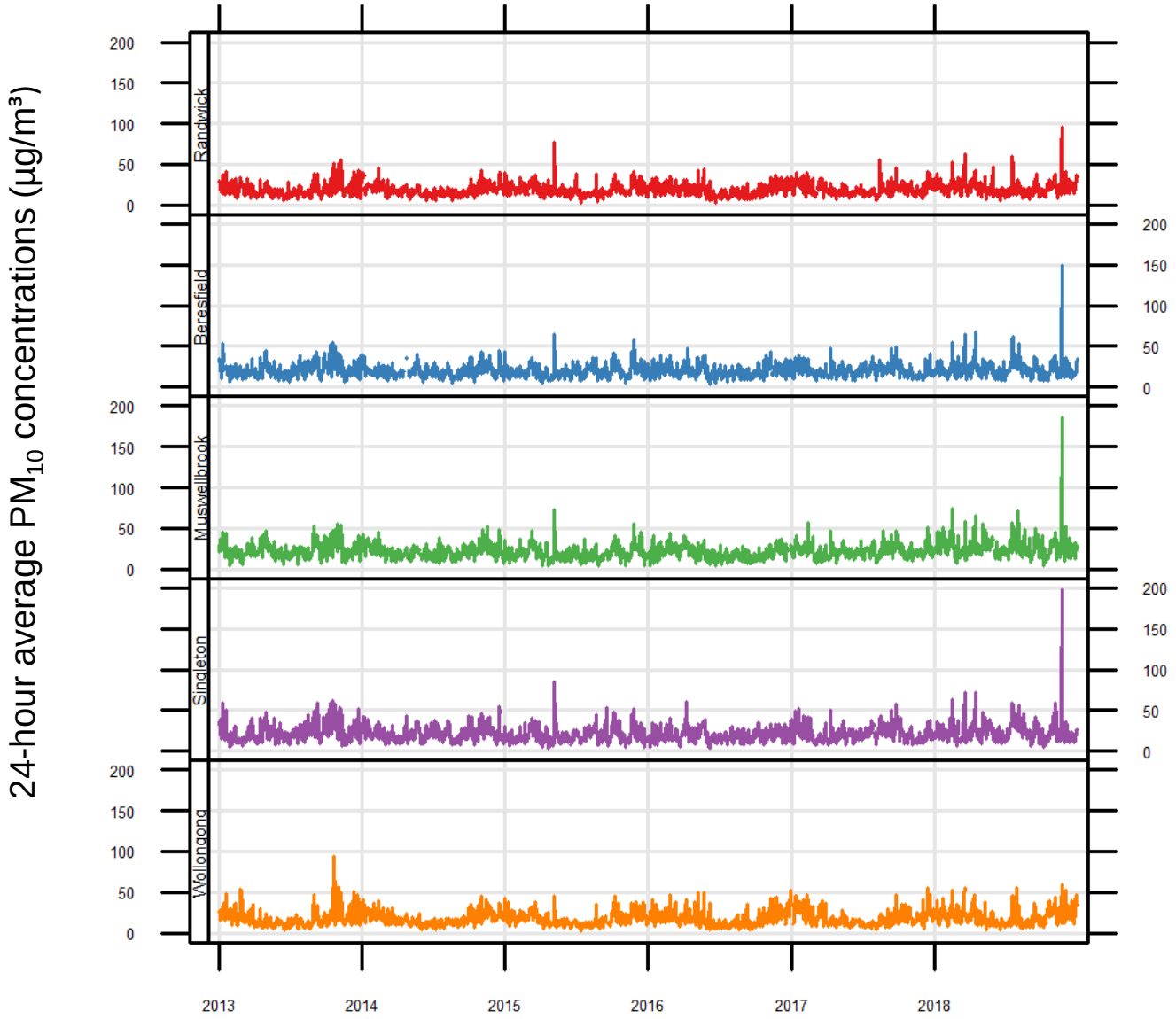
Comparison of rainfall and Upper Hunter PM_{10}



Comparison of coal production and Upper Hunter PM_{10}



Comparison of PM_{10} concentrations at selected sites



Randwick, Sydney

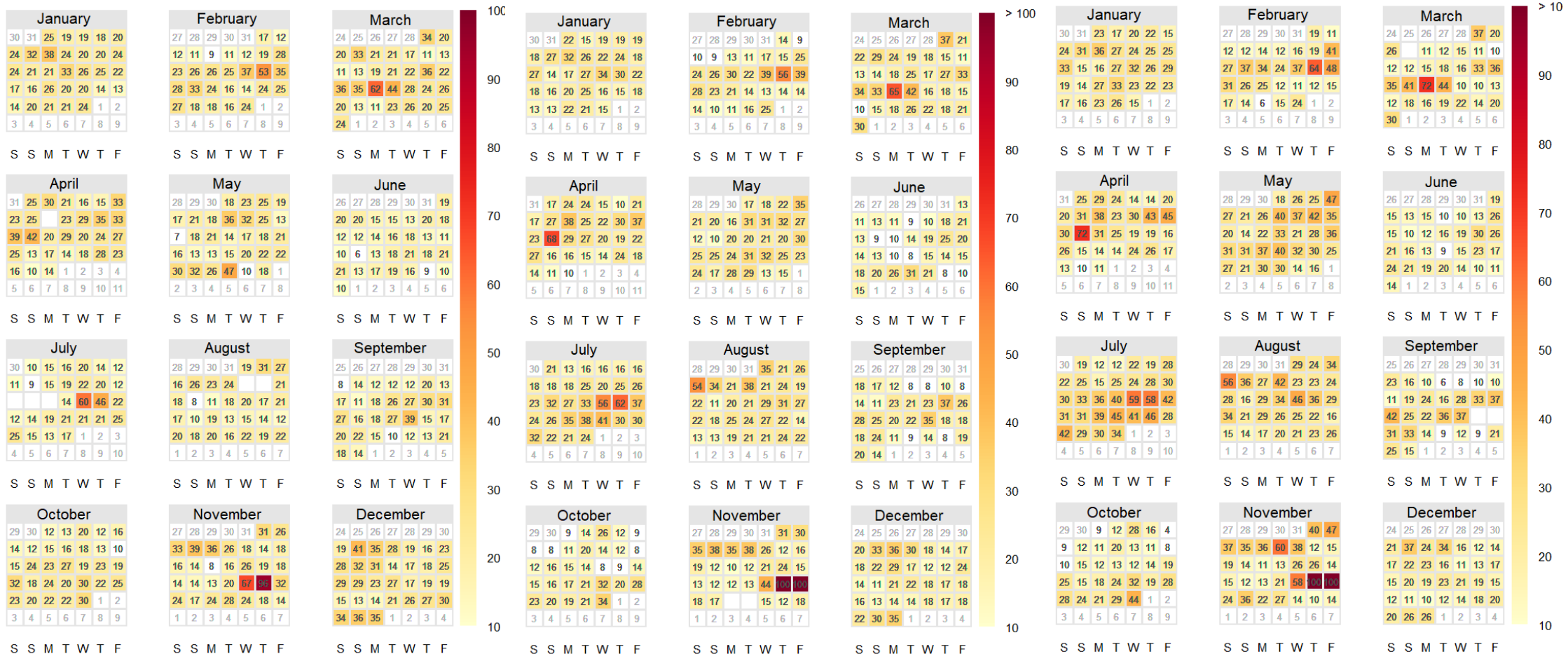
Beresfield, Lower Hunter

Muswellbrook, Upper Hunter

Singleton, Upper Hunter

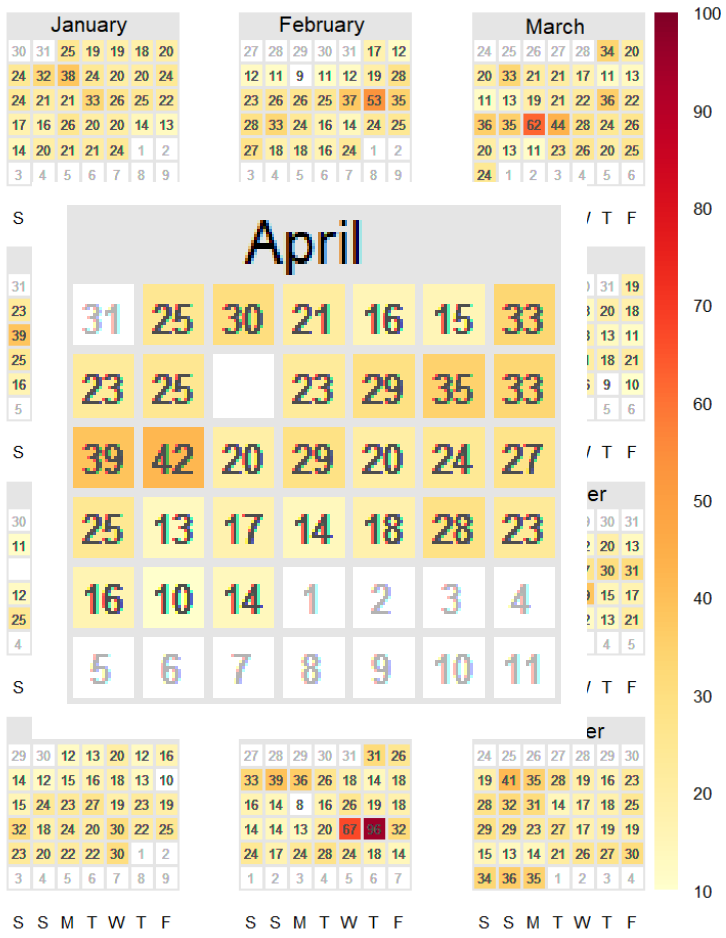
Wollongong

PM_{10} Calendar Plots for 2018

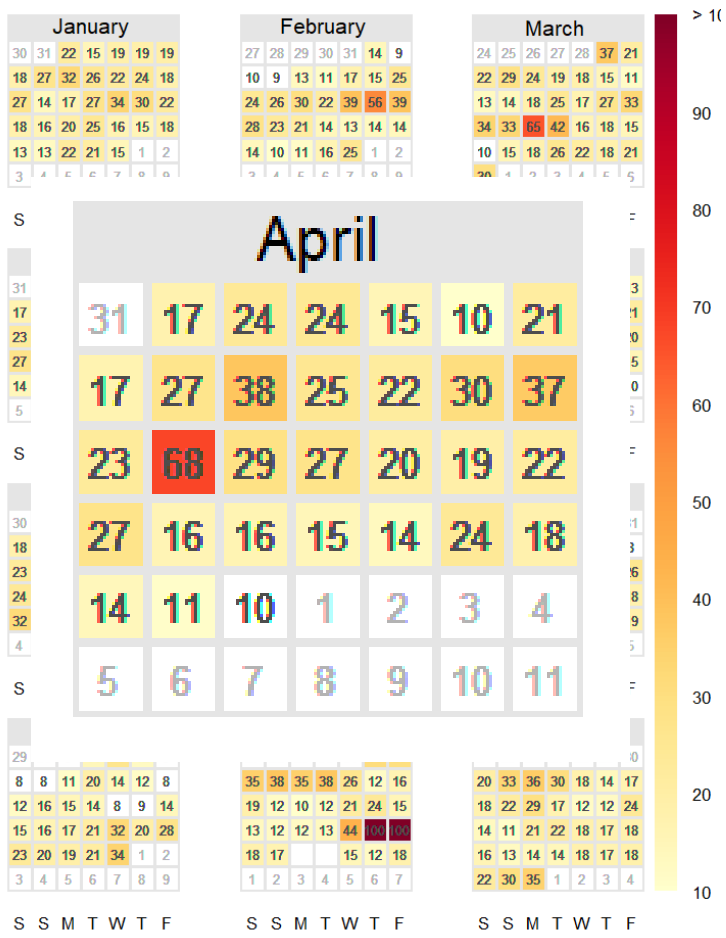


April 2018

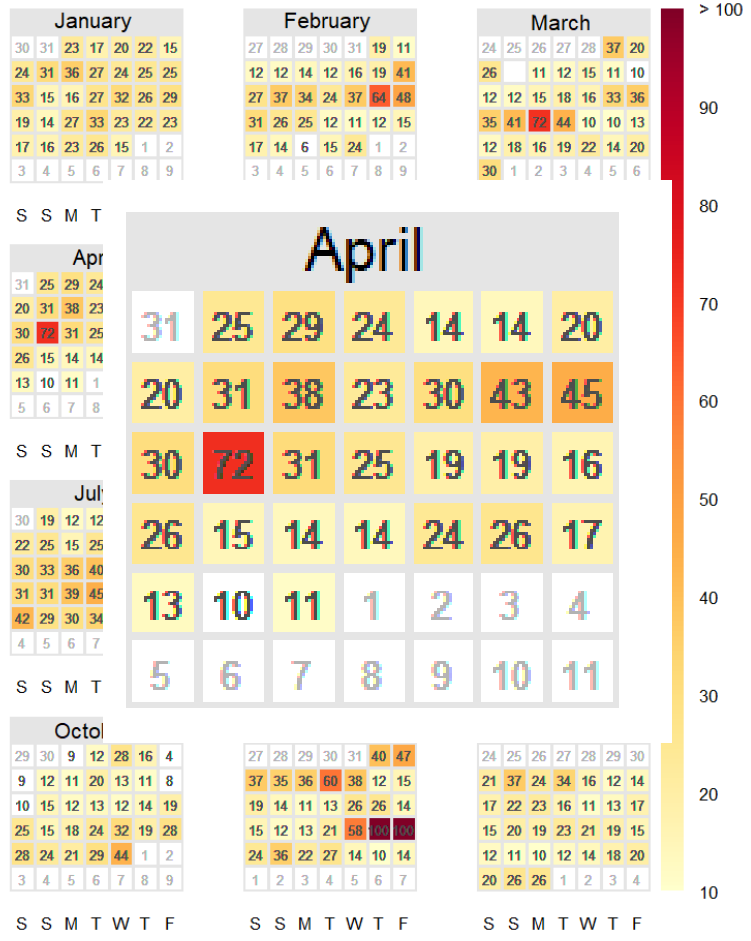
Randwick



Beresfield



Singleton

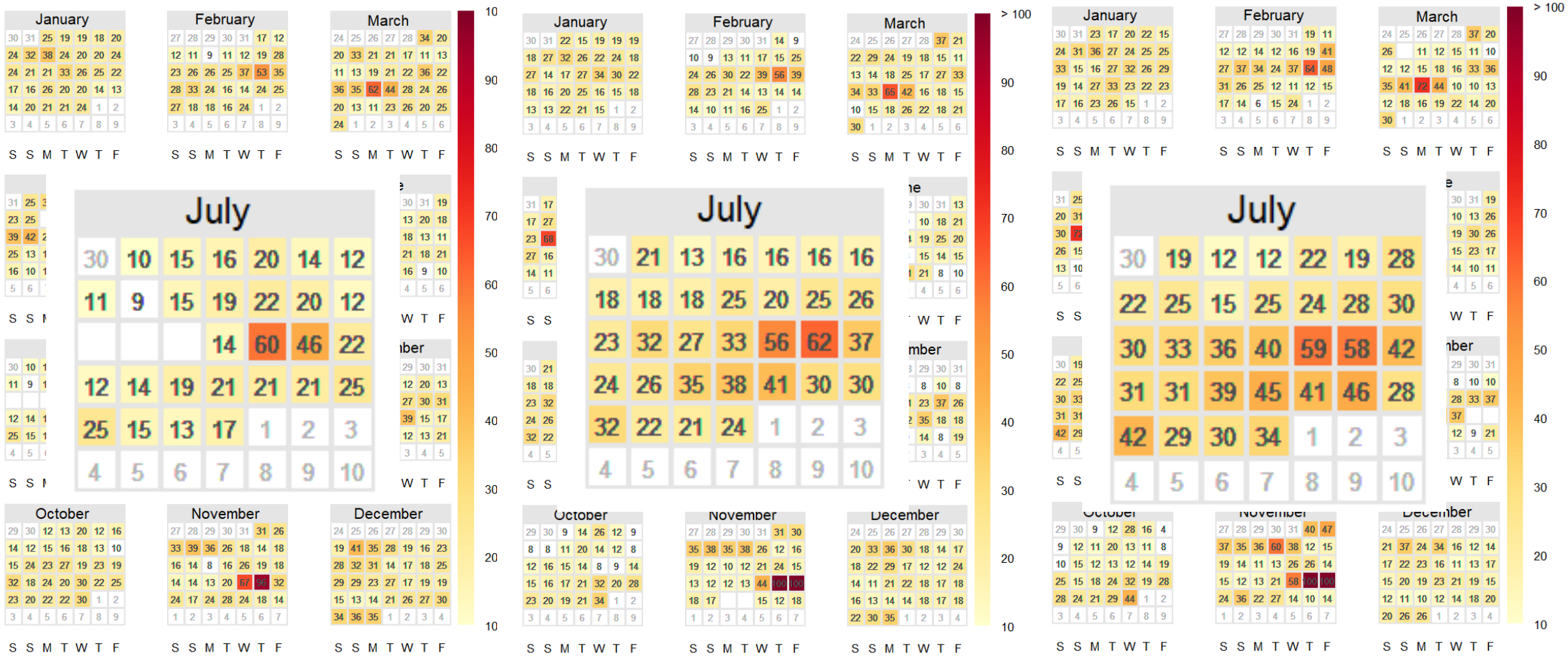


July 2018

Randwick

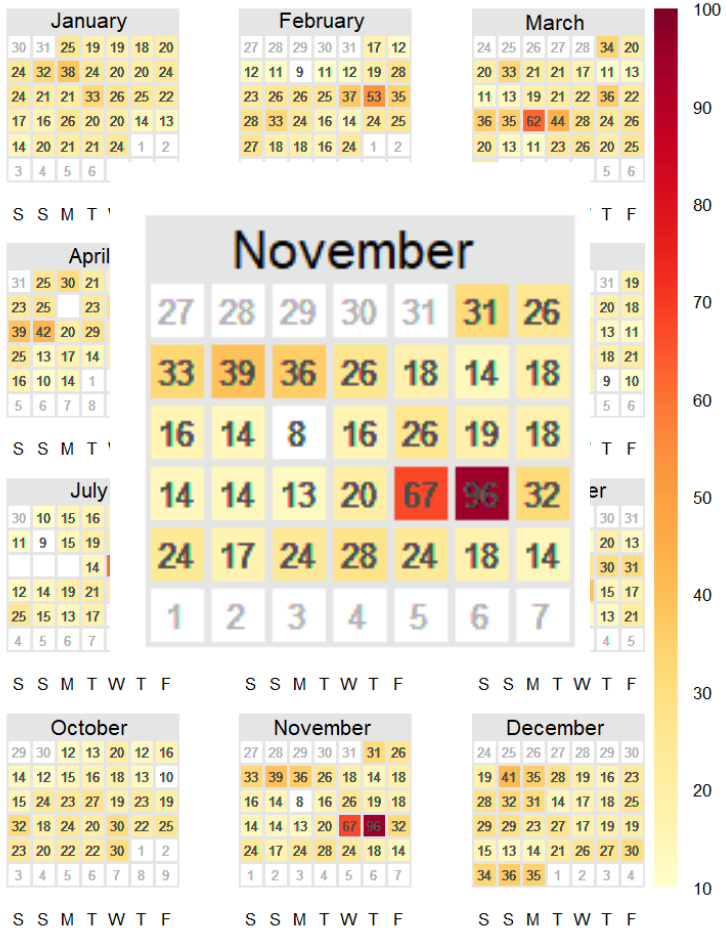
Beresfield

Singleton

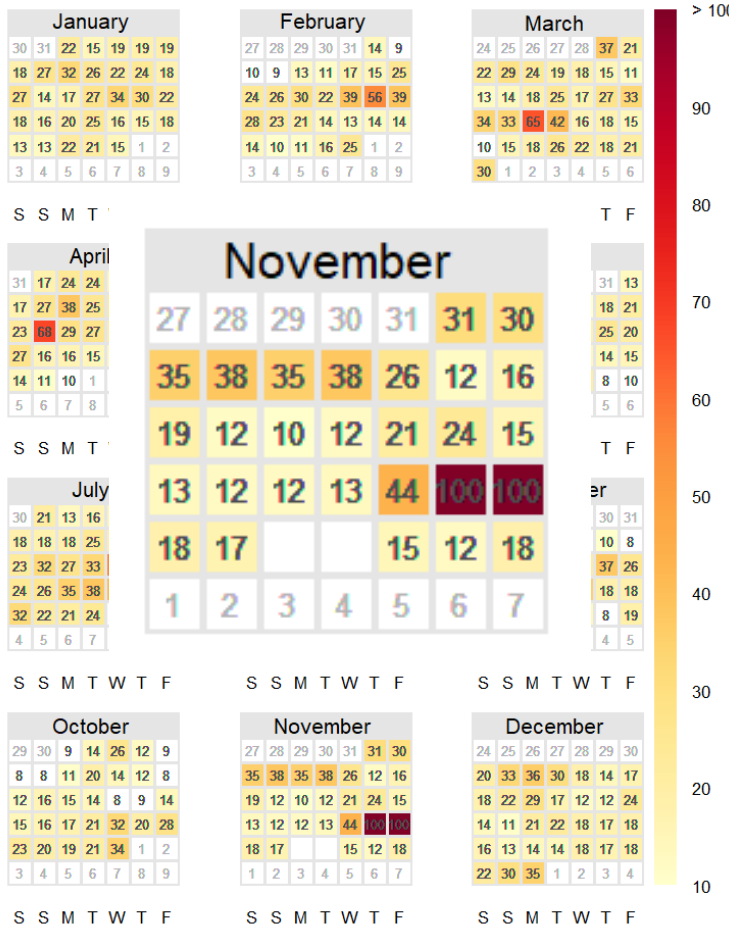


November 2018

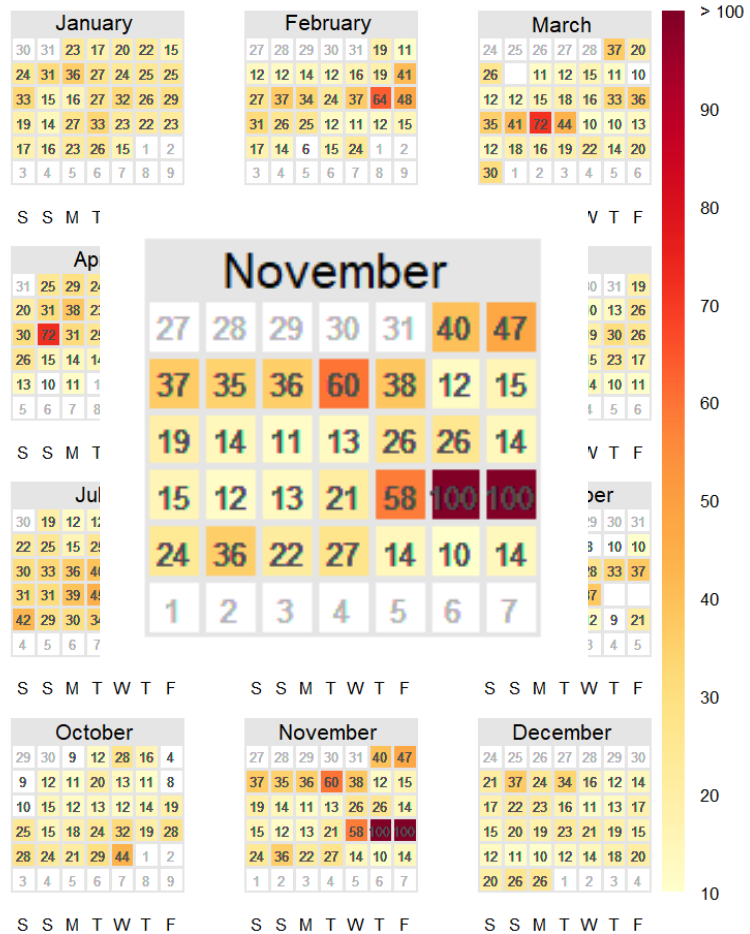
Randwick



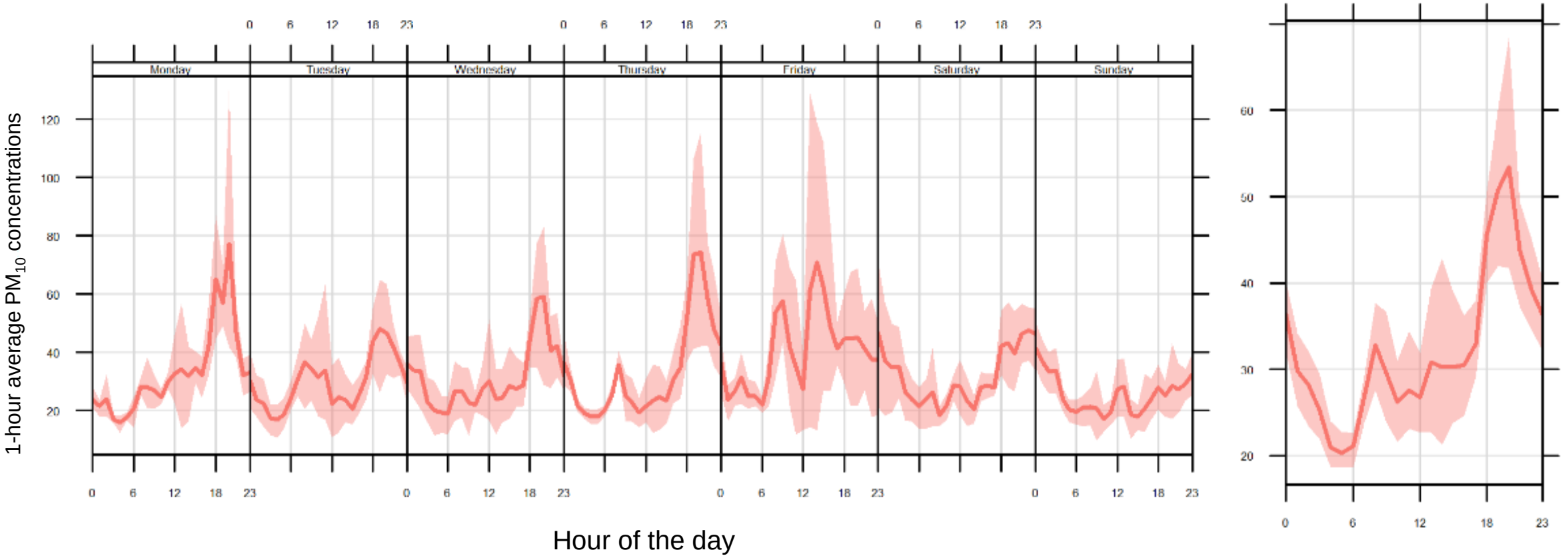
Beresfield



Singleton

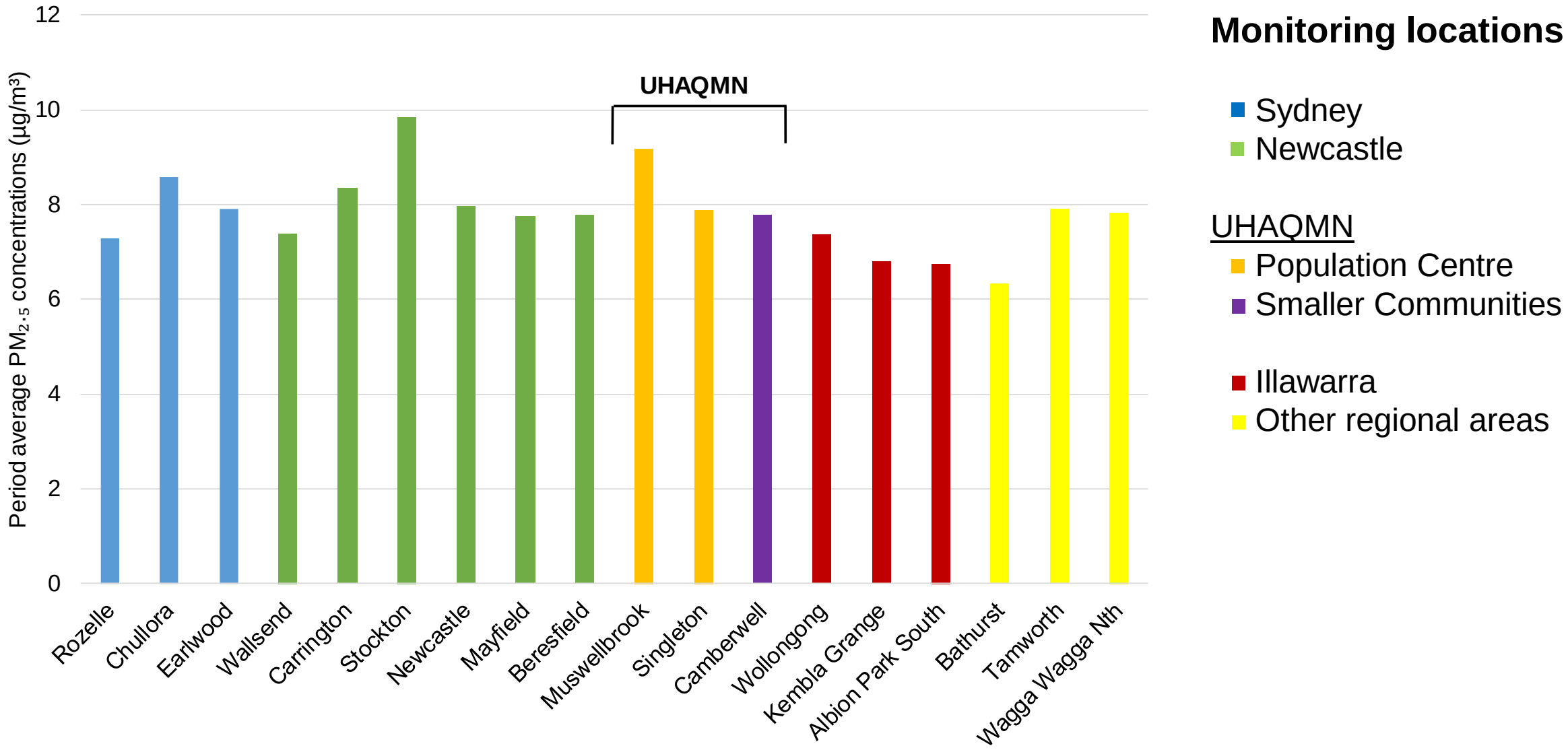


PM_{10} concentrations in Muswellbrook during May 2018

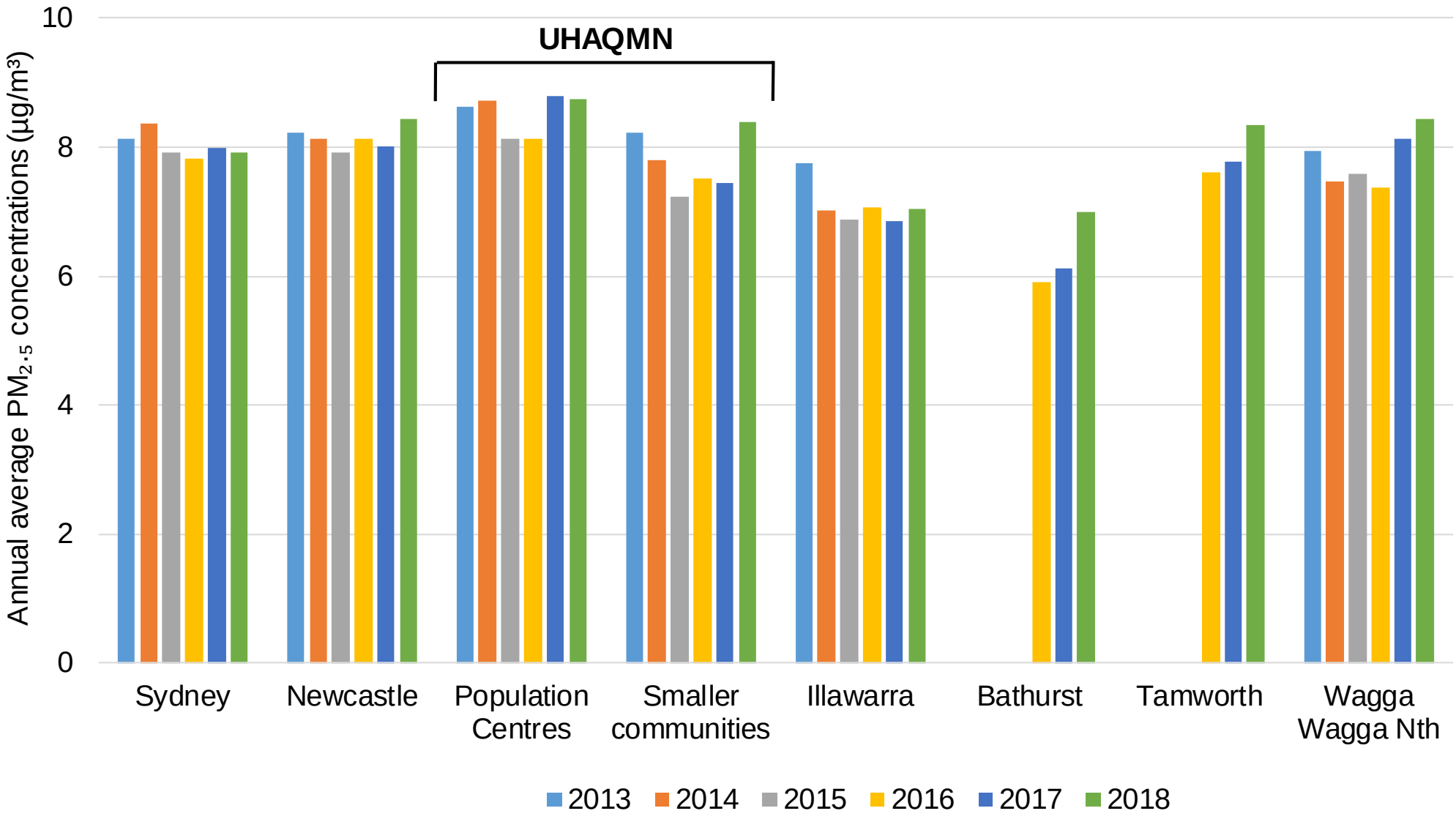


Discussion of $PM_{2.5}$ Concentrations

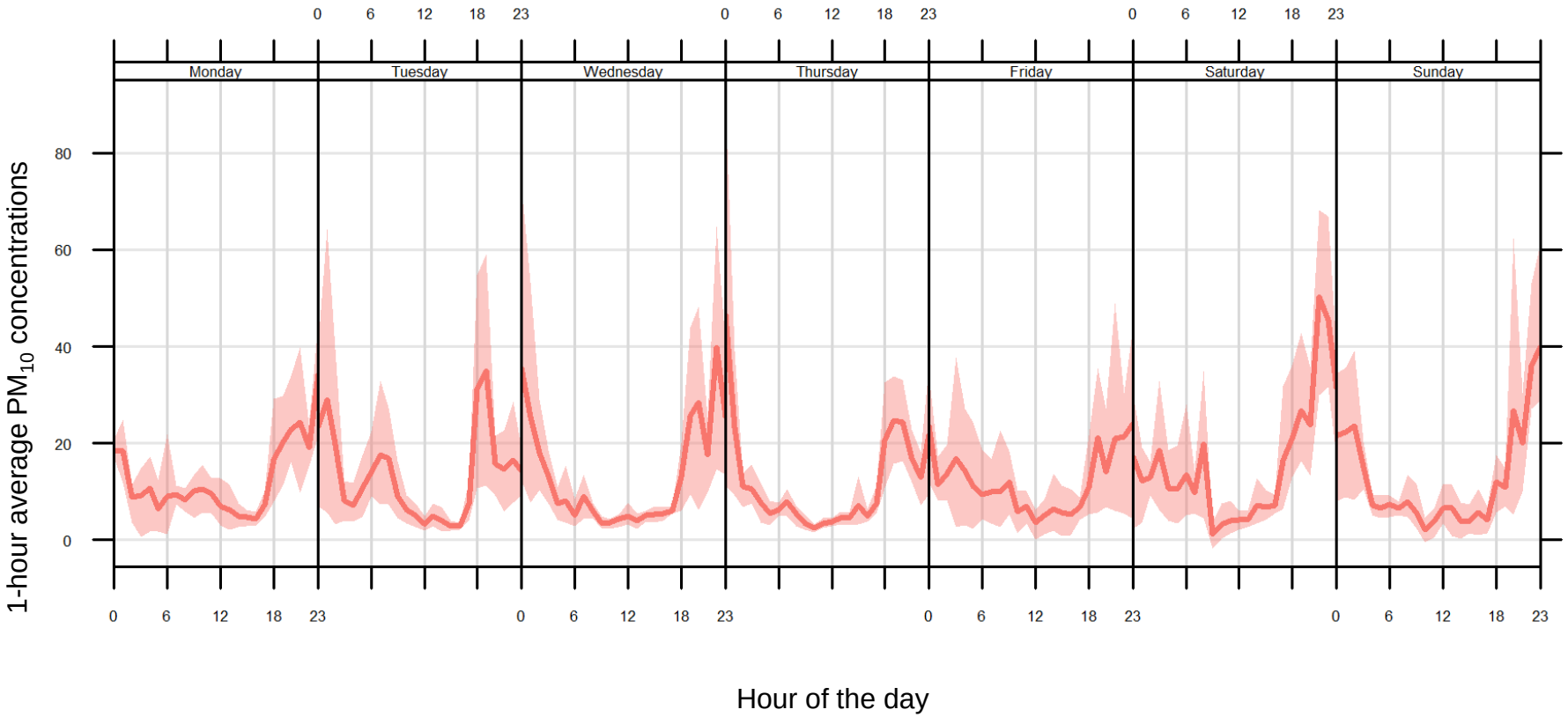
Comparison of period average $PM_{2.5}$ concentrations



Comparison of annual average $PM_{2.5}$ concentrations



$PM_{2.5}$ concentrations in Muswellbrook during May 2018



Summary

1. Has the air quality in the Upper Hunter changed since monitoring began?

- From 2013 to 2015 there were reductions in annual average PM_{10} and $PM_{2.5}$ concentrations at most monitoring locations within the Upper Hunter.
- From 2015 to 2018 there were year-on-year increases in annual average PM_{10} and $PM_{2.5}$ concentrations at almost all monitoring locations within the Upper Hunter.
- In 2018, there was a 45% reduction in total annual rainfall from 2015 levels.
- Annual trends appear to be more strongly correlated to rainfall than coal production.

Summary

2. Is the air quality in the Upper Hunter measured at the monitoring stations different from air quality measured at other locations in NSW?

- Since 2015, there has been a year-on-year increase in annual average PM_{10} concentrations in Sydney, Newcastle, Upper Hunter and Illawarra.
- Elevated dust concentrations during 2018 were apparent across the Sydney GMR, Newcastle/Lower Hunter and the Upper Hunter with peaks evident across all regions.

Thank you

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