



Adelaide Brighton Cement Ltd

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QUARTERLY GROUND LEVEL PARTICULATE MONITORING REPORT FOR BIRKENHEAD WORKS

COMPLIANCE DATE: 31/10/23 - Quarter 3, 2023

**EPA Licence 1126: Ground Level Particulate Monitoring and
Reporting plan (U - 1555)**

Licensed site: Adelaide Brighton Cement, Birkenhead Works

62 Elder Road, Birkenhead, SA 5015

Date of Submission: 31 October 2023

Version Number: 1



Report Submitted by: Advisor Environment (C&L (SA/NSW/NT))

Glossary

Term	Definition
$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
μm	micrometre
$^{\circ}\text{C}$	degrees Celsius
m	metre
m^3	cubic metre
m^3/s	cubic metres per second

Nomenclature	Definition
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PM_{10}	Particulate matter with a diameter less than 10 micrometres
$\text{PM}_{2.5}$	Particulate matter with a diameter less than 2.5 micrometres
24 hour average	Calendar day (midnight to midnight)

Abbreviations	Definition
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ABC	Adelaide Brighton Cement
Air EPP	South Australian Environment Protection (Air Quality) Policy 2016
GLPMRP	ABC's Ground Level Particulate Monitoring and Reporting Plan
EPA	Environment Protection Authority

Sampling Locations

- Map showing sampling locations, major infrastructure, sensitive environmental receptors, and north arrow



Sampling locations are indicated by colour-coded dots on the above map.

NB: Four sampling points are located on the Birkenhead Works site; the other sampling points are in the community (Community Park).

The property (not owned by ABC), on which the Gunn Street Monitor was located, was sold for redevelopment and was no longer available for use. As a consequence the monitor was removed on 28 June 2022. A new monitoring location is currently being determined.

Monitoring Objective	<p>To provide monitoring and reporting of ground level particulate concentrations (PM₁₀ and PM_{2.5}), from a network of monitors located within and external to the site premises.</p> <ul style="list-style-type: none"> • Monitoring data for each monitor (on site and off site) shall include: <ul style="list-style-type: none"> ○ Monthly wind rose showing the distribution of wind directions ○ Monthly dust rose showing the distribution of PM₁₀ concentration ○ Monthly dust rose showing the distribution of PM_{2.5} concentration ○ Particulate monitoring data for each ABC monitor (on site and off site) including EPA monitor (Le Fevre 1) for comparison as follows; <ul style="list-style-type: none"> ○ Monthly time series graph of 24-hour average PM₁₀ concentration reported against the Air EPP for PM₁₀ of 50 micrograms per cubic metre (24-hour average). ○ Monthly time series graph of 24-hour average PM_{2.5} concentration reported against the Air EPP for PM_{2.5} of 25 micrograms per cubic metre (24-hour average).
Monitoring Plan	<p>This monitoring report has been prepared in compliance with the Ground Level Particulate Monitoring and Reporting Plan (GLPMRP), approved 16 October 2023 by the South Australian EPA.</p> <p>The Plan is available on the ABC Birkenhead Community Website: https://adelaidebrightoncommunity.com.au/</p>
Monitoring data for each ABC monitor	<p>Monitoring reports for July, August and September are in the appendix.</p> <p>Monitoring reports provide for each monitor the following:</p> <ul style="list-style-type: none"> • PM_{2.5}, PM₁₀ 24-hour averages • PM_{2.5}, PM₁₀ monthly wind & dust rose <p>The property (not owned by ABC), on which the Gunn Street Monitor was located, was sold for redevelopment and was no longer available for use. As a consequence the monitor was removed on 28 June 2022. A new monitoring location is currently being determined.</p> <p>There were no 24-hour exceedances of PM₁₀ and PM_{2.5} Air (EPP) criteria on ambient particulate monitors in the community, during this reporting period.</p> <p>Insufficient data was collected on internal monitors to calculate 24-hr averages on the following days in the reporting period:</p> <ul style="list-style-type: none"> • Community Park 30 July – 3 August (inclusive) monitor failed to reset after power outage. • Block 9 monitor on 3,4 10 July and 1,2, 12-15 18 - 22 Aug. This was due to the monitor failing to operate due to battery voltage below 11.6 v. Investigation found the battery was at end of life and failing to recharge effectively (solar powered monitor), resulting in loss of about 6-7 hours data (typically from about 1 am – 8 am) on these days see Figure 1 Block 9 monitor: Typical data loss due to low monitor battery voltage. The battery has been replaced and an alarm condition has been incorporated into the monitoring system, to pick up this condition.

Figure 1: Block 9 monitor: Typical data loss due to low monitor battery voltage

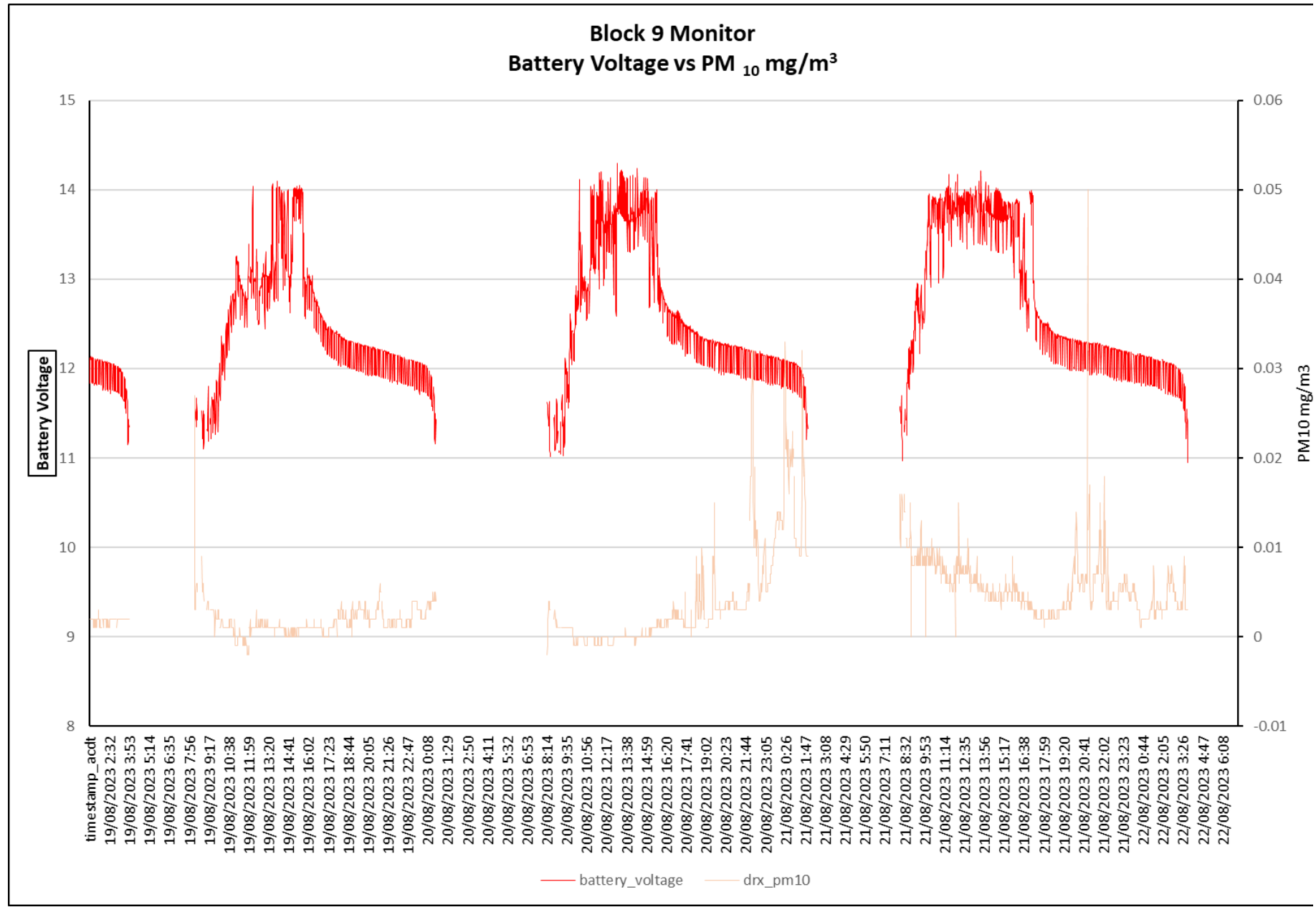
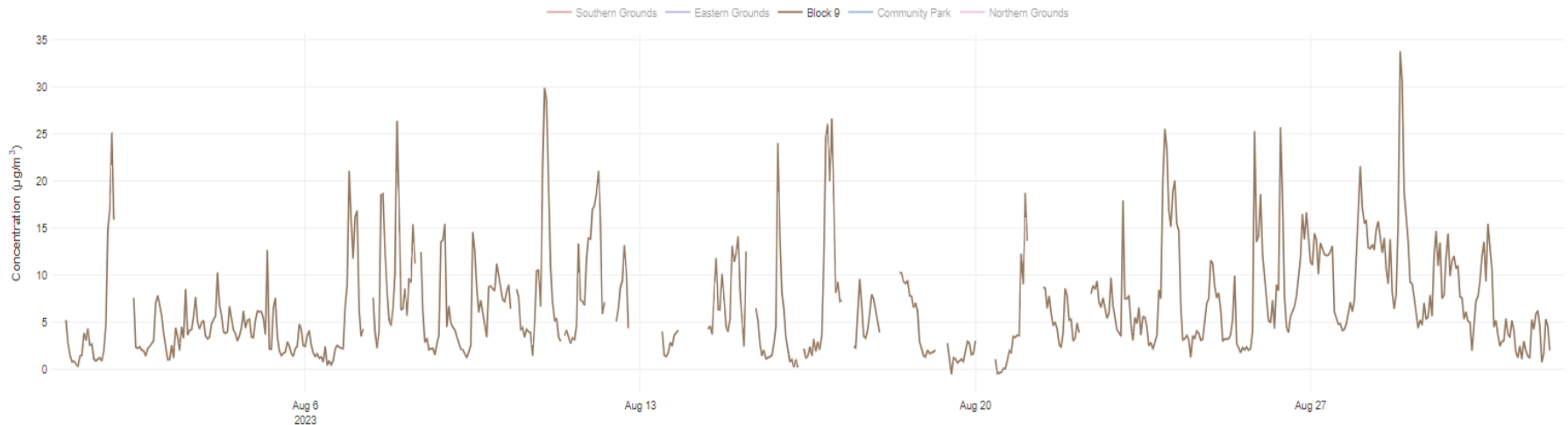


Figure 2: Block 9 Monitor: Hourly PM10 $\mu\text{g}/\text{m}^3$ for August 2003



There is no wind direction data for the Eastern grounds monitor in July, and also no trigger alerts were raised for July. Investigation identified that the wind direction sensor had accumulated dust build up, causing intermittent wind measurement data. The wind sensor had been operating reliably and without issue since installation six years ago. The sensor has been operating effectively, following cleaning.

This event has highlighted one questionable feature of ABC’s dust management system, which is that when no wind direction data is available, no alert is generated at all, which is probably not ideal. ABC’s Dust Management Dashboard and Control System has been reprogrammed to:

- Create an alarm when there is no wind direction data and
- To generating an alert, by assuming that the wind is blowing towards receptors when there is a PM10 concentration above an alert threshold when there is no valid wind direction record (a conservative approach)

Appendix

July, August and September Monitoring Reports (attached)

Contents

Monitoring Summary (01 Jul, 2023 - 31 Jul, 2023)	1
Public Monitors	1
Internal Monitors	4
EPA Monitoring	11

Monitoring Summary (01 Jul, 2023 - 31 Jul, 2023)

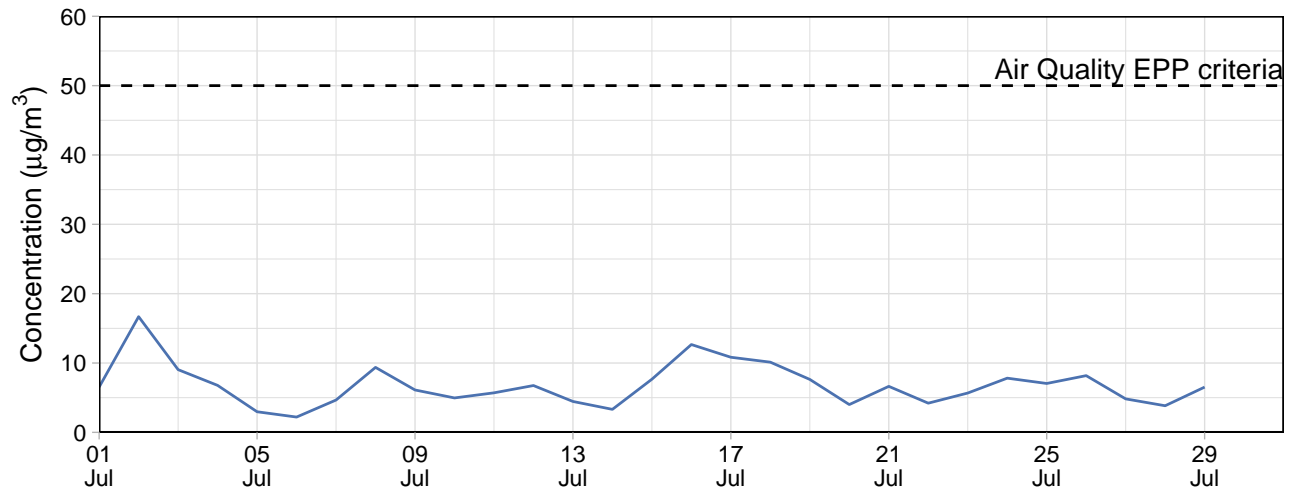
Public Monitors

Table 1: Summary of 24-hour average data collected at public monitors ($\mu\text{g}/\text{m}^3$)

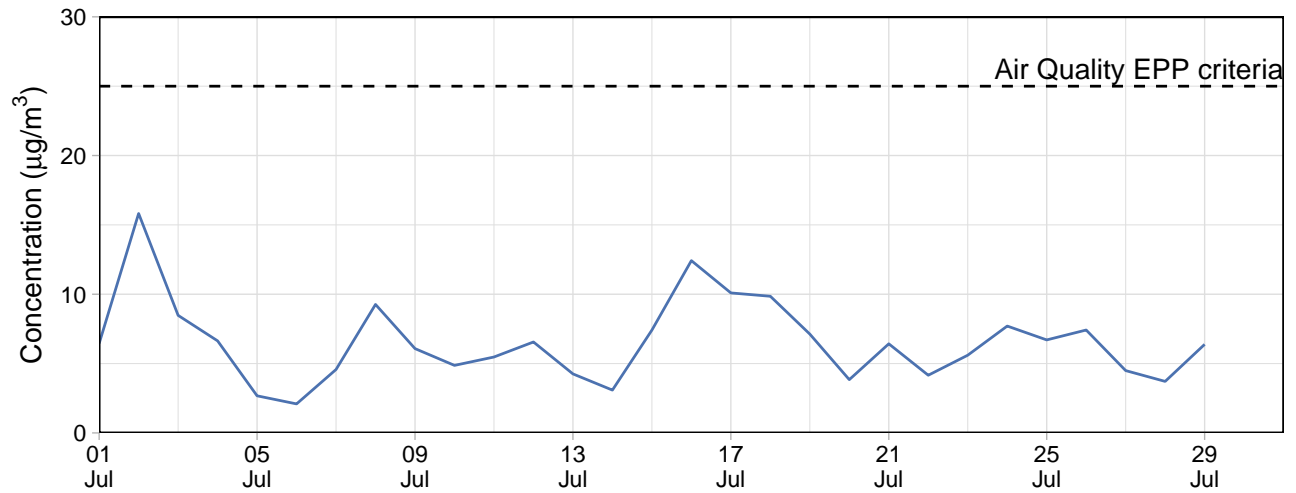
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Community Park	2.2	6.8	16.7	93.5	2.1	6.5	15.8	93.5

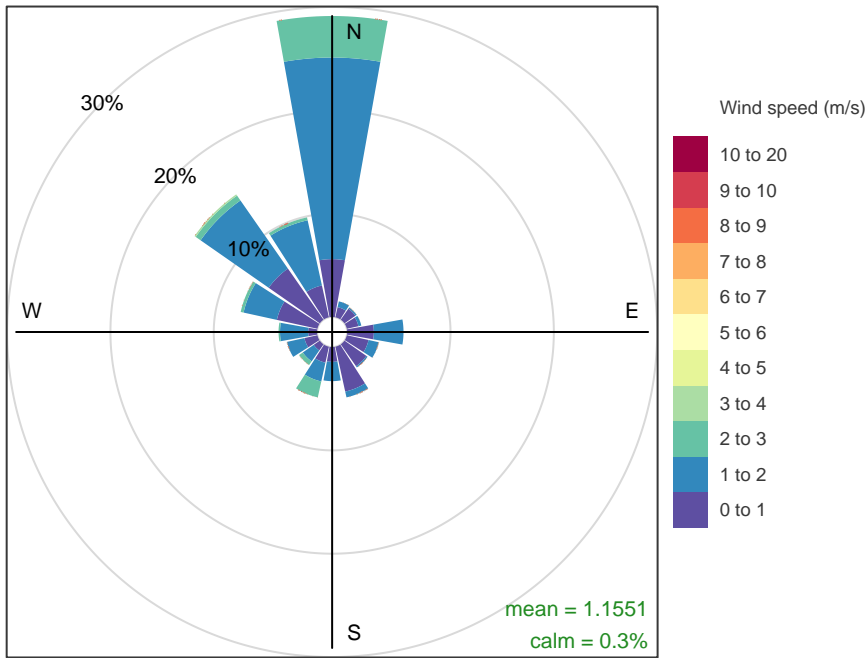
Community Park

Community Park – 24-hour average PM₁₀

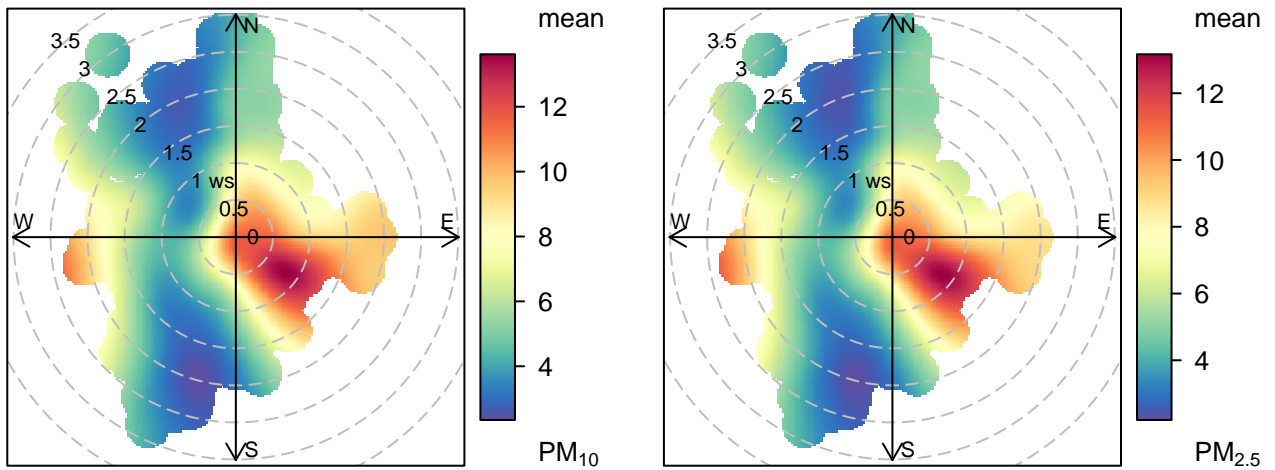


Community Park – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



Gunn Street

No data available for the reporting period.

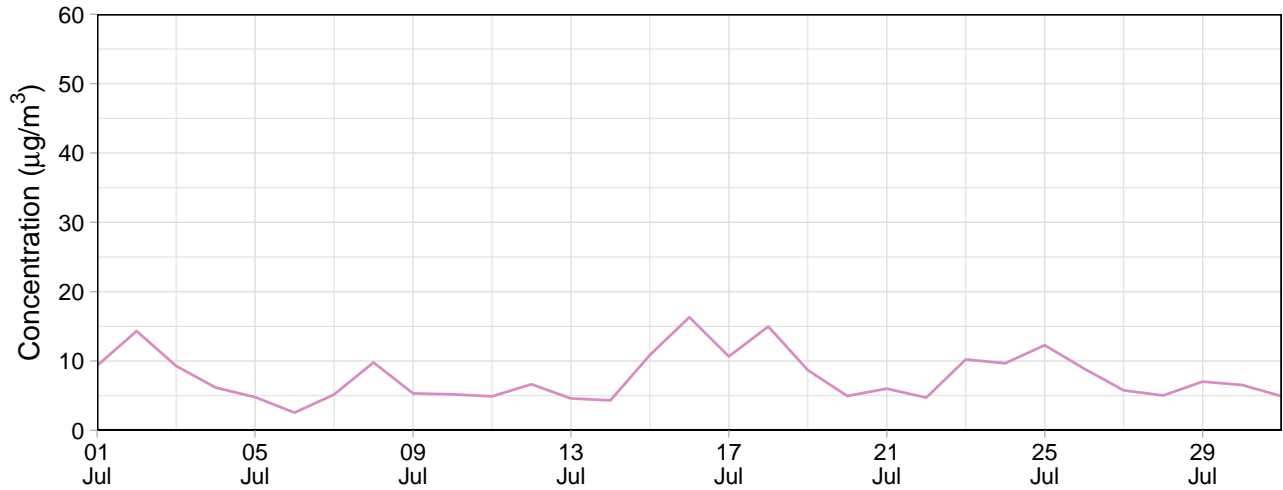
Internal Monitors

Table 2: Summary of 24-hour average data collected at internal monitors ($\mu\text{g}/\text{m}^3$)

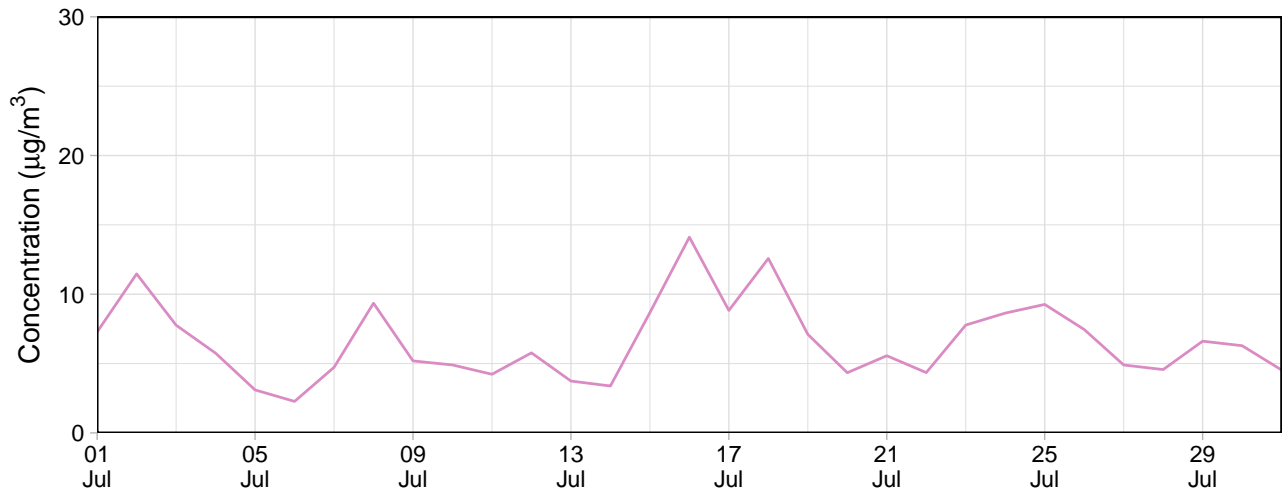
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Southern Grounds	3.2	8.4	16.3	100.0	2.9	7.8	15.3	100.0
Eastern Grounds	5.8	11.2	16.3	100.0	4.6	9.3	14.8	100.0
Block 9	2.1	6.4	13.6	90.3	1.9	6.0	12.3	90.3
Northern Grounds	2.6	7.7	16.3	100.0	2.3	6.6	14.1	100.0

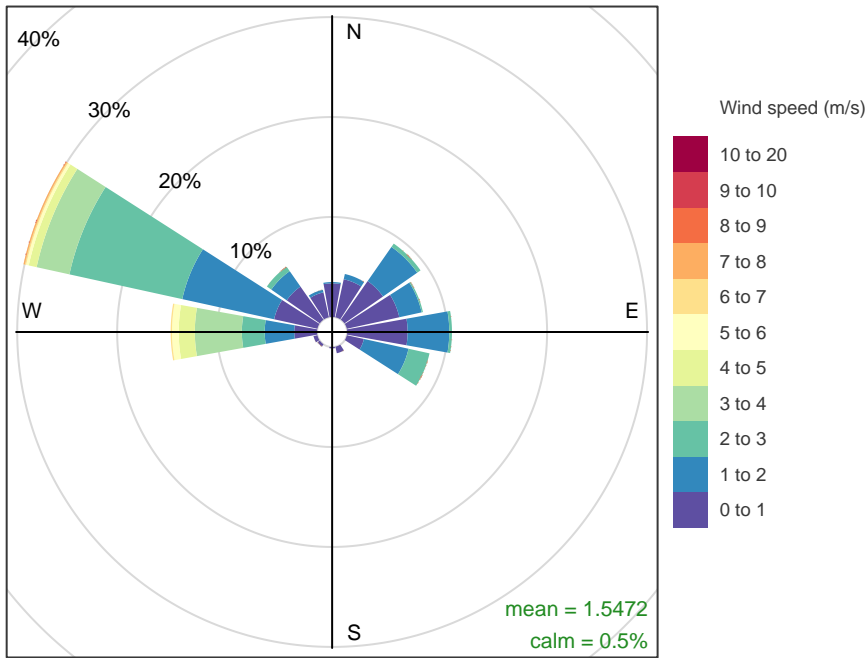
Northern Grounds

Northern Grounds – 24-hour average PM₁₀

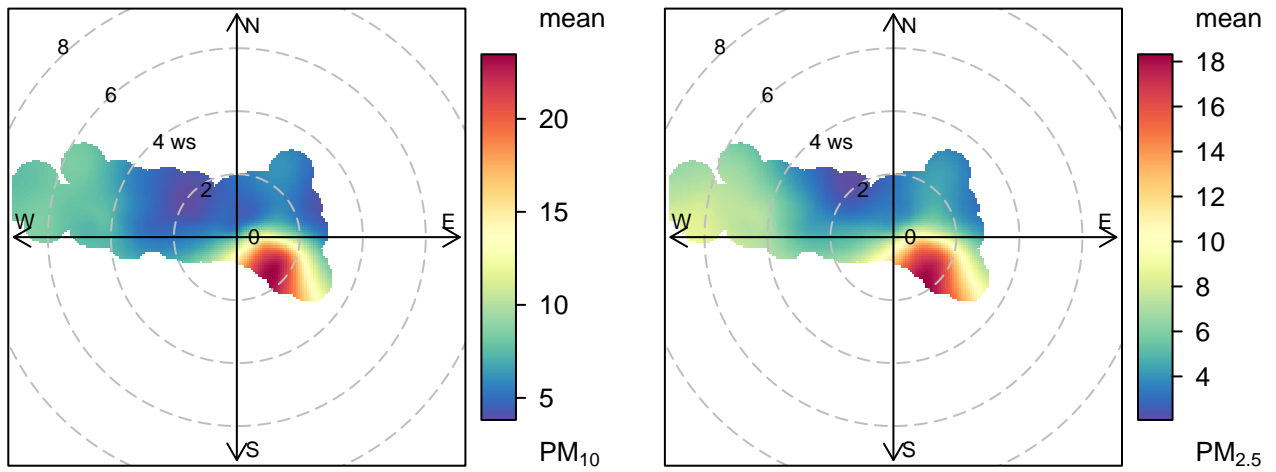


Northern Grounds – 24-hour average PM_{2.5}



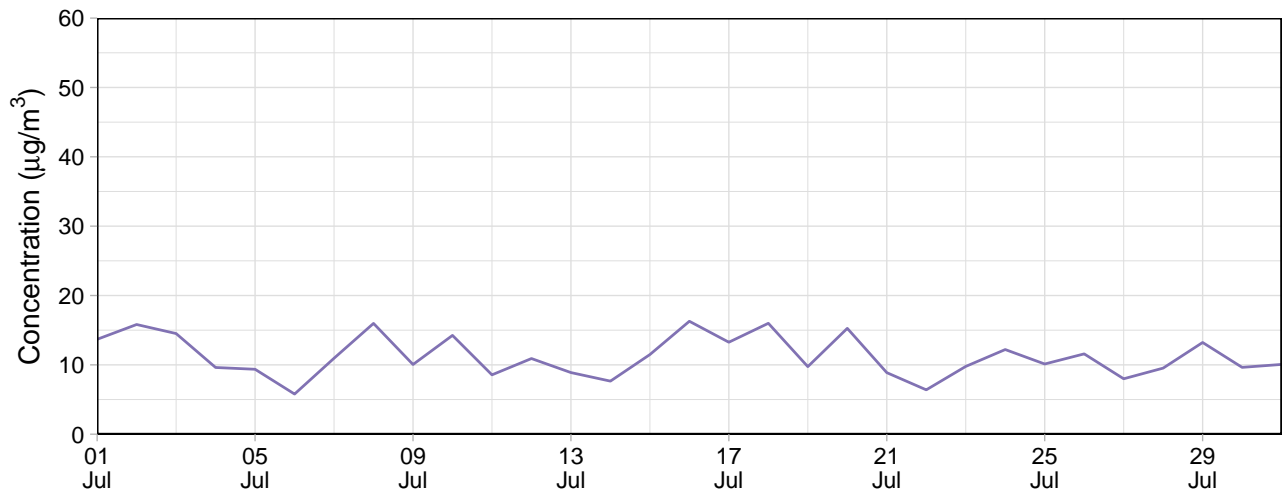


Frequency of counts by wind direction (%)

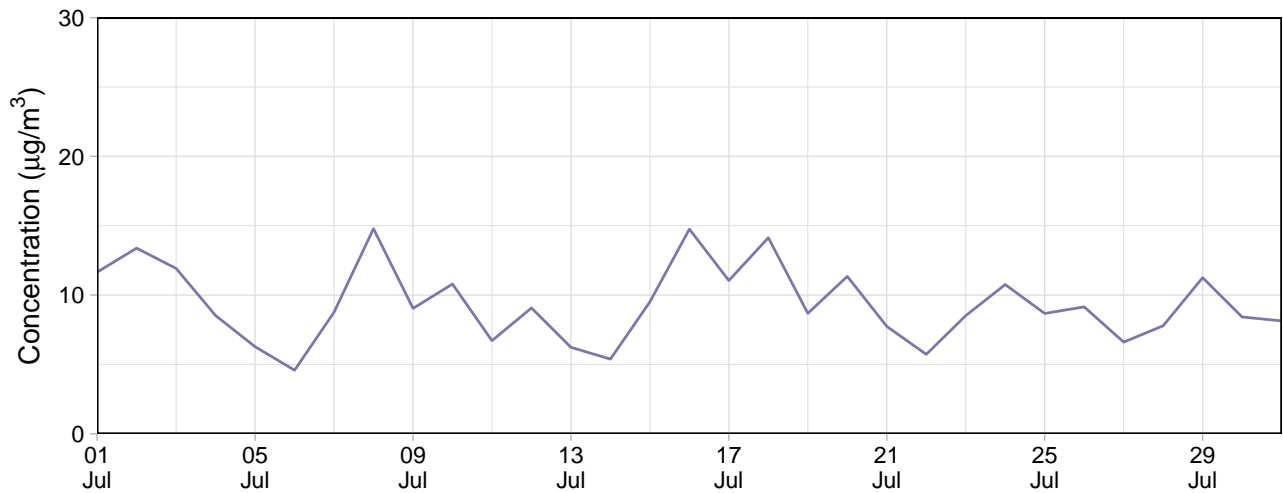


Eastern Grounds

Eastern Grounds – 24-hour average PM₁₀

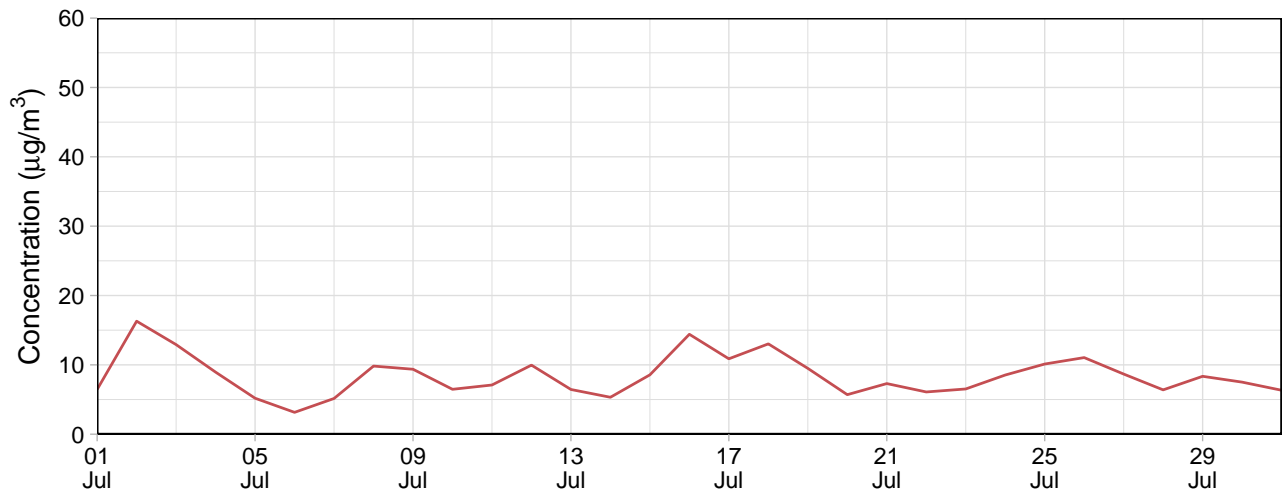


Eastern Grounds – 24-hour average PM_{2.5}

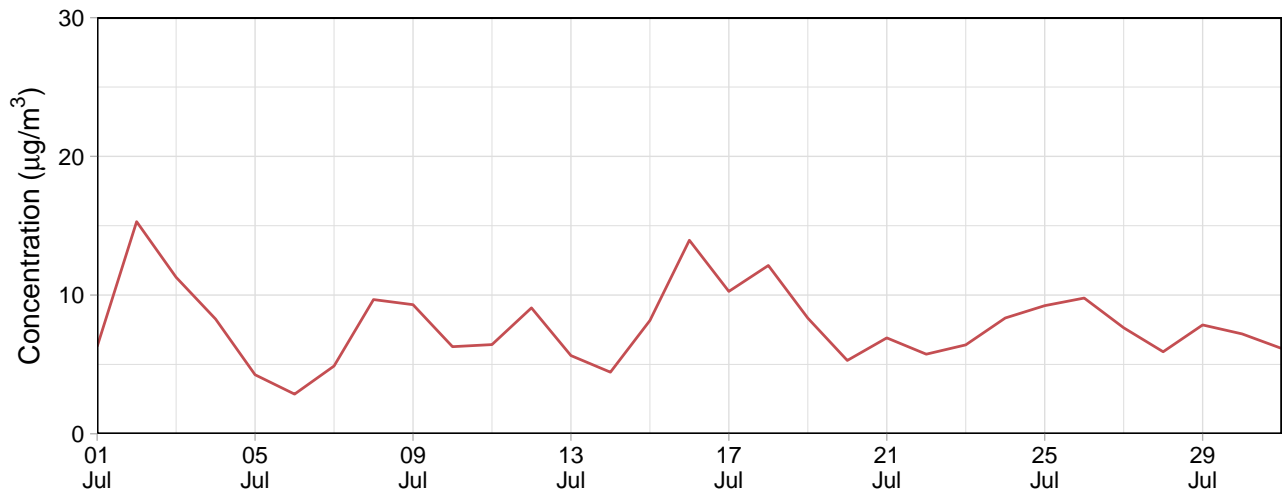


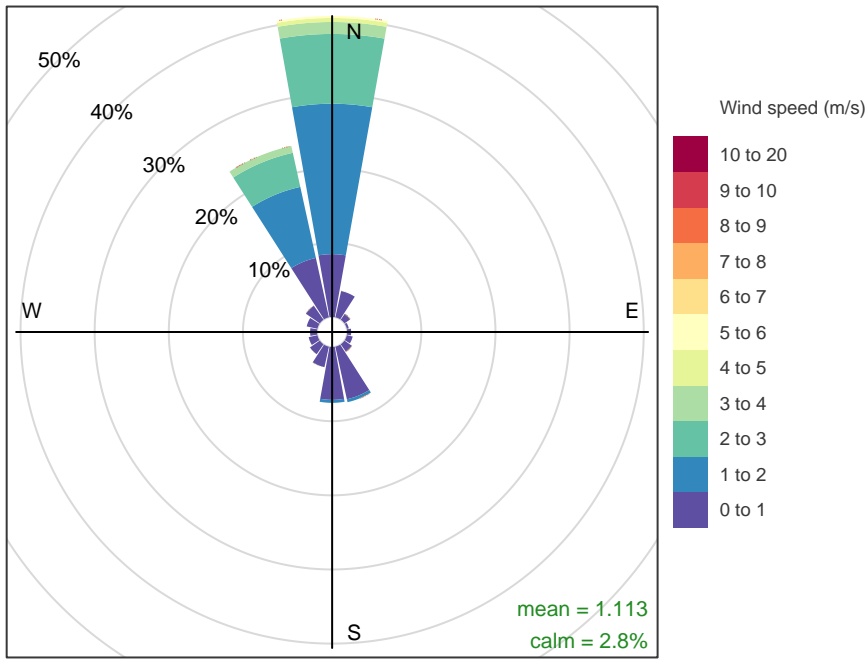
Southern Grounds

Southern Grounds – 24-hour average PM₁₀

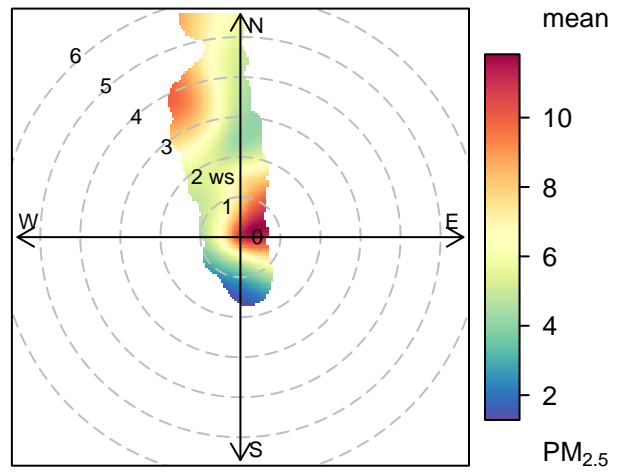
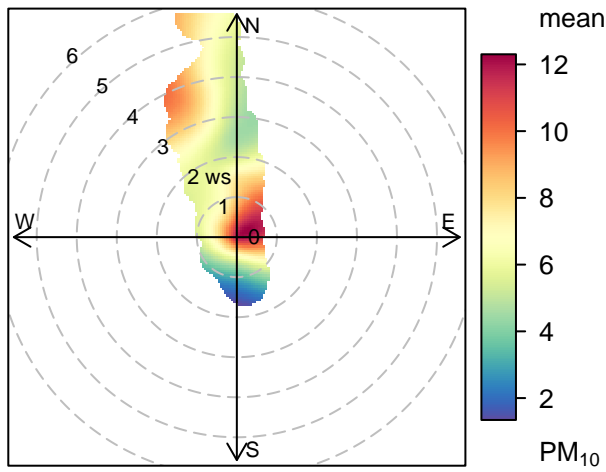


Southern Grounds – 24-hour average PM_{2.5}



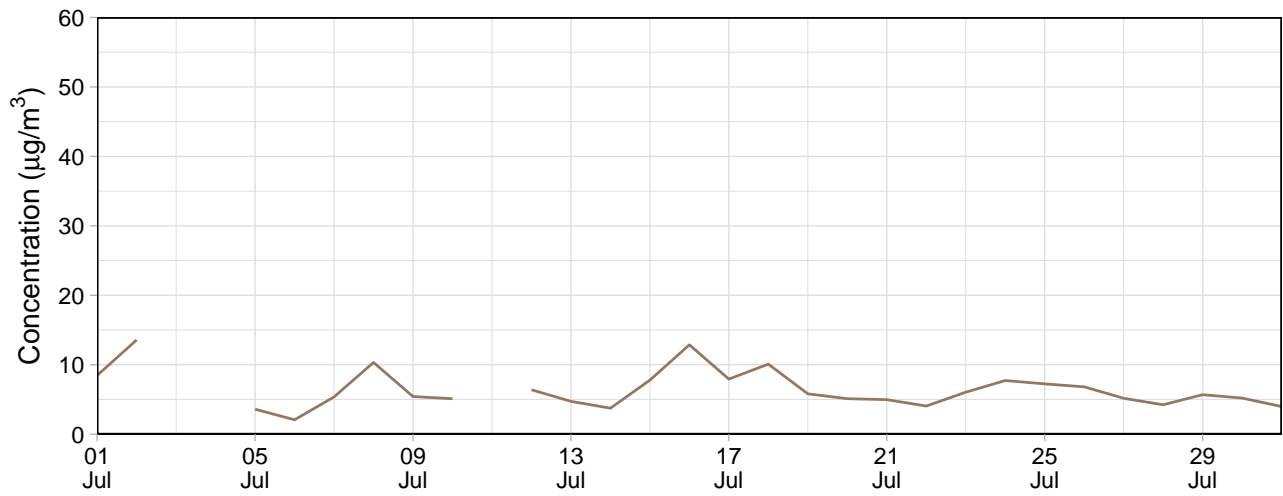


Frequency of counts by wind direction (%)

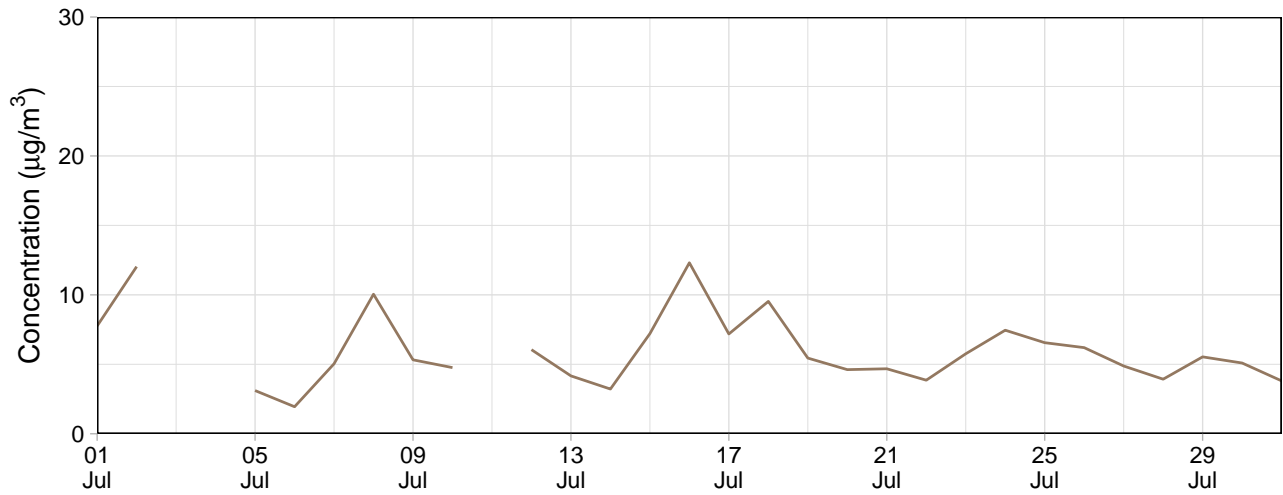


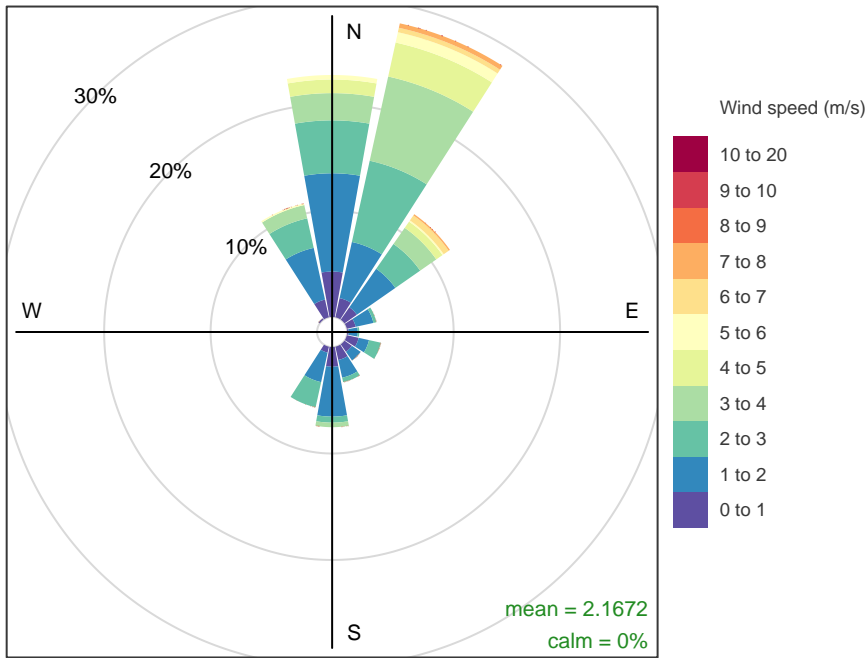
Block 9

Block 9 – 24-hour average PM₁₀

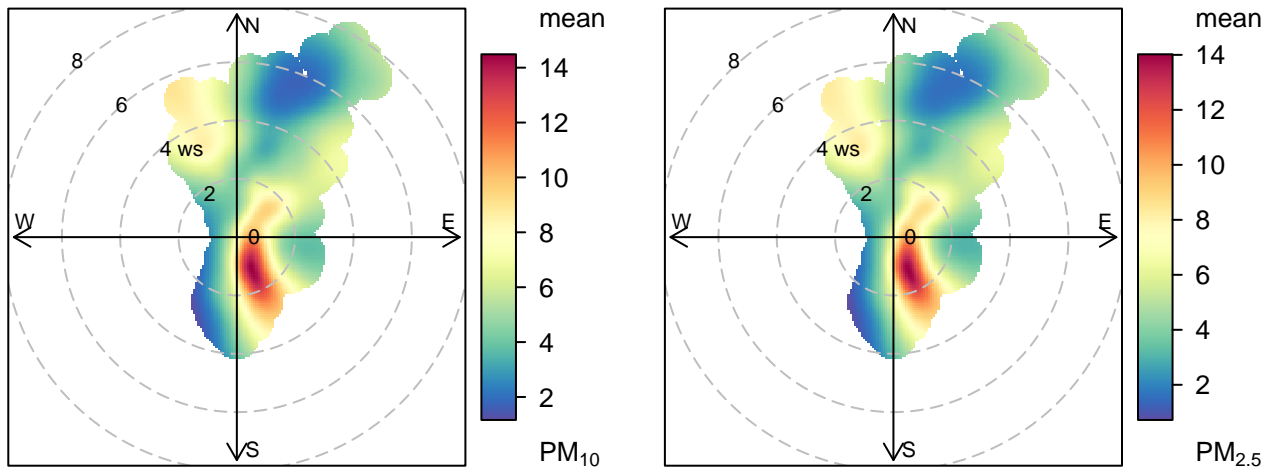


Block 9 – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



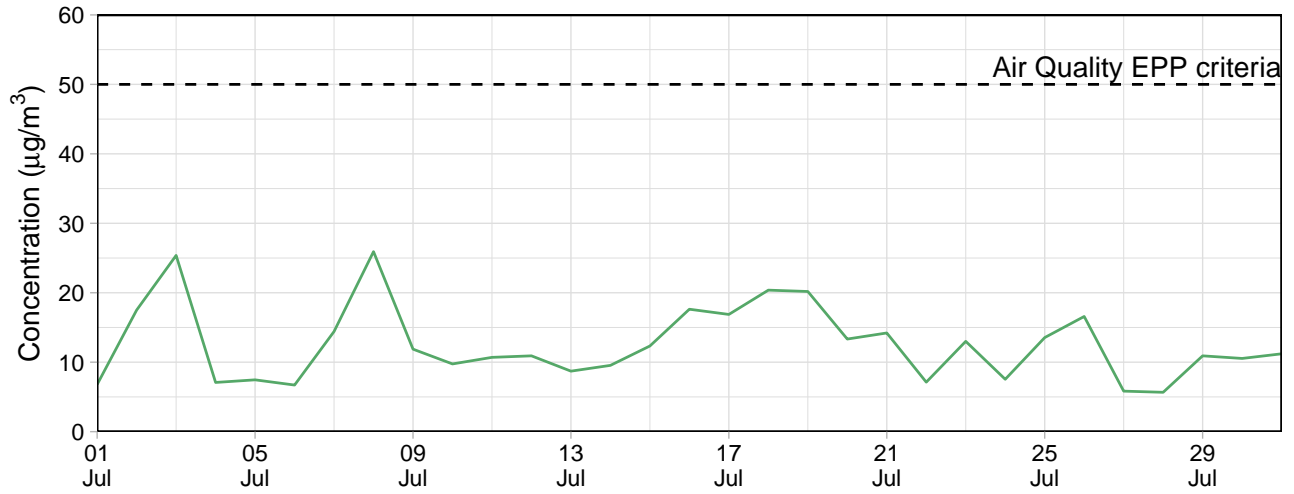
EPA Monitoring

Le Fevre 1

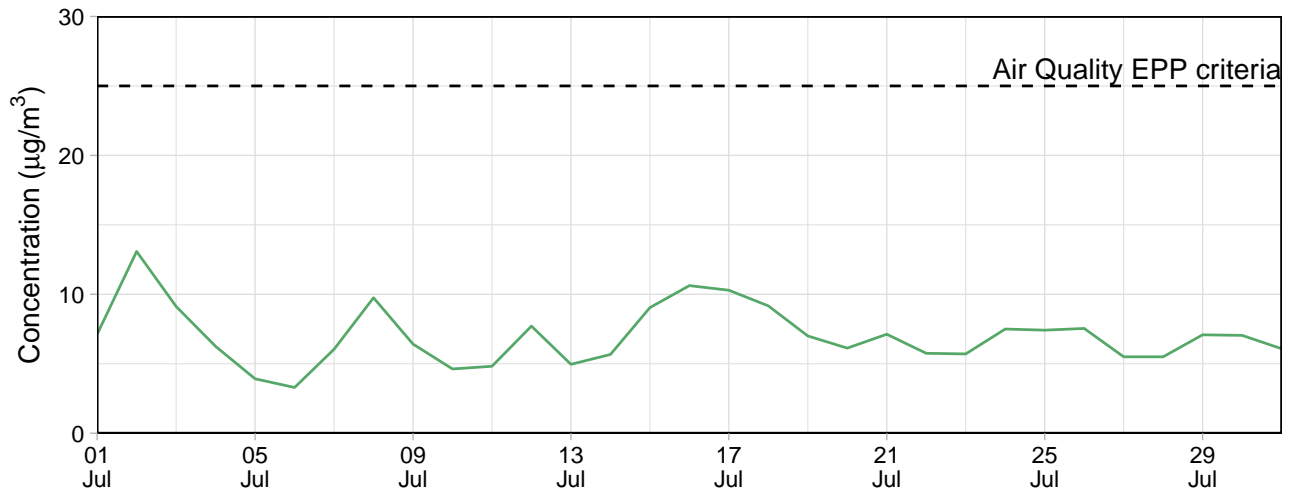
Table 3: Summary of 24-hour average data collected at EPA monitors ($\mu\text{g}/\text{m}^3$)

Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Le Fevre 1	5.7	12.6	25.9	100	3.3	7	13.1	100

Le Fevre 1 – 24-hour average PM₁₀



Le Fevre 1 – 24-hour average PM_{2.5}



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Monitoring Summary (01 Aug, 2023 - 31 Aug, 2023)

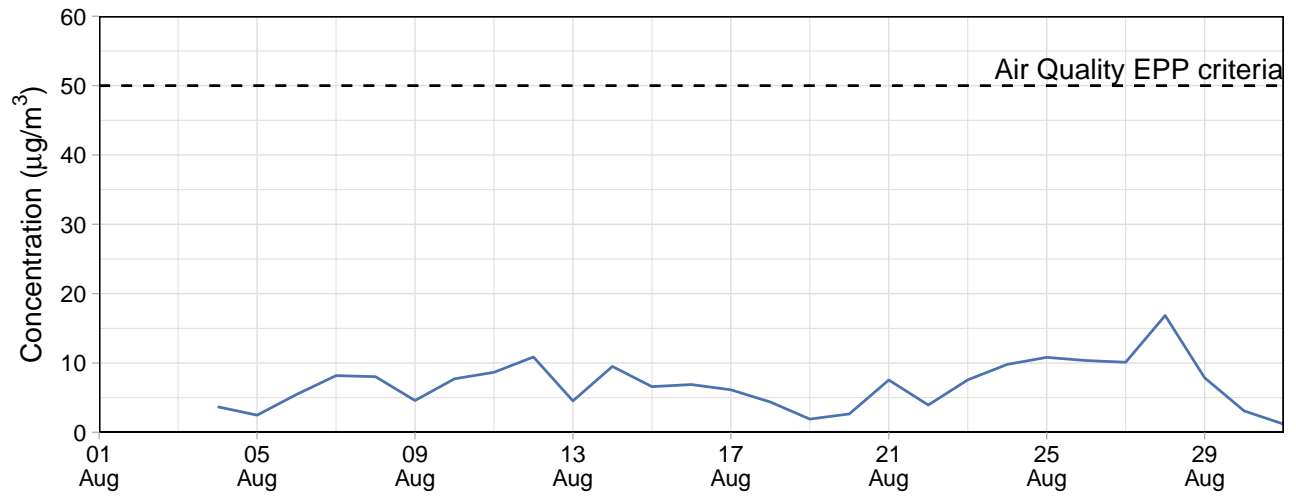
Public Monitors

Table 1: Summary of 24-hour average data collected at public monitors ($\mu\text{g}/\text{m}^3$)

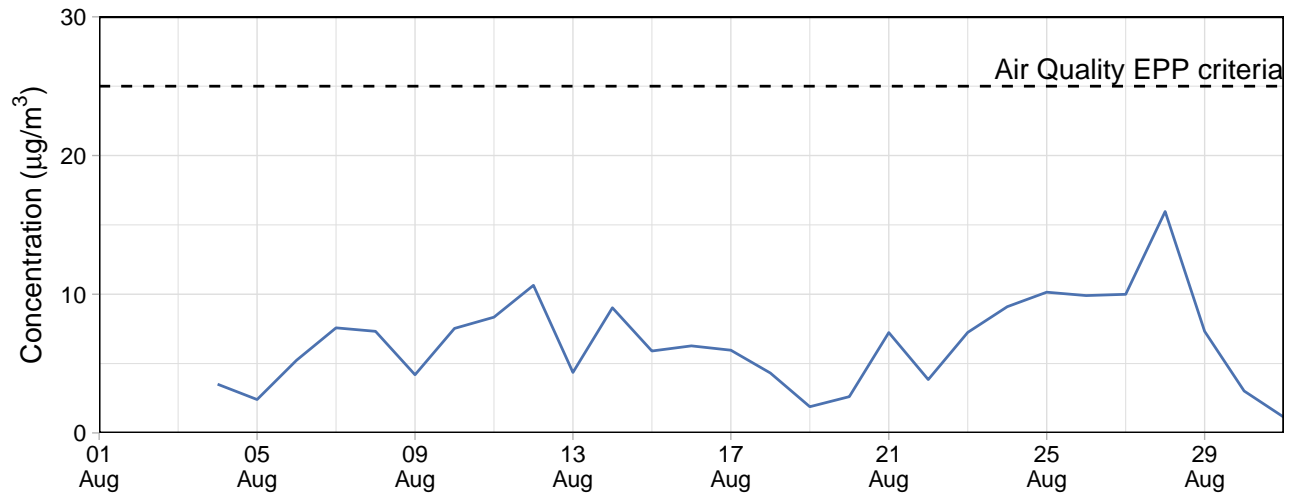
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Community Park	1.2	6.8	16.9	90.3	1.1	6.5	16	90.3

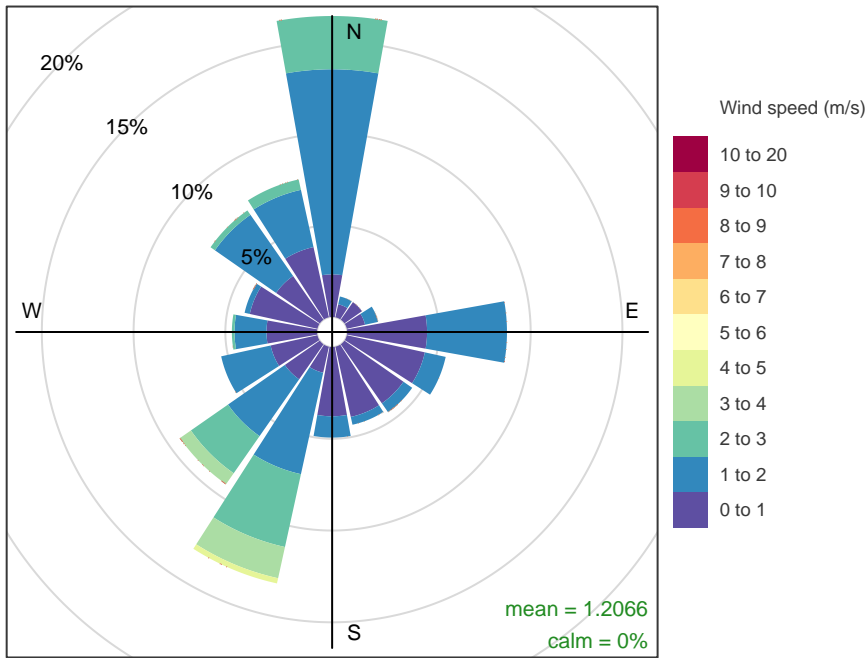
Community Park

Community Park – 24-hour average PM₁₀

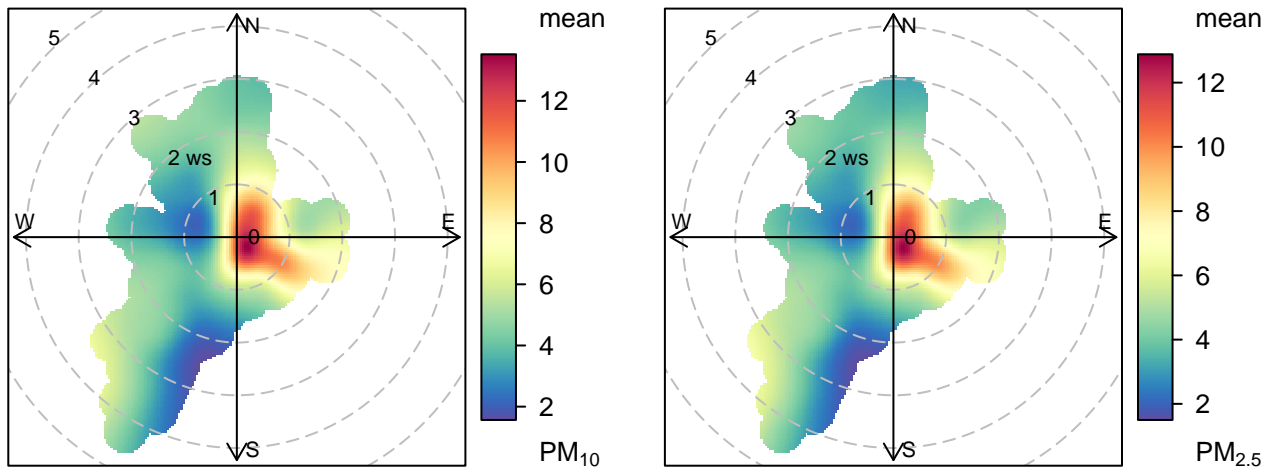


Community Park – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



Gunn Street

No data available for the reporting period.

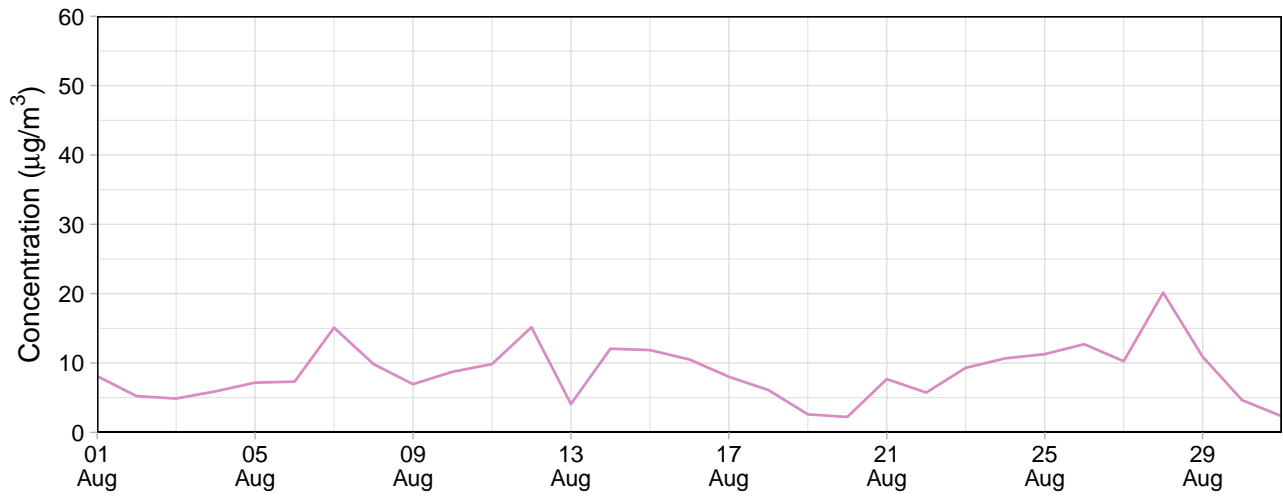
Internal Monitors

Table 2: Summary of 24-hour average data collected at internal monitors ($\mu\text{g}/\text{m}^3$)

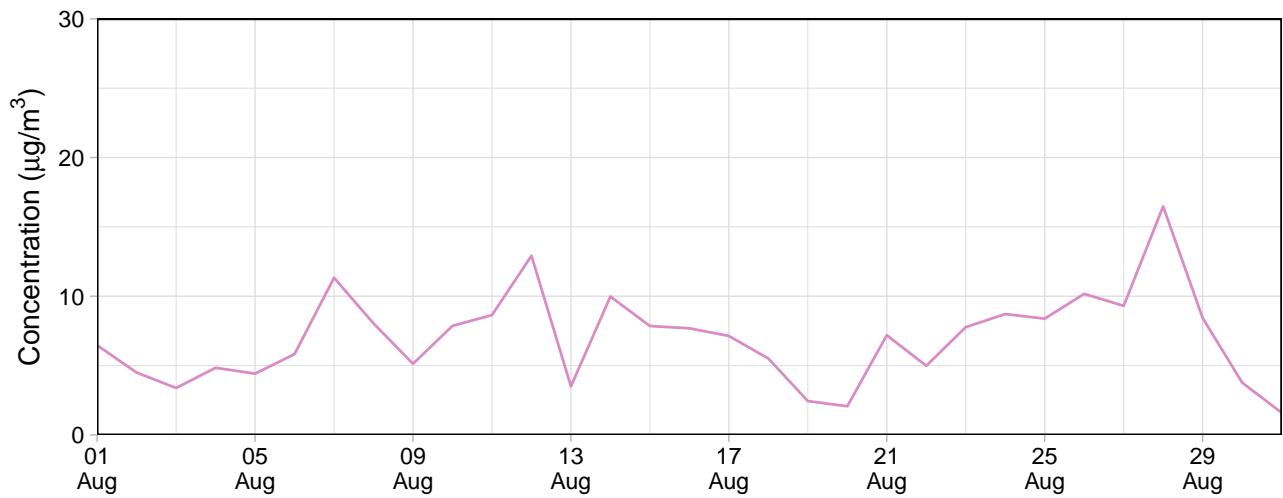
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Southern Grounds	1.6	8.2	18.4	100.0	1.5	7.6	16.8	100.0
Eastern Grounds	5.2	11.4	20.6	100.0	4.5	9.1	17.2	100.0
Block 9	1.6	6.9	15.1	77.4	1.5	6.1	13.9	77.4
Northern Grounds	2.2	8.6	20.1	100.0	1.6	7.0	16.5	100.0

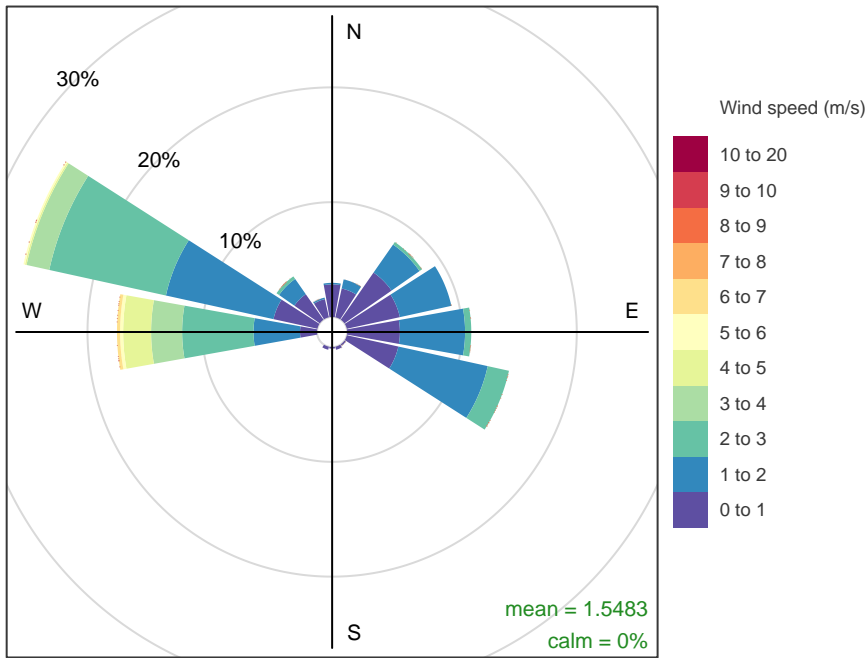
Northern Grounds

Northern Grounds – 24-hour average PM₁₀

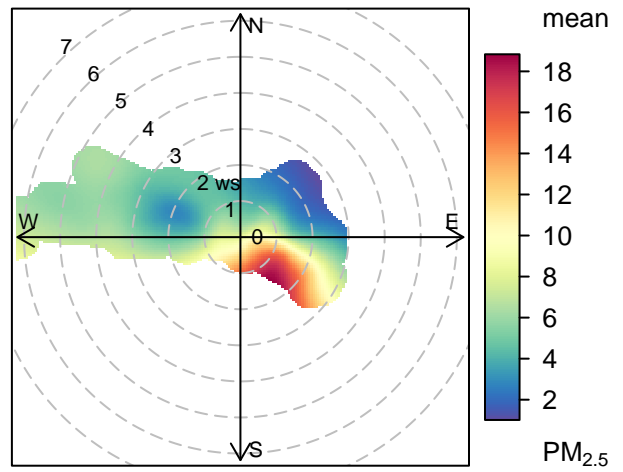
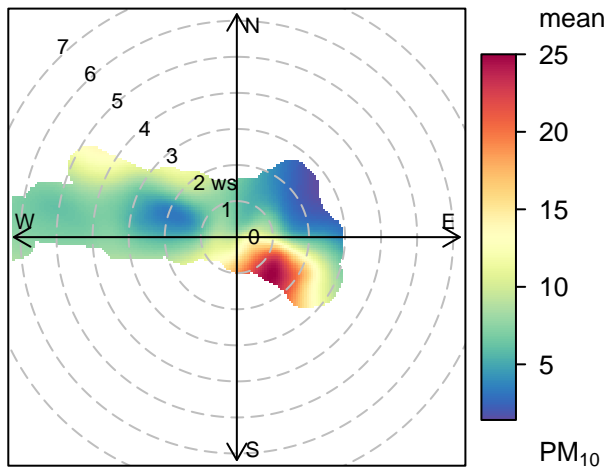


Northern Grounds – 24-hour average PM_{2.5}



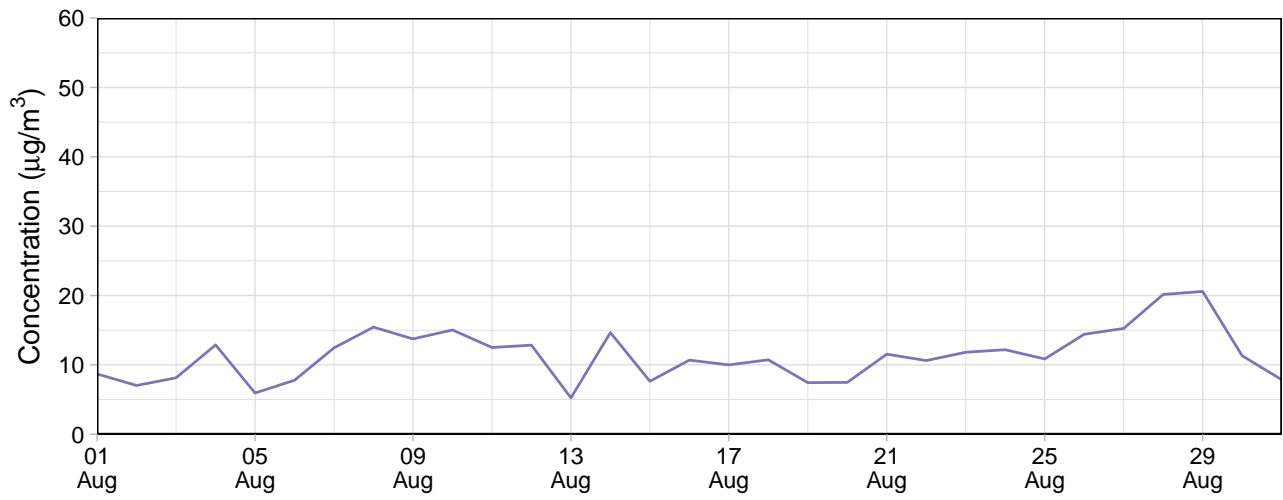


Frequency of counts by wind direction (%)

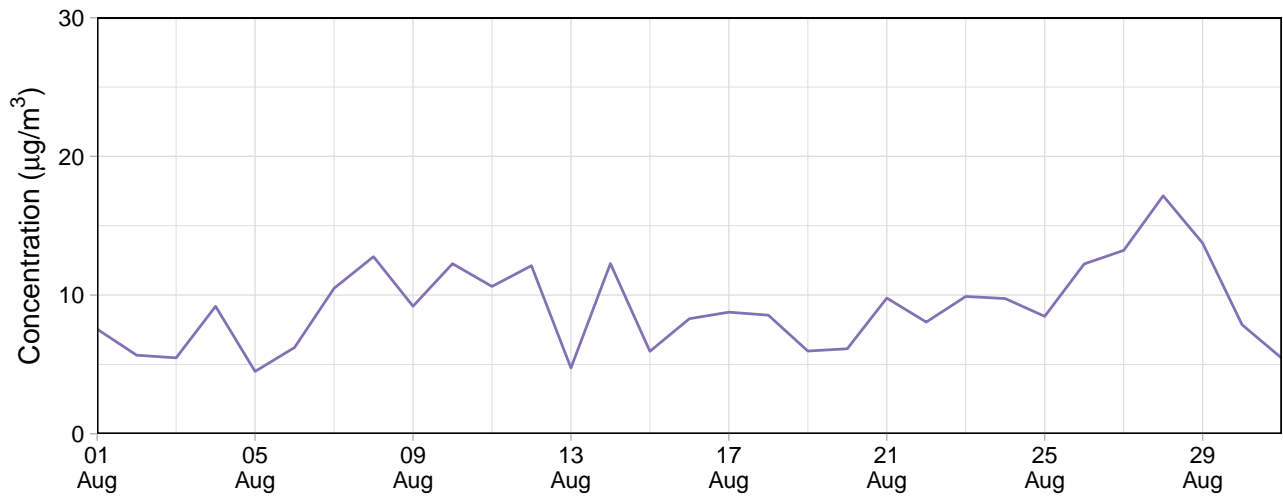


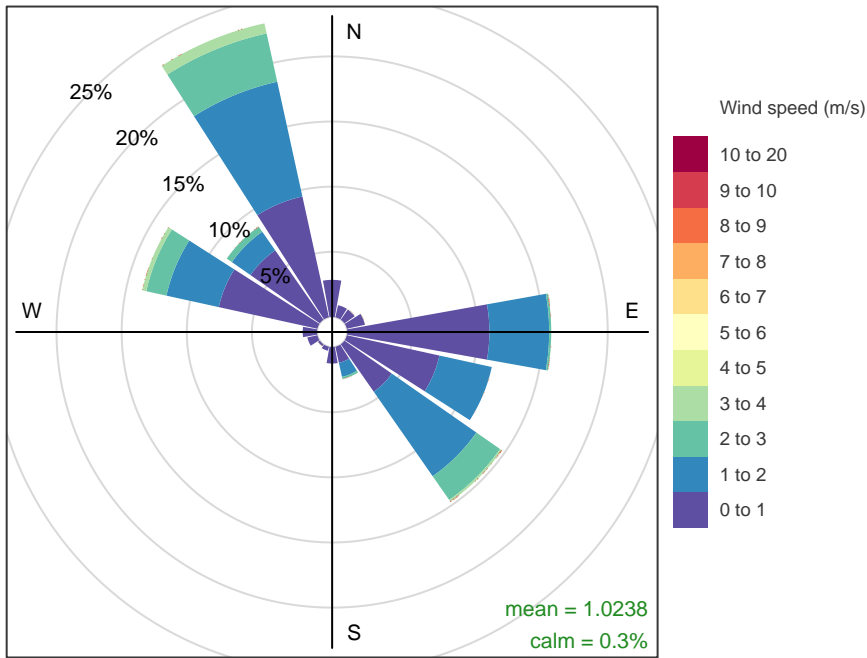
Eastern Grounds

Eastern Grounds – 24-hour average PM₁₀

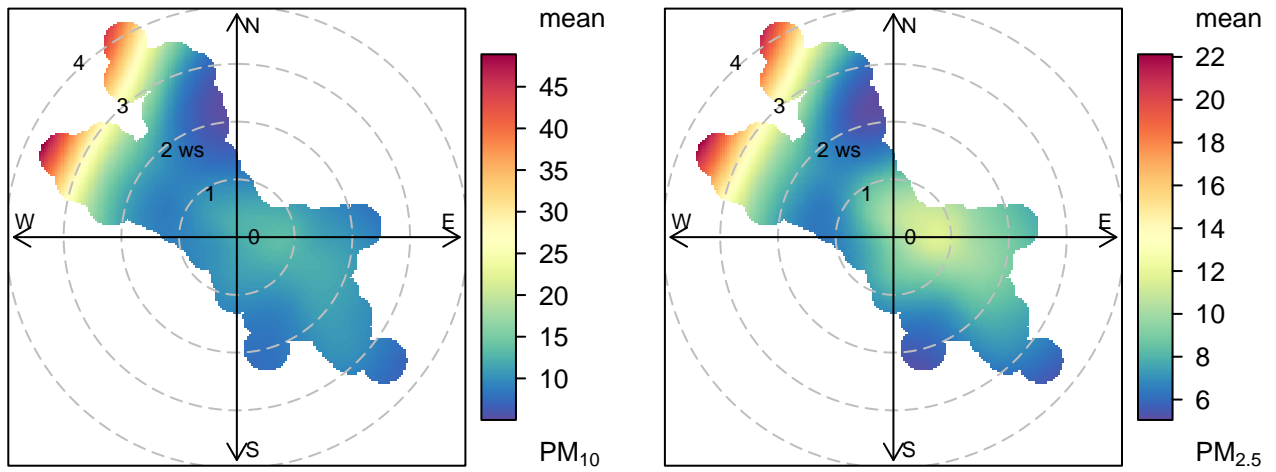


Eastern Grounds – 24-hour average PM_{2.5}



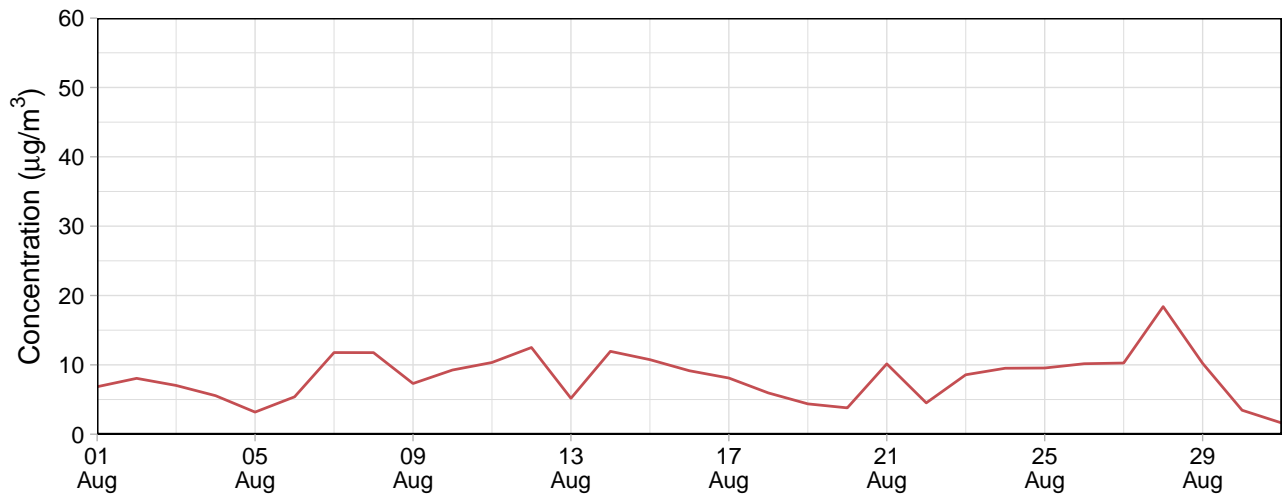


Frequency of counts by wind direction (%)

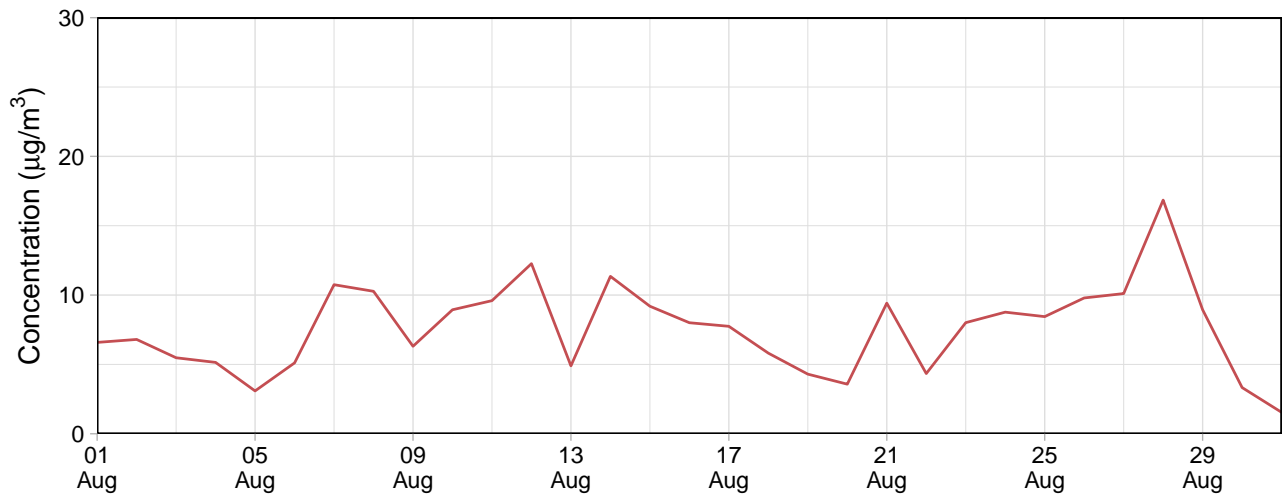


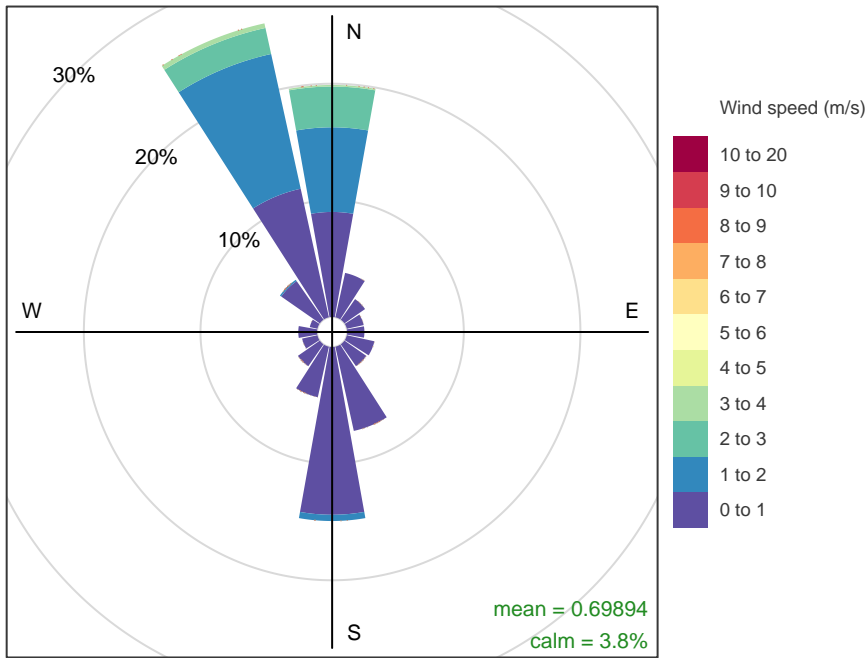
Southern Grounds

Southern Grounds – 24-hour average PM₁₀

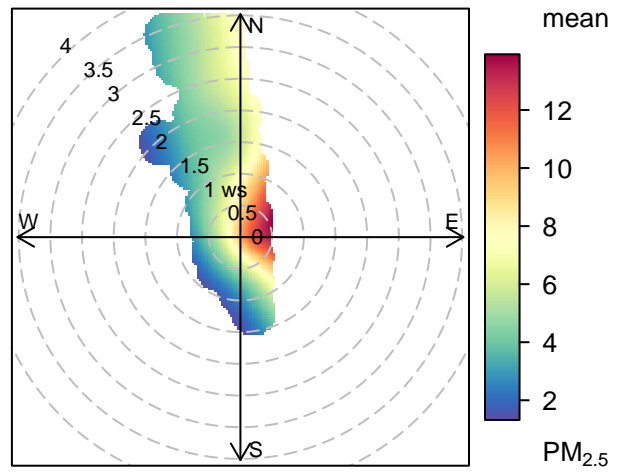
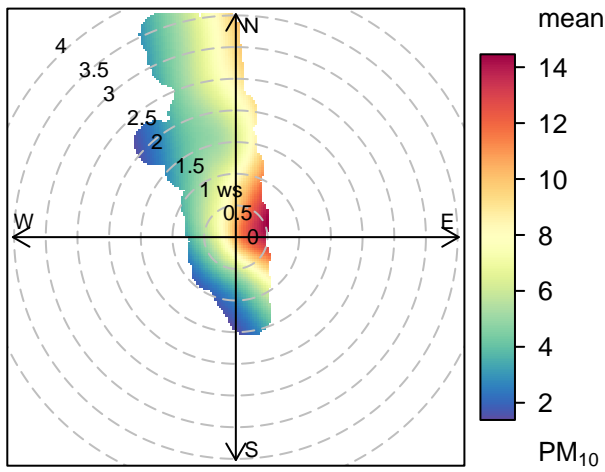


Southern Grounds – 24-hour average PM_{2.5}



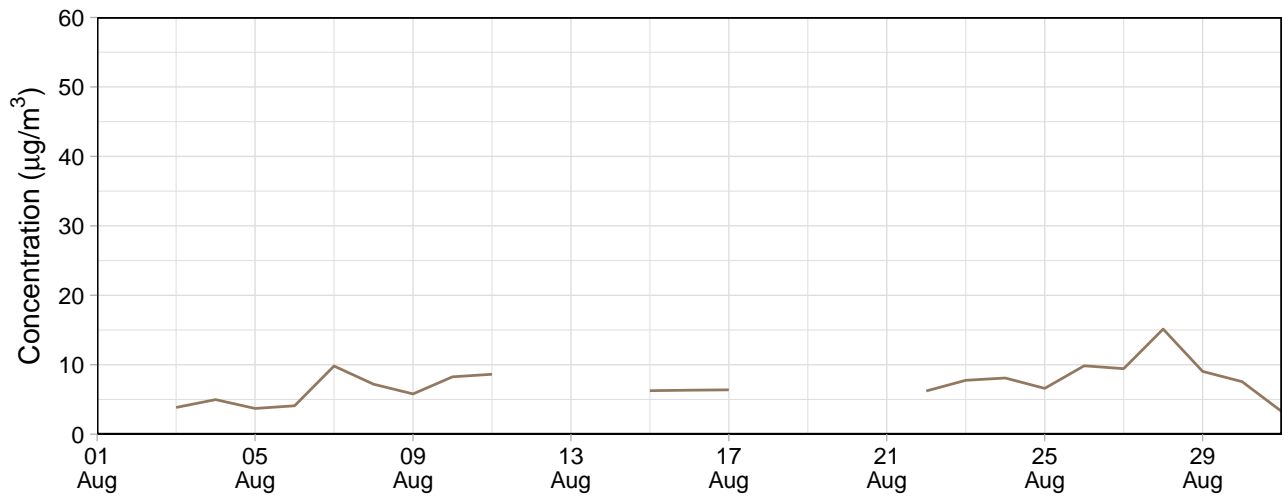


Frequency of counts by wind direction (%)

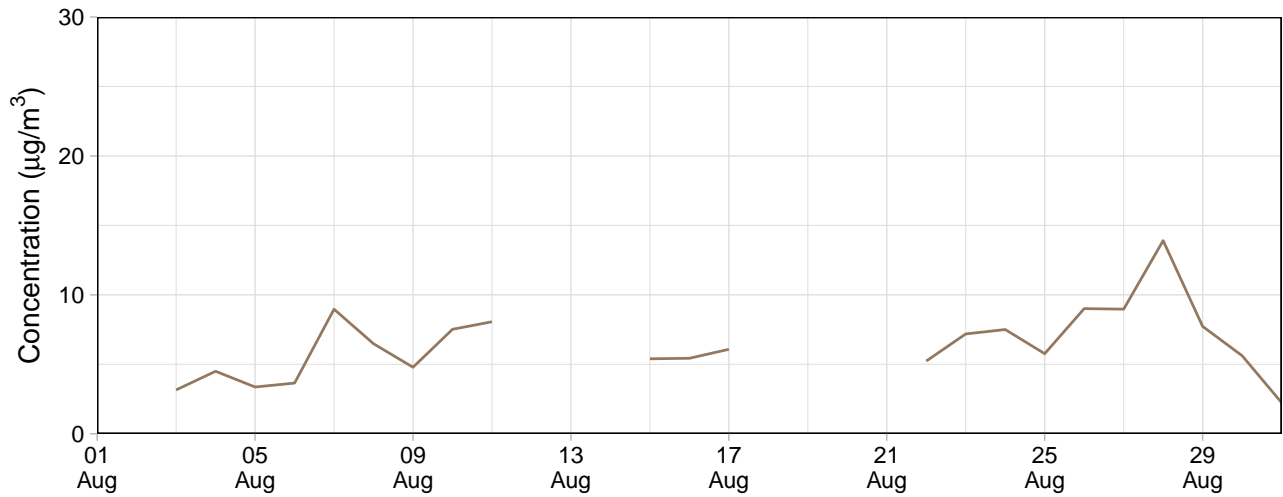


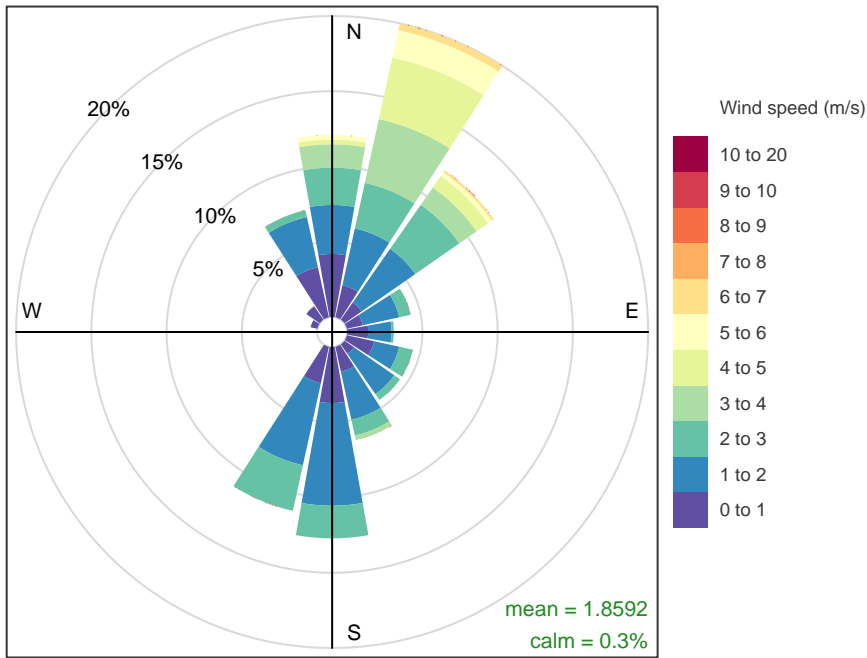
Block 9

Block 9 – 24-hour average PM₁₀

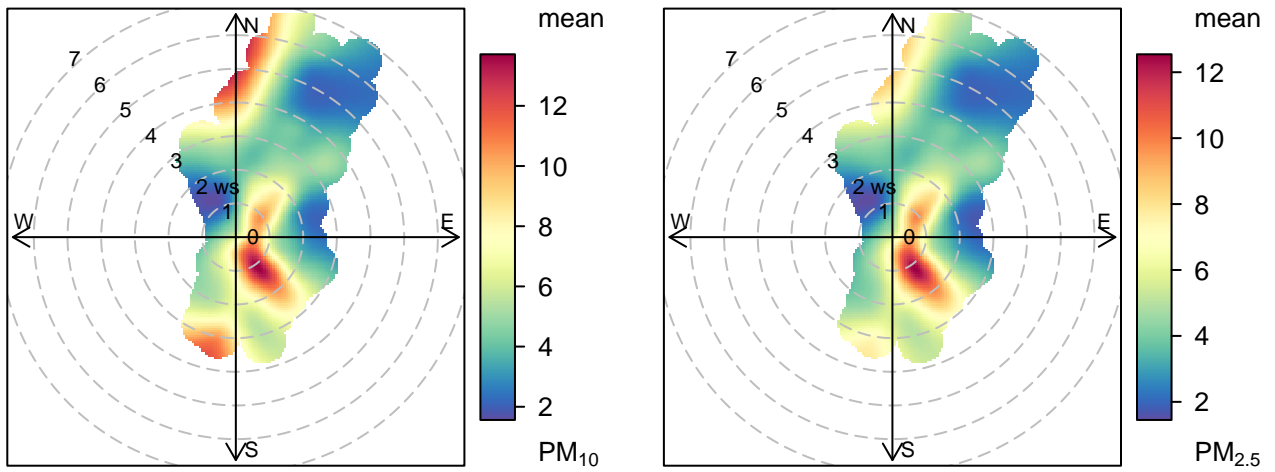


Block 9 – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



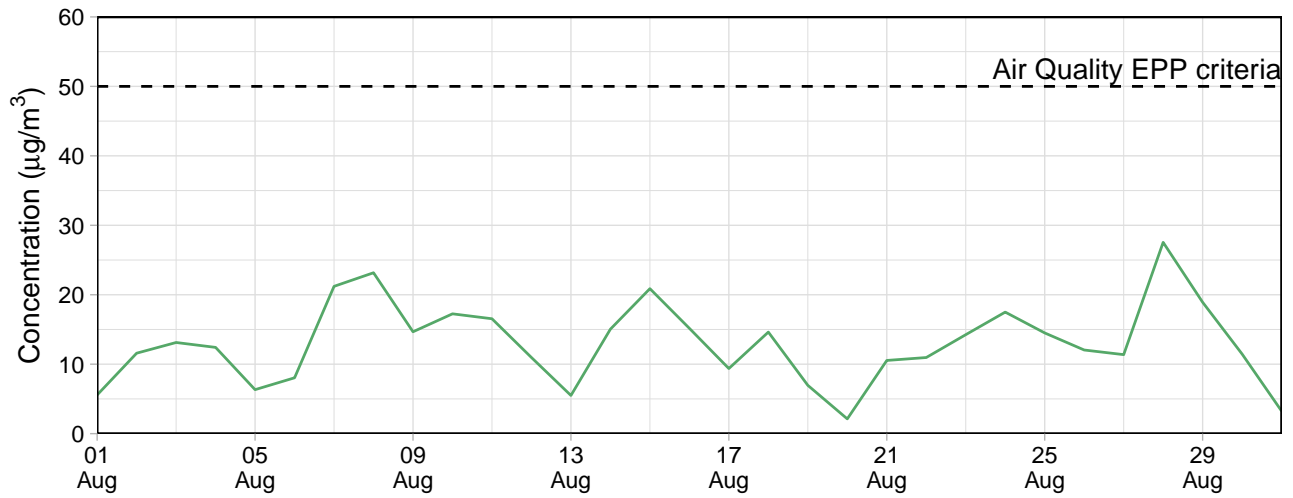
EPA Monitoring

Le Fevre 1

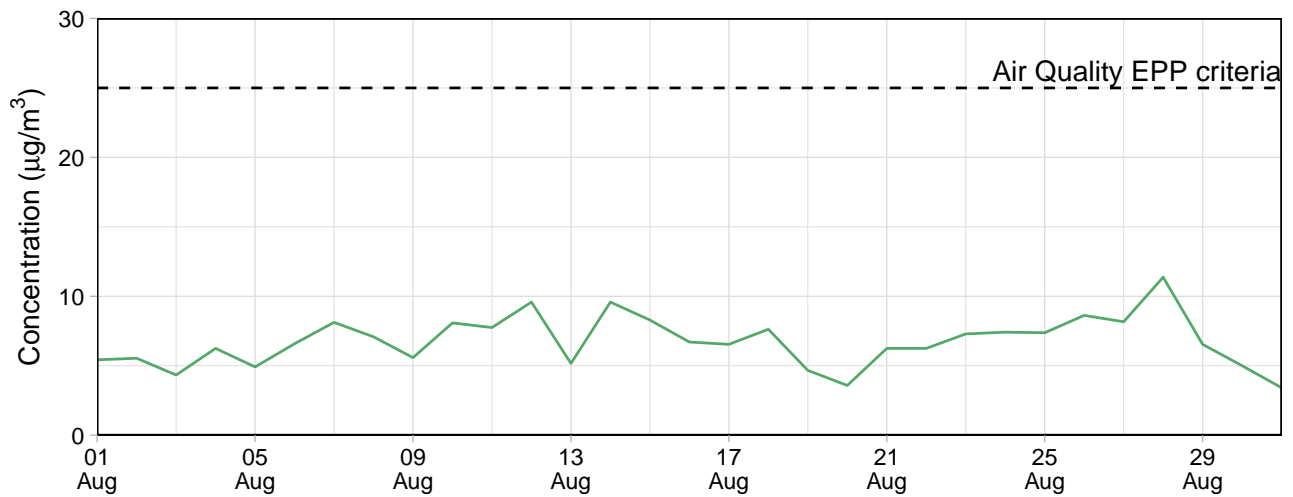
Table 3: Summary of 24-hour average data collected at EPA monitors ($\mu\text{g}/\text{m}^3$)

Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Le Fevre 1	2.1	13	27.5	100	3.4	6.7	11.4	100

Le Fevre 1 – 24-hour average PM₁₀



Le Fevre 1 – 24-hour average PM_{2.5}



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Monitoring Summary (01 Sep, 2023 - 30 Sep, 2023)

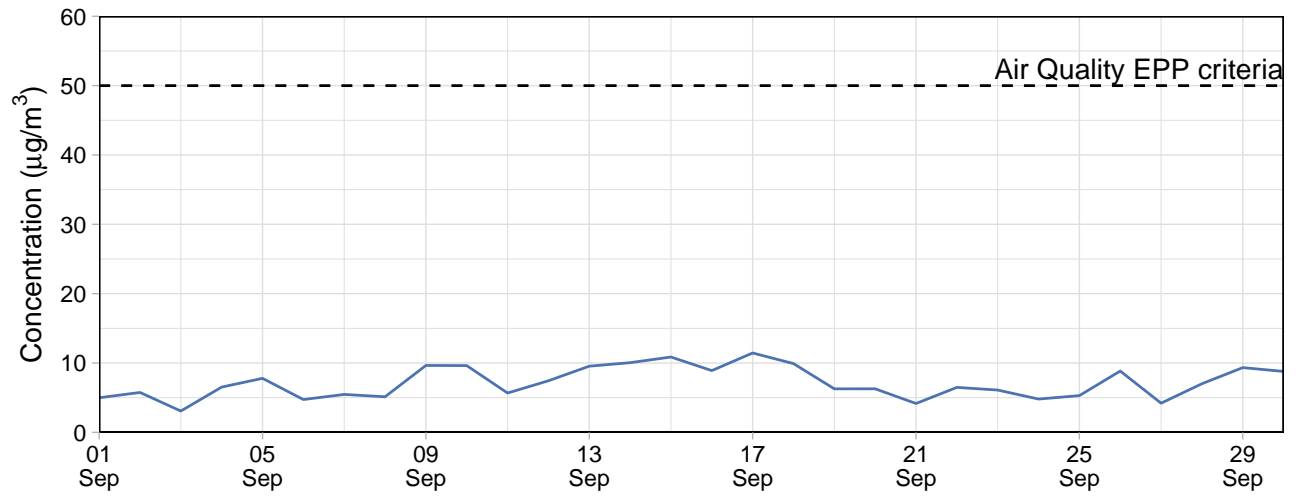
Public Monitors

Table 1: Summary of 24-hour average data collected at public monitors ($\mu\text{g}/\text{m}^3$)

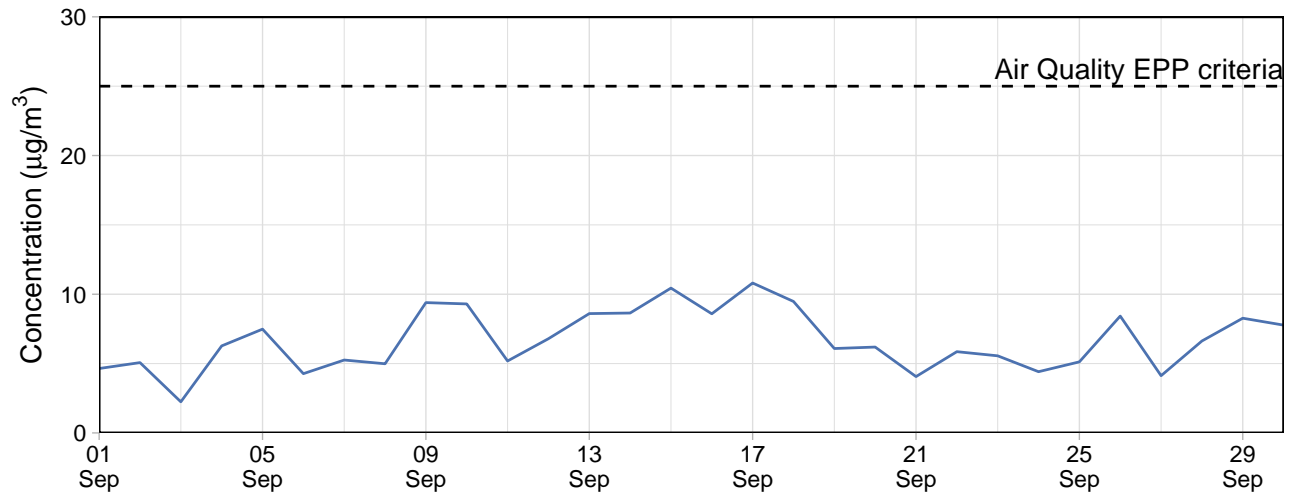
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Community Park	3.1	7.1	11.4	100	2.2	6.7	10.8	100

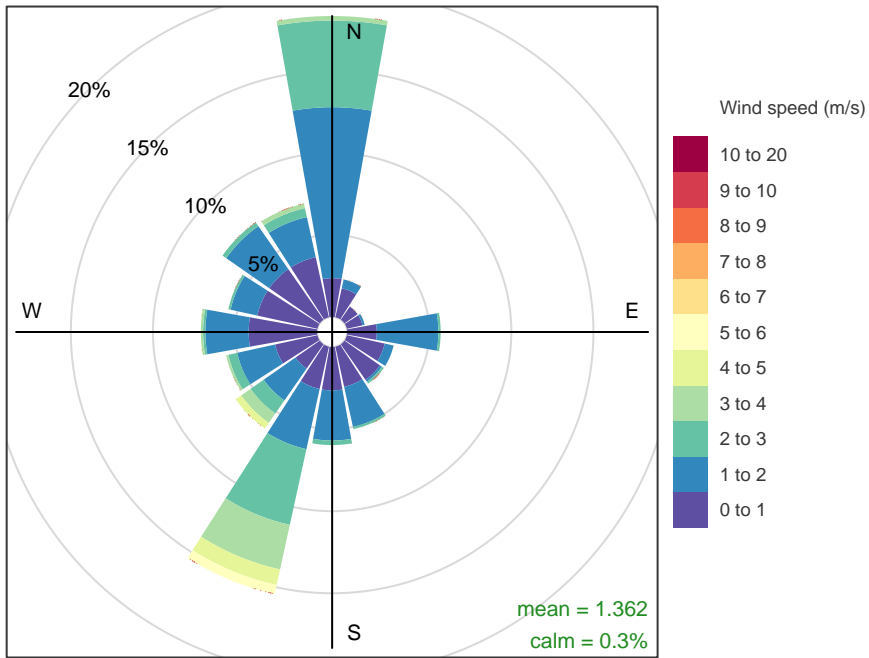
Community Park

Community Park – 24-hour average PM₁₀

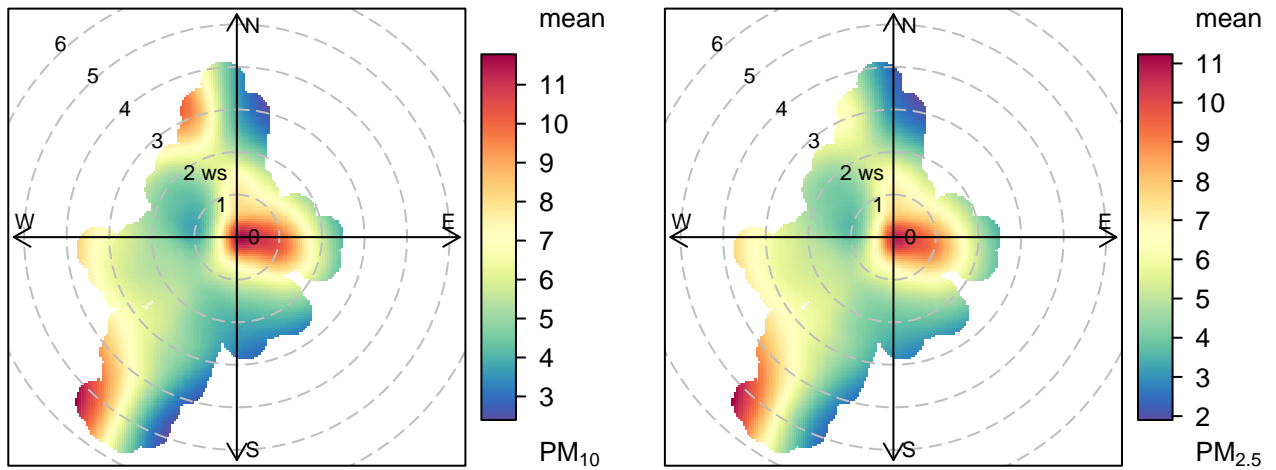


Community Park – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



Gunn Street

No data available for the reporting period.

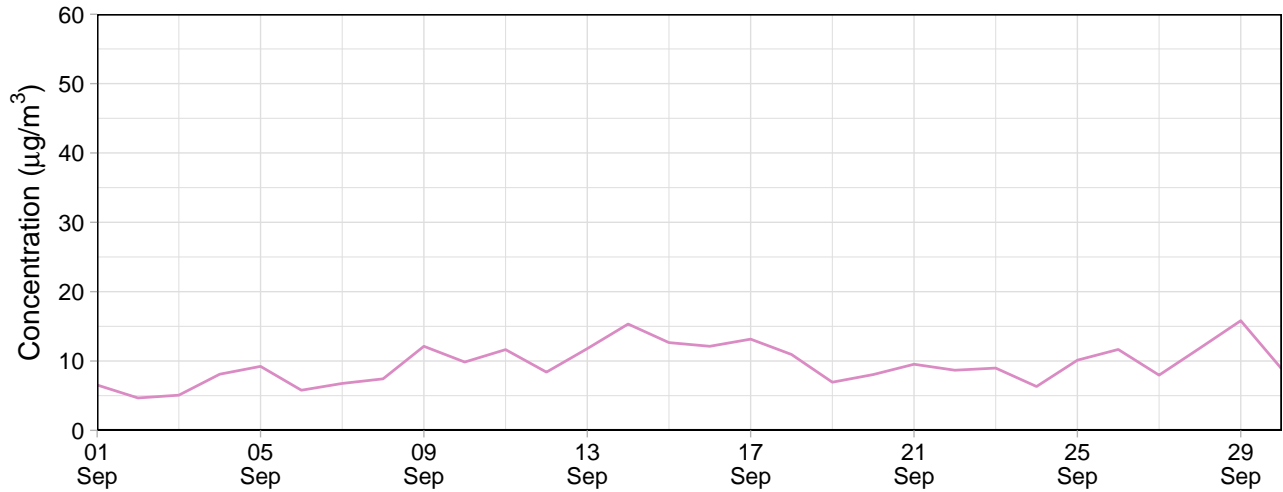
Internal Monitors

Table 2: Summary of 24-hour average data collected at internal monitors ($\mu\text{g}/\text{m}^3$)

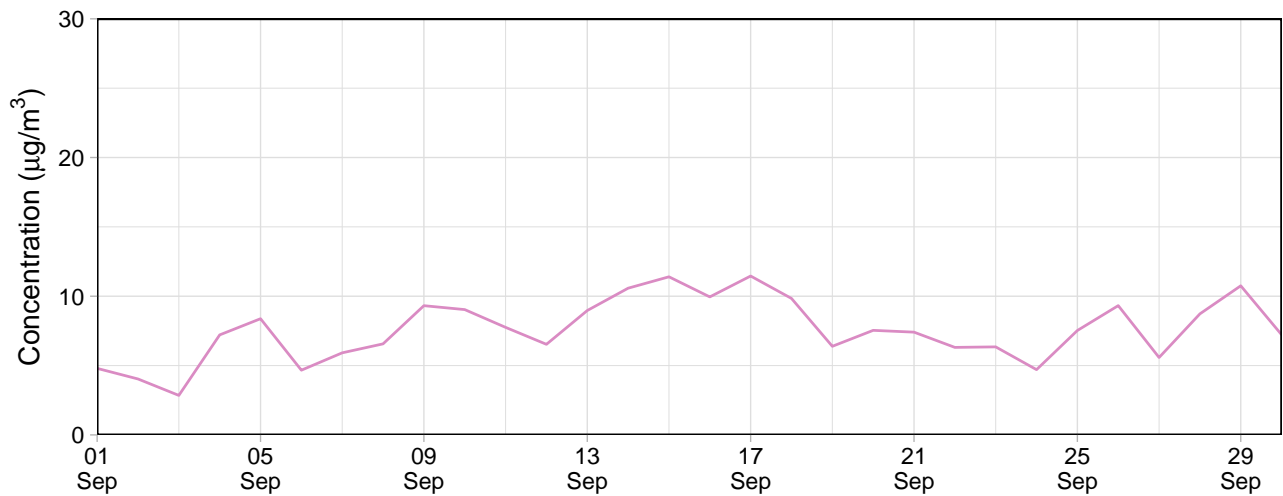
Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Southern Grounds	4.7	8.6	14.4	100	4.3	7.8	12.6	100
Eastern Grounds	5.2	10.9	17.9	100	2.8	8.7	12.4	100
Block 9	2.1	7.1	12.0	100	1.7	6.3	10.9	100
Northern Grounds	4.7	9.5	15.8	100	2.8	7.6	11.5	100

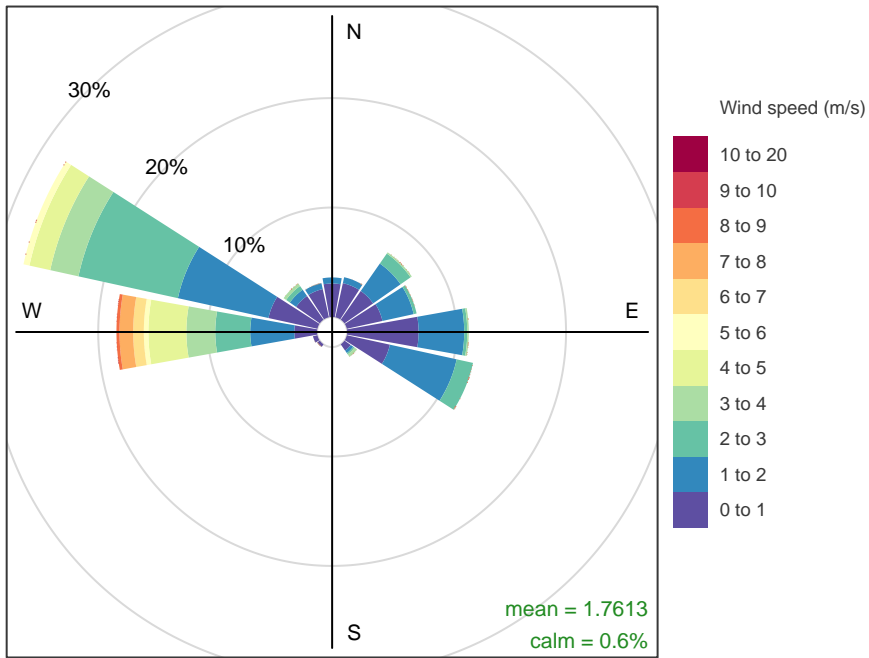
Northern Grounds

Northern Grounds – 24-hour average PM₁₀

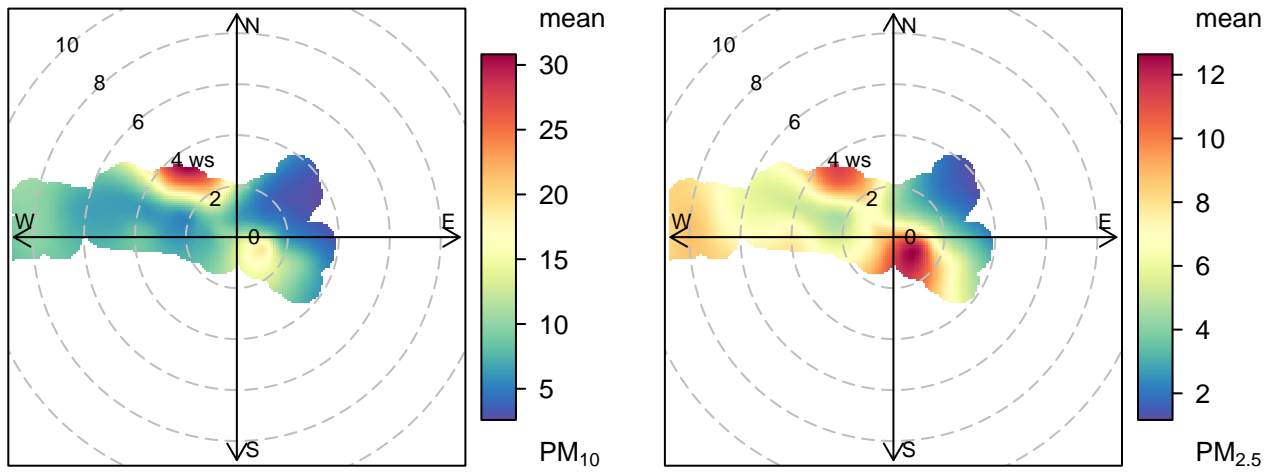


Northern Grounds – 24-hour average PM_{2.5}



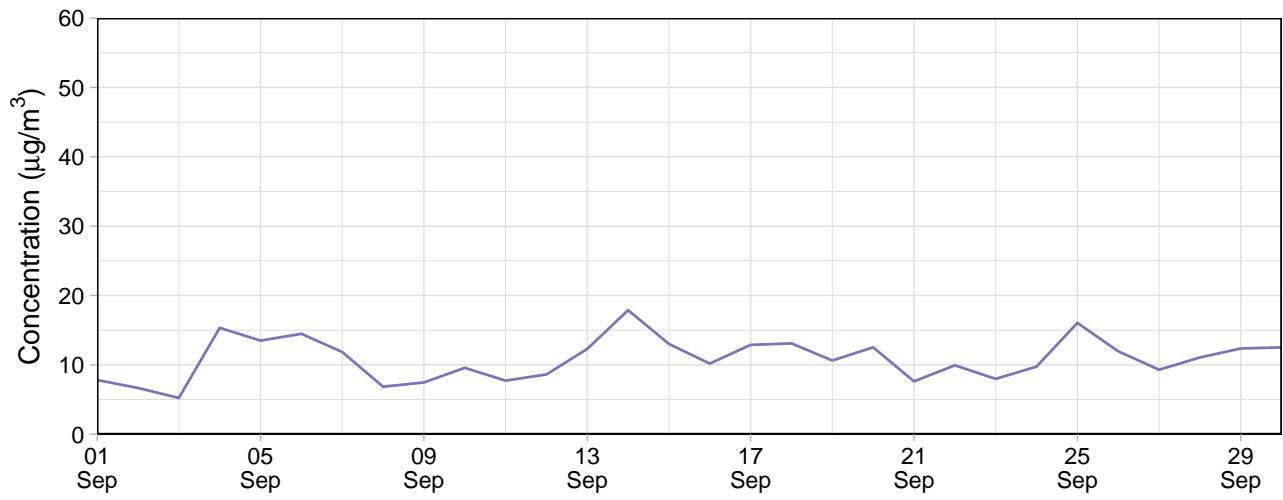


Frequency of counts by wind direction (%)

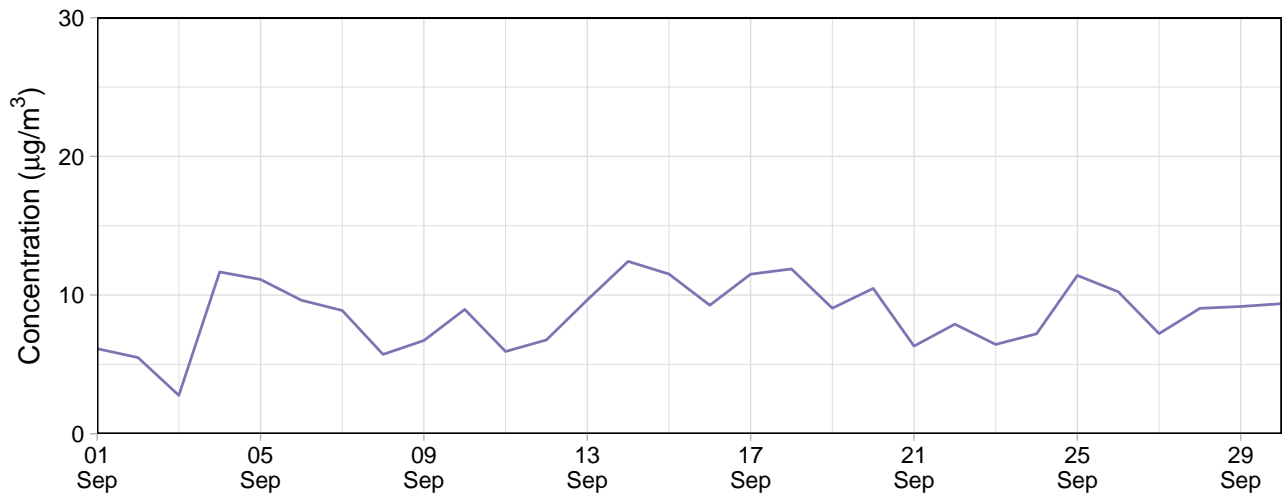


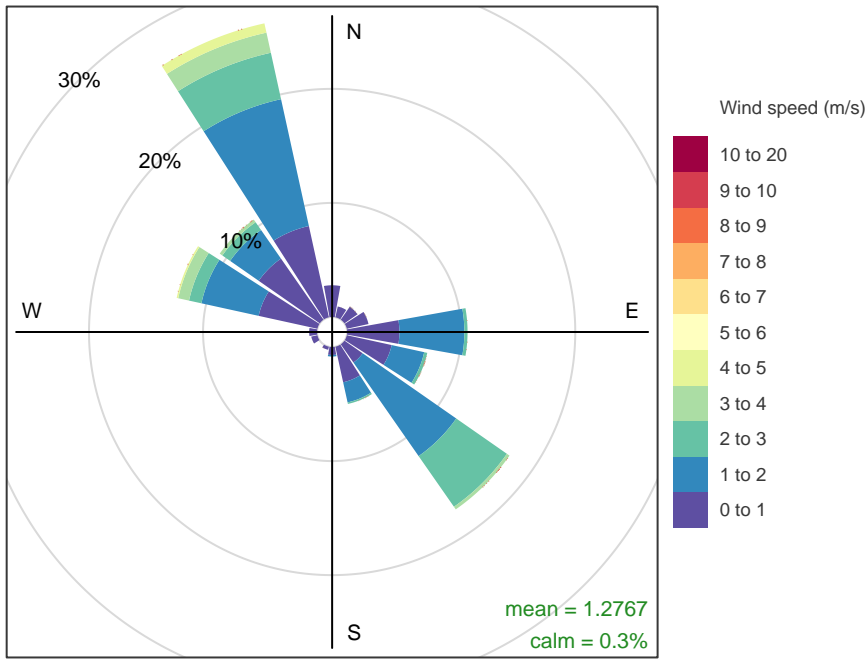
Eastern Grounds

Eastern Grounds – 24-hour average PM₁₀

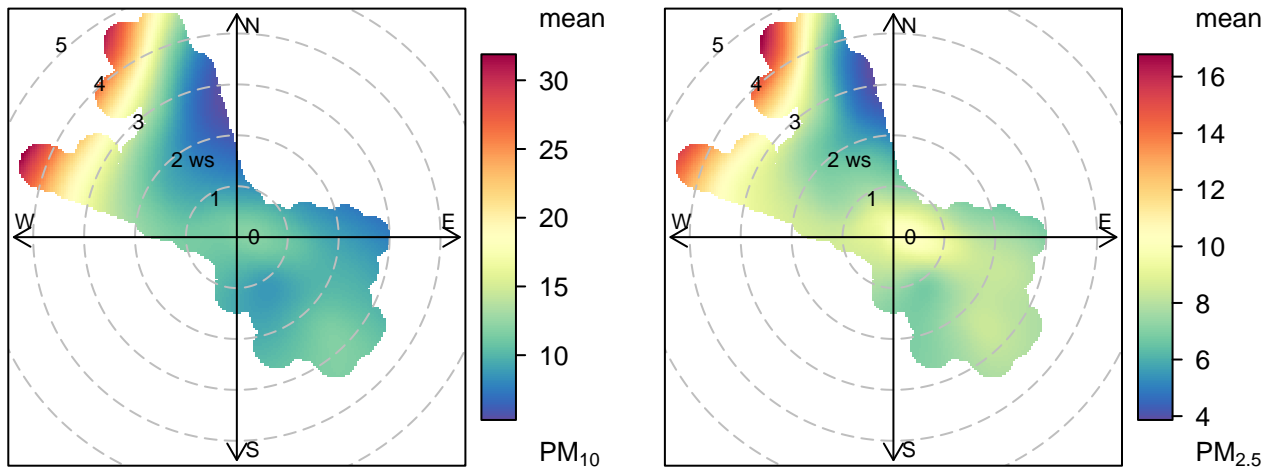


Eastern Grounds – 24-hour average PM_{2.5}



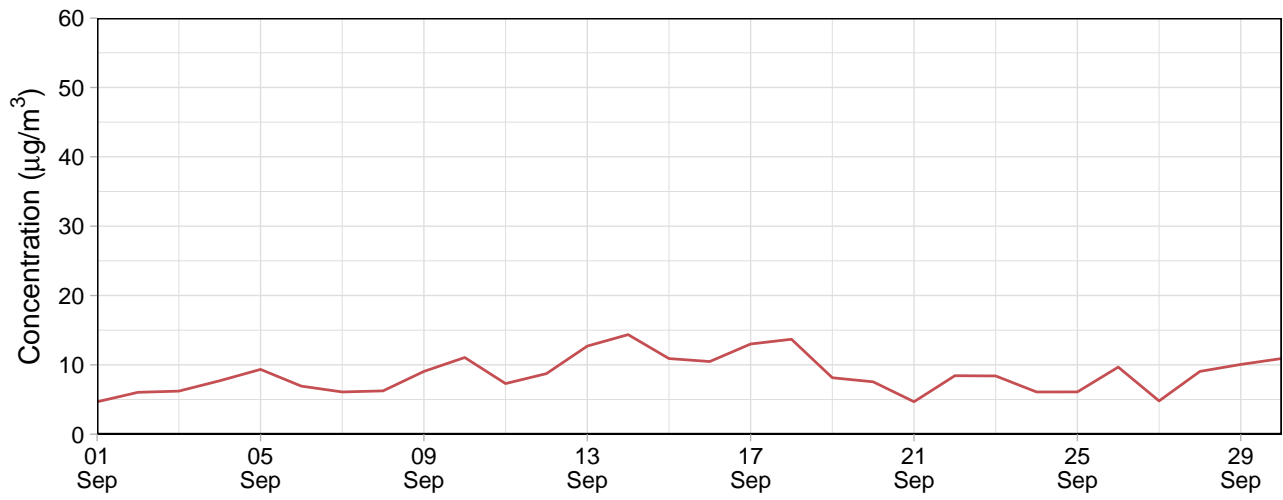


Frequency of counts by wind direction (%)

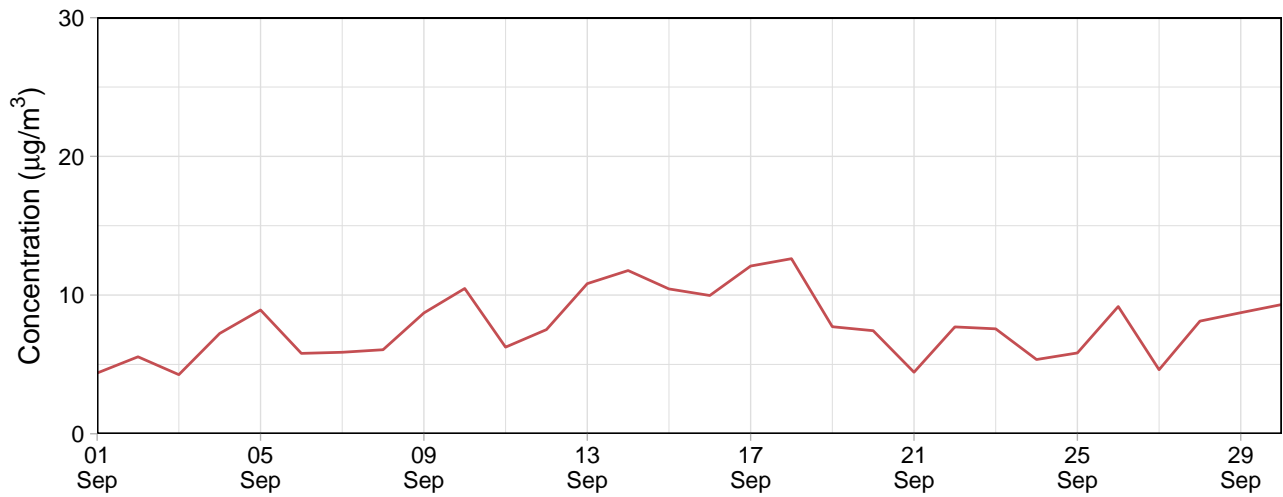


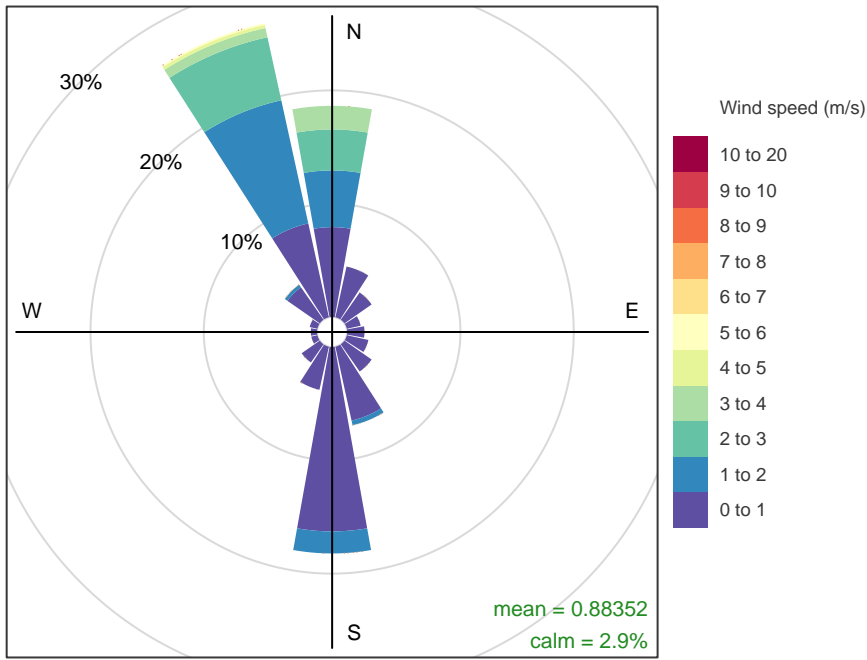
Southern Grounds

Southern Grounds – 24-hour average PM₁₀

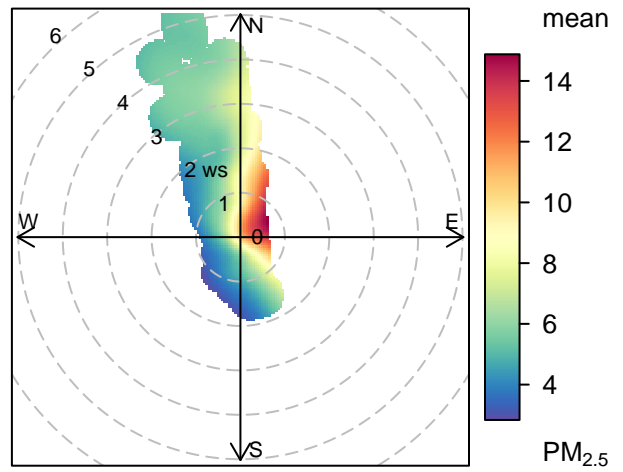
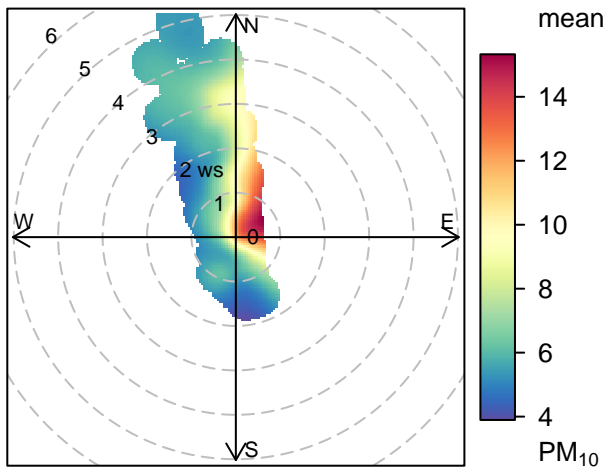


Southern Grounds – 24-hour average PM_{2.5}



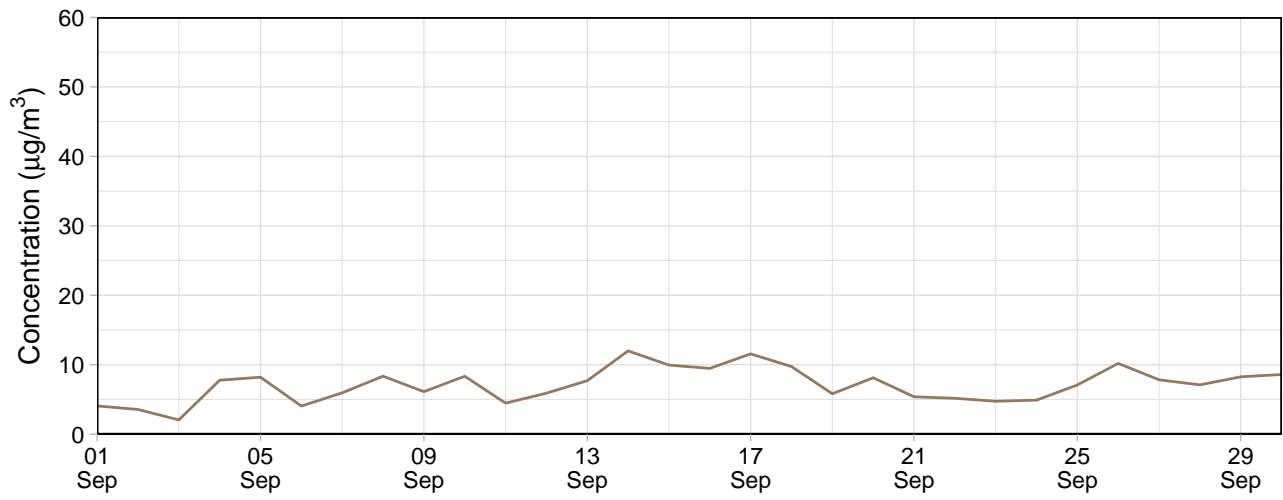


Frequency of counts by wind direction (%)

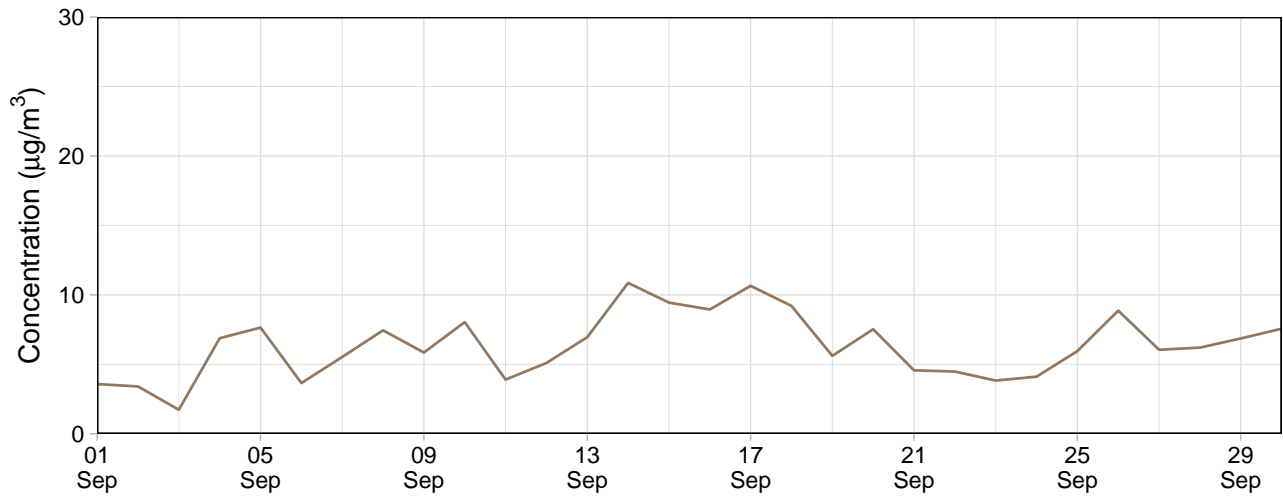


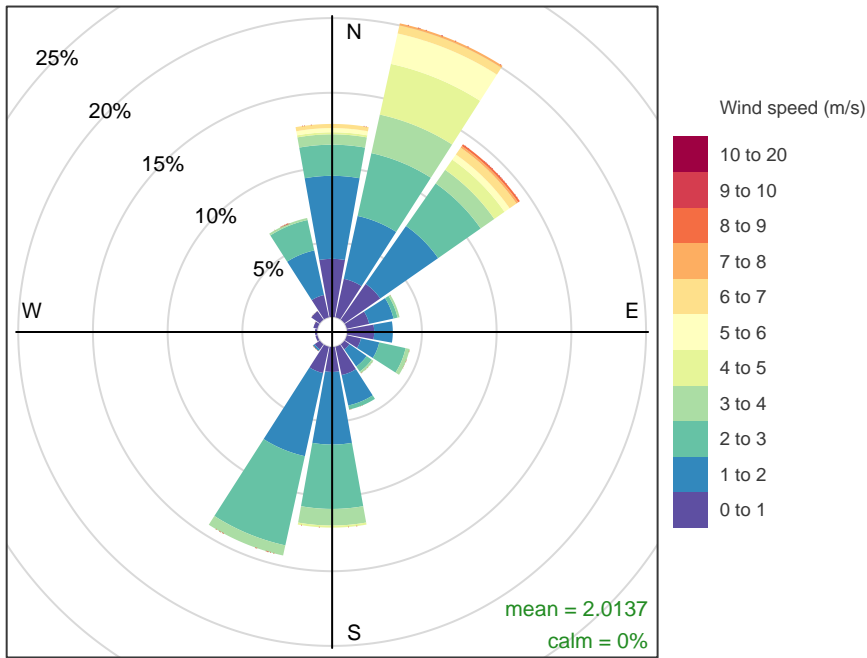
Block 9

Block 9 – 24-hour average PM₁₀

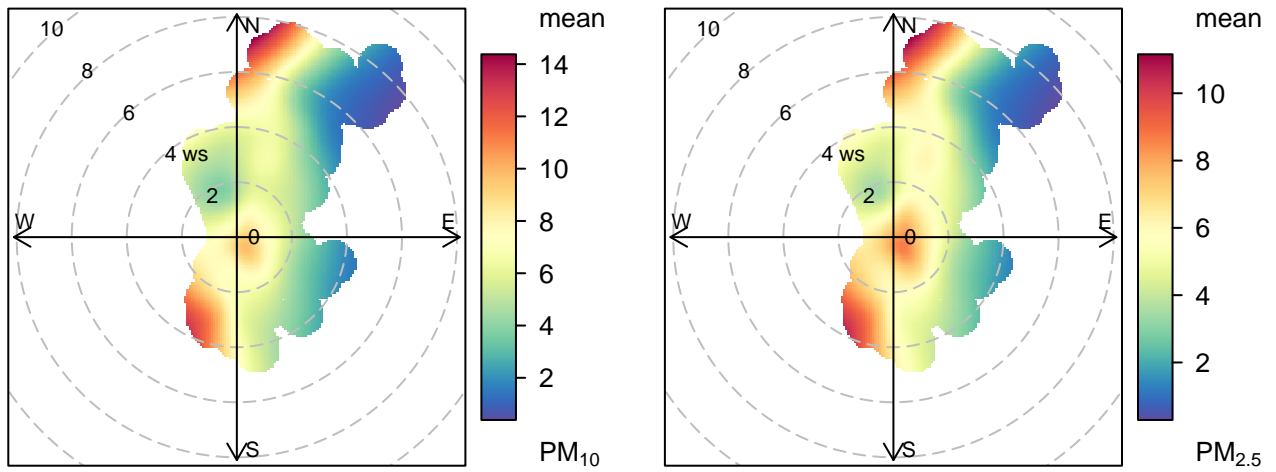


Block 9 – 24-hour average PM_{2.5}





Frequency of counts by wind direction (%)



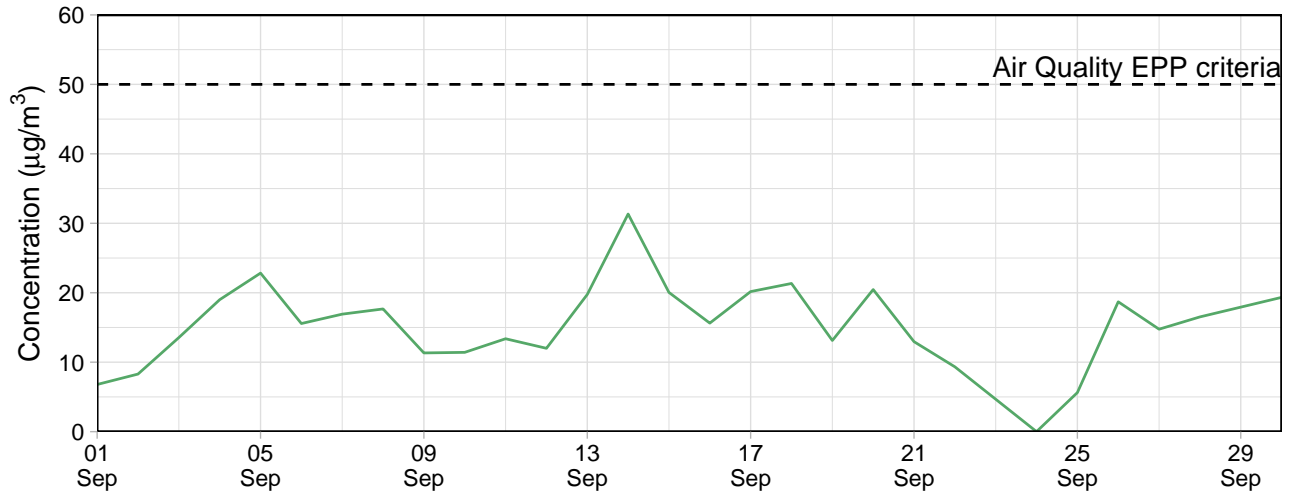
EPA Monitoring

Le Fevre 1

Table 3: Summary of 24-hour average data collected at EPA monitors ($\mu\text{g}/\text{m}^3$)

Site	PM ₁₀				PM _{2.5}			
	Min	Avg	Max	Capture (%)	Min	Avg	Max	Capture (%)
Le Fevre 1	0	15.3	31.3	100	0	6.3	10.3	100

Le Fevre 1 – 24-hour average PM₁₀



Le Fevre 1 – 24-hour average PM_{2.5}

