



Peace Airshed Zone Association

Ambient Air Monitoring Network Summary

Ambient Air Quality Monitoring Program

Monthly Report

March 2021

April 30, 2021

Alberta Environment and Parks

11th Floor, Oxbridge Place
9820-106 Street
Edmonton Alberta T5K 2J6

Subject: **Peace Airshed Zone Association (PAZA)**
March 2021 Ambient Air Quality Monitoring Report

Please find enclosed the PAZA Ambient Air Quality Monitoring Network Report for the month of March 2021.

The representative of the Person Responsible for this monitoring program is:

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This report was prepared by Matrix Solutions Inc. and reviewed by Mandeep Dhaliwal.

PAZA has retained the services of WSP Canada Inc. to conduct continuous ambient monitoring and Matrix Solutions Inc. to provide data validation and reporting.

This report is submitted by PAZA on behalf of the industrial member companies to satisfy the requirements of the facility Operating Approvals listed in Table A

The monthly summary report includes the operational summaries and hourly continuous monitoring and monthly passive results

Continuous Monitoring:

Seven (7) Stations including Henry Pirker (Grande Prairie), Evergreen Park, Smoky Heights, Beaverlodge, Valleyview, Donnelly and Wembley-Portable. Detailed Summaries are included in the report

Calibration and Data Submission:

Monthly report, hourly data and calibration reports for March 2021 were submitted to the ETS data system.

Table A. PAZA members with Facility Operating Approvals

Company	Facility	LSD	EPEA Approval No.
Advantage Oil & Gas Ltd.	Glacier	05-02-076-13-W6	262479-00-00
Alberta Power (2000) Ltd. (an ATCO company)	Sturgeon	SW-06-069-21-W5	10283-02-02
ATCO Power Canada	Poplar Hill	11-19-073-08-W6	67774-01-01
ATCO Power Canada	Valleyview	SW-06-069-21-W5	147709-01-01
AltaGas Ltd.	Pouce Coupe	03-03-081-13-W6	247673-00-00
	Ante Creek	02-26-068-25-W5	266694-00-00
	Gordondale	02-26-068-25-W5	287474-00-00
Apache Canada Ltd.	House Mountain	01-08-070-10-W5	10137-02-02
Birchcliff Energy Ltd.	Pouce Coupe	03-22-078-12-W6	252529-00-00
Canadian Natural Resources Limited	Bonanza	11-25-081-11-W6	00000029-01-00
	Progress/Gordondale	01-01-077-10-W6	00010036-02-00
	Gold Creek	13-26-067-05-W6	00010446-02-00
	Teepee Creek	SE-2-074-04-W6	00001635-02-00
	Sturgeon/Valleyview	02-02-069-22-W5	1633-02-00
Canfor Forest Products	Grande Prairie	SW-23-071-06-W6	152645-01-00
Conocophillips Canada Energy Partnership	Wembley	06-19-073-08-W6	00000212-01-00
Devon Canada	NW Belloy (Dunvegan)	16-36-079-03-W6	00009810-02-00
	Eaglesham (South)	02-14-077-25-W5	00047669-01-00
	North Normanville	03-36-079-23-W5	00047455-01-00
	West Culp	05-34-078-25-W6	00136284-00-00
	Cecil	08-15-084-08-W6	00010032-02-00
Encana Corporation	Sexsmith	04-08-075-07-W6	00010002-01-00
Enerplus Resources	Pouce Coupe	SW-06-069-21-W5	1464-02-03
Exshaw Oil Corporation	Spirit River	03-10-077-07-W6	344521-00-00
Grande Prairie Generation Inc.	Northern Prairie Power Project	04-19-073-08-W6	00238762-00-00
Inception Exploration Ltd.	Gold Creek	03-26-069-05-W6	00335317-00-02
Long Run Exploration	Eaglesham	01-25-076-01-W6	00241532-00-00
	Kakut	14-12-075-03-W6	00248469-00-00
	Donnelly	06-01-077-21-W5	00000087-02-00
	Puskwaskau	03-26-074-01-W6	00017524-01-00
Longview Oil Corp.	Sunset House	06-22-070-20-W5	138884-01-00
Penn West Petroleum Ltd.	Tangent	13-29-080-23-W5	00001746-02-00
	Pouce Coupe	16-07-078-11-W6	00000614-01-00
Petrus Resources	Rycroft	08-25-077-06-W6	11351-02-00
	Spirit River	08-34-077-06-W6	11096-02-00
NorthRiver Midstream Inc.	Fourth Creek	16-11-082-09-W6	00000263-01-00
	Gordondale	11-26-079-09-W6	00011495-01-01
	Pouce Coupe/Bonanza	03-23-080-13-W6	00070203-01-01
Suncor Energy Inc.	Progress	07-22-078-09-W6	00011428-02-00
Strathcona Resources Ltd.	Jayar Sour Gas Processing Plant	06-08-062-03 W6	3612040
TAQA North Ltd.	Valhalla	13-21-076-09-W6	00017620-01-00
Veresen Energy	Hythe Brainard	11-18-074-12-W6	00010910-02-00
Weyerhaeuser Canada	Grande Prairie Pulp and Wood Plant	01-14-070-05-W6	00000113-02-00

Concentrations in excess of the Clean Air (Maximum Levels) Regulation:

There were no readings above the AAAQO or AAAQG

Operational times less than 90 percent:

There were no operational times less than 90% in March 2021

Air Incidents

None were reported to PAZA

Deviations from Authorized Monitoring Methods

None to report.

Passive Monitoring

- 38 Stations throughout the PAZA zone, the passive sample analyses were performed by Bureau Veritas Laboratories
- There were twelve duplicate sites sampled in the month of March with RPD ranging from 4 to 16% (SO₂), 4% (O₃), 0 to 34% (NO₂), 10% (H₂S);
 - SO₂ duplicates at Wembley, Gold Creek, McLennan, Peavine, Jayar Bone Yard stations
 - O₃ duplicate at Bay Crooked Creek station
 - NO₂ duplicates at Steeprock Creek, Spirit River, Wanham, Grande Prairie I, Jayar Bone Yard stations
 - H₂S duplicate Jayar Camp station
- The following field notes were listed of potential issues.
 - Site 16 (Beaverlodge) – Collected, from two month exposure
 - Girouxville 4 – duplicate not collected due to road conditions
 - Milner Sites collected and reported separately.
- There were no exceedances of the AAAQOs for all monitored parameters at any of the passive monitoring stations during this month.

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements.

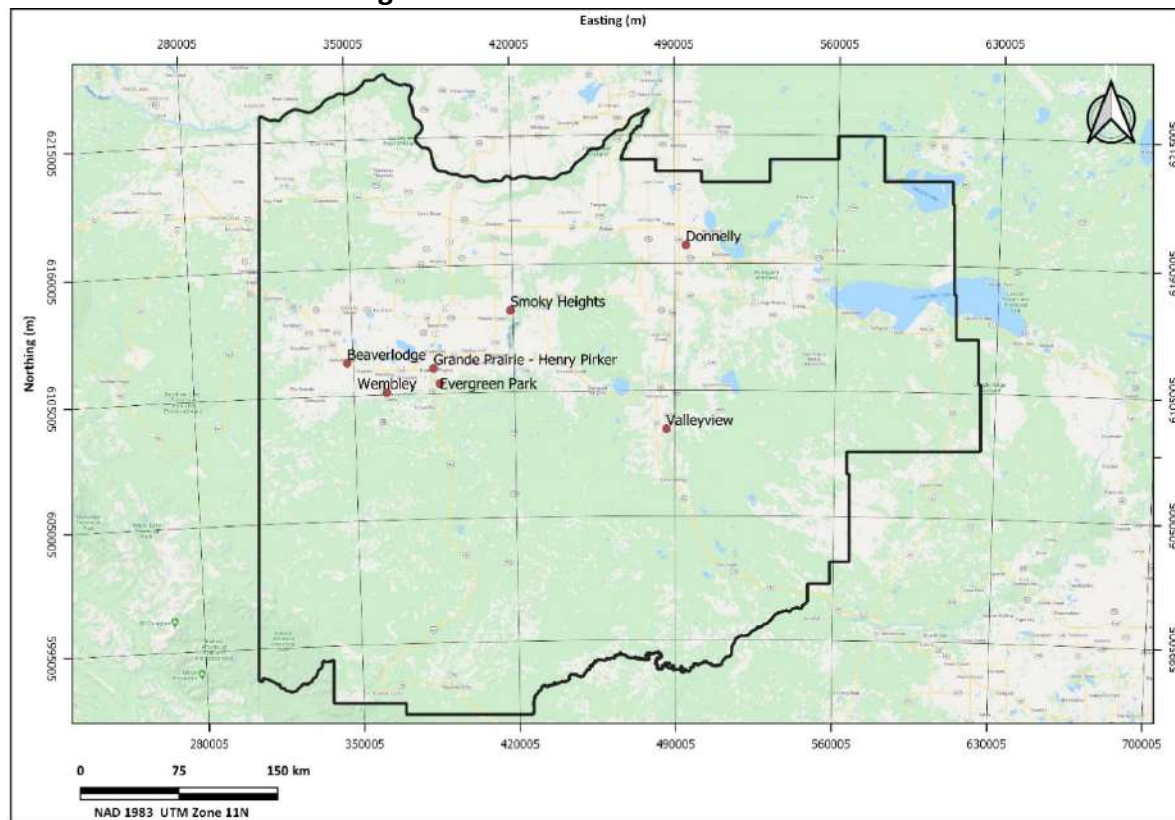


Mandeep Dhaliwal, B.Sc., P.Chem.
Program Manager

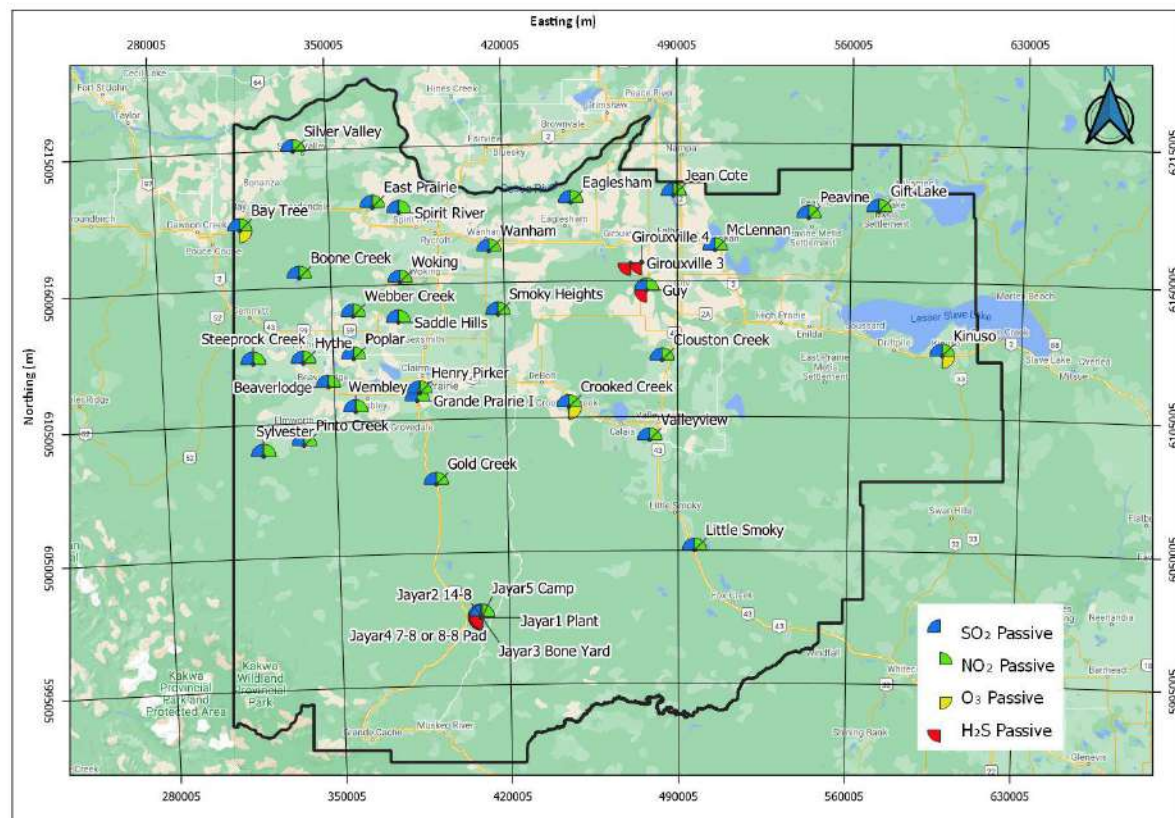
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PAZA Continuous Monitoring Station Locations



PAZA Passive Monitoring Station Locations



1 March Monthly Station Summaries

The following summaries are for the equipment and data results from the continuous ambient monitoring network

1.1 Beaverlodge Air Monitoring Station

PAZA - March 2021 Beaverlodge Station Report

Parameter	March		Valid	Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum				Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
NO (ppb)	0.8	0.0	95.0%	100.0%	15.6	-	Mar-04 12:00	3.8	-	Mar-04	-	-	-	-	Mar 02, 2021
NO ₂ (ppb)	4.1	0.4	95.0%	100.0%	19.2	159	Mar-04 07:00	13.6	-	Mar-04	0	-	-	-	Mar 02, 2021
NO _x (ppb)	4.8	0.4	95.0%	100.0%	34.0	-	Mar-04 12:00	17.5	-	Mar-04	-	-	-	-	Mar 02, 2021
O ₃ (ppb)	37.0	12.0	95.3%	100.0%	50.3	76	Mar-20 15:00	45.3	-	Mar-31	0	-	-	-	Mar 02, 2021
PM _{2.5} (µg/m ³)	3.6	0.2	99.7%	100.0%	23.9	80	Mar-18 02:00	12.9	29	Mar-04	0	-	0	-	Mar 04, 2021
SO ₂ (ppb)	0.8	0.0	95.3%	100.0%	14.0	172	Mar-18 02:00	4.4	48	Mar-18	0	-	0	0	Mar 04, 2021
Average															
Temp (°C)	-0.9	-15.9	100.0%	100.0%	10.5										
RH (%)	64.4	30.4	100.0%	100.0%	100.0										
WS (km/hr)	11.2	0.4	100.0%	100.0%	48.6										
WD (deg)	267	0.8	100.0%	100.0%	355.3										

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction 267 W

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	Thermo	42i	No Operational issues noted during the month
O ₃	Thermo	49i	No Operational issues noted during the month
PM _{2.5}	Sharp	5030	No Operational issues noted during the month
SO ₂	Thermo	43i-TLE	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.2 Evergreen Park Air Monitoring Station

PAZA - March 2021 Evergreen Park Station Report

Parameter	March		Valid	Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum				Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
PM _{2.5} (µg/m ³)	3.2	0.0	98.8%	99.7%	23.2	80	Mar-18 13:00	10.9	29	Mar-18	0	-	0	-	Mar-17-2021
SO ₂ (ppb)	0.4	0.0	95.3%	100.0%	19.0	172	Mar-15 12:00	1.4	48	Mar-15	0	-	0	0	Mar-17-2021
TRS (ppb)	0.6	0.0	95.3%	100.0%	2.8	-	Mar-01 15:00	1.1	-	Mar-01	-	-	-	-	Mar-17-2021
Average															
Temp (°C)	-1.6	-21.8	100.0%	100.0%	11.0										
RH (%)	65.5	27.7	100.0%	100.0%	96.6										
WS (km/hr)	3.9	0.0	100.0%	100.0%	17.1										
WD (deg)	263	0.1	100.0%	100.0%	359.0										

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction 263 W

Update Summary:

Parameter	Make	Model	Equipment summary
PM _{2.5}	Thermo	TEOM AB	No Operational issues; Negative drift resulted in 2 hrs removed
SO ₂	TECO	43i	No Operational issues
TRS	TECO	43C	No Operational issues
Met Equip	Gil/RMYoung	MetPak/RMY86004	No Operational issues

1.3 Grande Prairie - Henry Pirker Air Monitoring Station

PAZA - March 2021 Henry Pirker Station Report

Parameter	March				Operational	1-hour			8-hour / 24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid			Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	
NO (ppb)	6.1	0.0	95.2%	100.0%	191.1	-	-	Mar-01 10:00	33.1	-	Mar-01	-	-	-	-	Mar 08, 2021
NO ₂ (ppb)	13.4	0.7	95.2%	100.0%	67.3	159	-	Mar-01 11:00	30.5	-	Mar-03	0	-	-	-	Mar 08, 2021
NO _x (ppb)	19.7	0.8	95.2%	100.0%	255.0	-	-	Mar-01 10:00	58.2	-	Mar-01	-	-	-	-	Mar 08, 2021
O ₃ (ppb)	27.9	0.3	95.3%	100.0%	49.3	76	-	Mar-31 15:00	42.5	-	Mar-31	0	-	-	-	Mar 08, 2021
PM _{2.5} (µg/m ³)	4.9	0.2	99.5%	100.0%	32.7	80	-	Mar-17 07:00	12.3	29	Mar-18	0	-	0	-	Mar 05, 2021
SO ₂ (ppb)	0.5	0.0	95.3%	100.0%	12.2	172	-	Mar-16 11:00	1.9	48	Mar-25	0	-	0	0	Mar 08, 2021
H ₂ S (ppb)	0.3	0.0	95.3%	100.0%	2.3	10	-	Mar-01 10:00	0.6	3	Mar-01	0	-	0	-	Mar 05, 2021
CH ₄ (ppm)	2.2	1.9	95.2%	100.0%	4.6	-	-	Mar-06 11:00	2.6	-	Mar-03	-	-	-	-	Mar 09, 2021
THC (ppm)	2.2	1.9	95.2%	100.0%	4.7	-	-	Mar-03 07:00	2.7	-	Mar-03	-	-	-	-	Mar 09, 2021
NMHC (ppm)	0.0	0.0	95.2%	100.0%	0.7	-	-	Mar-03 07:00	0.1	-	Mar-03	-	-	-	-	Mar 09, 2021
CO (ppm)	0.3	0.0	95.3%	100.0%	1.5	13	-	Mar-01 10:00	0.4	5	Mar-01	0	0	-	-	Mar 09, 2021
Average																
Temp (°C)	-1.2	-22.6	100.0%	100.0%	11.5	<div>Note: Valid hours must be greater than 75%</div> <div>Operational hours must be greater than 90%</div>										
RH (%)	60.5	27.8	100.0%	100.0%	88.1											
SR (W/m ²)	96.0	0.0	100.0%	100.0%	506.3											
WS (km/hr)	6.8	0.2	98.1%	98.1%	31.7											
WD (deg)	274	0.0	98.1%	98.1%	359.3											
						Average Wind Direction		274 W								

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	Thermo	42i	No Operational issues noted during the month
O ₃	TECO	49i	No Operational issues noted during the month
PM _{2.5}	Sharp	5030	No Operational issues noted during the month
SO ₂	TEI	43i-TLE	No Operational issues noted during the month
H ₂ S	TEI	450i	No Operational issues noted during the month
THC/CH ₄ /NMHC	TEI	55i	No Operational issues noted during the month
CO	TEI	48i-TLE	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month; March 23-24 wind head froze resulting in 14hrs removed

1.4 Smoky Heights Air Monitoring Station

PAZA - March 2021 Smoky Heights Station Report

AAR - March 2021 Smoky Heights Station Report																
Parameter	March				1-hour			24-hour			Exceedance				Calibration	
	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	Date	
PM _{2.5} (µg/m³)	3.4	0.0	99.6%	100.0%	15.9	80	Mar-04 19:00	9.7	29	Mar-04	0	-	0	-	Mar 03, 2021	
SO ₂ (ppb)	0.6	0.0	95.3%	100.0%	14.2	172	Mar-26 20:00	2.1	48	Mar-26	0	-	0	0	Mar 03, 2021	
TRS (ppb)	0.2	0.0	95.0%	100.0%	0.7	-	Mar-11 06:00	0.3	-	Mar-11	-	-	-	-	Mar 03, 2021	
	Average	Minimum	Valid	Operational	Maximum											
Temp (°C)	-2.5	-20.8	100.0%	100.0%	11.5	<div>Note: Valid hours must be greater than 75%</div> <div>Operational hours must be greater than 90%</div>										
WS (km/hr)	12.1	0.3	100.0%	100.0%	40.0											
WD (deg)	261	0.4	100.0%	100.0%	359.8											
						Average Wind Direction		261 WNW								

Update Summary:

Parameter	Make	Model	Equipment summary
PM _{2.5}	Sharp	5030	No Operational issues noted during the month
SO ₂	TECO	43i	No Operational issues noted during the month
TRS	TEI	43i APSAA	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.5 Valleyview Air Monitoring Station

PAZA - March 2021 Valleyview Station Report

Parameter	March Average	Minimum	Valid	Operational	Max	1-hour Objective	Max Day and Time	Max	24-hour Objective	Max Day	Exceedance				Calibration Date
SO ₂ (ppb)	0.2	0.0	95.2%	100.0%	2.6	172	Mar-26 20:00	0.5	48	Mar-11	1hr	8hr	24hr	30d	Mar 15, 2021
H ₂ S (ppb)	0.1	0.0	95.2%	100.0%	0.4	10	Mar-08 05:00	0.2	3	Mar-05	0	-	0	-	Mar 15, 2021
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	-0.7	-22.1	100.0%	100.0%	18.3	<div>Note: Valid hours must be greater than 75%</div> <div>Operational hours must be greater than 90%</div>									
RH (%)	69.0	15.9	100.0%	100.0%	100.2										
WS (km/hr)	4.4	0.1	100.0%	100.0%	18.5										
WD (deg)	268	0.0	100.0%	100.0%	359.8										
									Average Wind Direction		268	NW			

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	TEI	431-APSCB	No Operational issues noted during the month
H ₂ S	TEI	4501-APHAA	No Operational issues noted during the month
Met Equip	RMYoung	RMY86004	No Operational issues noted during the month

1.6 Donnelly Air Monitoring Station

PAZA - March 2021 Donnelly Station Report

Parameter	March Average	Minimum	Valid	Operational	Max	1-hour Objective	Max Day and Time	Max	24-hour Objective	Max Day	Exceedance				Calibration Date
SO ₂ (ppb)	0.2	0.0	95.3%	100.0%	2.6	172	Mar-11 19:00	0.7	48	Mar-26	0	-	0	0	Mar 18, 2021
H ₂ S (ppb)	0.0	0.0	95.2%	100.0%	0.3	10	Mar-01 13:00	0.1	3	Mar-15	0	-	0	-	Mar 18, 2021
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	-1.7	-16.0	100.0%	100.0%	11.6	<div>Note: Valid hours must be greater than 75%</div> <div>Operational hours must be greater than 90%</div>									
WS (km/hr)	12.1	0.3	100.0%	100.0%	38.4										
WD (deg)	223	0.1	100.0%	100.0%	356.7										
									Average Wind Direction		223	SW			

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	Teco	43i	No Operational issues noted during the month
H ₂ S	Thermo	45C	No Operational issues noted during the month
Met Equip	RMYoung	5103	No Operational issues noted during the month

1.7 Wembley Air Monitoring Station

PAZA - March 2021 Wembley Station Report

Parameter	March Average	Minimum	Valid	Operational	Max	1-hour Objective	Max Day and Time	Max	24-hour Objective	Max Day	Exceedance				Calibration Date
NO (ppb)	1.0	0.0	95.2%	100.0%	18.0	-	Mar-11 10:00	3.9	-	Mar-03	-	-	-	-	Mar 10, 2021
NO ₂ (ppb)	4.5	0.3	95.2%	100.0%	31.8	159	Mar-03 20:00	14.8	-	Mar-03	0	-	-	-	Mar 10, 2021
NO _x (ppb)	5.5	0.3	95.2%	100.0%	42.0	-	Mar-03 14:00	18.9	-	Mar-03	-	-	-	-	Mar 10, 2021
O ₃ (ppb)	36.1	12.3	95.3%	100.0%	53.7	76	Mar-31 22:00	45.5	-	Mar-31	0	-	-	-	Mar 10, 2021
PM _{2.5} (µg/m³)	3.2	0.0	98.7%	99.5%	25.5	80	Mar-03 11:00	11.1	29	Mar-04	0	-	0	-	Mar 11, 2021
SO ₂ (ppb)	0.9	0.0	95.4%	100.0%	30.4	172	Mar-17 17:00	6.1	48	Mar-17	0	-	0	0	Mar 10, 2021
TRS (ppb)	0.3	0.0	95.3%	100.0%	1.5	-	Mar-01 15:00	0.5	-	Mar-04	-	-	-	-	Mar 12, 2021
CH ₄ (ppm)	2.1	1.9	95.0%	100.0%	2.7	-	Mar-04 09:00	2.4	-	Mar-18	-	-	-	-	Mar 11, 2021
THC (ppm)	2.1	1.9	95.0%	100.0%	3.4	-	Mar-04 10:00	2.4	-	Mar-18	-	-	-	-	Mar 11, 2021
NMHC (ppm)	0.0	0.0	95.0%	100.0%	0.8	-	Mar-04 10:00	0.0	-	Mar-04	-	-	-	-	Mar 11, 2021
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	-1.5	-20.1	100.0%	100.0%	10.3	<div>Note: Valid hours must be greater than 75%</div> <div>Operational hours must be greater than 90%</div>									
WS (km/hr)	8.2	0.5	100.0%	100.0%	34.9										
WD (deg)	302	2.1	100.0%	100.0%	359.1										
									Average Wind Direction		302	WNW			

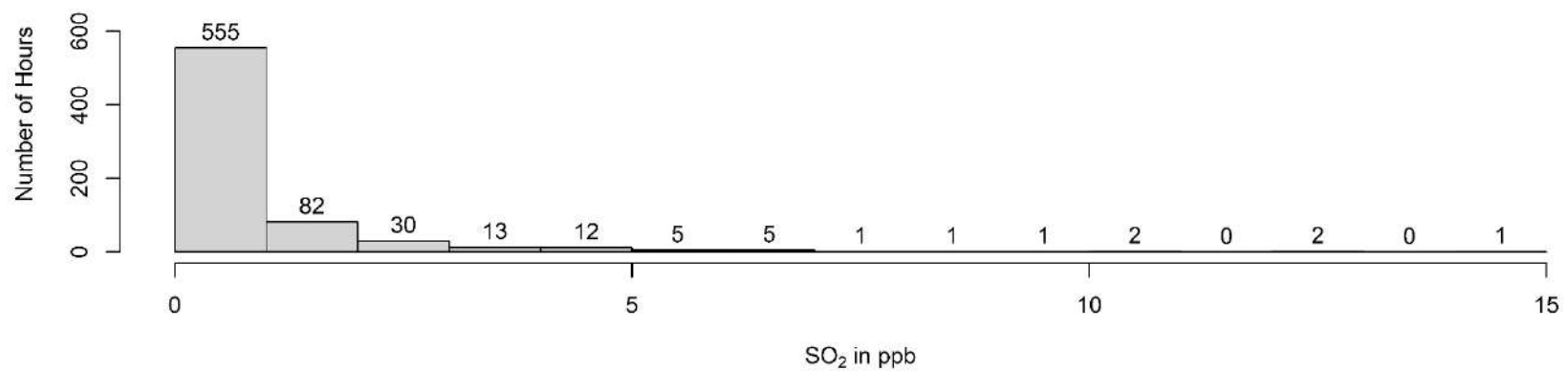
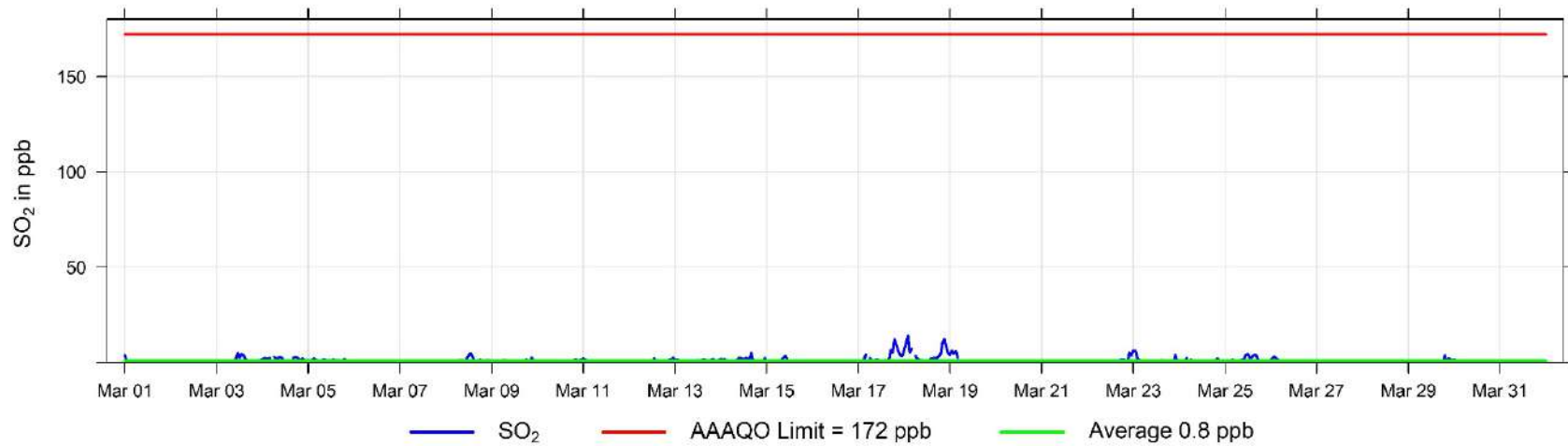
Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	TEI	42i	No Operational issues noted
O ₃	TEI	49i	No Operational issues noted
PM _{2.5}	Thermo	TEOM AB	No Operational issues noted; excessive negative drift resulted in 4 hours removed
SO ₂	TEI	43i	No Operational issues noted
TRS	TEI	43i	No Operational issues noted
THC/CH ₄ /NMHC	TEI	551-A3PHAA	Nitrogen cylinder replaced; removal cal due to THC and NMHC points; bleed new tank to analyzer, calibration passed
Met Equip	MetOne	50.5	No Operational issues noted

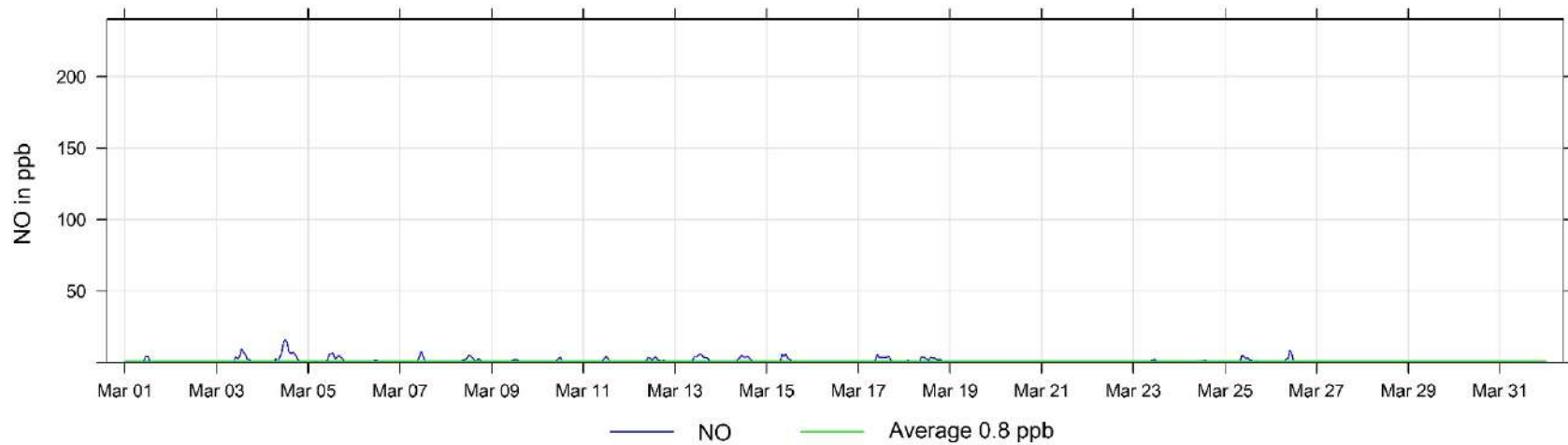
2 Beaverlodge Charts

The following pages include the charts and histograms for Beaverlodge Station

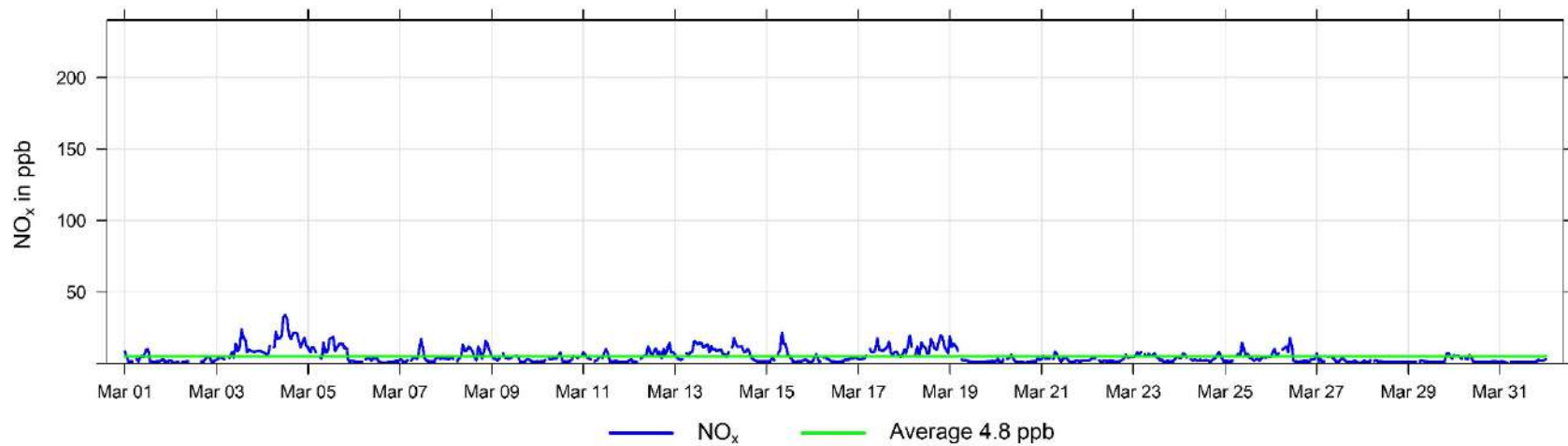
March Hourly Concentration Readings of SO₂ (in ppb) at Beaverlodge



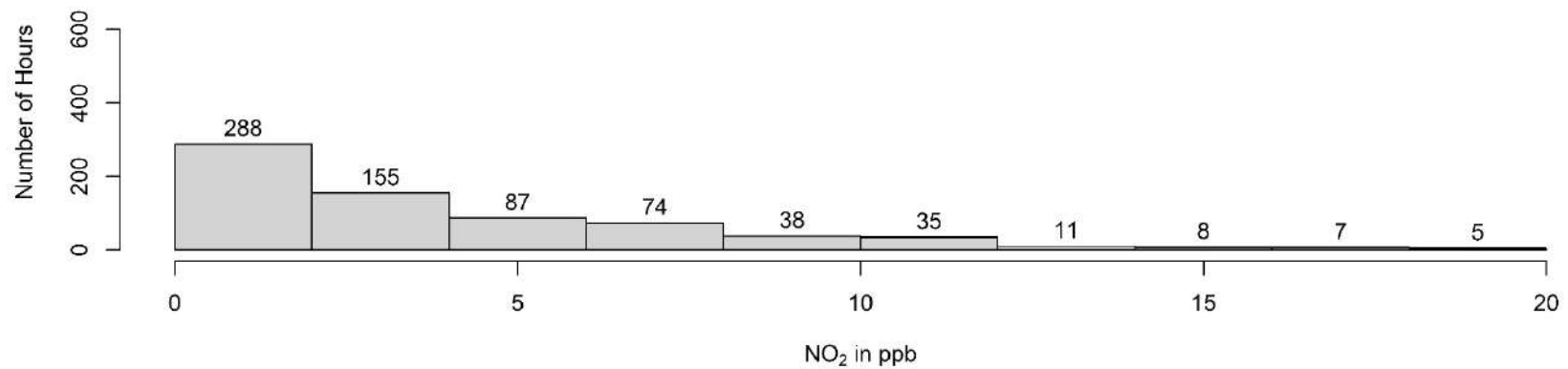
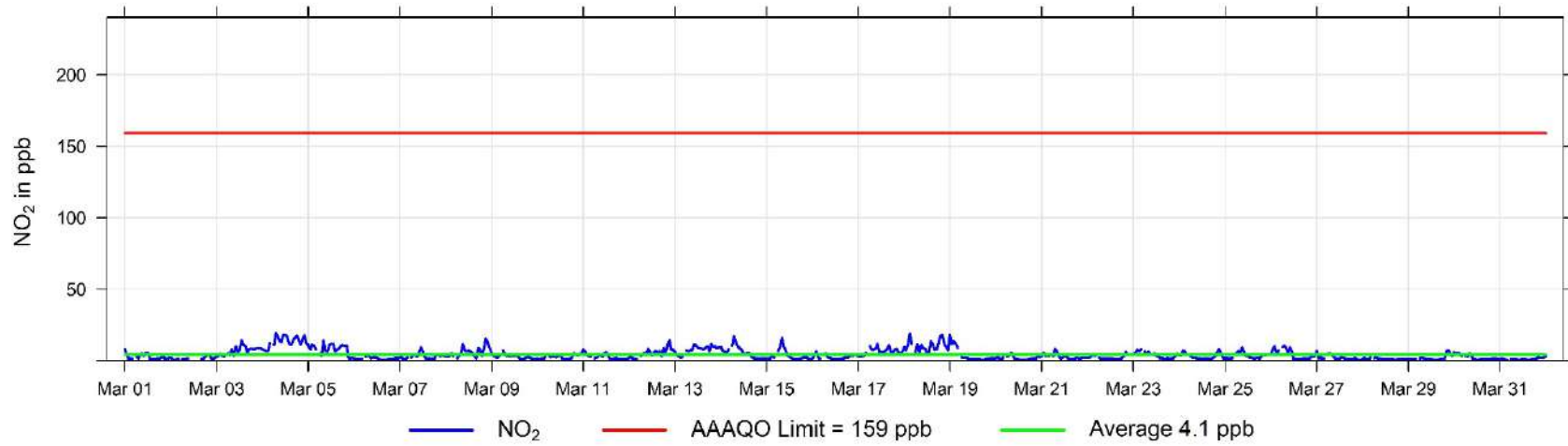
March Hourly Concentration Readings of NO (in ppb) at Beaverlodge



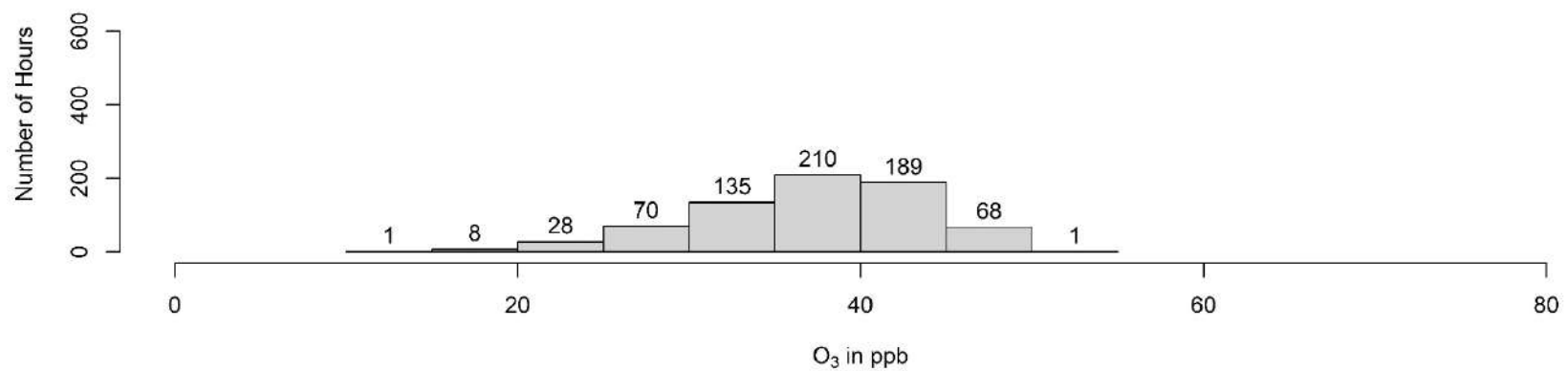
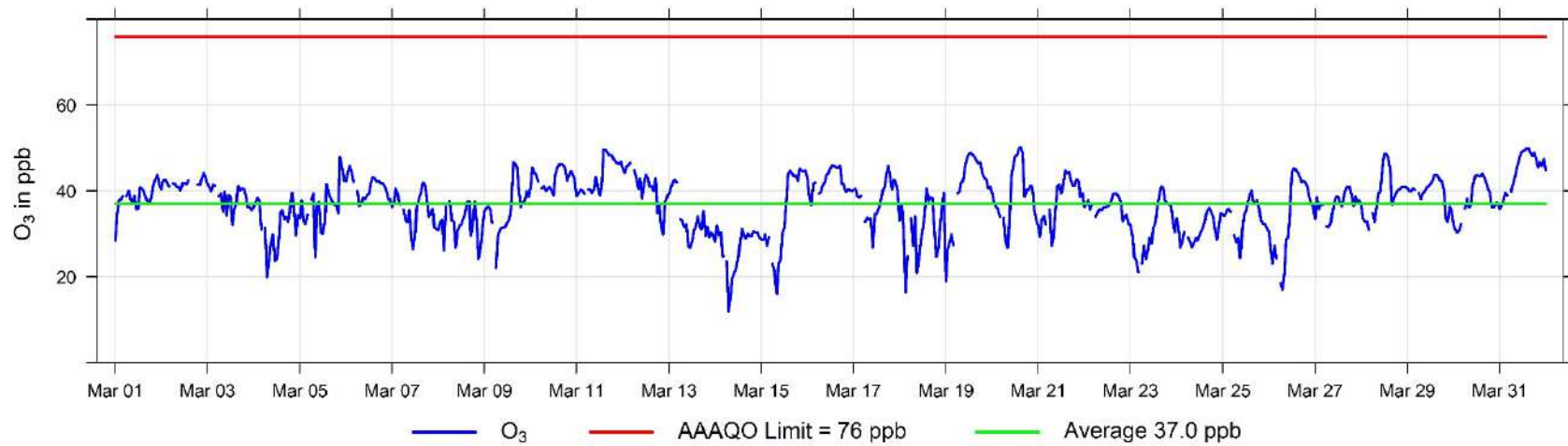
March Hourly Concentration Readings of NO_x (in ppb) at Beaverlodge



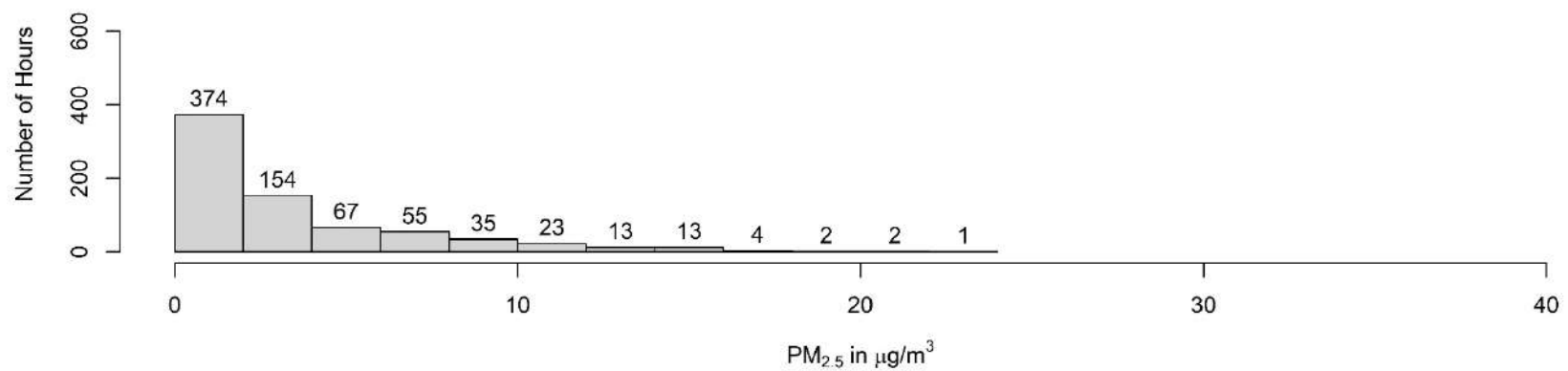
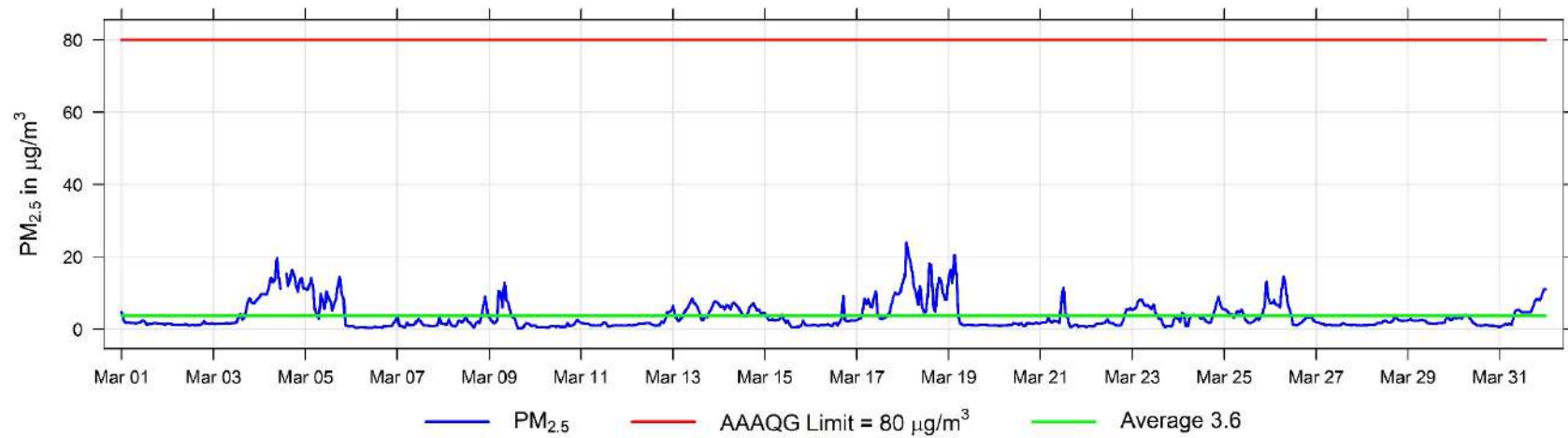
March Hourly Concentration Readings of NO₂ (in ppb) at Beaverlodge



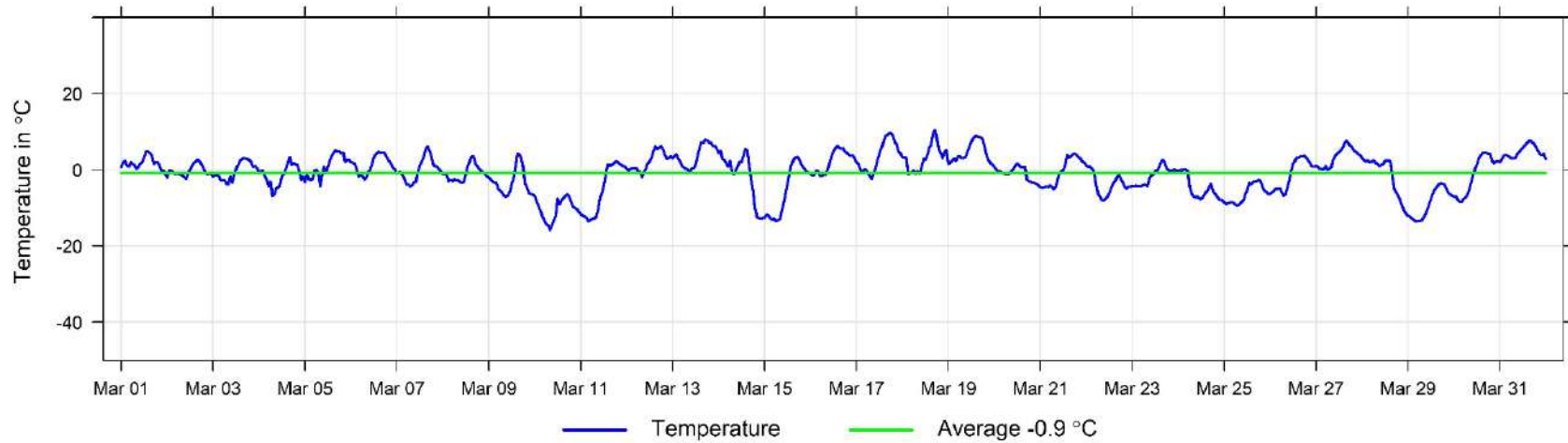
March Hourly Concentration Readings of O₃ (in ppb) at Beaverlodge



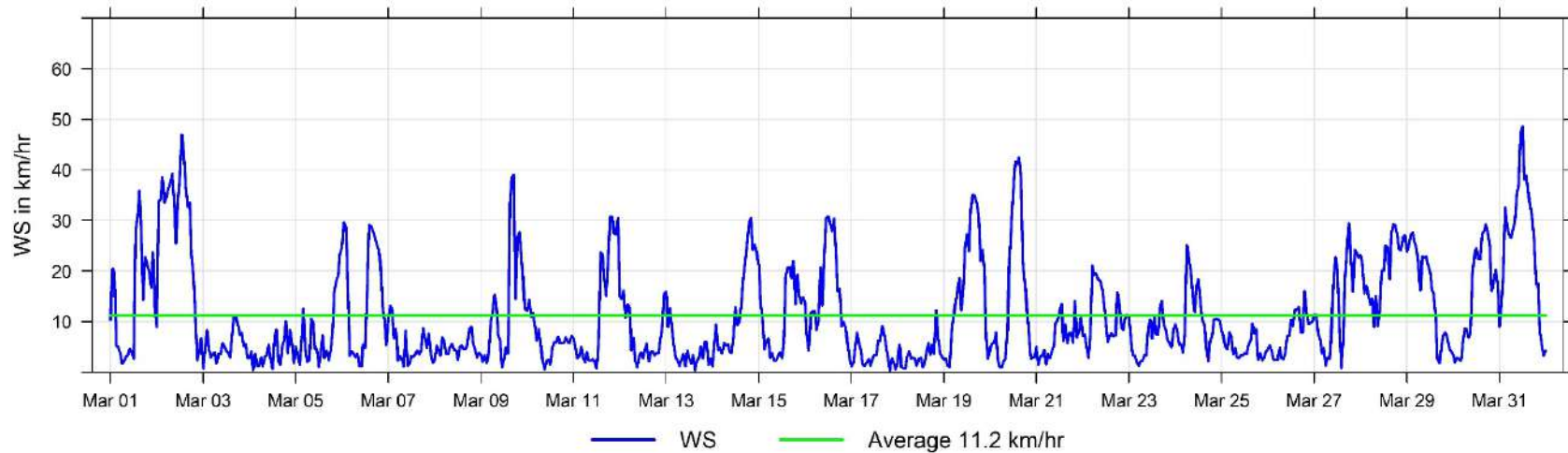
February Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Beaverlodge



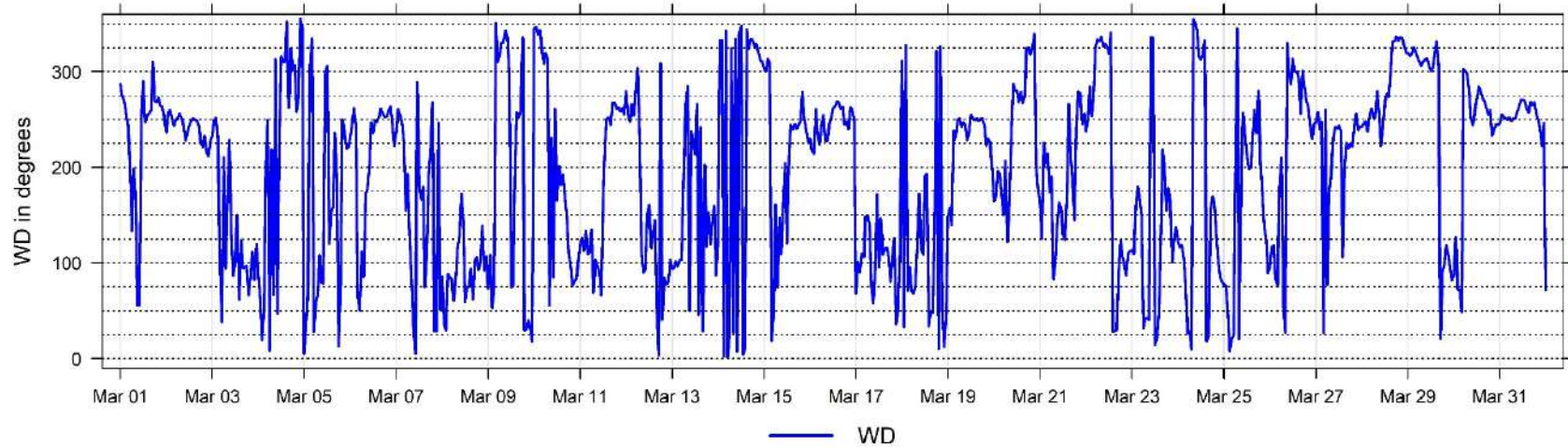
March Hourly Temperature Readings (in °C) at Beaverlodge



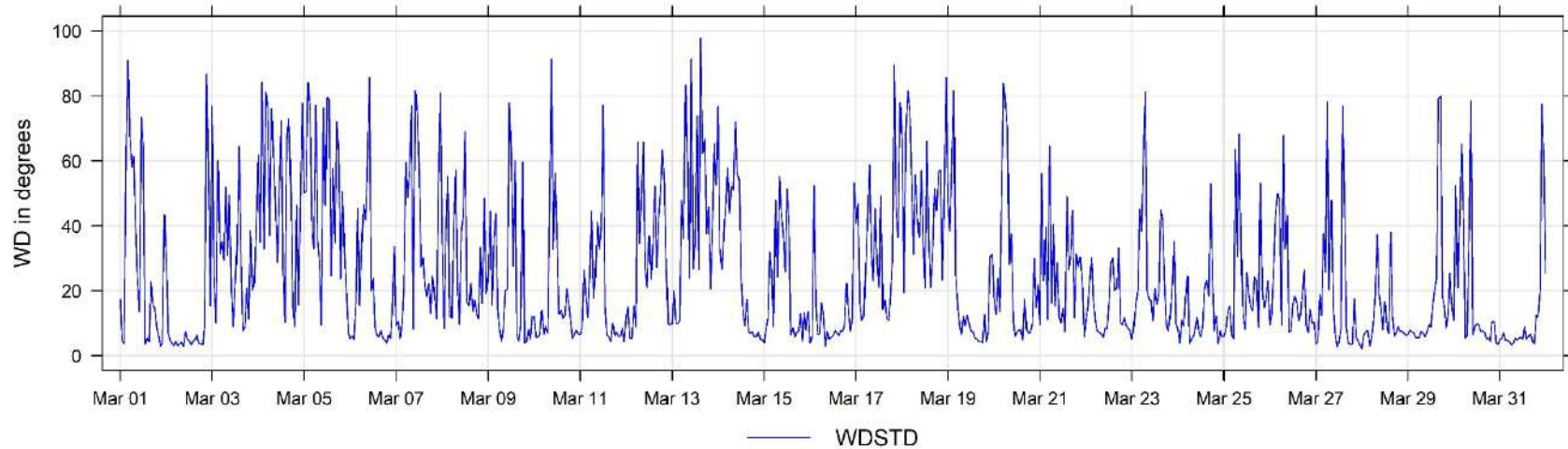
March Hourly Readings of Wind Speed (in km/hr) at Beaverlodge

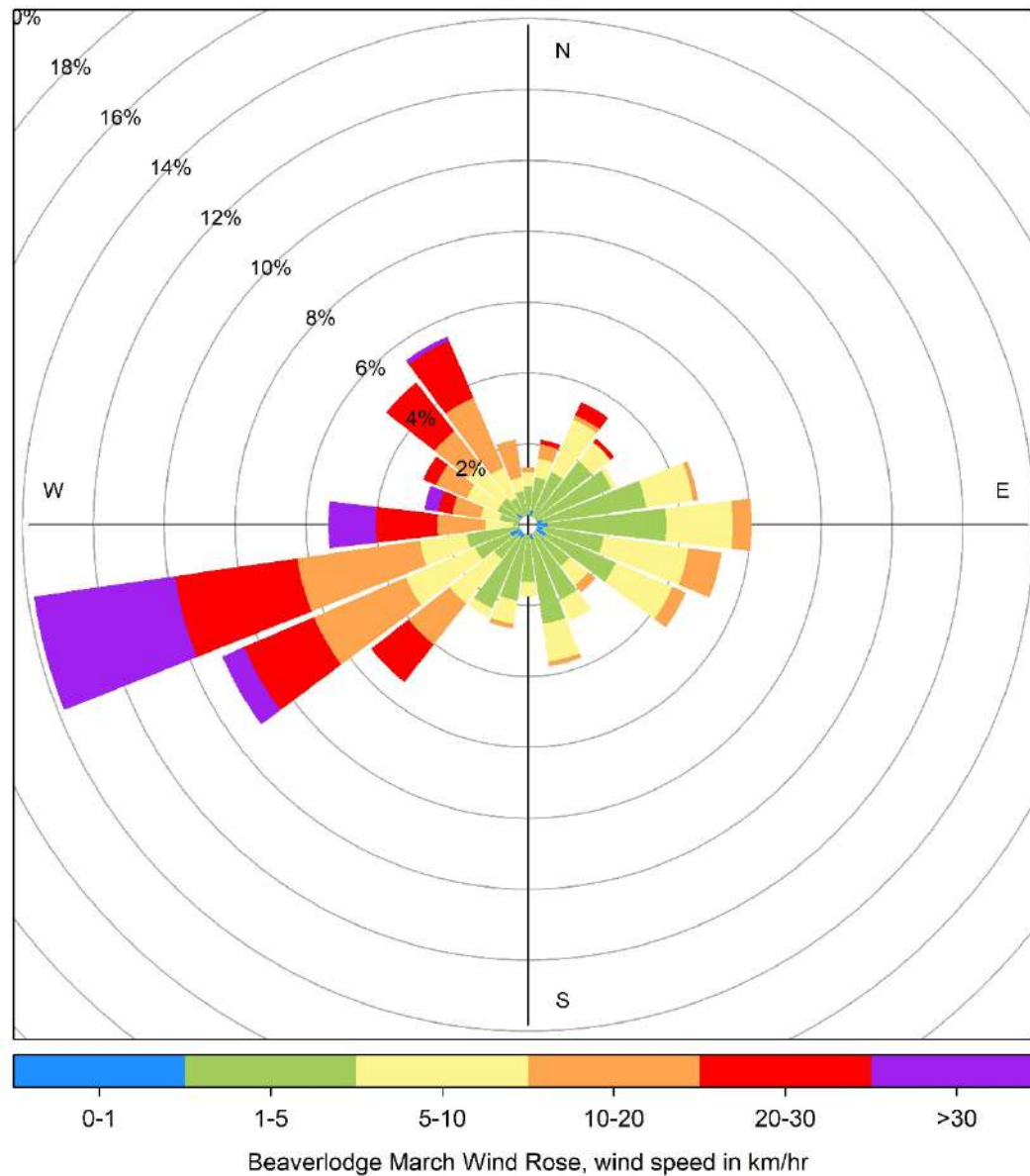


March Hourly Readings of Wind Direction (in degrees) at Beaverlodge



March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Beaverlodge

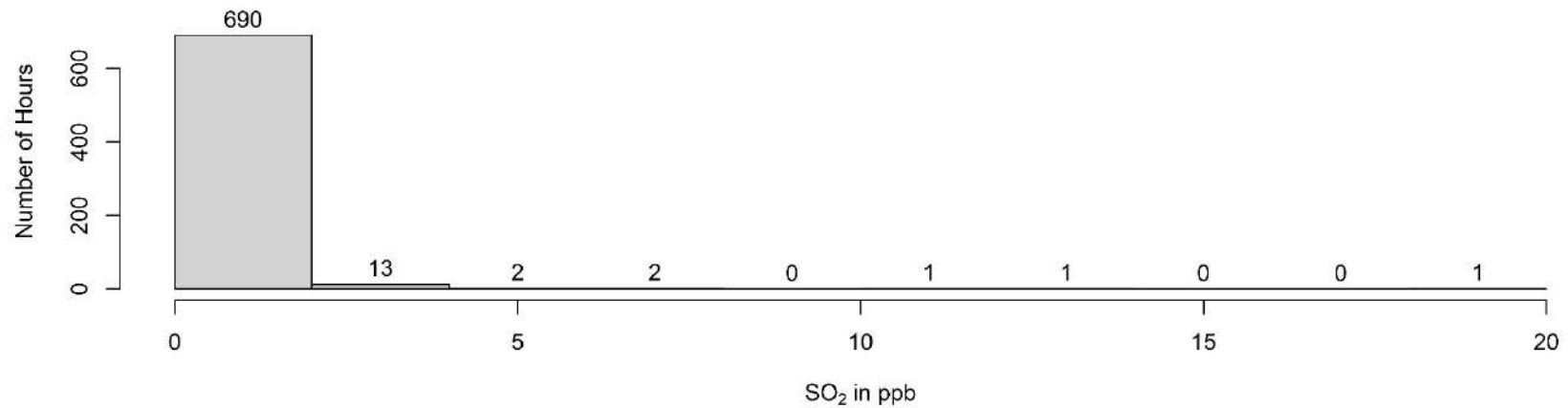
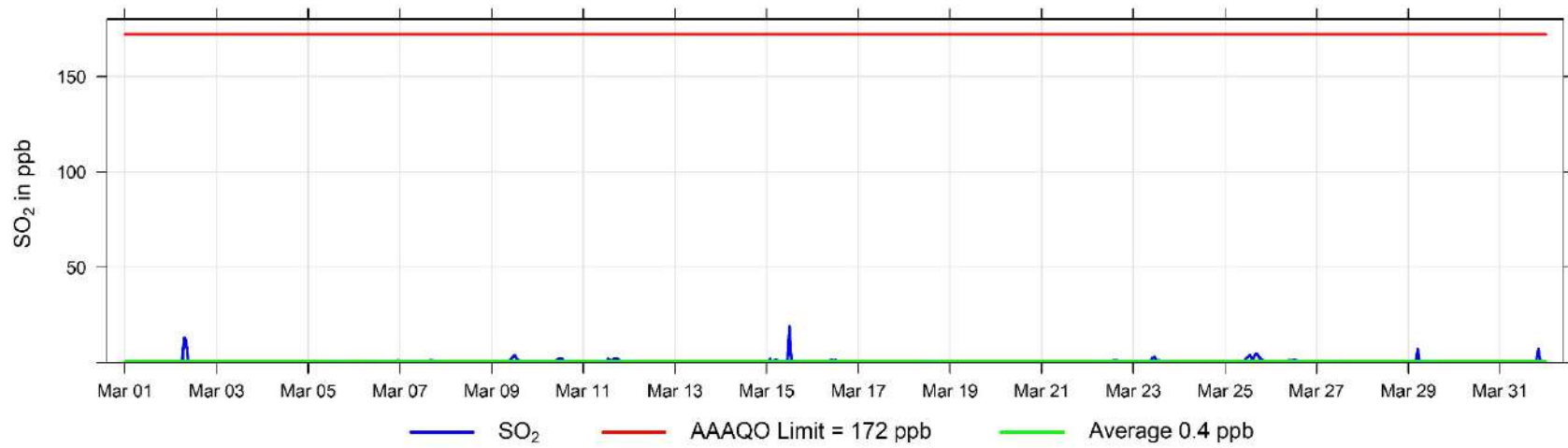




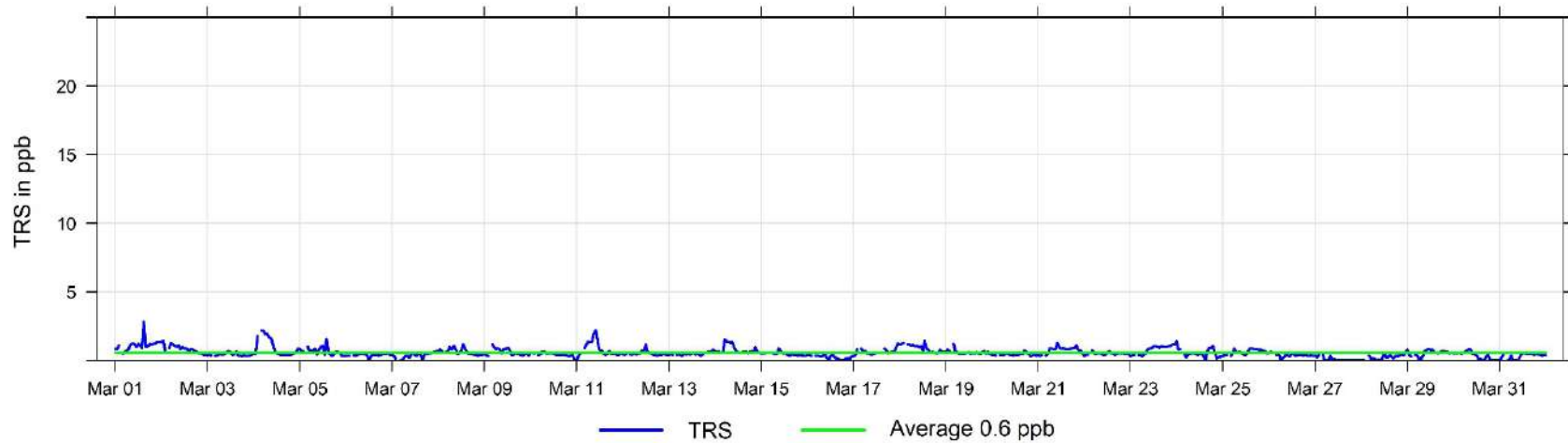
3 Evergreen Park Charts

The following pages include the charts and histograms for Evergreen Park Station

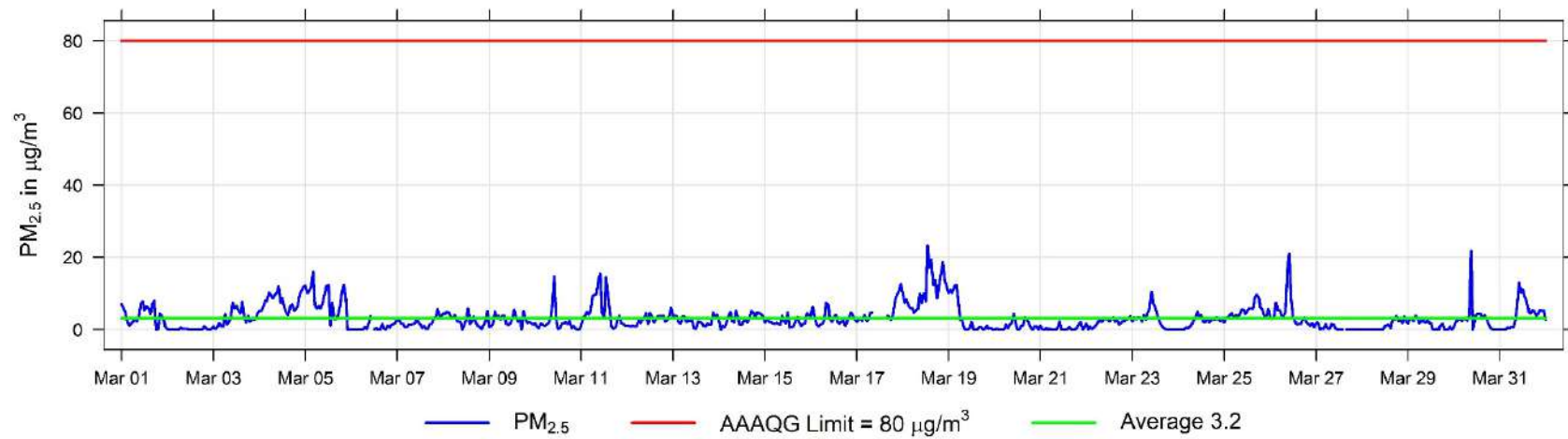
March Hourly Concentration Readings of SO₂ (in ppb) at Evergreen Park

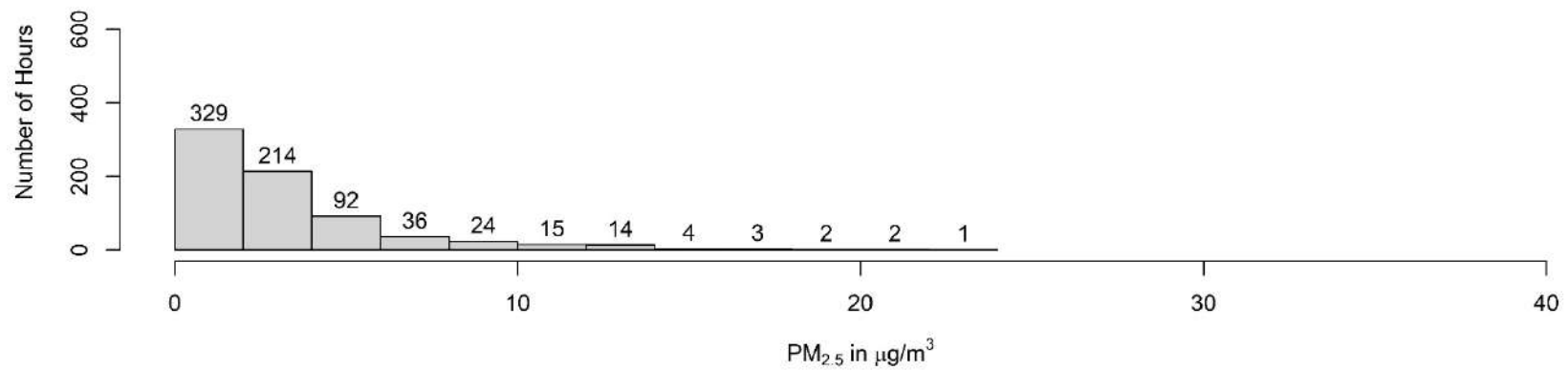


March Hourly Concentration Readings of TRS (in ppb) at Evergreen Park

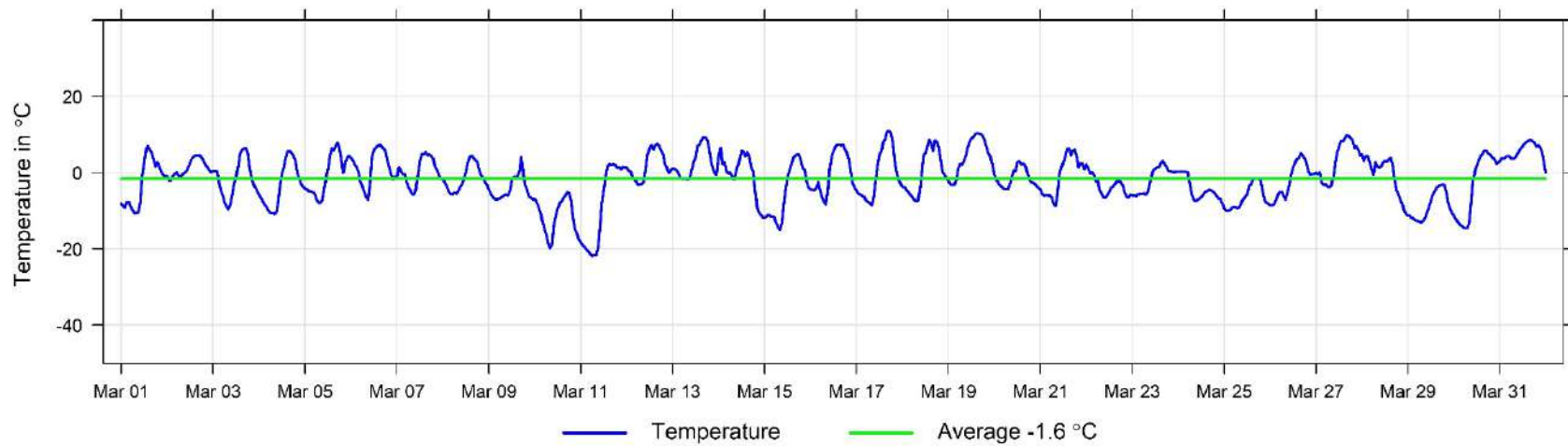


February Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Evergreen Park

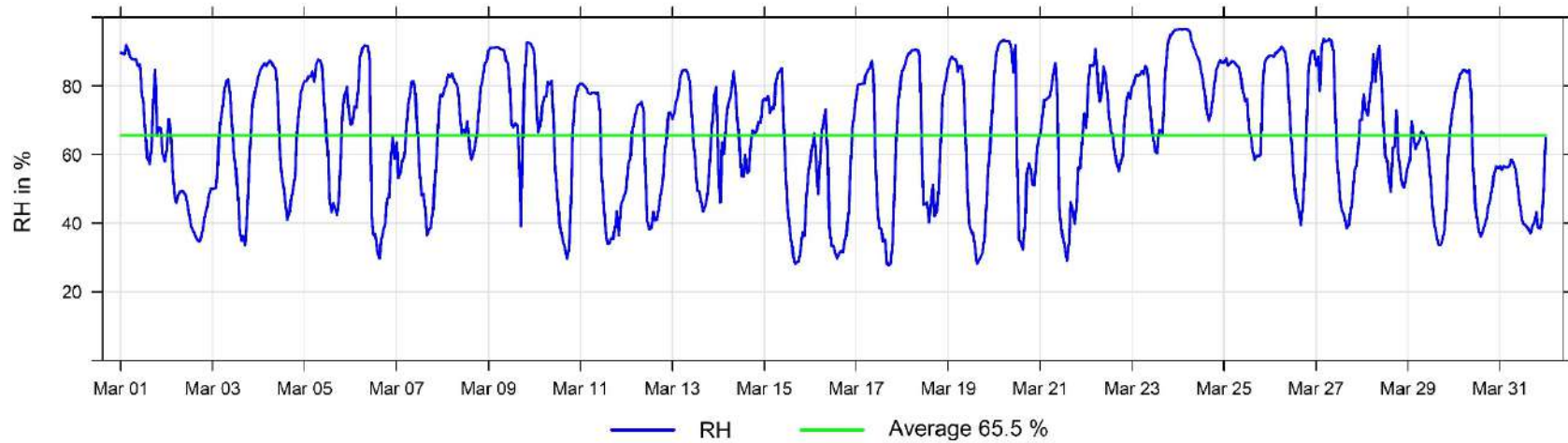




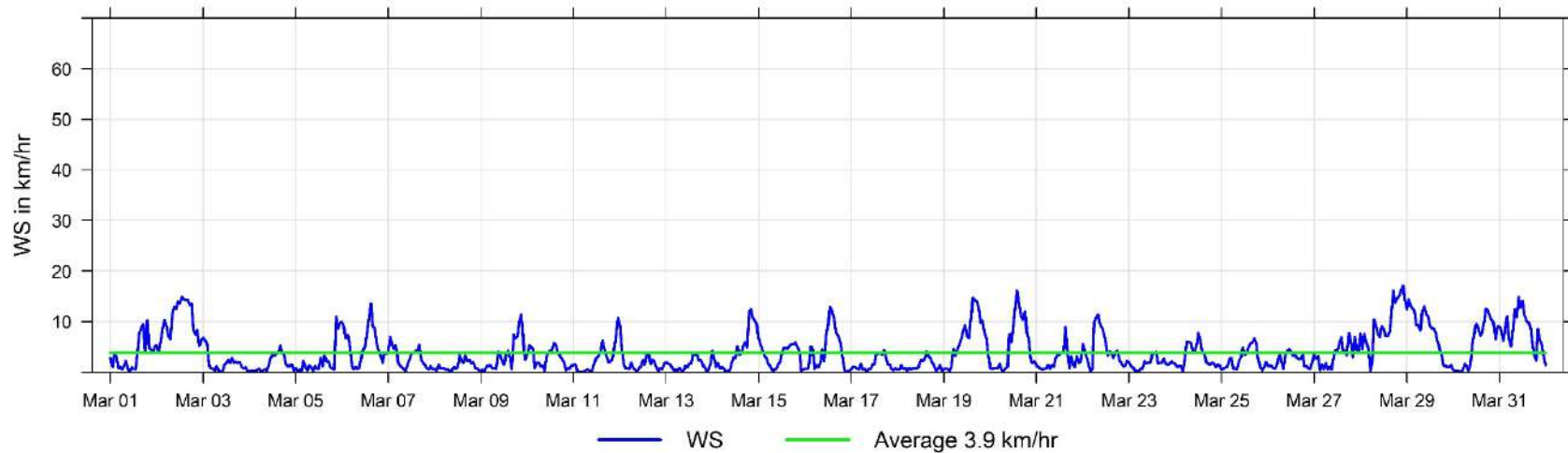
March Hourly Temperature Readings (in °C) at Evergreen Park



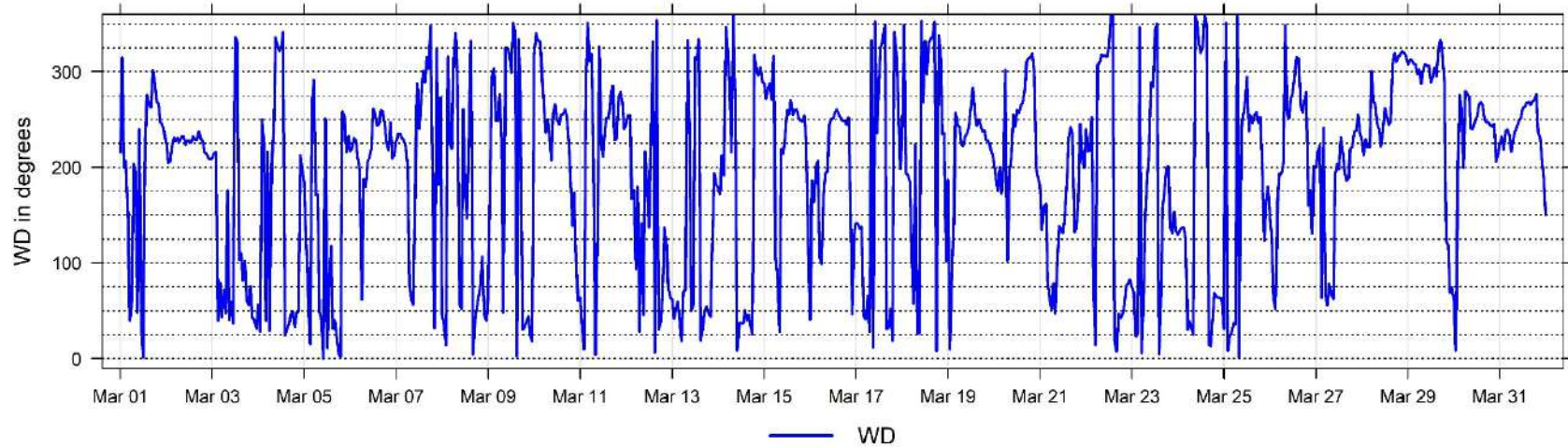
March Hourly Readings of Relative Humidity (in %) at Evergreen Park



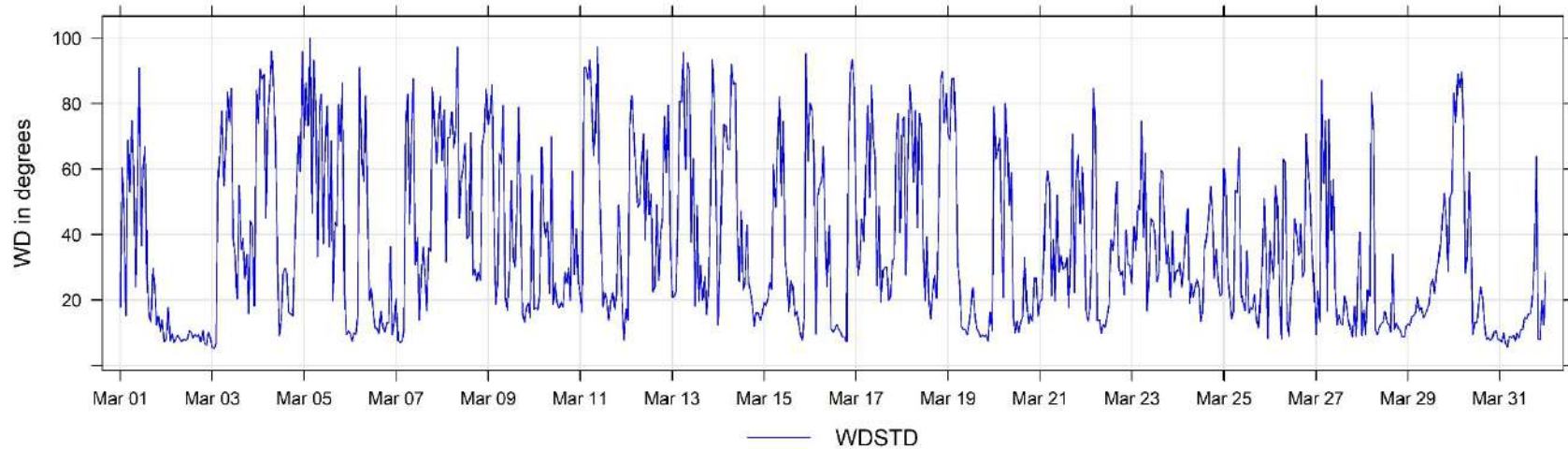
March Hourly Readings of Wind Speed (in km/hr) at Evergreen Park

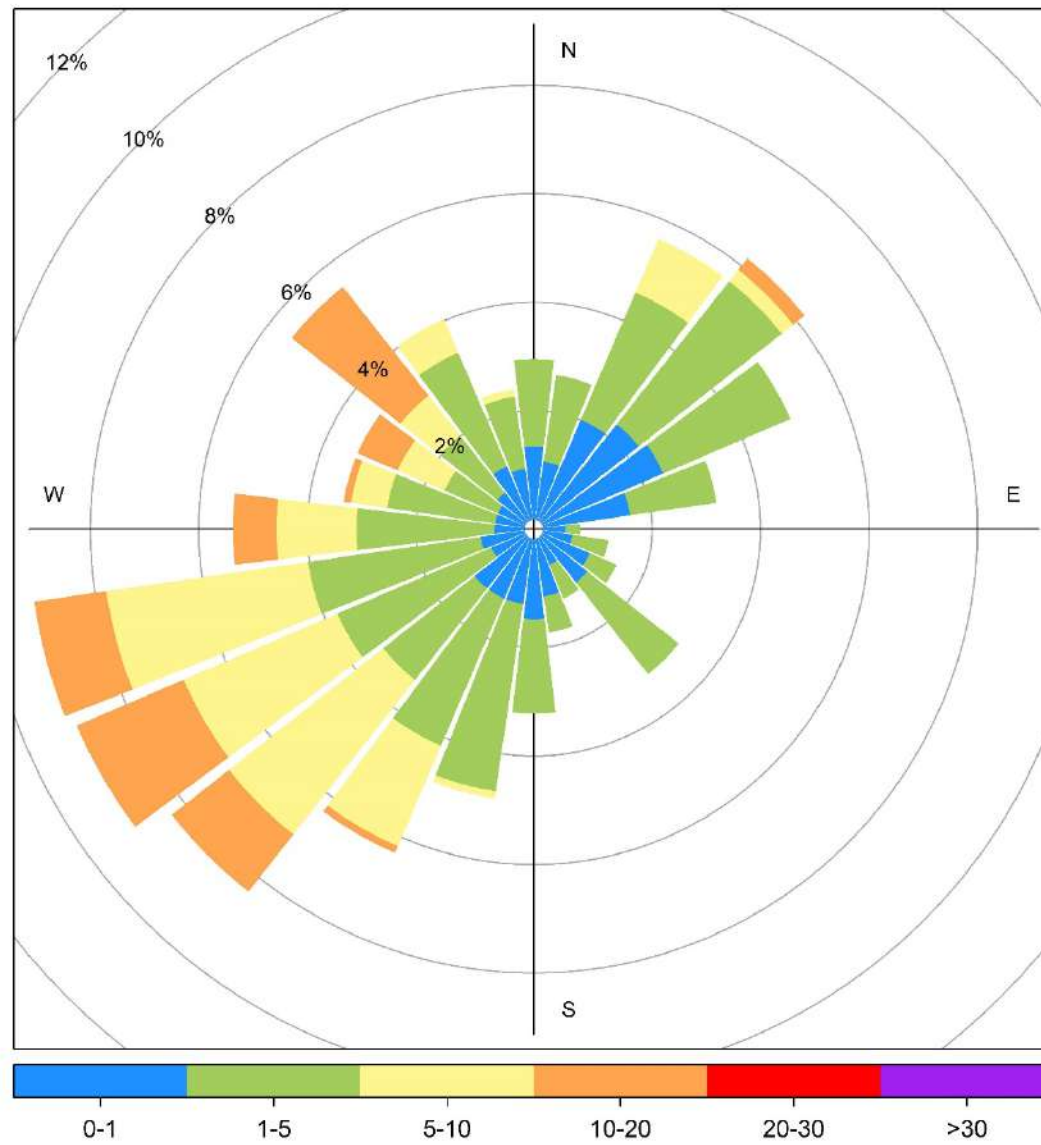


March Hourly Readings of Wind Direction (in degrees) at Evergreen Park



March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Evergreen Park



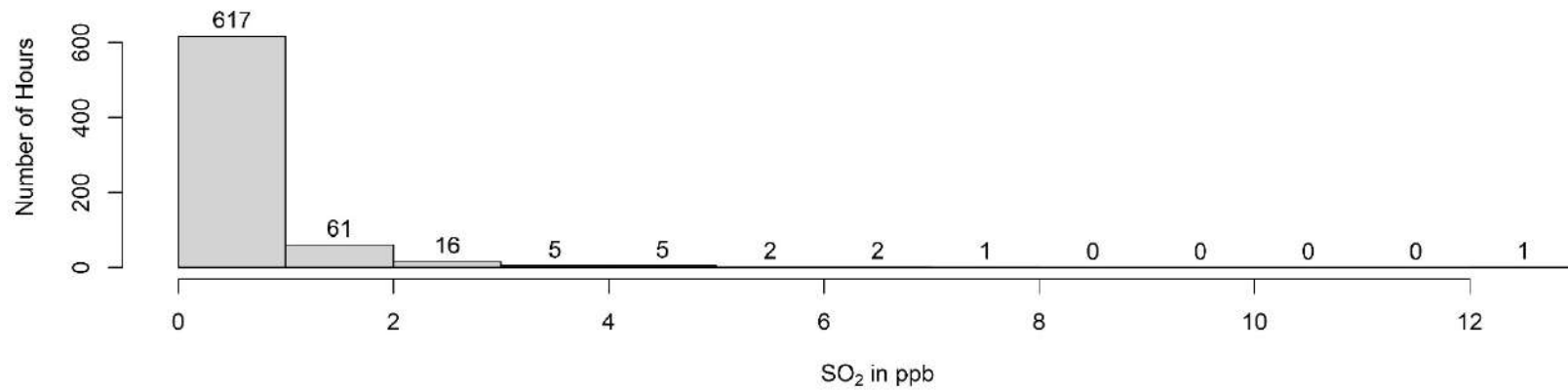
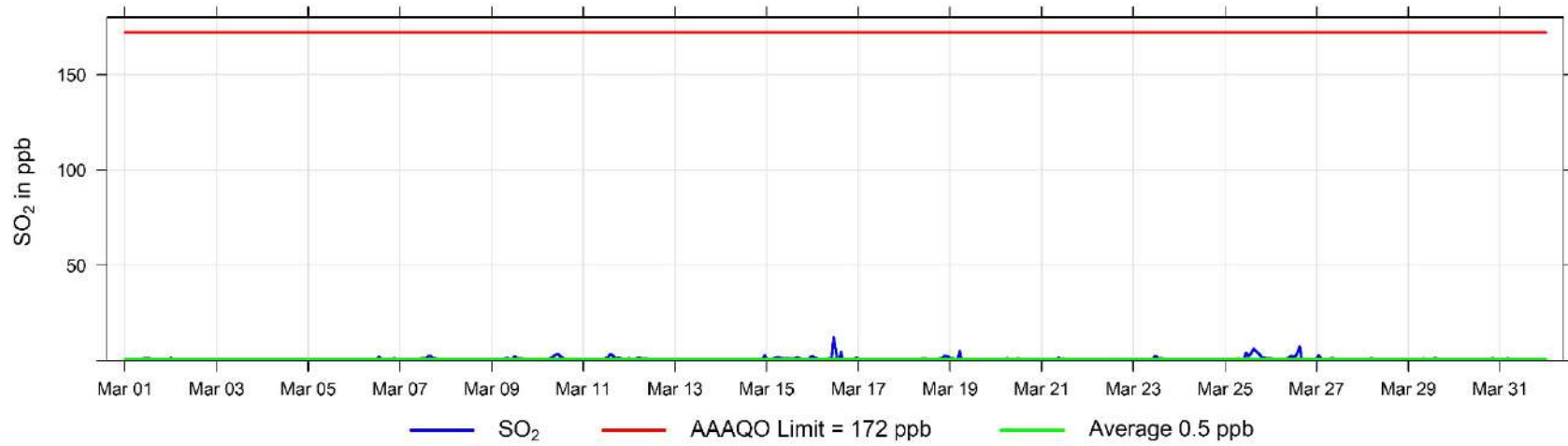


Evergreen Park March Wind Rose, wind speed in km/hr

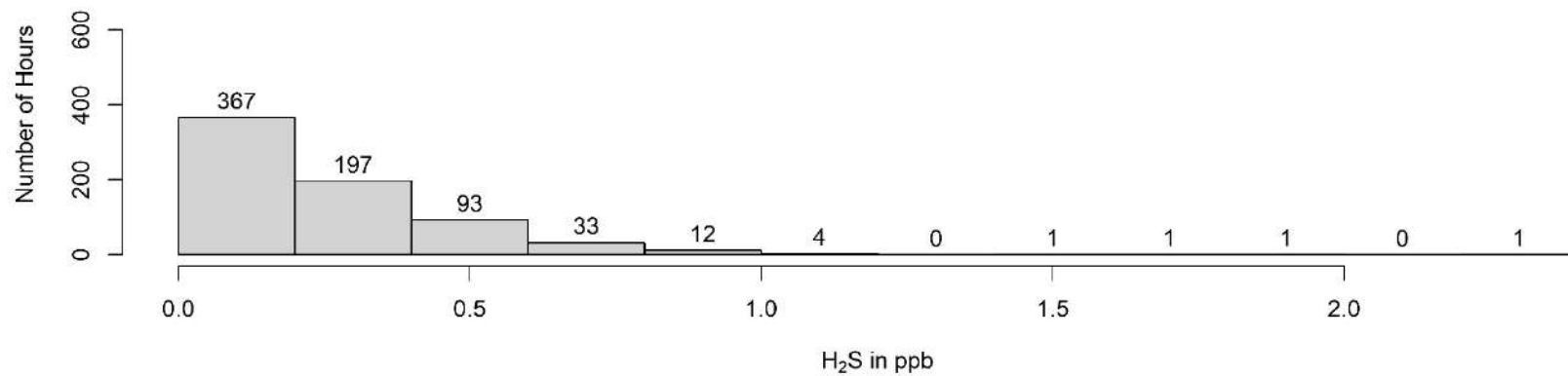
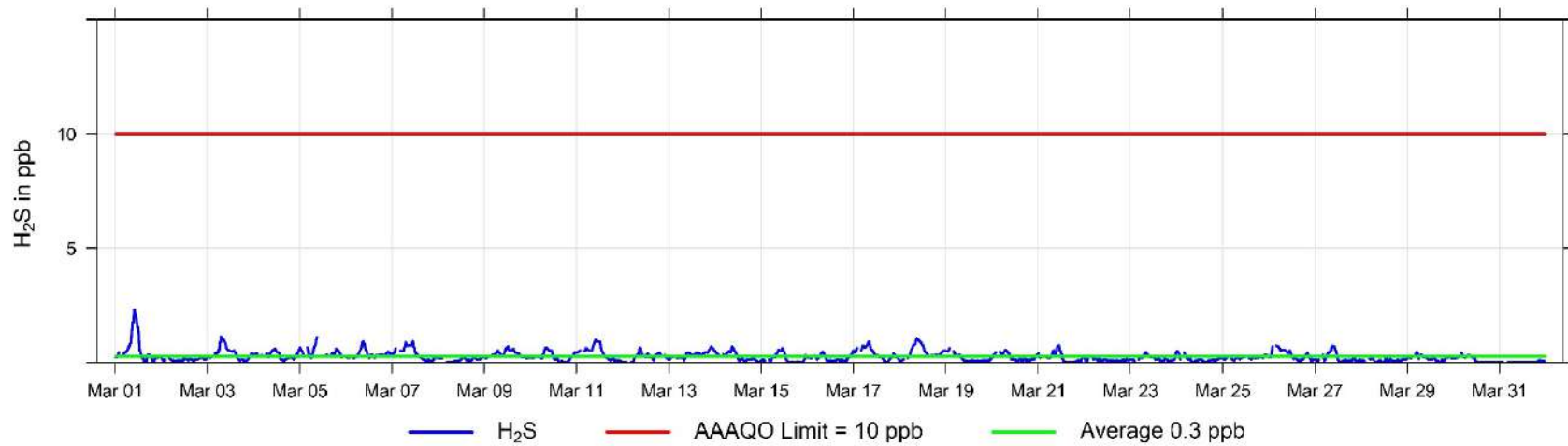
4 Grande Prairie - Henry Pirker Charts

The following pages include the charts and histograms for Henry Pirker Station in Grande Prairie

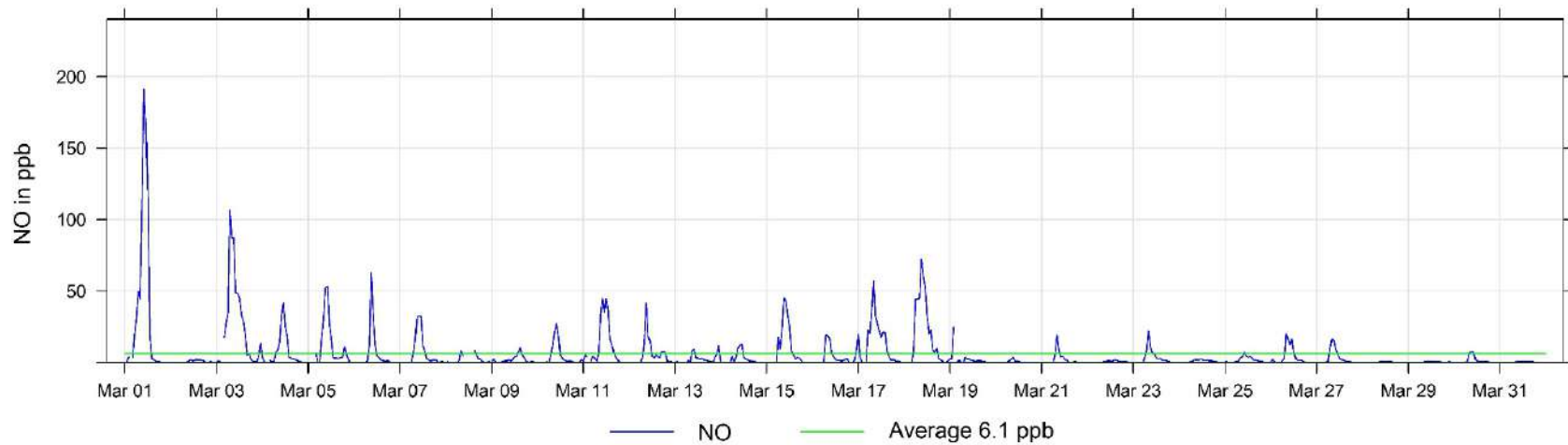
March Hourly Concentration Readings of SO₂ (in ppb) at Henry Pirker



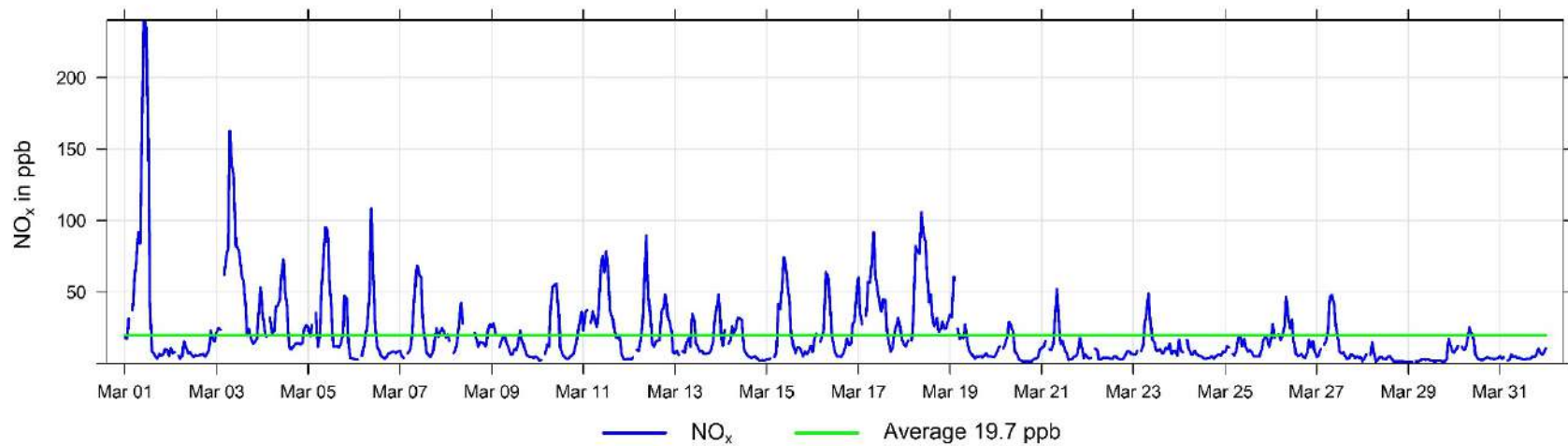
March Hourly Concentration Readings of H₂S (in ppb) at Henry Pirker



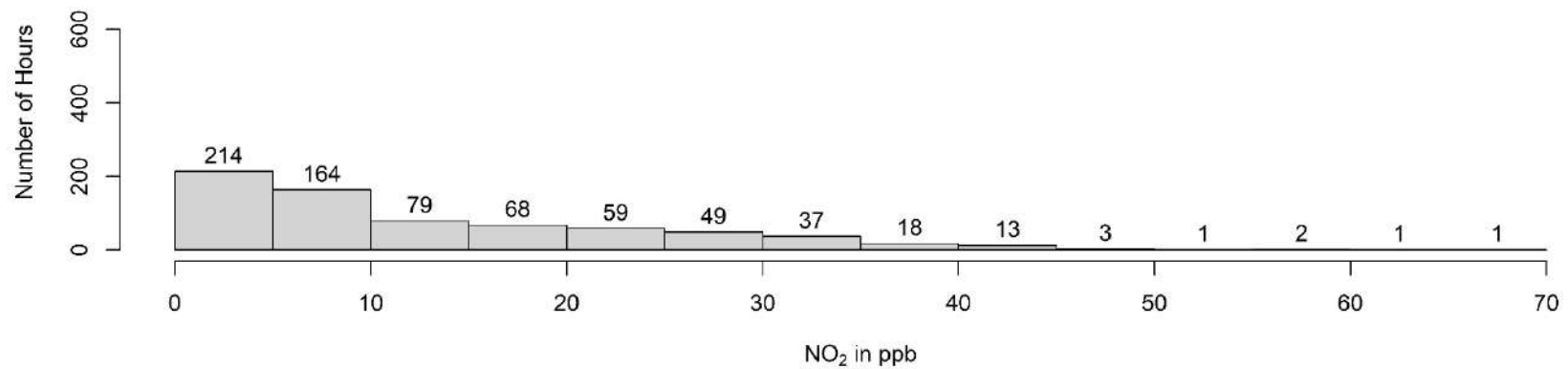
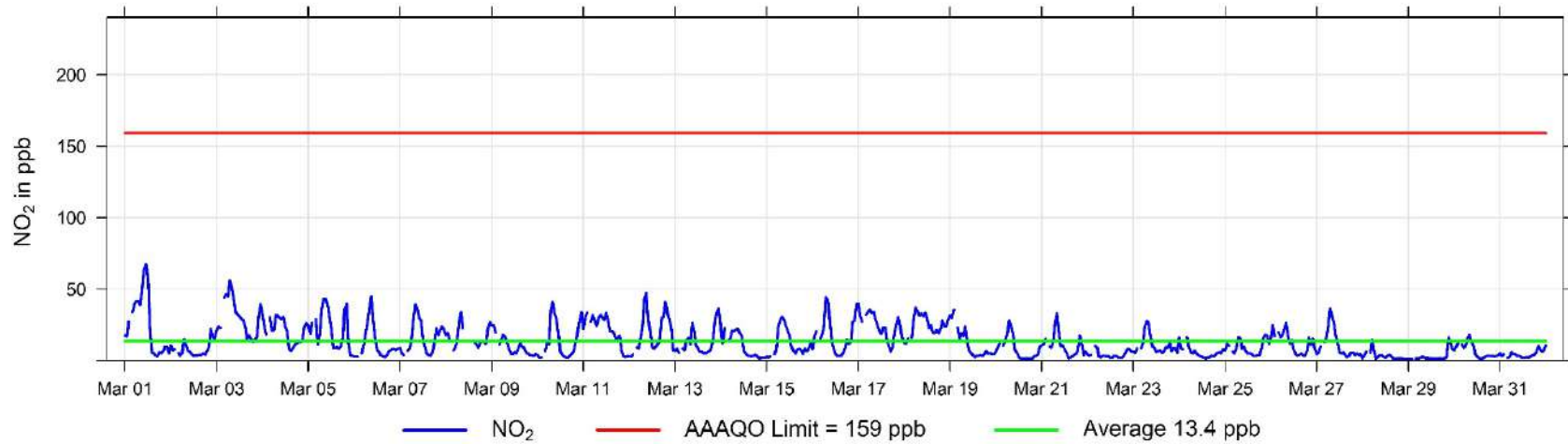
March Hourly Concentration Readings of NO (in ppb) at Henry Pirker



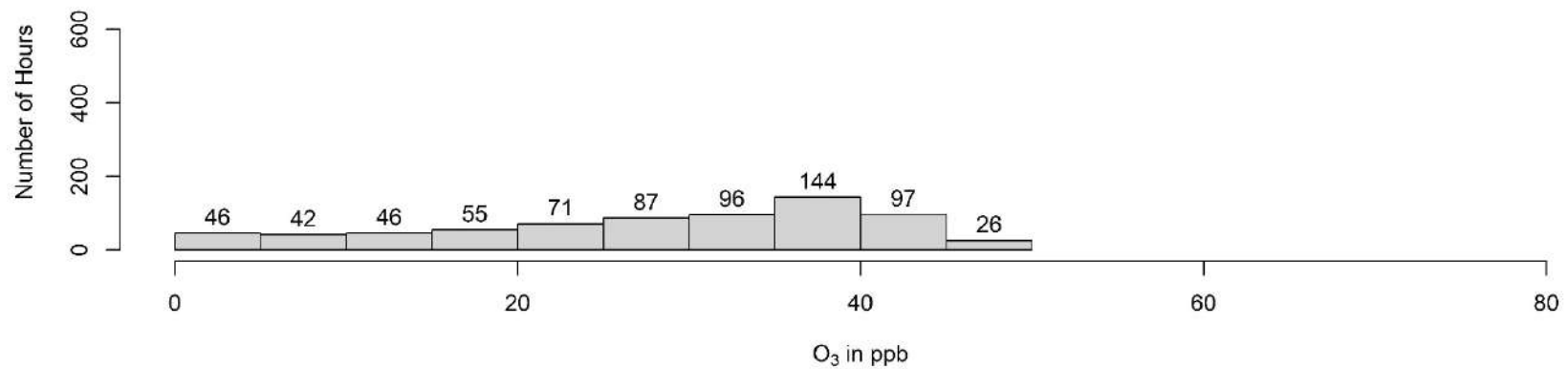
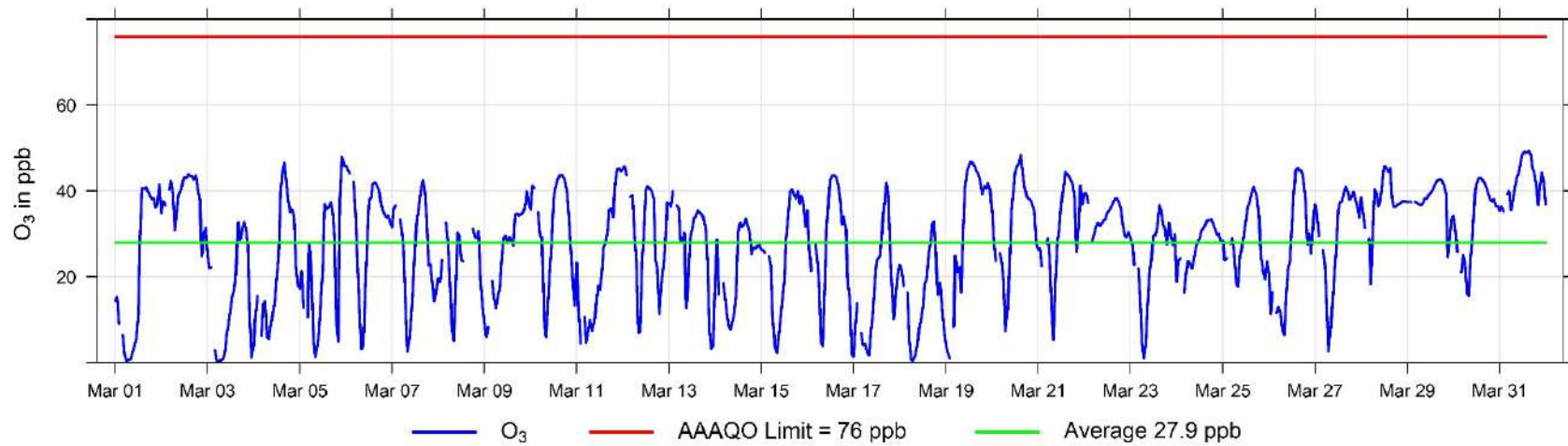
March Hourly Concentration Readings of NO_x (in ppb) at Henry Pirker



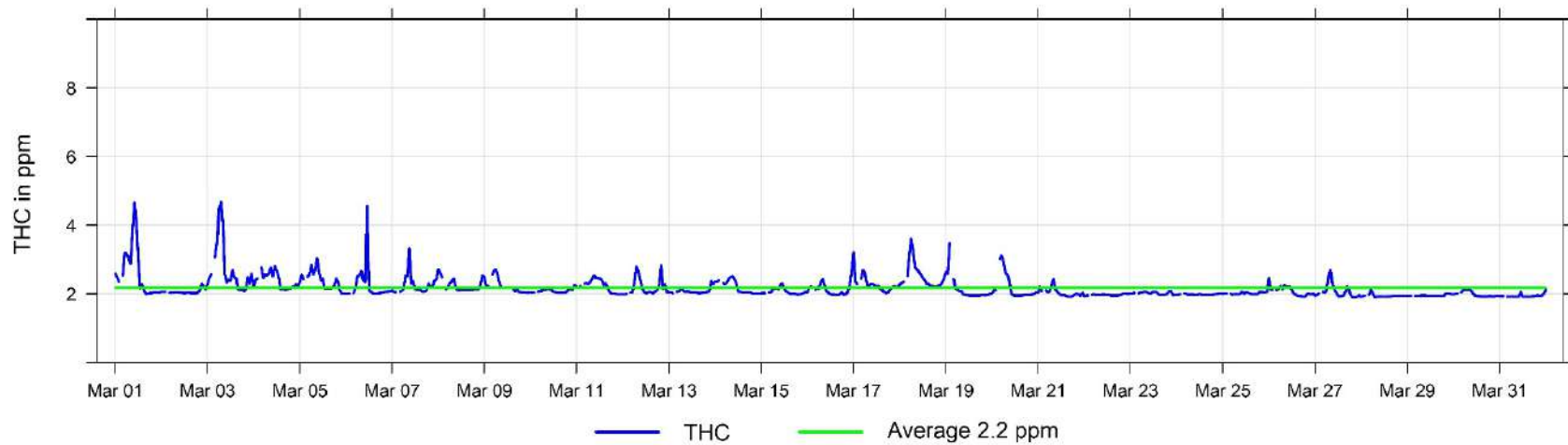
March Hourly Concentration Readings of NO₂ (in ppb) at Henry Pirker



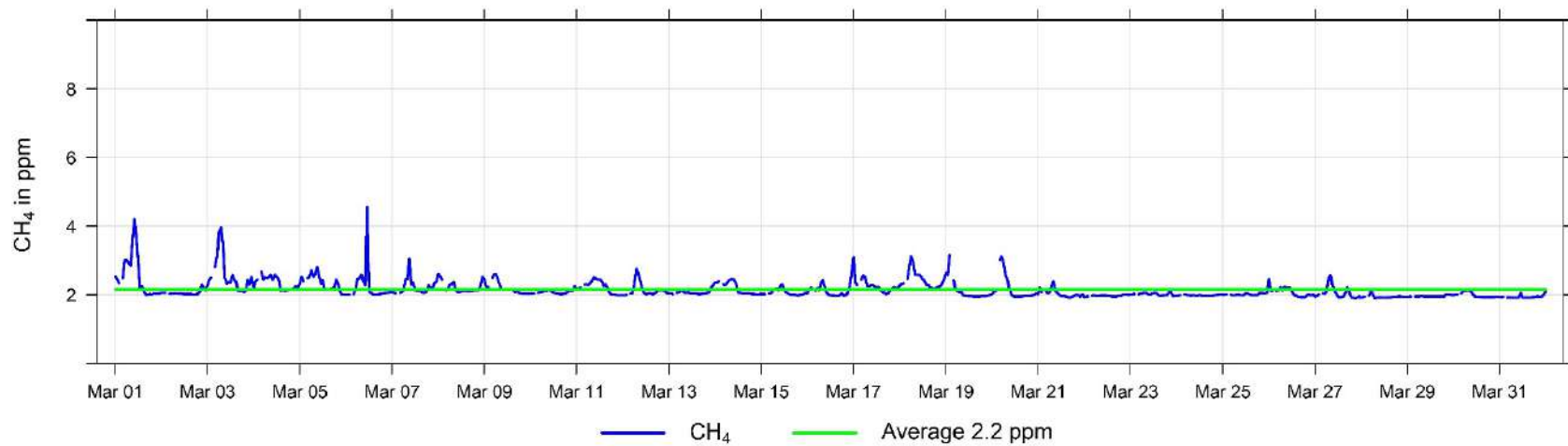
March Hourly Concentration Readings of O₃ (in ppb) at Henry Pirker



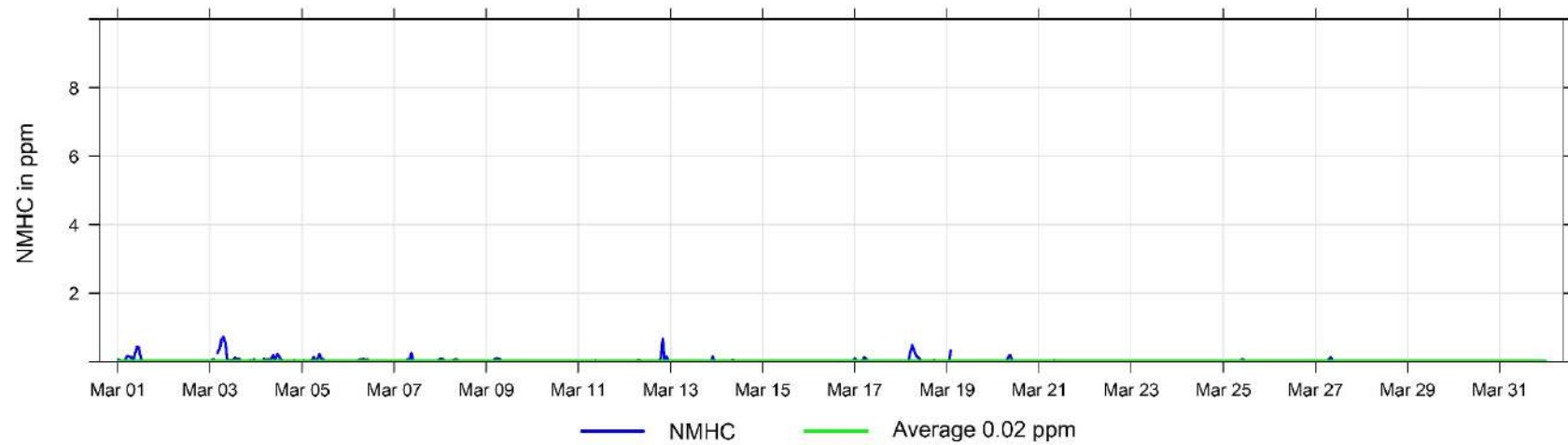
March Hourly Concentration Readings of THC (in ppm) at Henry Pirker



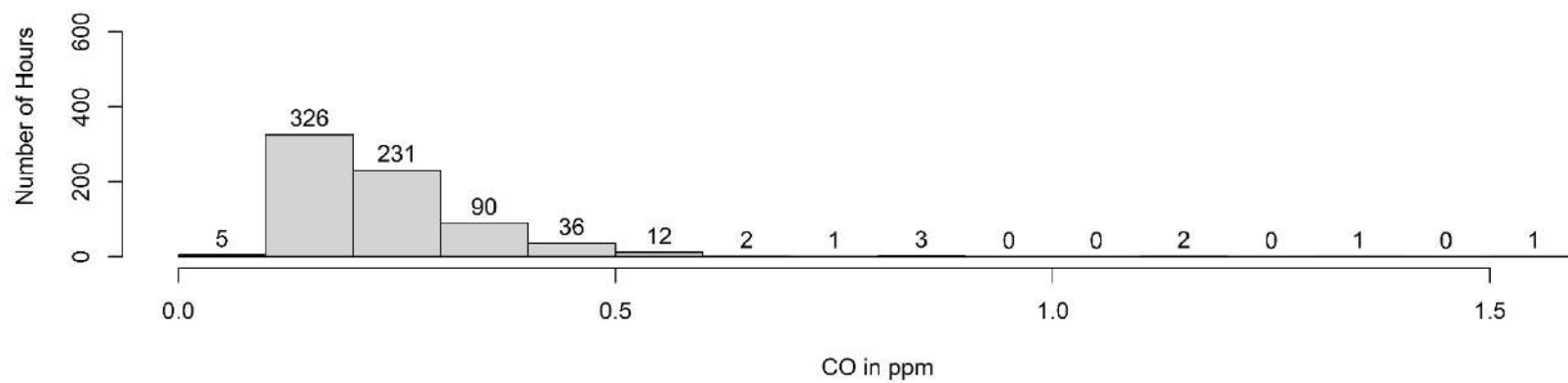
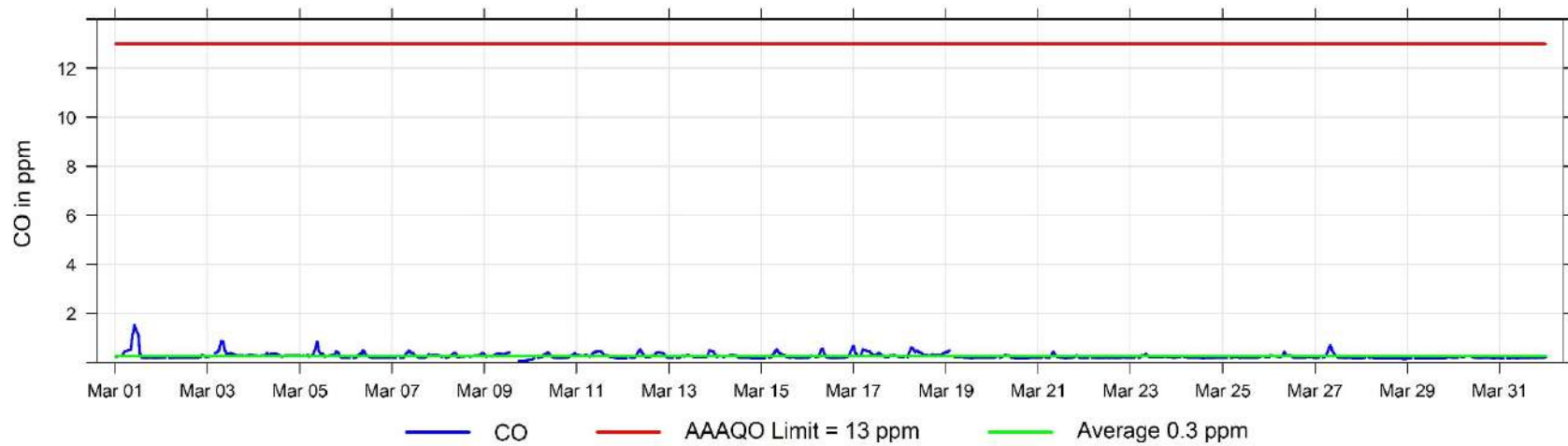
March Hourly Concentration Readings of CH₄ (in ppm) at Henry Pirker



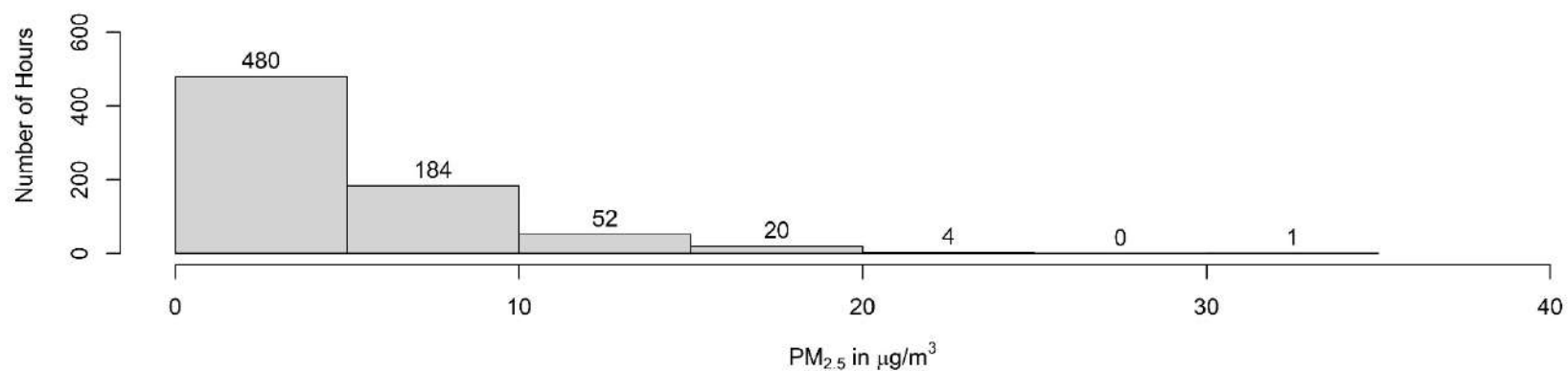
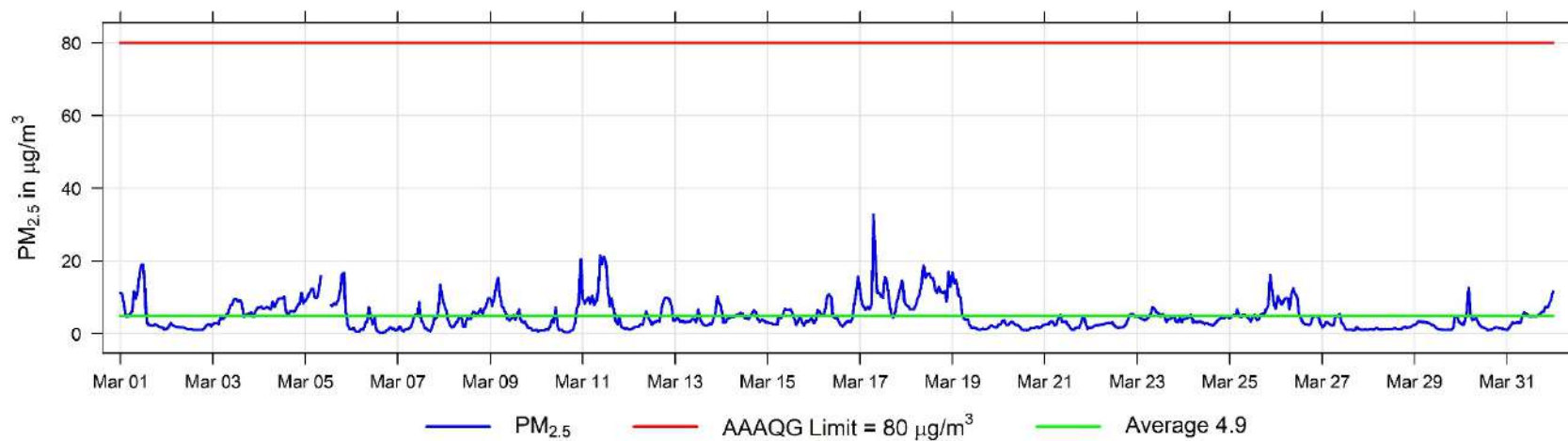
March Hourly Concentration Readings of NMHC (in ppm) at Henry Pirker



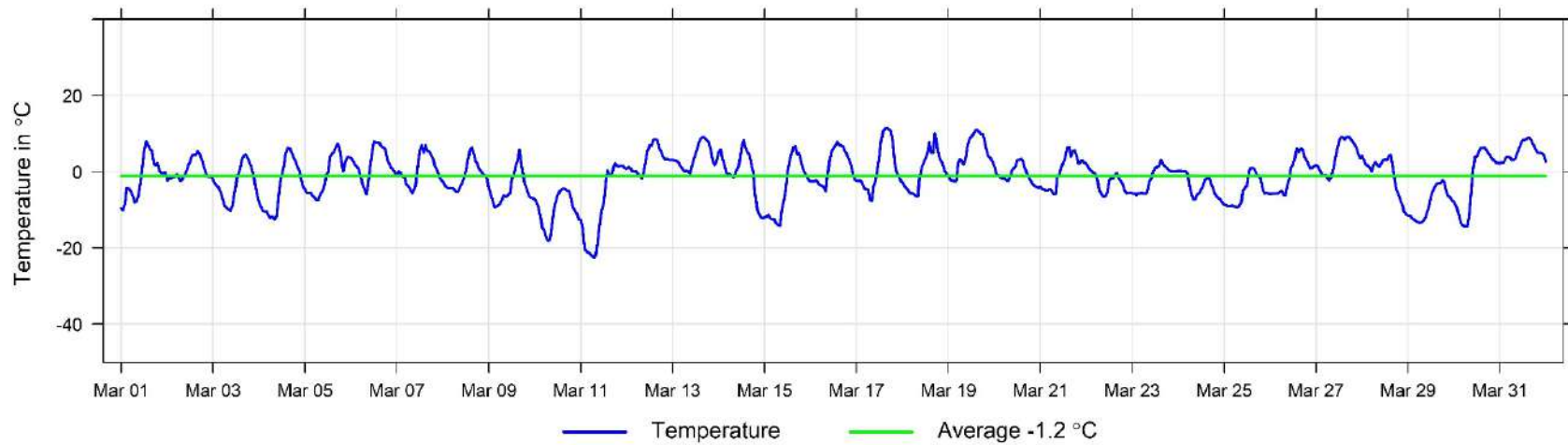
March Hourly Concentration Readings of CO (in ppm) at Henry Pirker



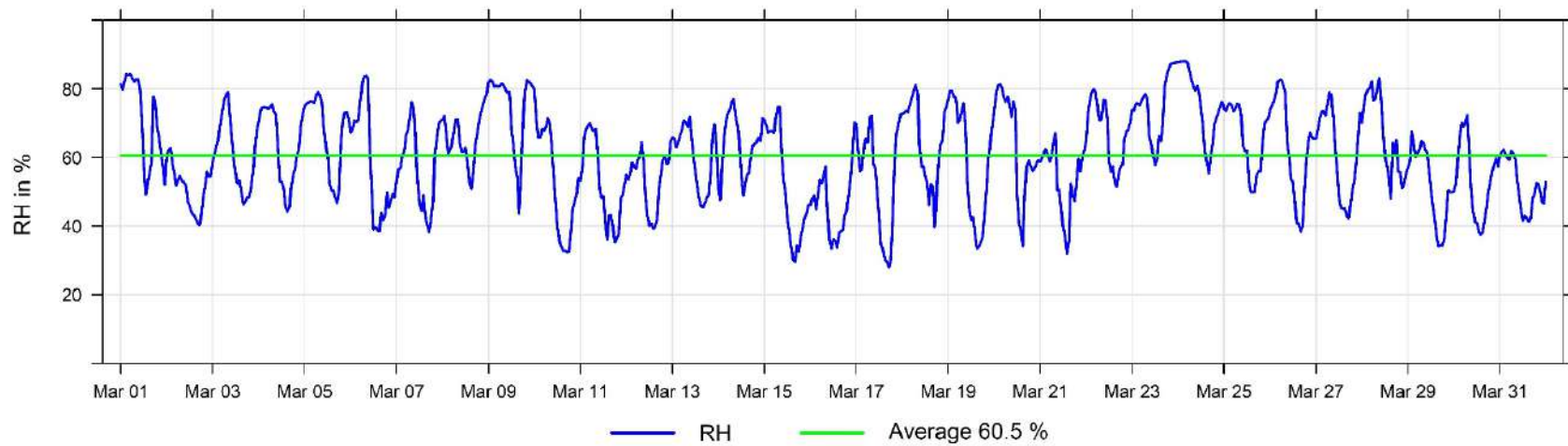
February Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Henry Pirker



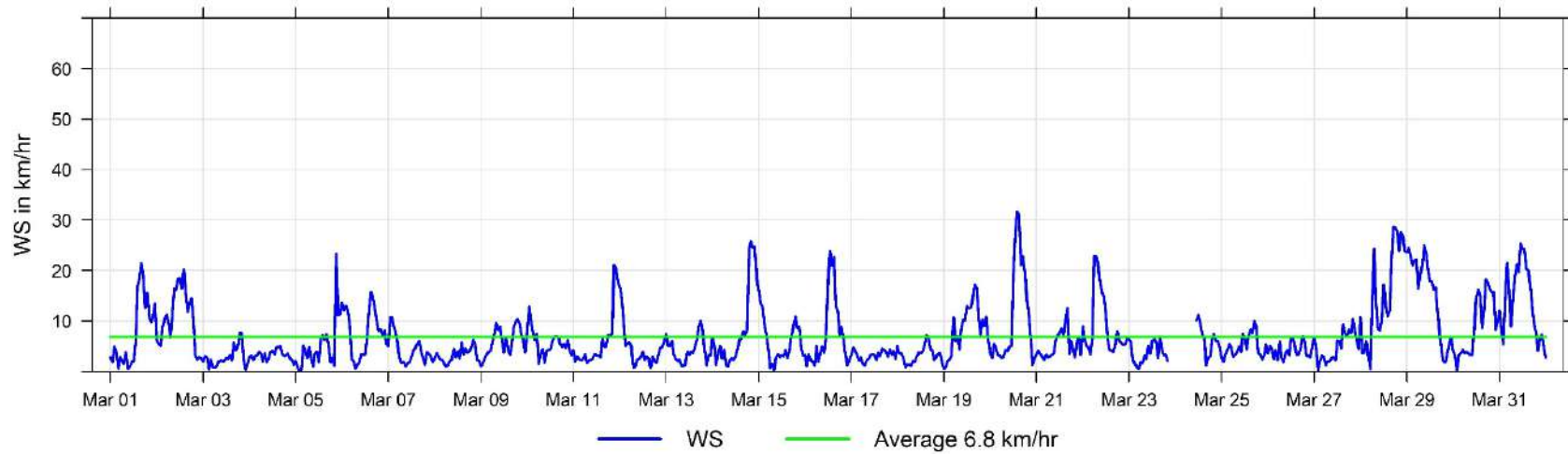
March Hourly Temperature Readings (in °C) at Henry Pirker



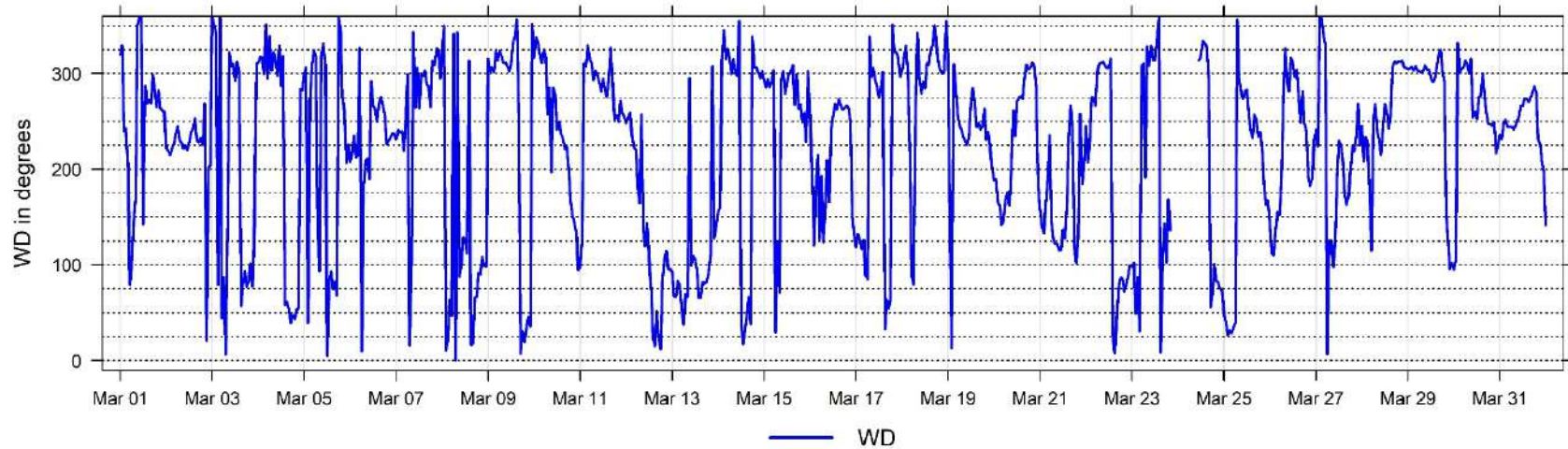
March Hourly Readings of Relative Humidity (in %) at Henry Pirker



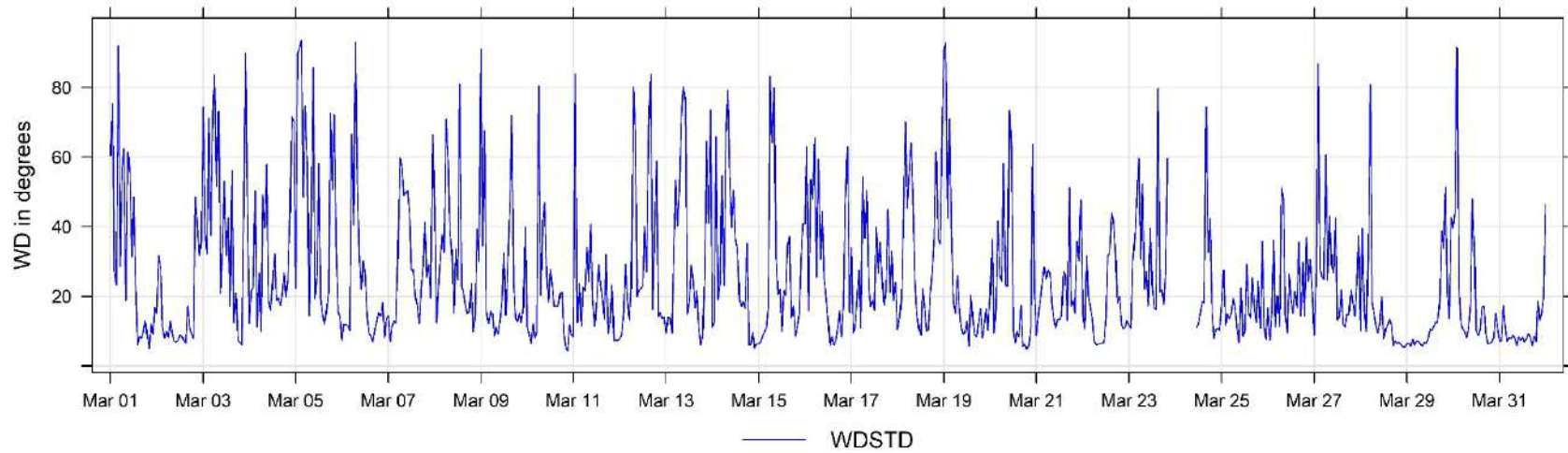
March Hourly Readings of Wind Speed (in km/hr) at Henry Pirker



March Hourly Readings of Wind Direction (in degrees) at Henry Pirker



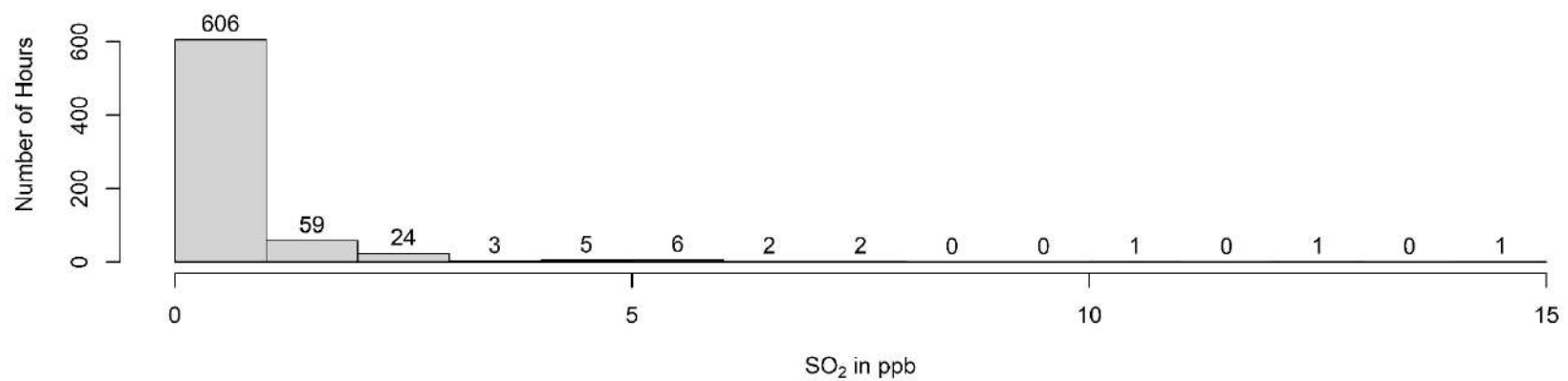
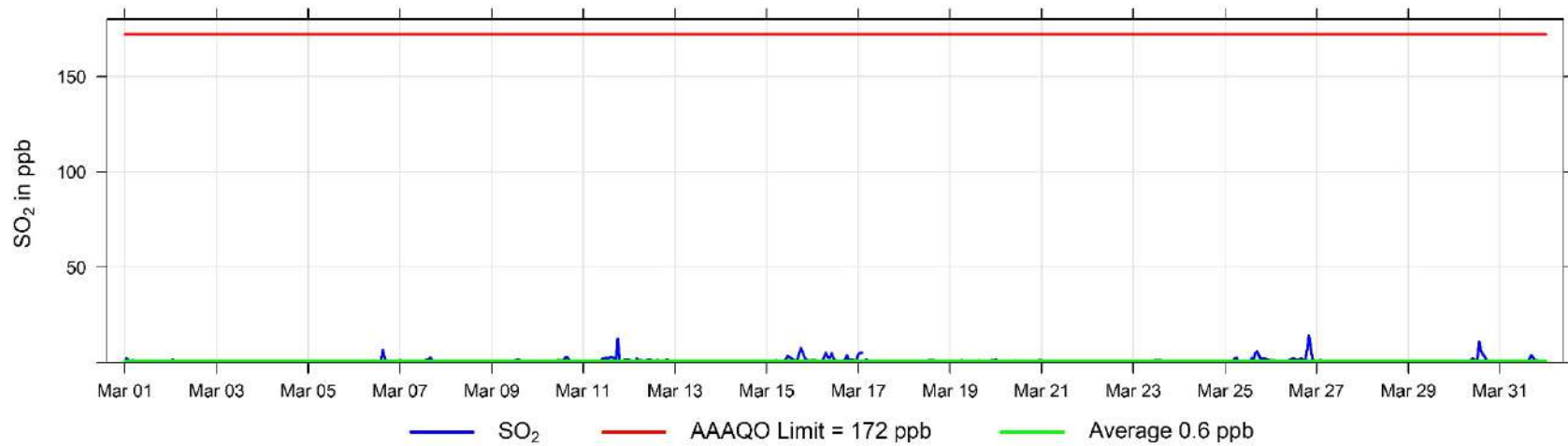
March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Henry Pirker



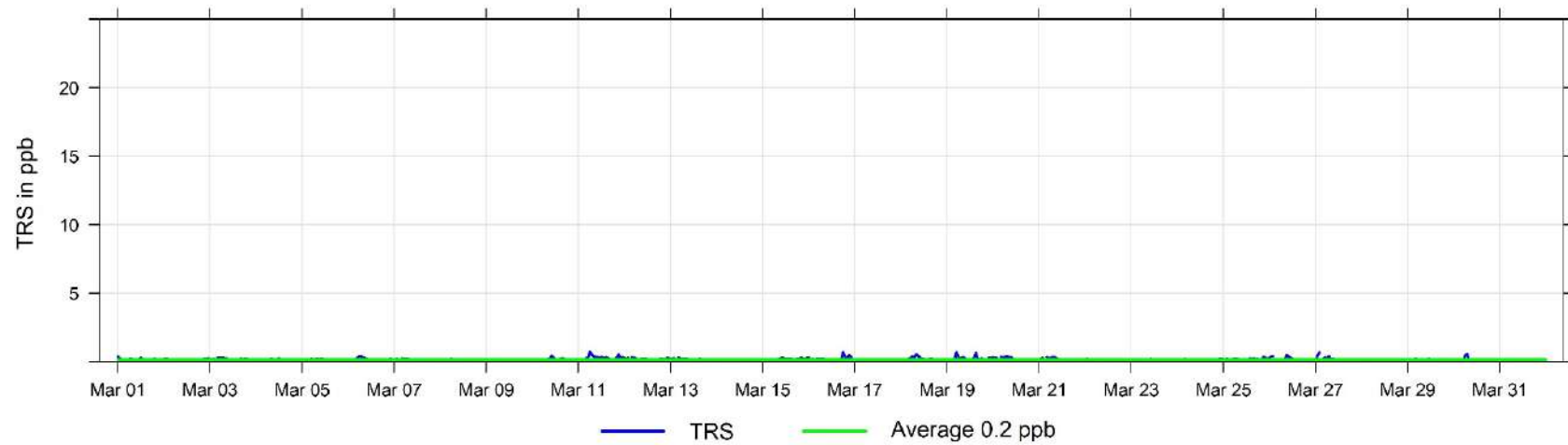
5 Smoky Heights Charts

The following pages include the charts and histograms for Smoky Heights Station

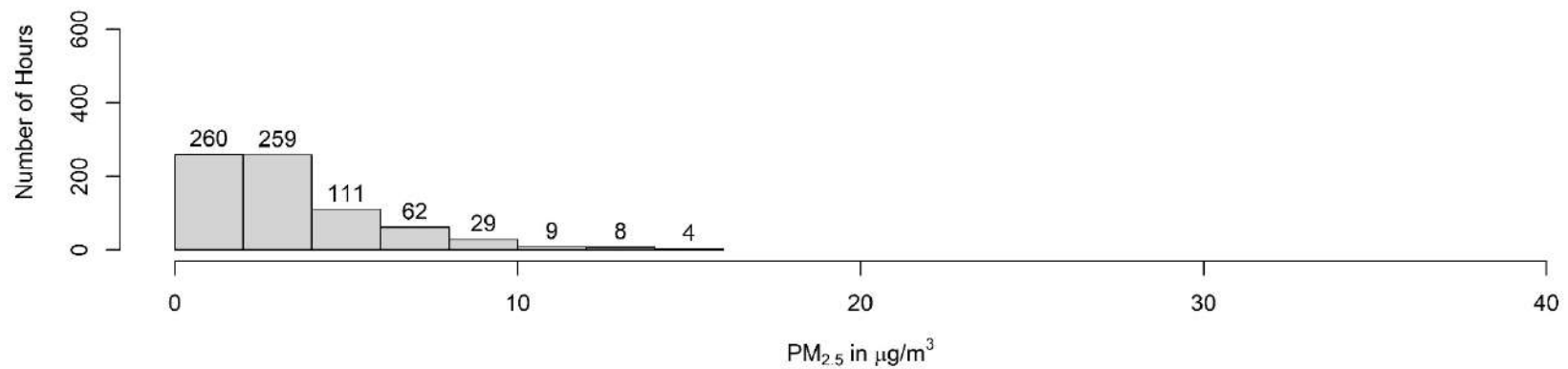
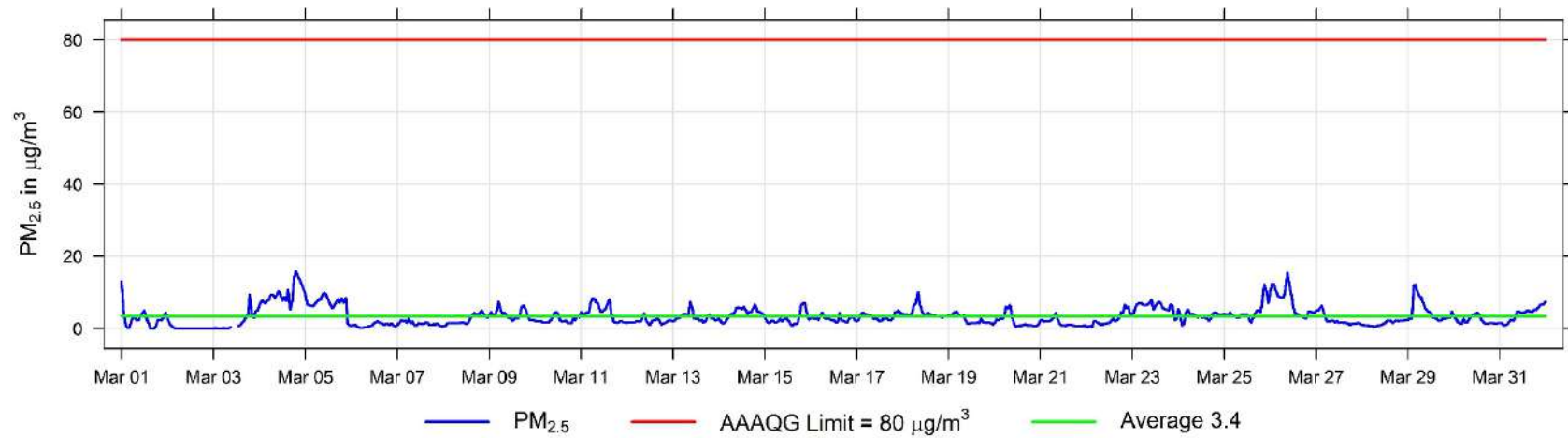
March Hourly Concentration Readings of SO₂ (in ppb) at Smoky Heights



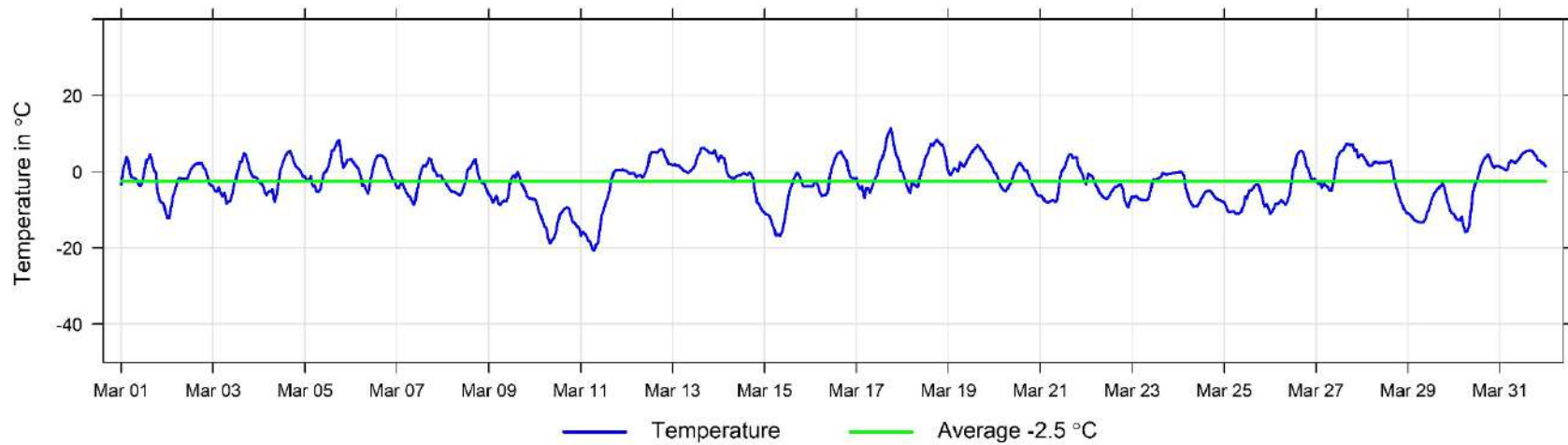
March Hourly Concentration Readings of TRS (in ppb) at Smoky Heights



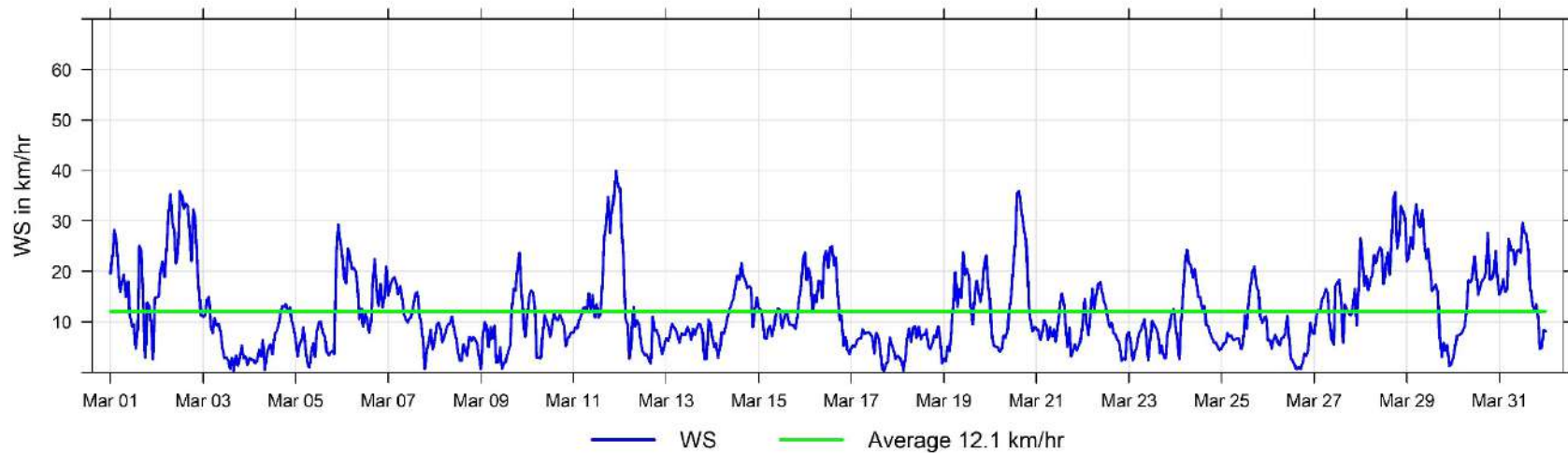
February Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Smoky Heights



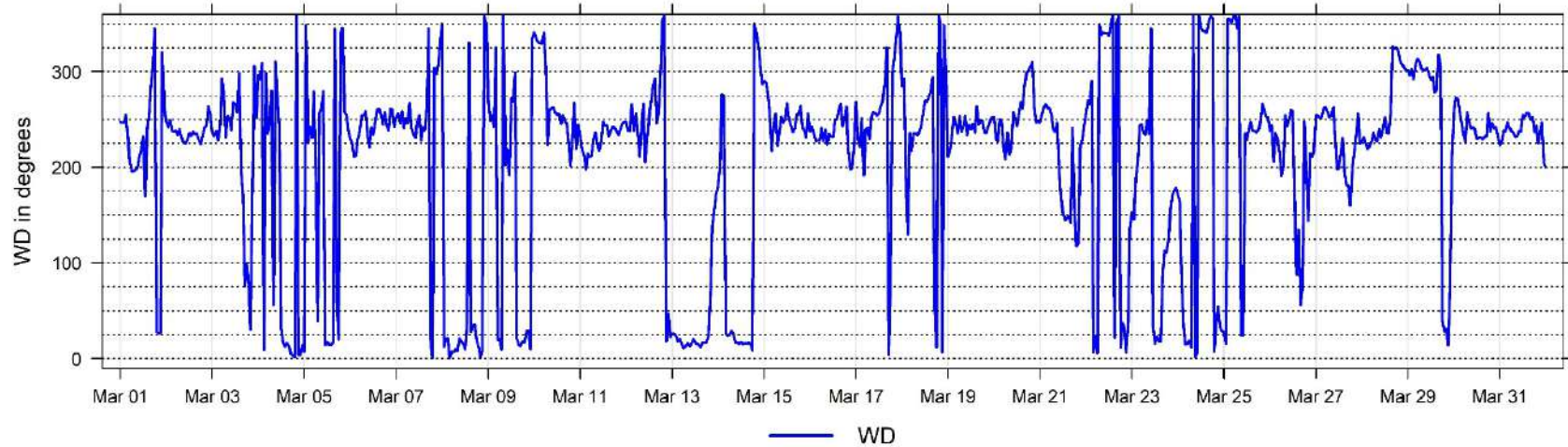
March Hourly Temperature Readings (in °C) at Smoky Heights



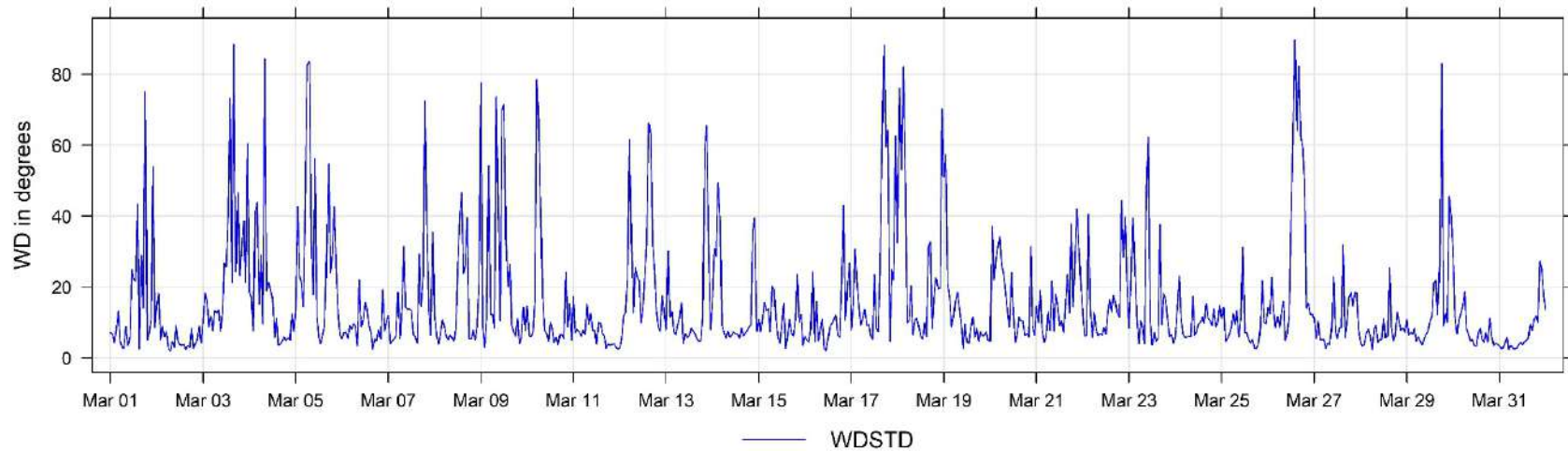
March Hourly Readings of Wind Speed (in km/hr) at Smoky Heights

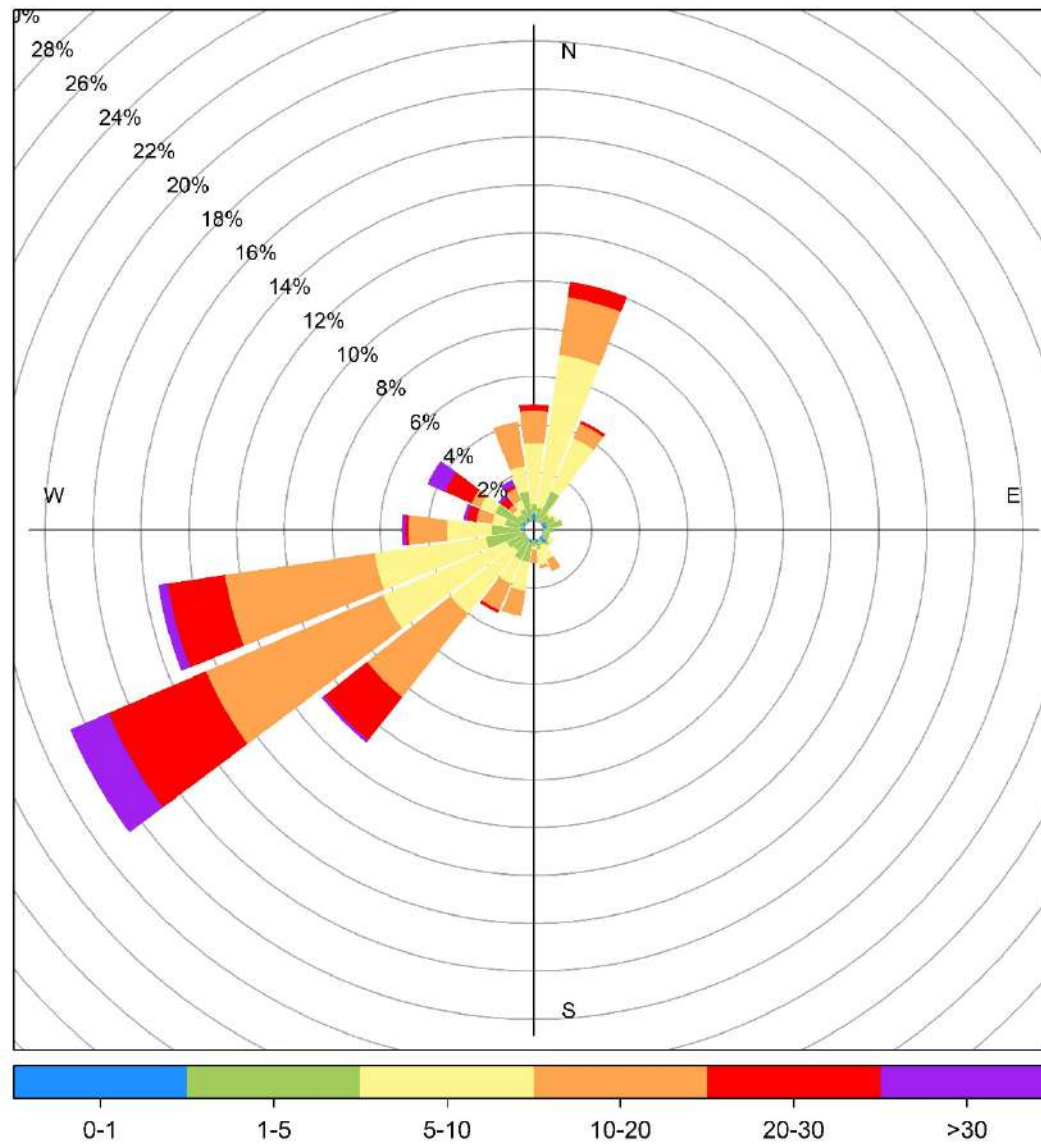


March Hourly Readings of Wind Direction (in degrees) at Smoky Heights



March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Smoky Heights



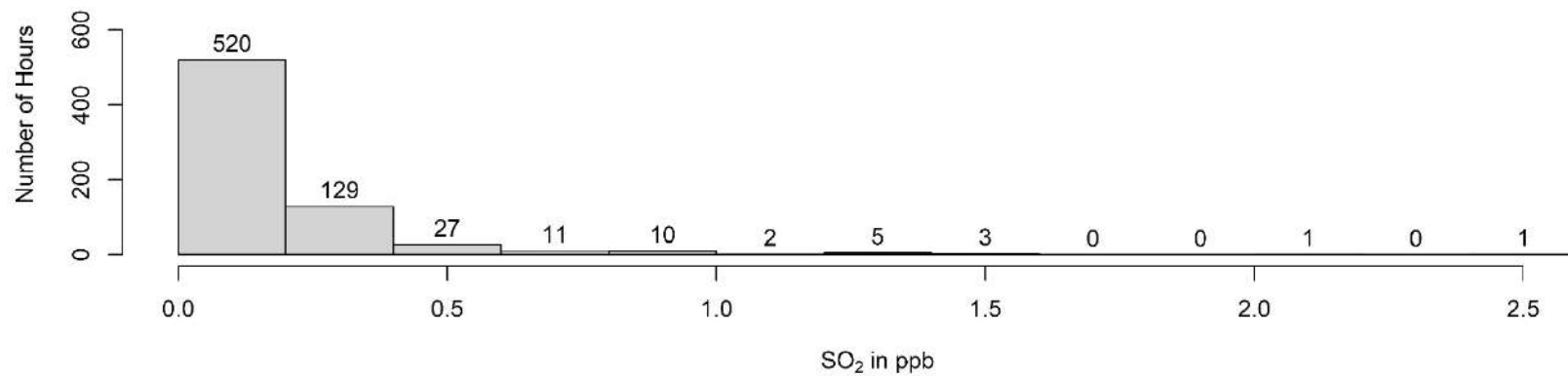
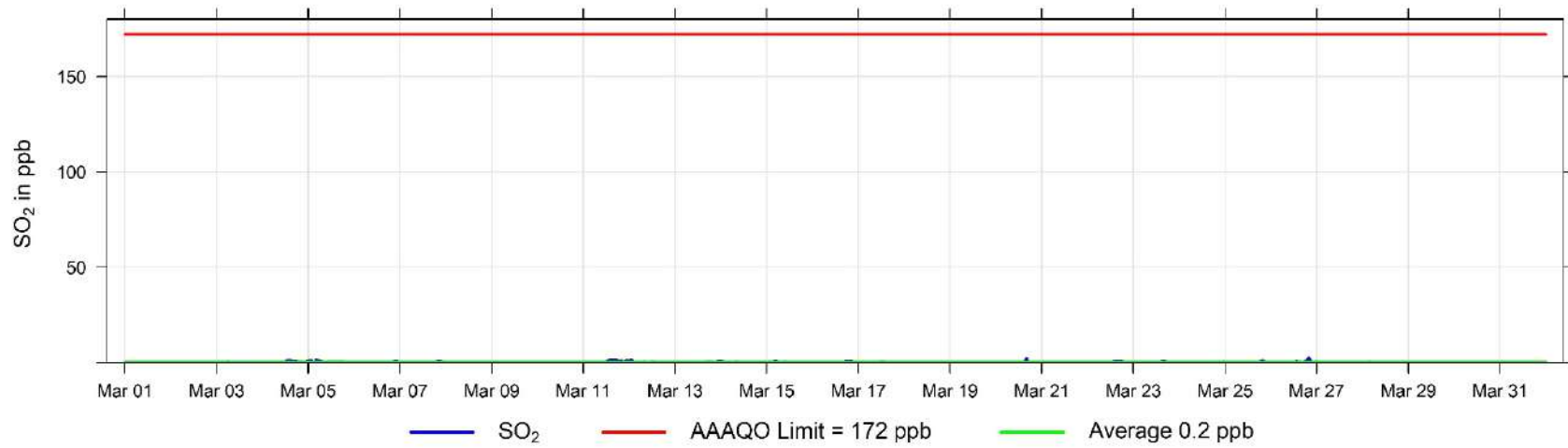


Smoky Heights March Wind Rose, wind speed in km/hr

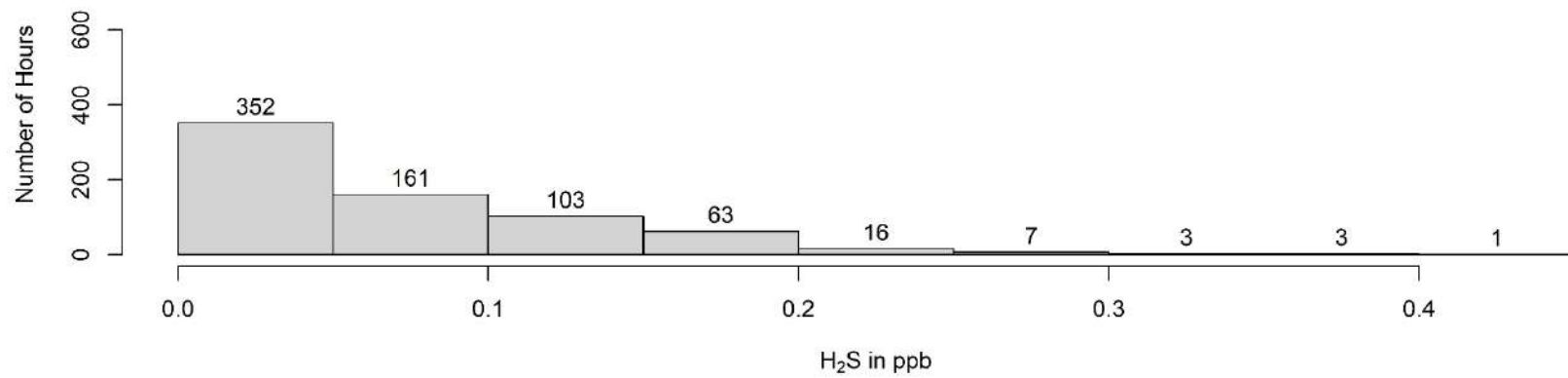
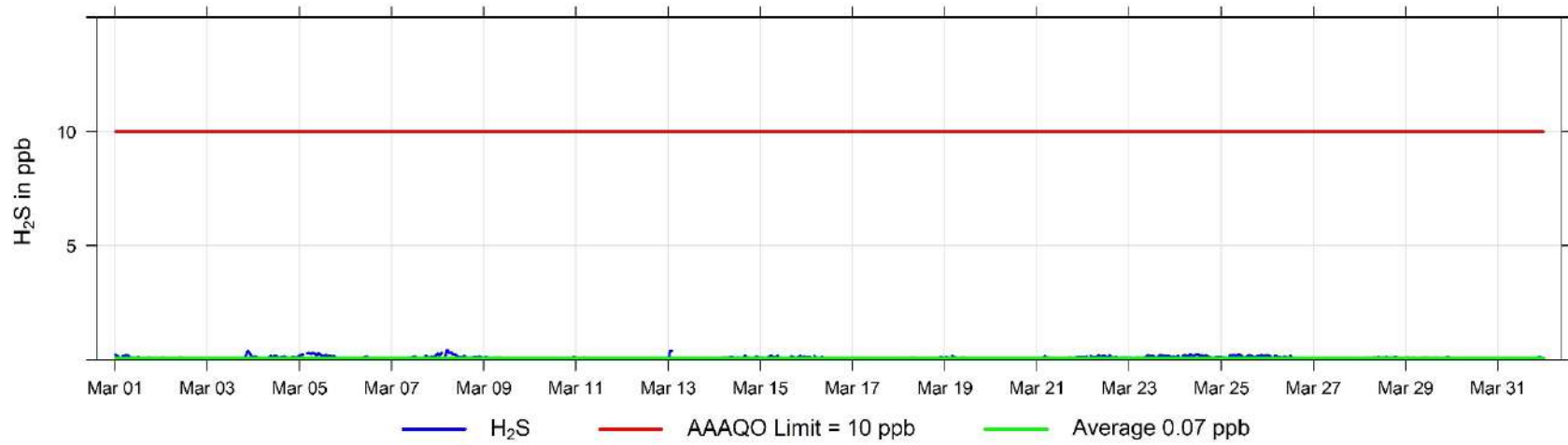
6 Valleyview Charts

The following pages include the charts and histograms for Valleyview Station

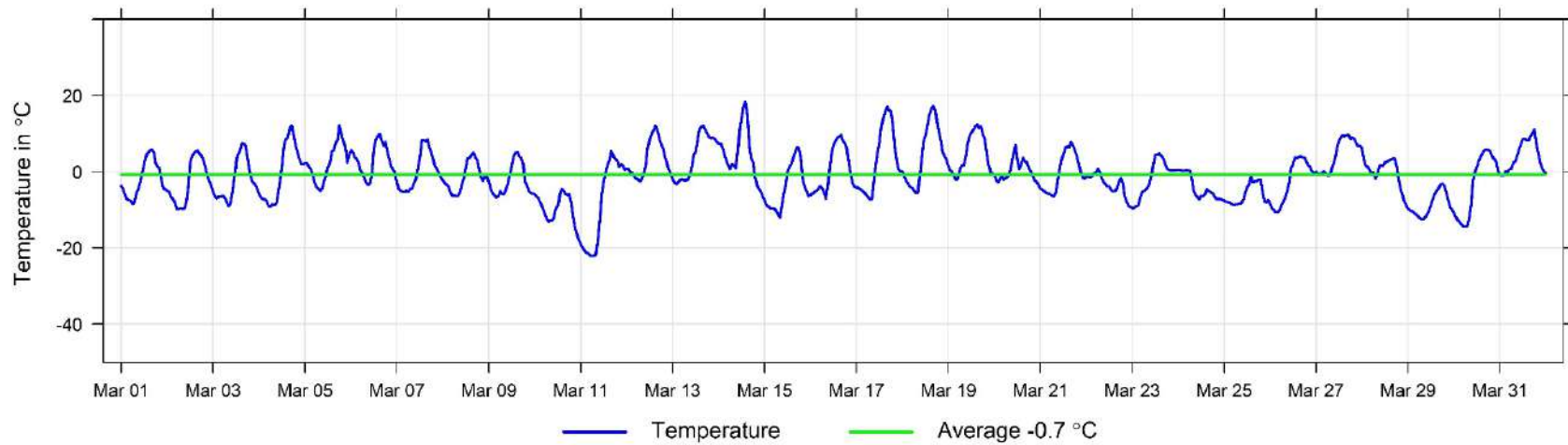
March Hourly Concentration Readings of SO₂ (in ppb) at Valleyview



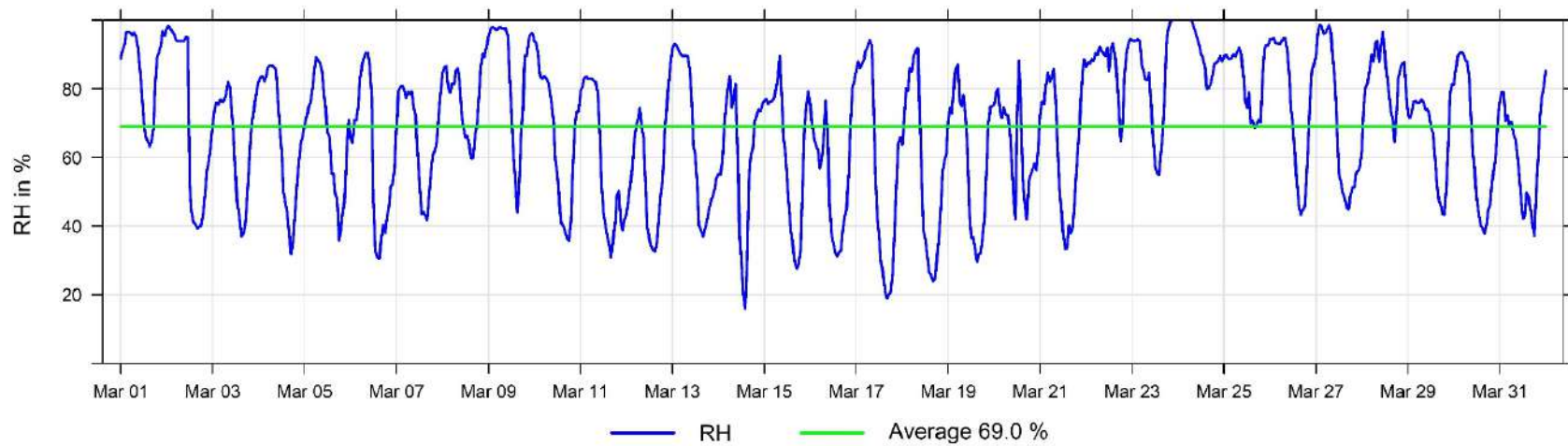
March Hourly Concentration Readings of H₂S (in ppb) at Valleyview



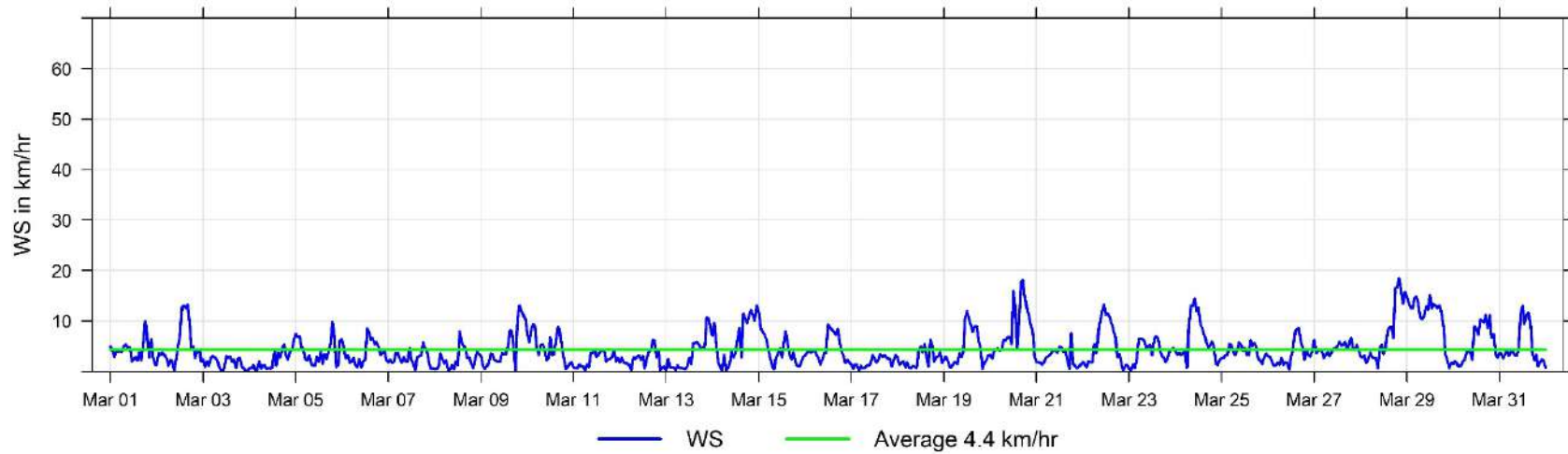
March Hourly Temperature Readings (in °C) at Valleyview



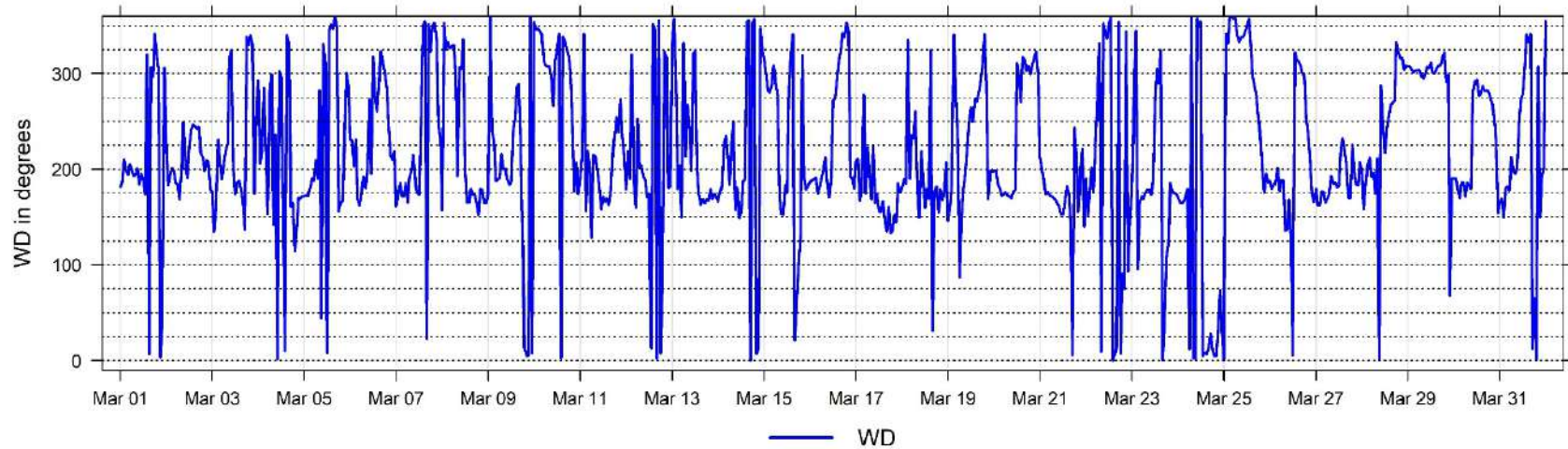
March Hourly Readings of Relative Humidity (in %) at Valleyview



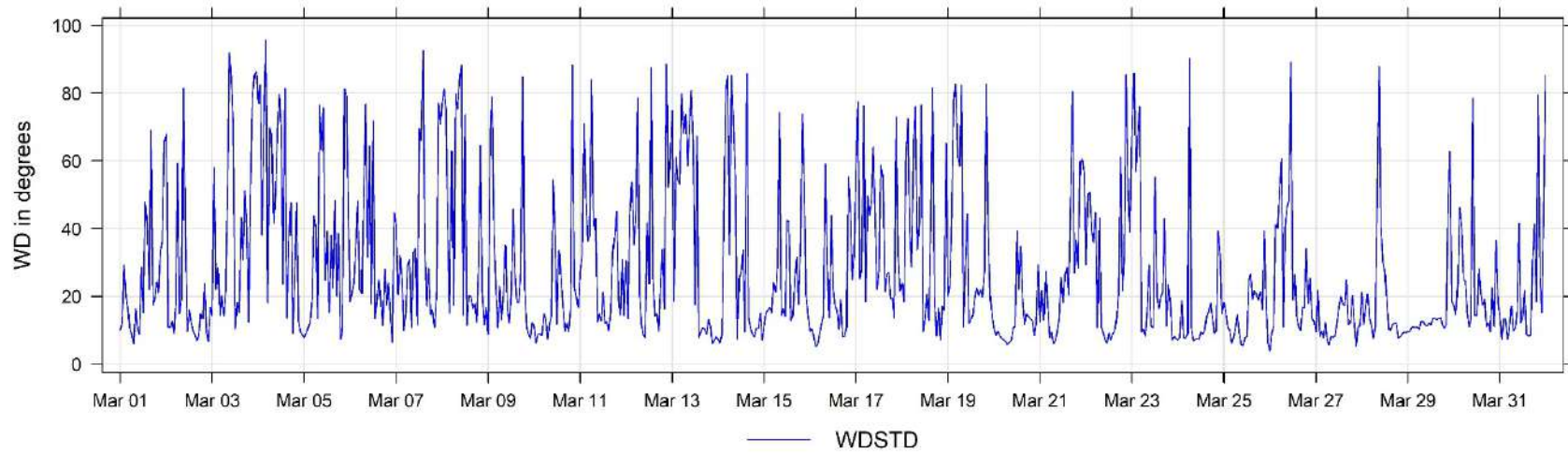
March Hourly Readings of Wind Speed (in km/hr) at Valleyview



March Hourly Readings of Wind Direction (in degrees) at Valleyview



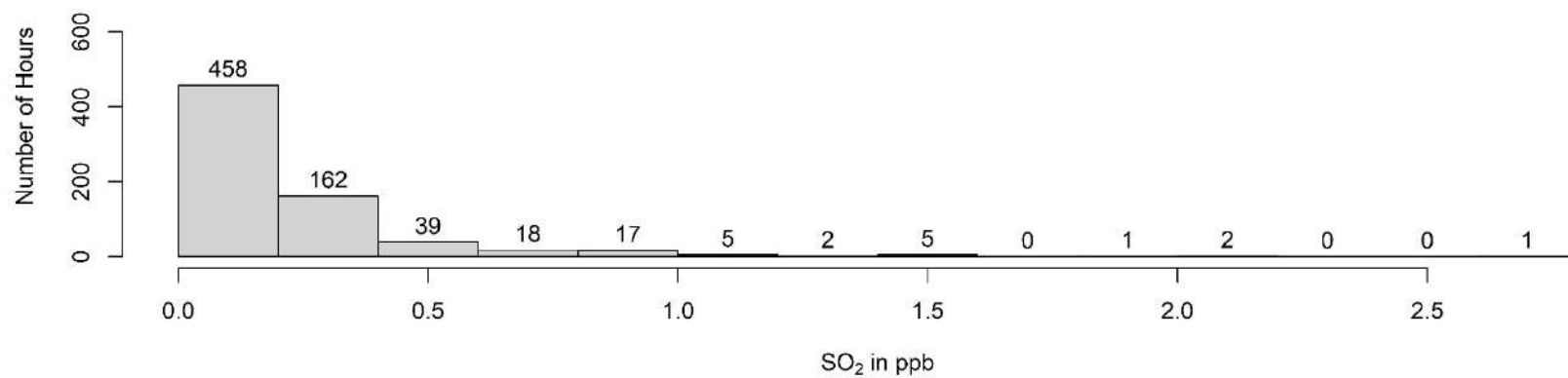
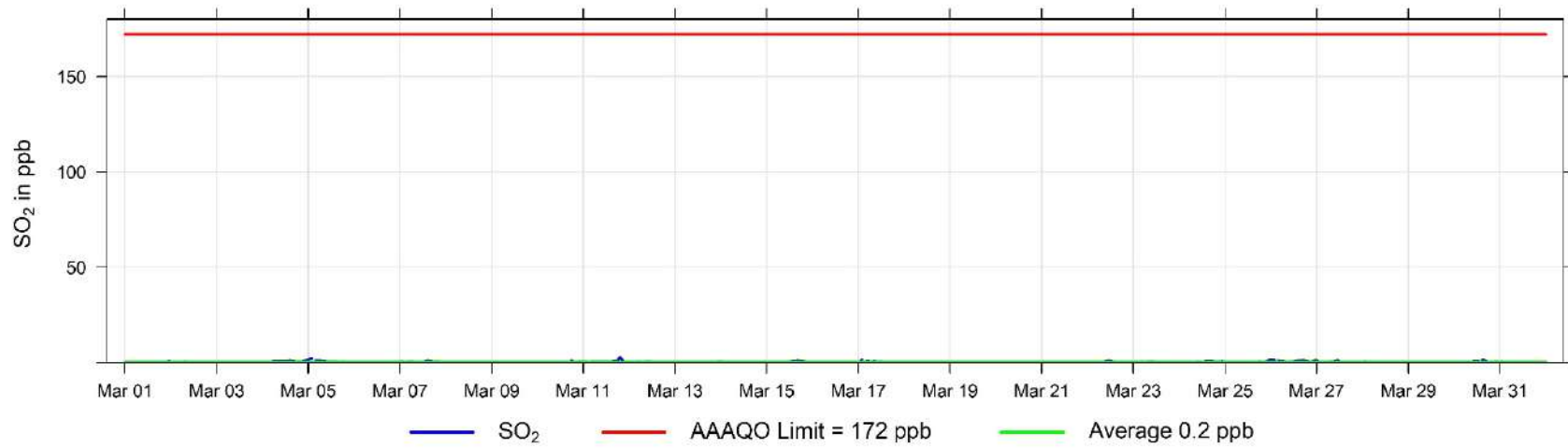
March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Valleyview



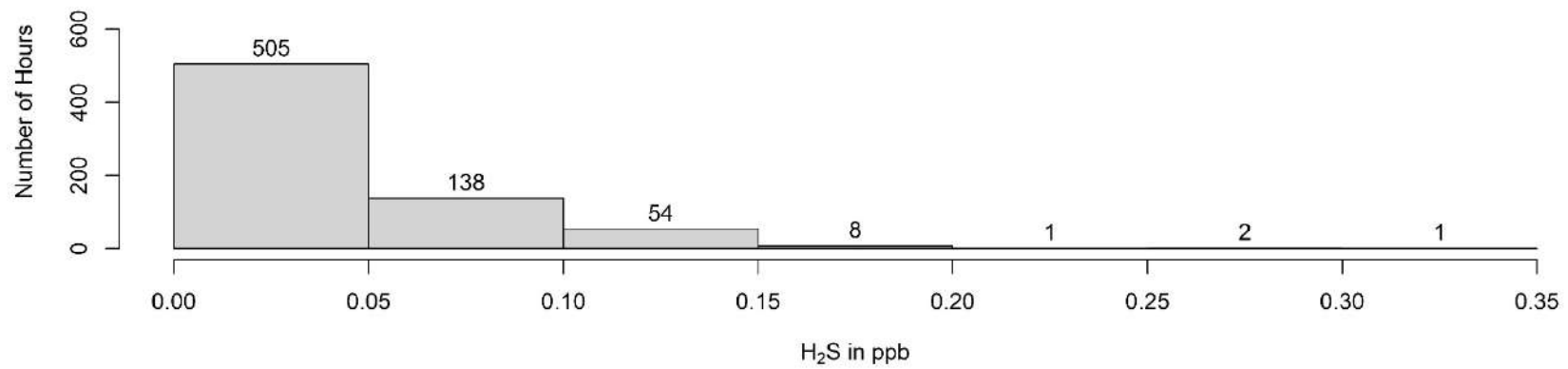
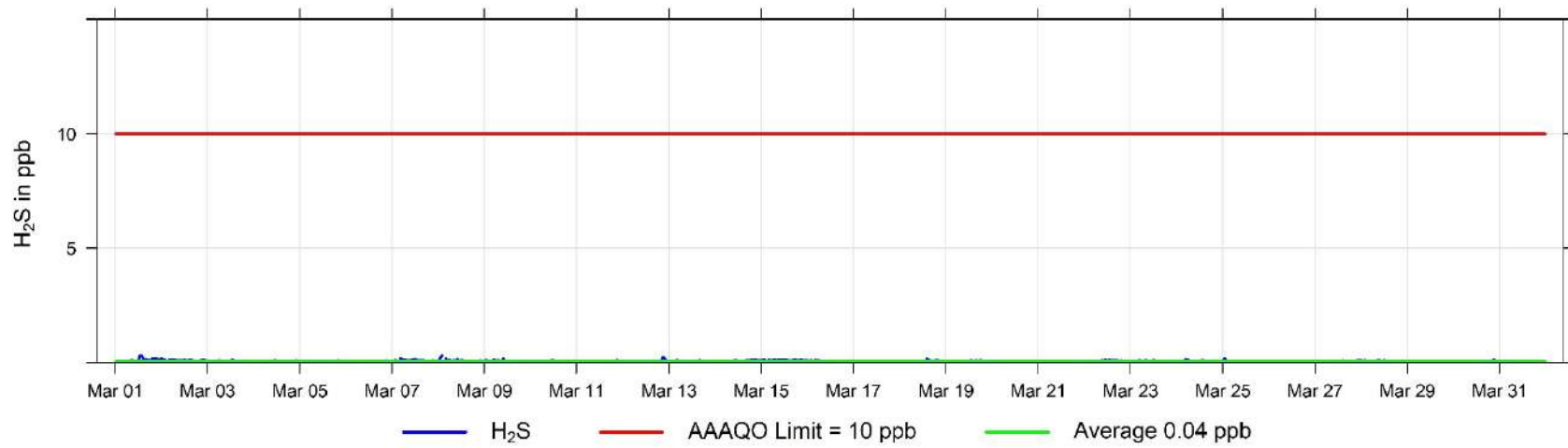
7 Donnelly Charts

The following pages include the charts and histograms for Donnelly Station

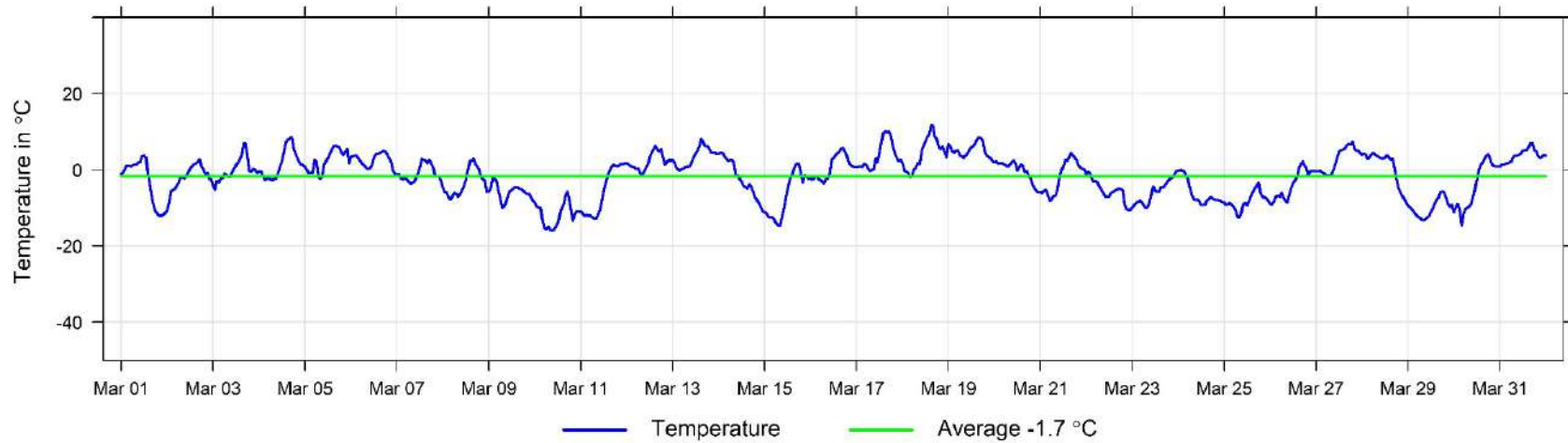
March Hourly Concentration Readings of SO₂ (in ppb) at Donnelly



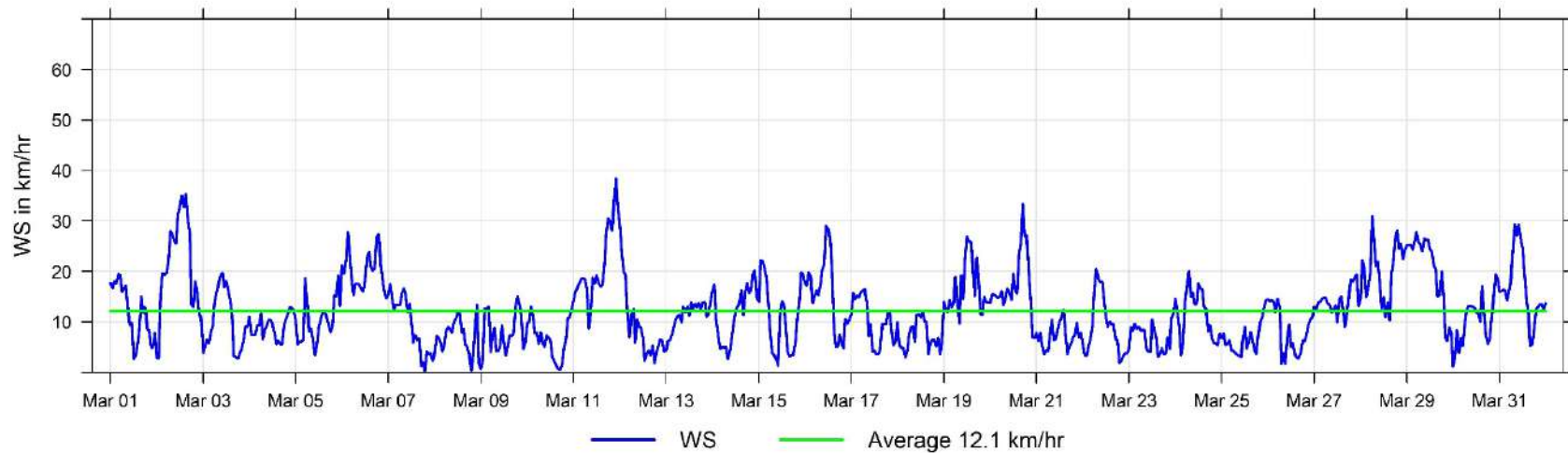
March Hourly Concentration Readings of H₂S (in ppb) at Donnelly



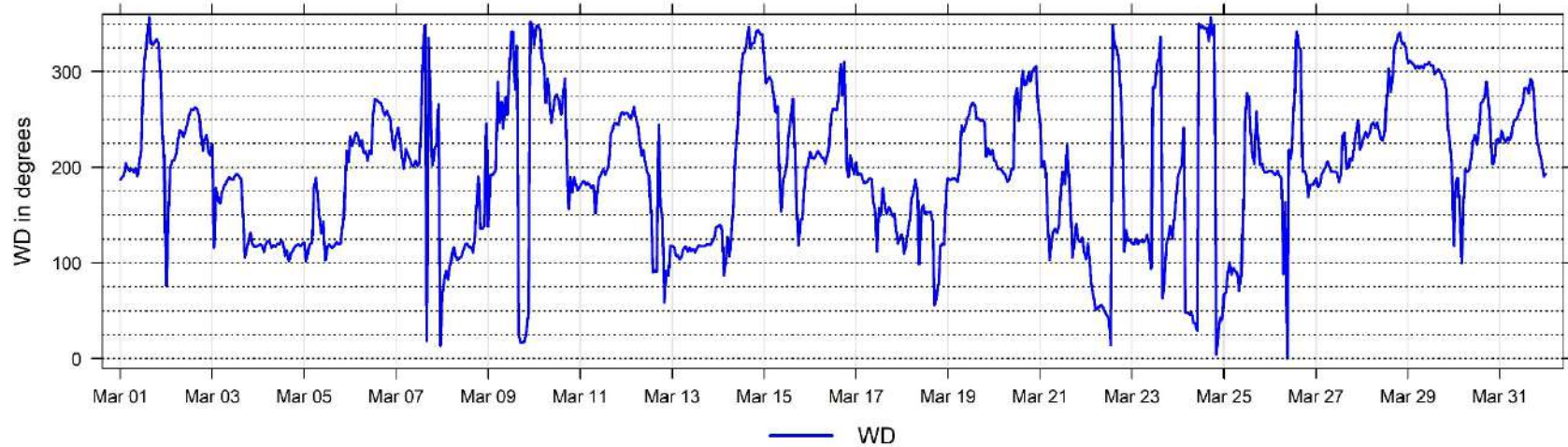
March Hourly Temperature Readings (in °C) at Donnelly



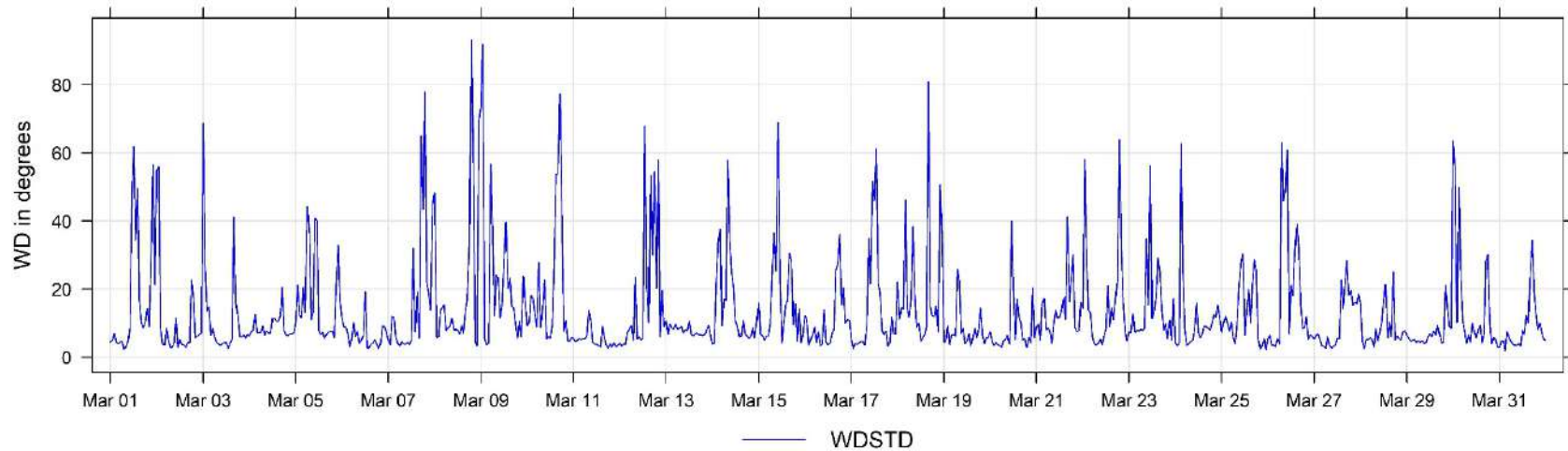
March Hourly Readings of Wind Speed (in km/hr) at Donnelly

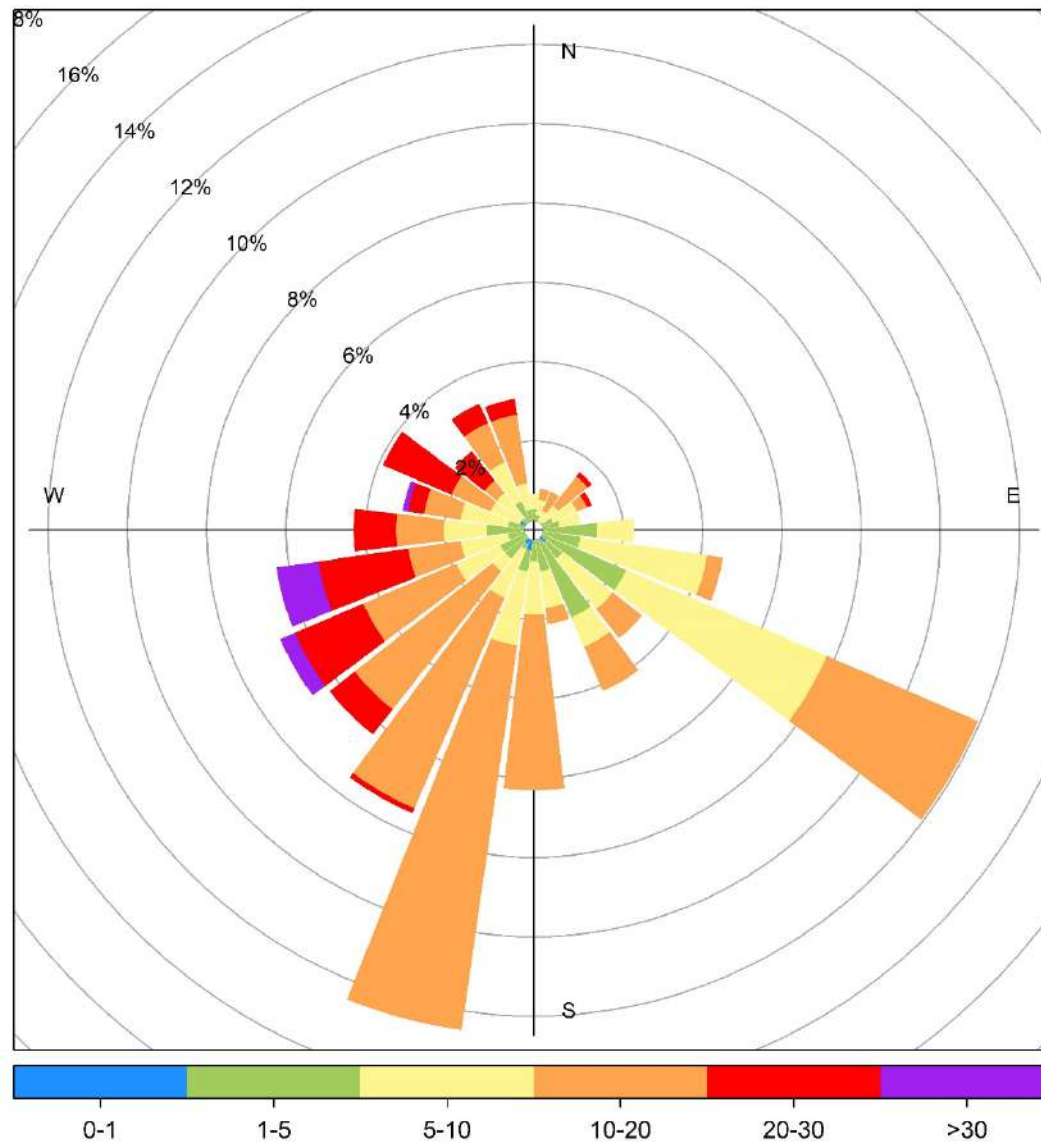


March Hourly Readings of Wind Direction (in degrees) at Donnelly



March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Donnelly



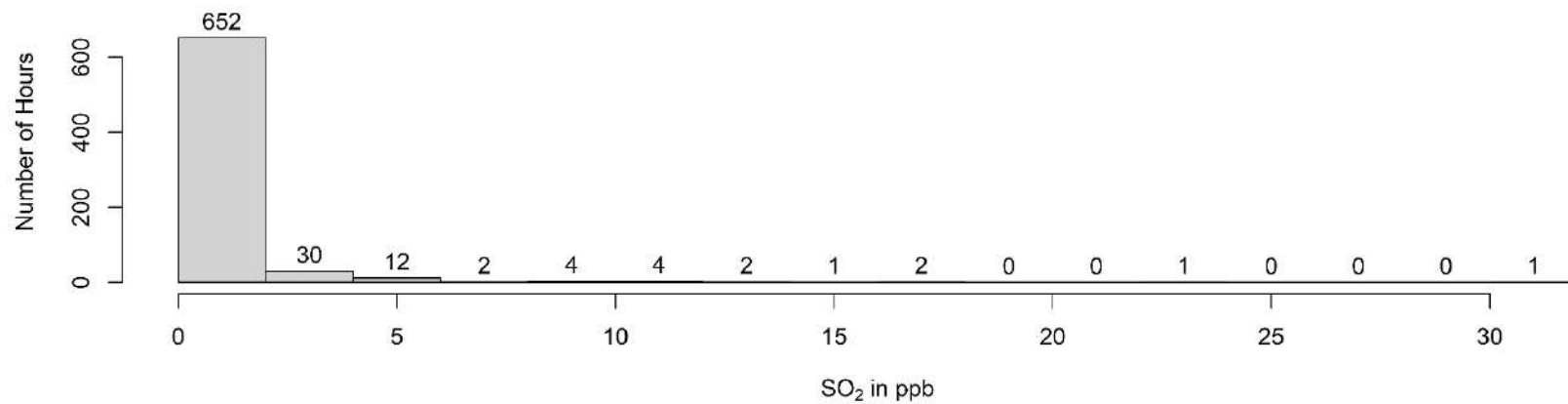
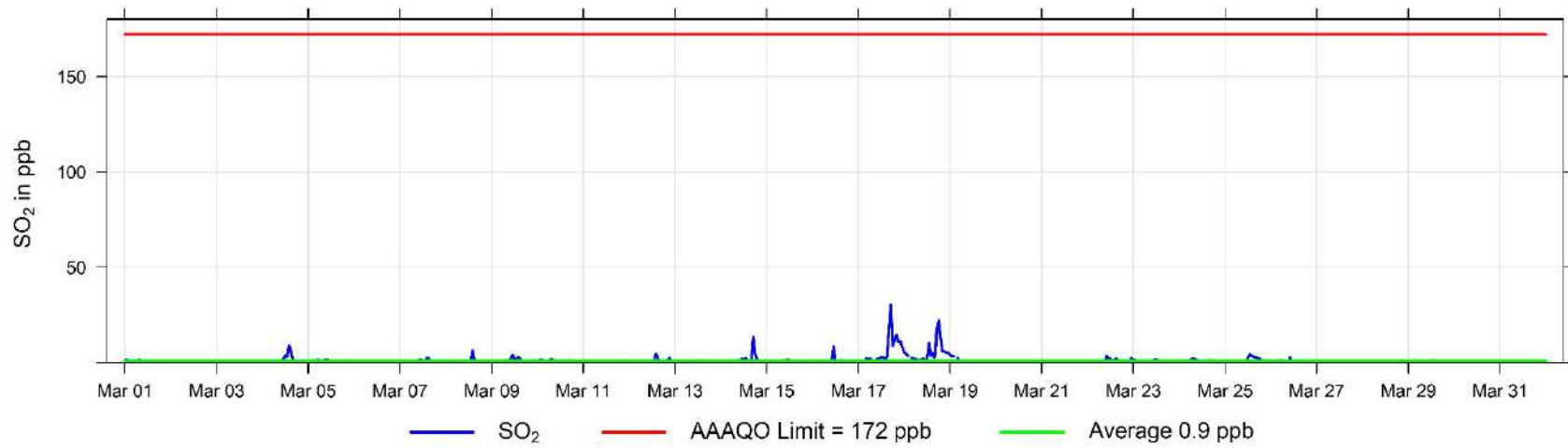


Donnelly March Wind Rose, wind speed in km/hr

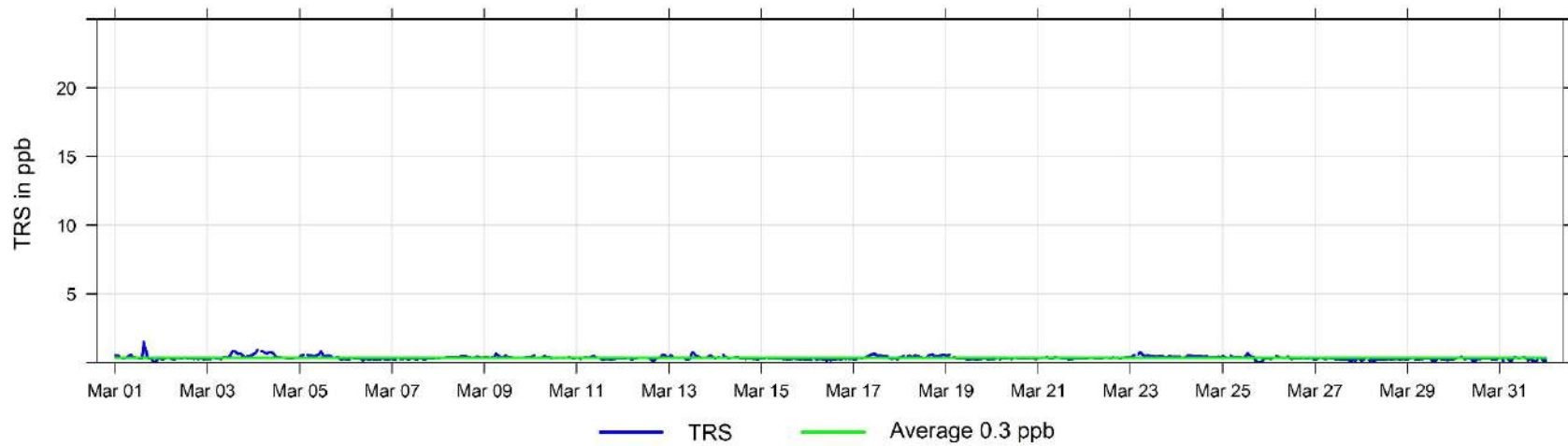
8 Wembley (Portable) Charts

The following pages include the charts and histograms for Wembley Portable Station

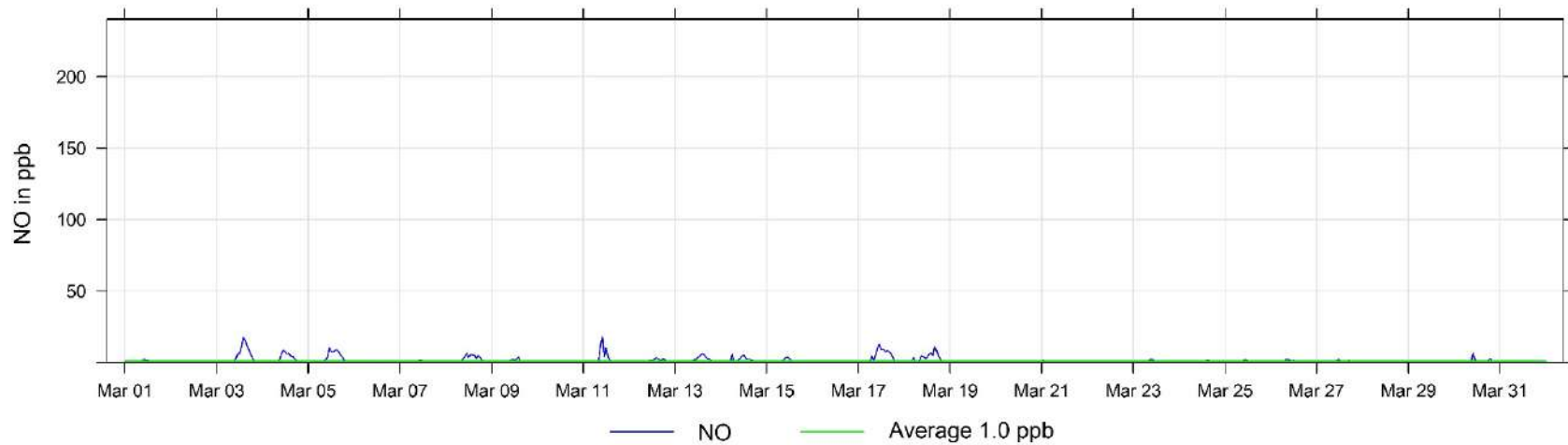
March Hourly Concentration Readings of SO₂ (in ppb) at Wembley



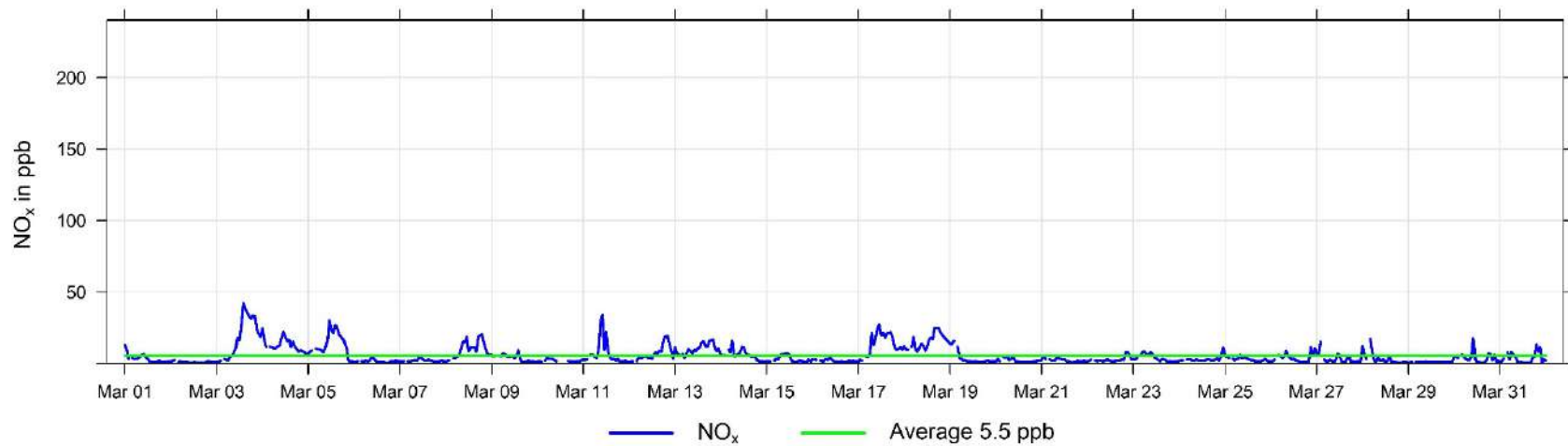
March Hourly Concentration Readings of TRS (in ppb) at Wembley



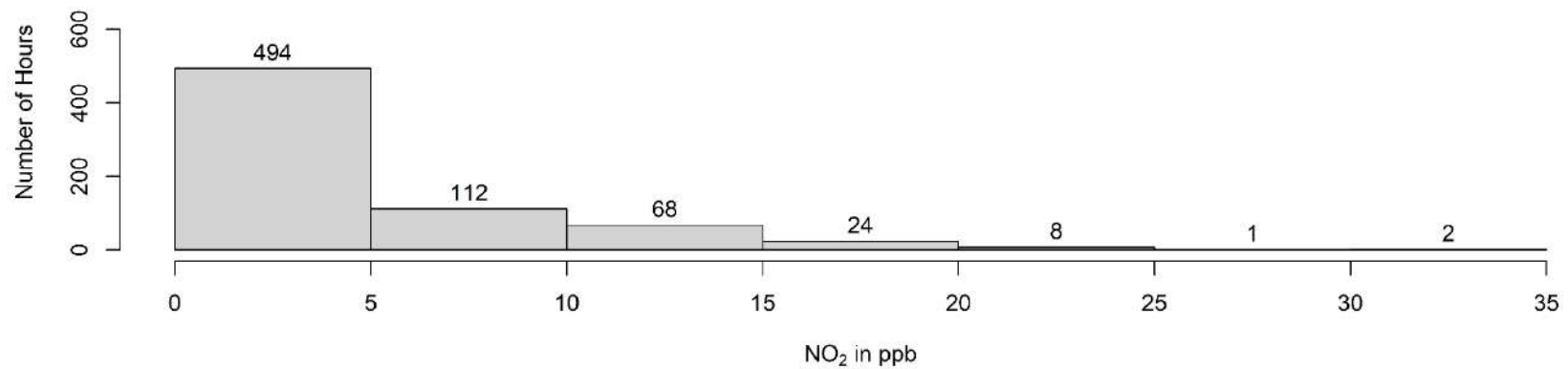
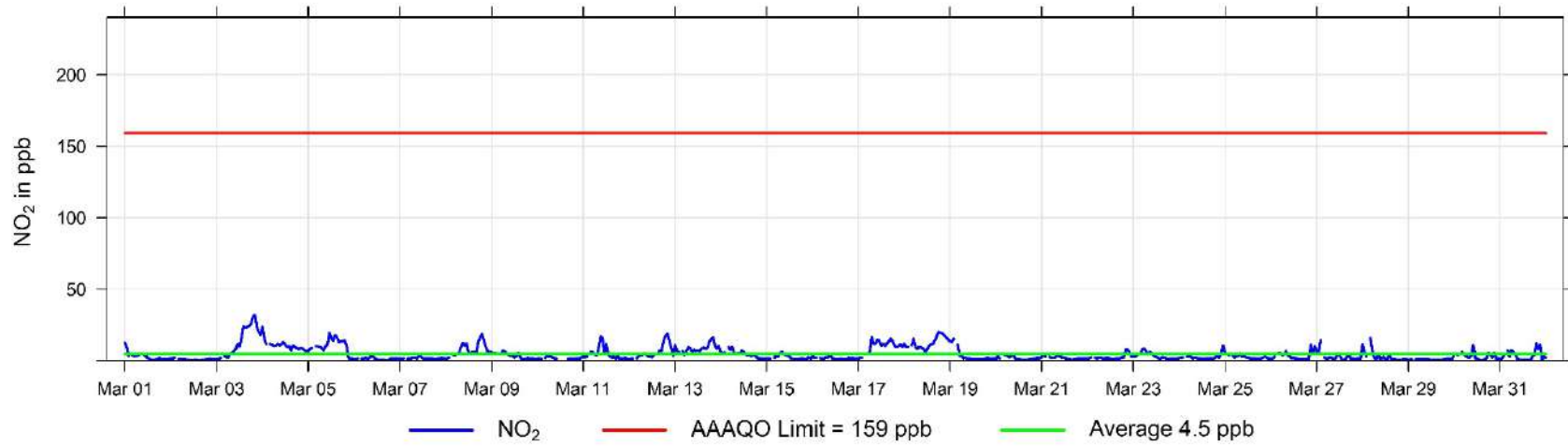
March Hourly Concentration Readings of NO (in ppb) at Wembley



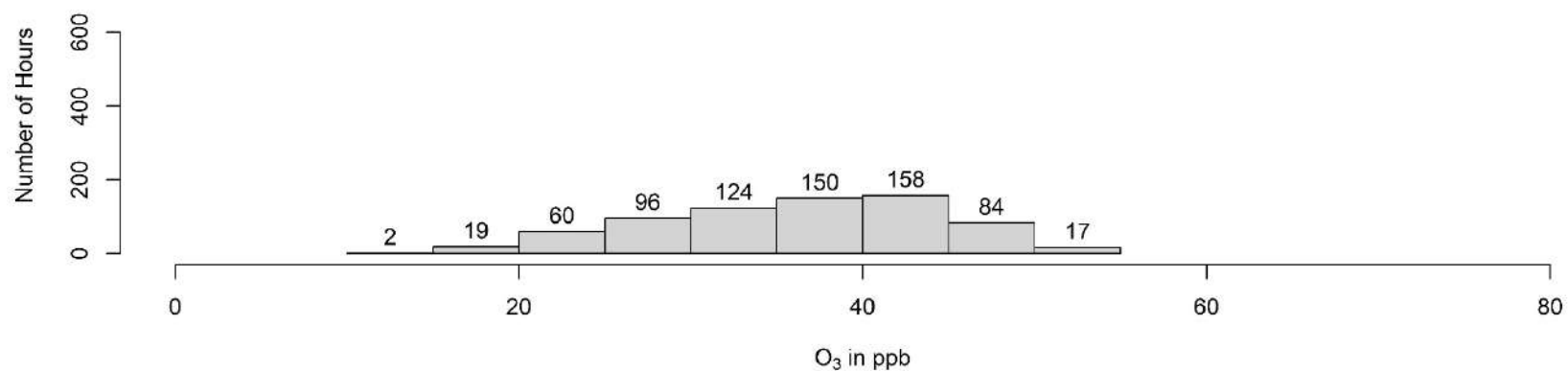
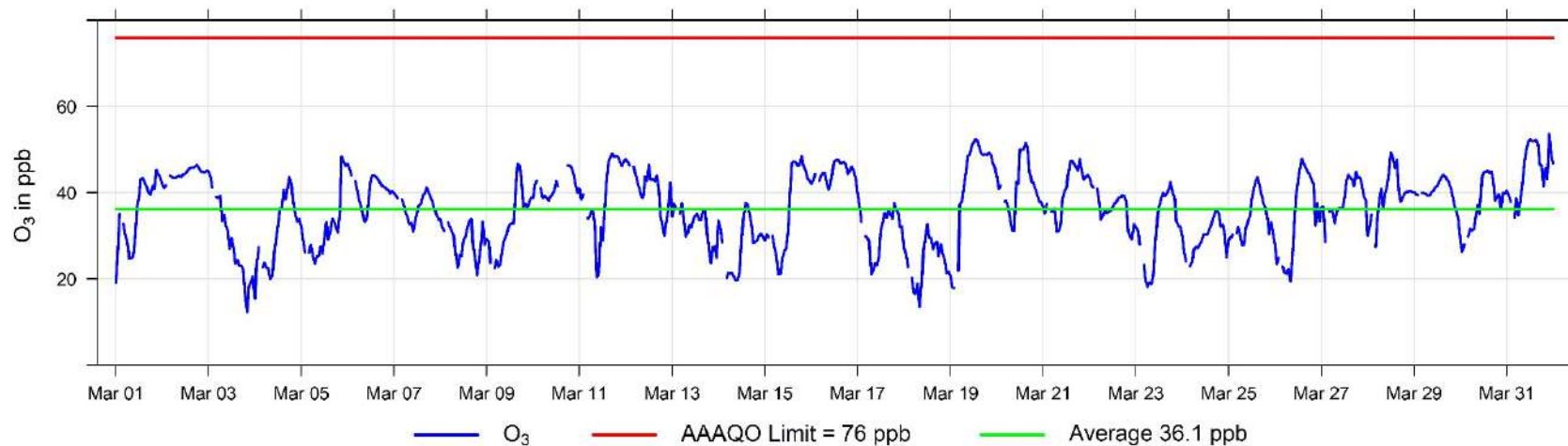
March Hourly Concentration Readings of NO_x (in ppb) at Wembley



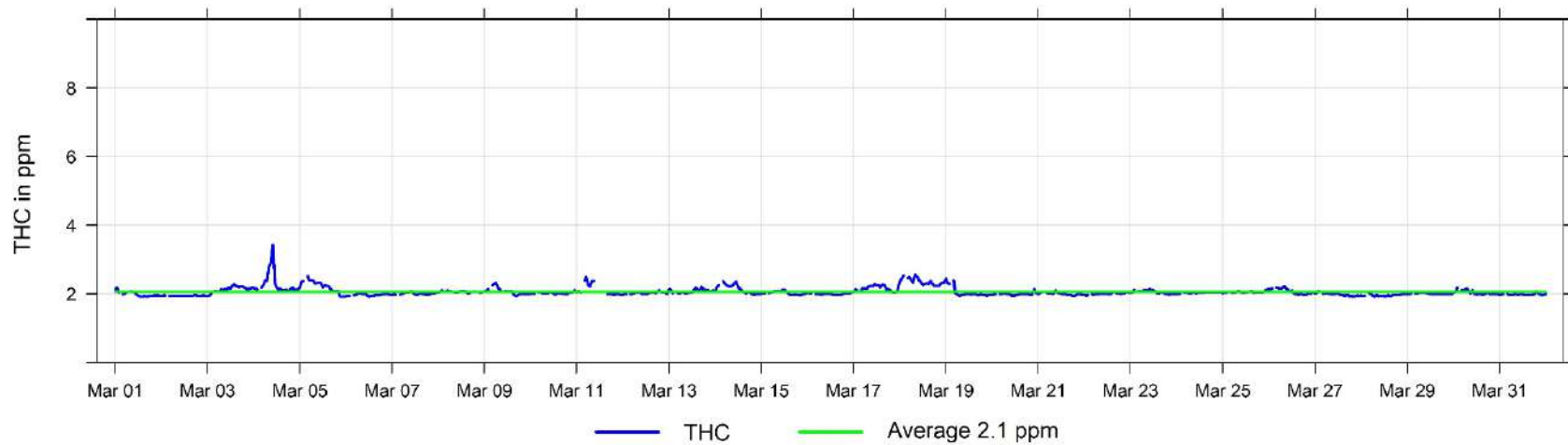
March Hourly Concentration Readings of NO₂ (in ppb) at Wembley



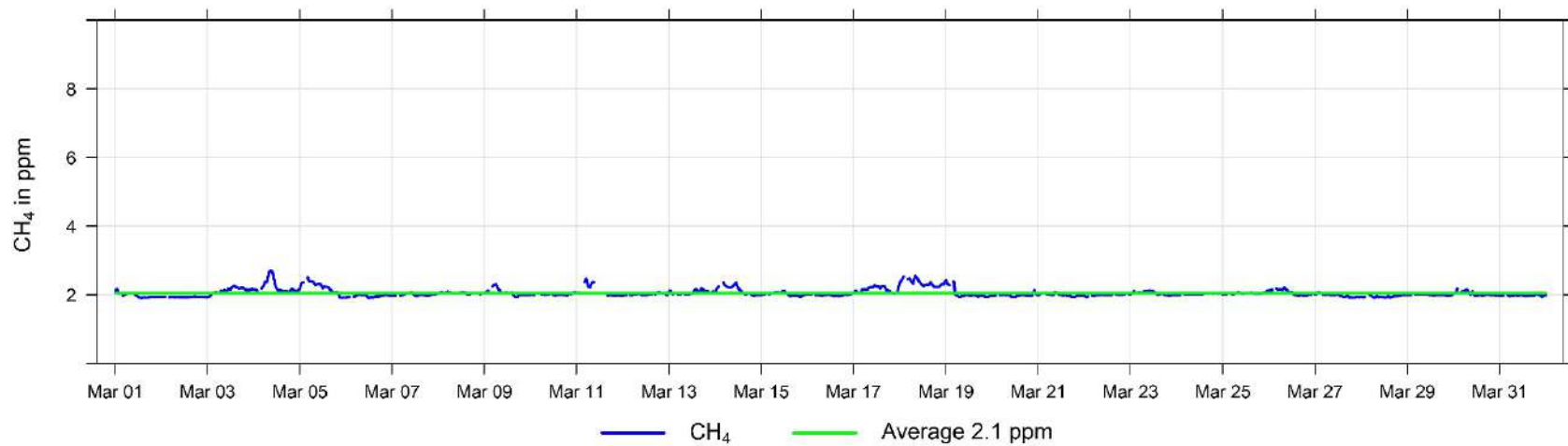
March Hourly Concentration Readings of O₃ (in ppb) at Wembley



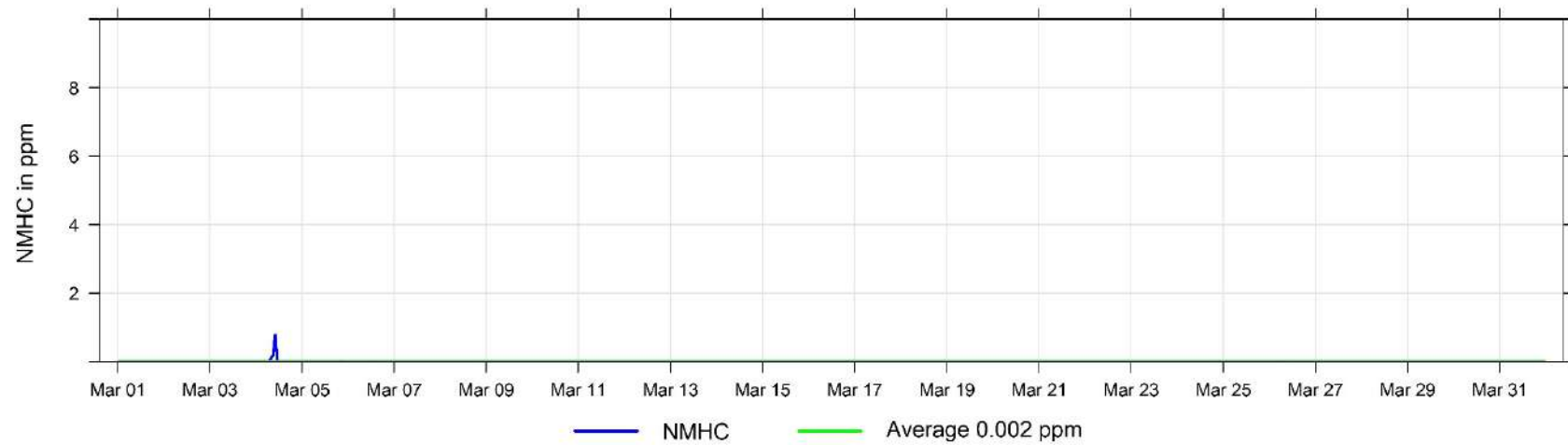
March Hourly Concentration Readings of THC (in ppm) at Wembley



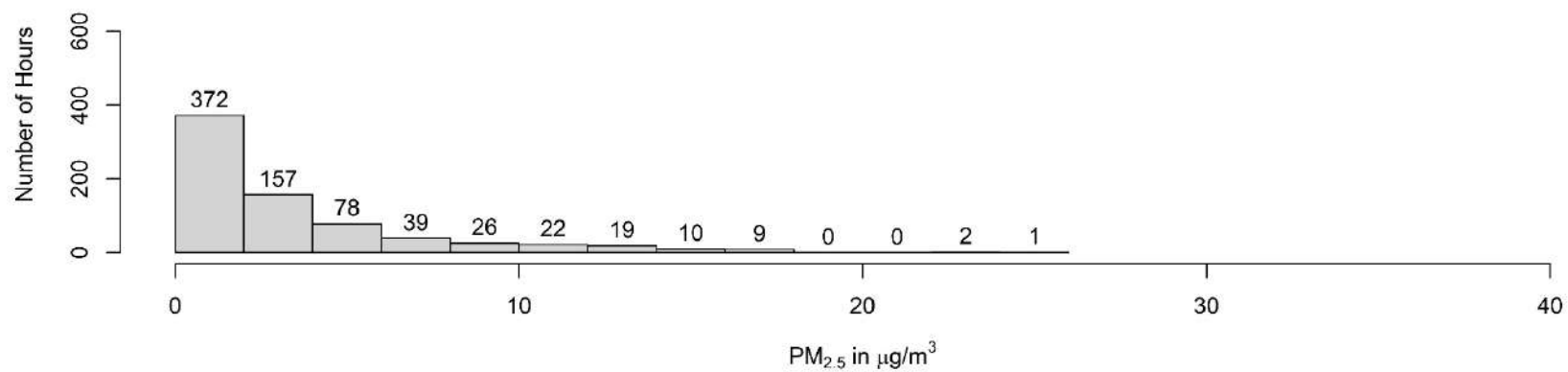
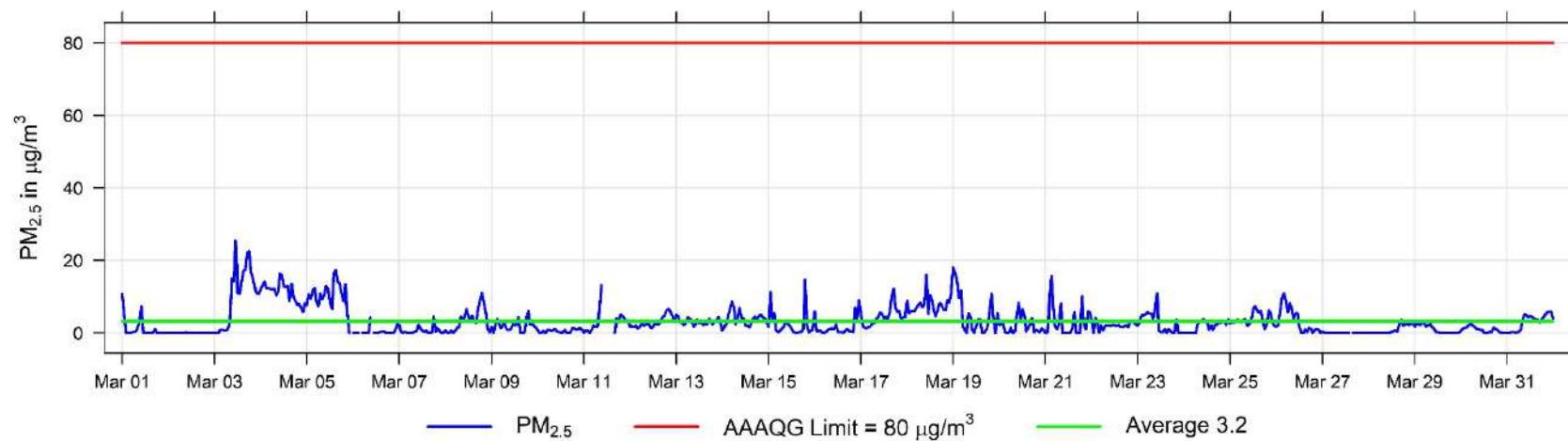
March Hourly Concentration Readings of CH₄ (in ppm) at Wembley



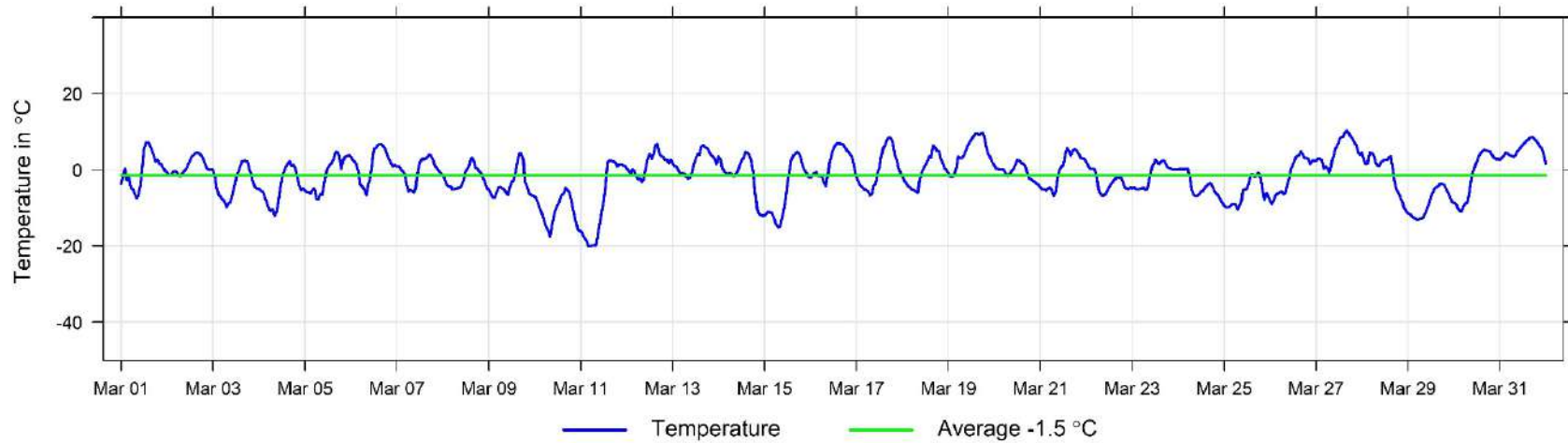
March Hourly Concentration Readings of NMHC (in ppm) at Wembley



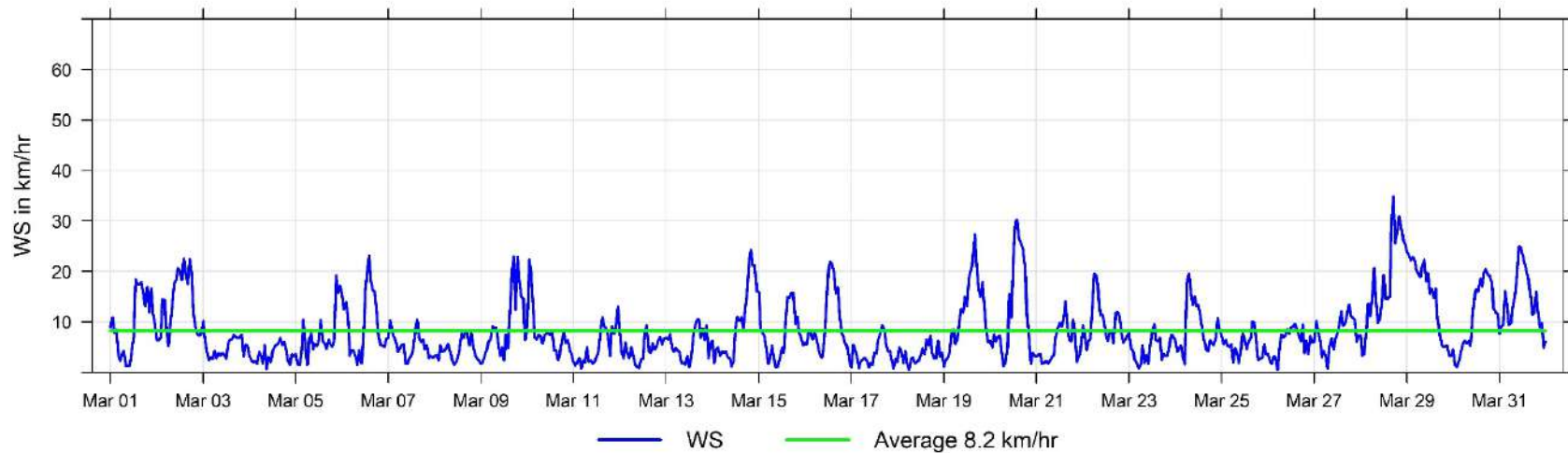
February Hourly Concentration Readings of PM_{2.5} in µg/m³ at Wembley



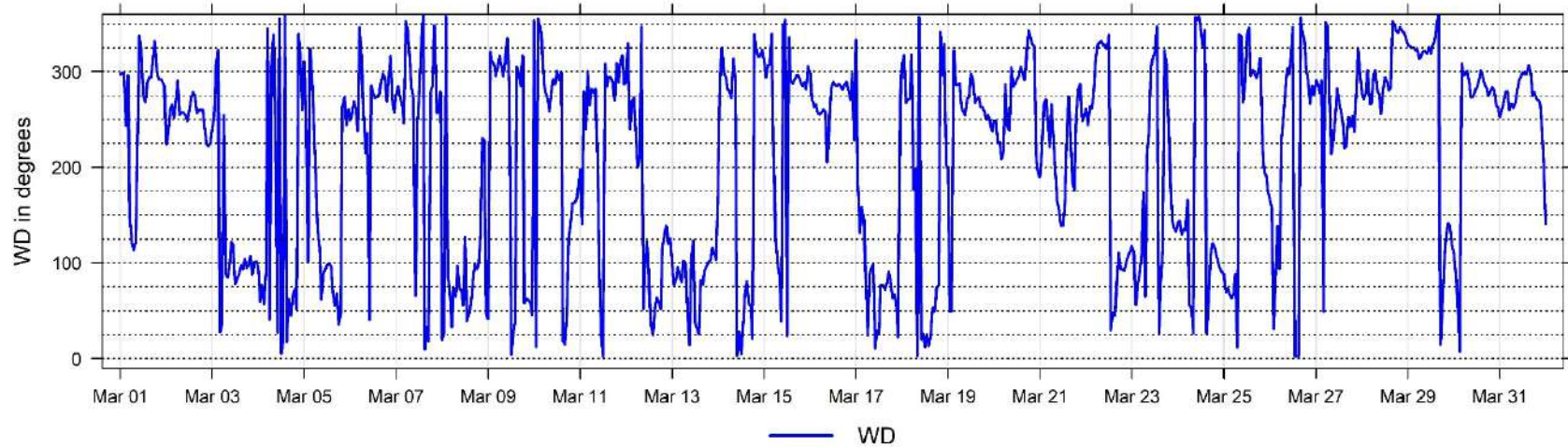
March Hourly Temperature Readings (in °C) at Wembley



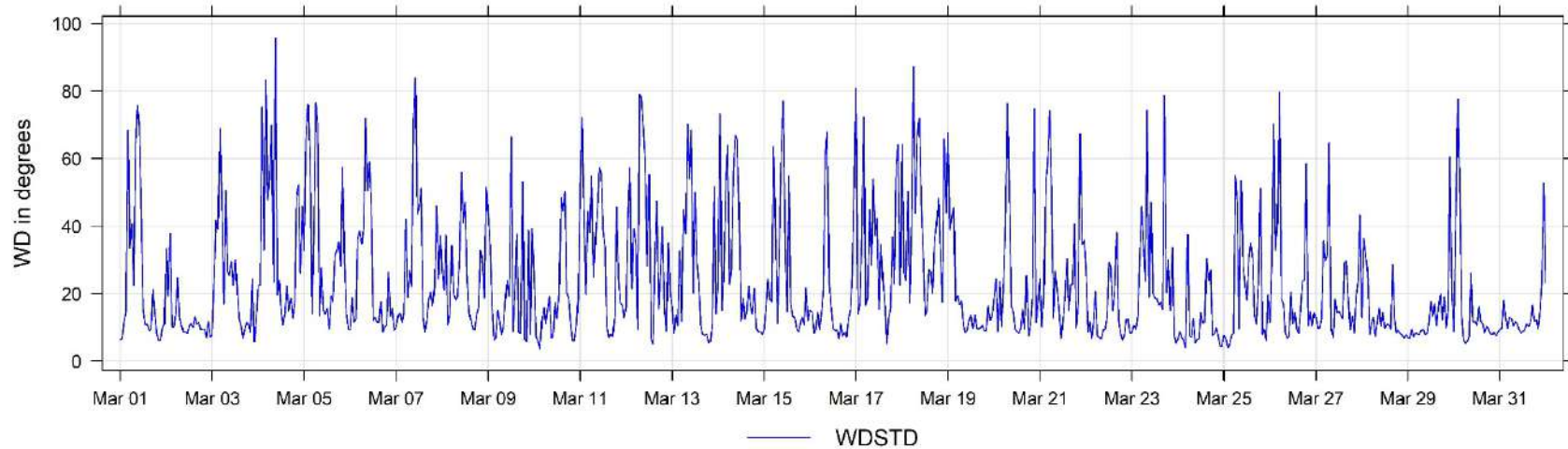
March Hourly Readings of Wind Speed (in km/hr) at Wembley

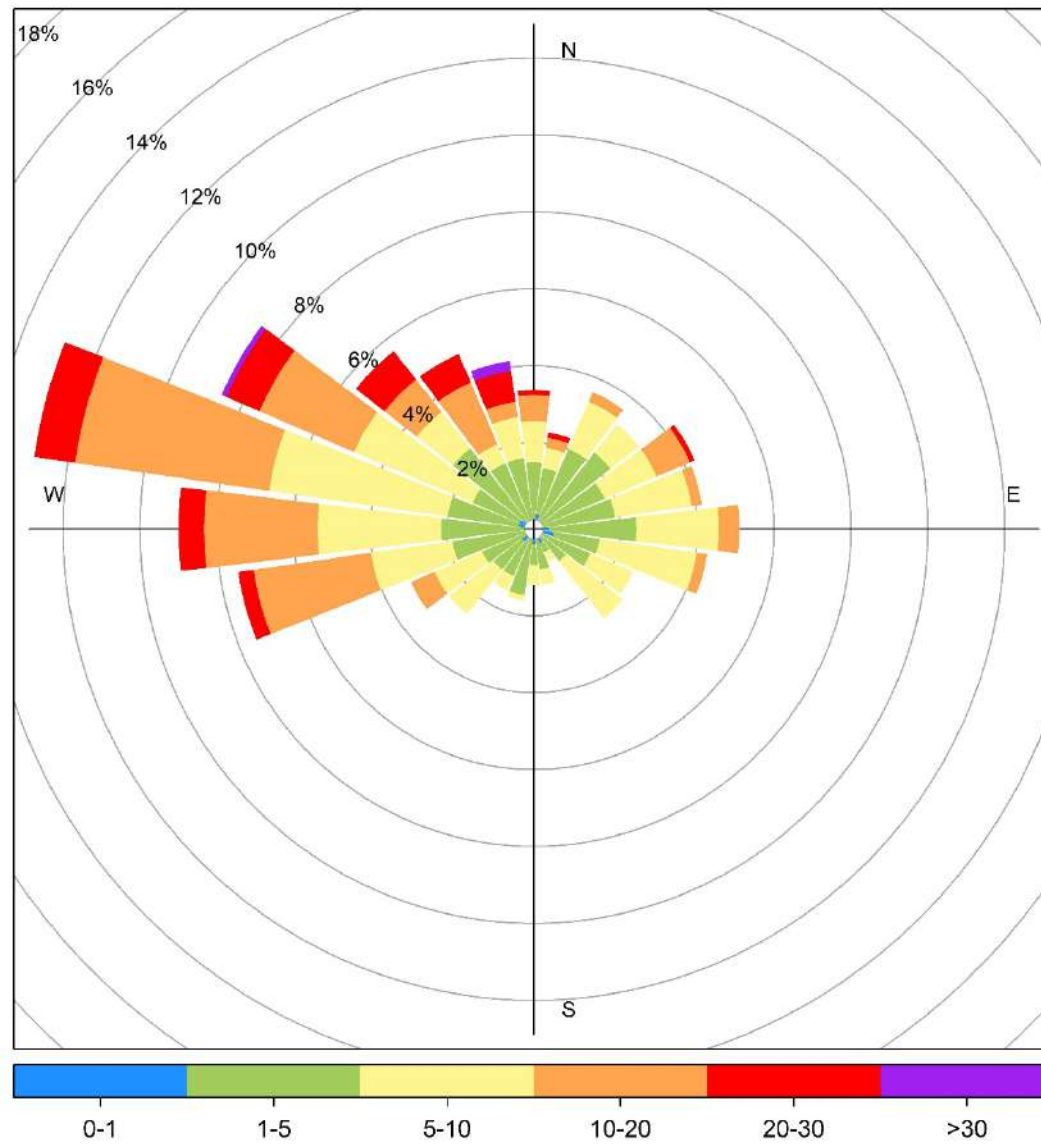


March Hourly Readings of Wind Direction (in degrees) at Wembley

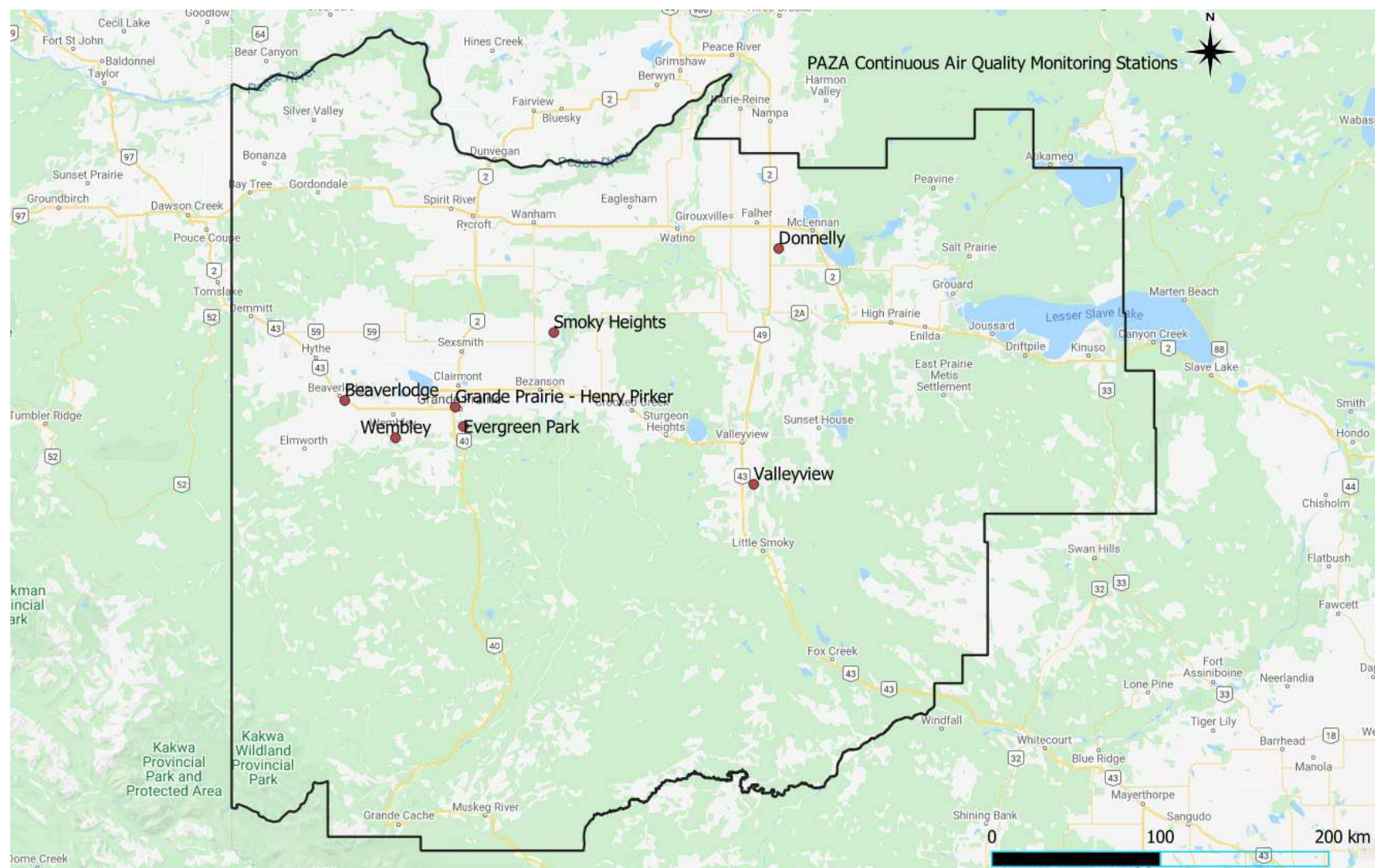


March Hourly Readings of Wind Direction Standard Deviation (in degrees) at Wembley



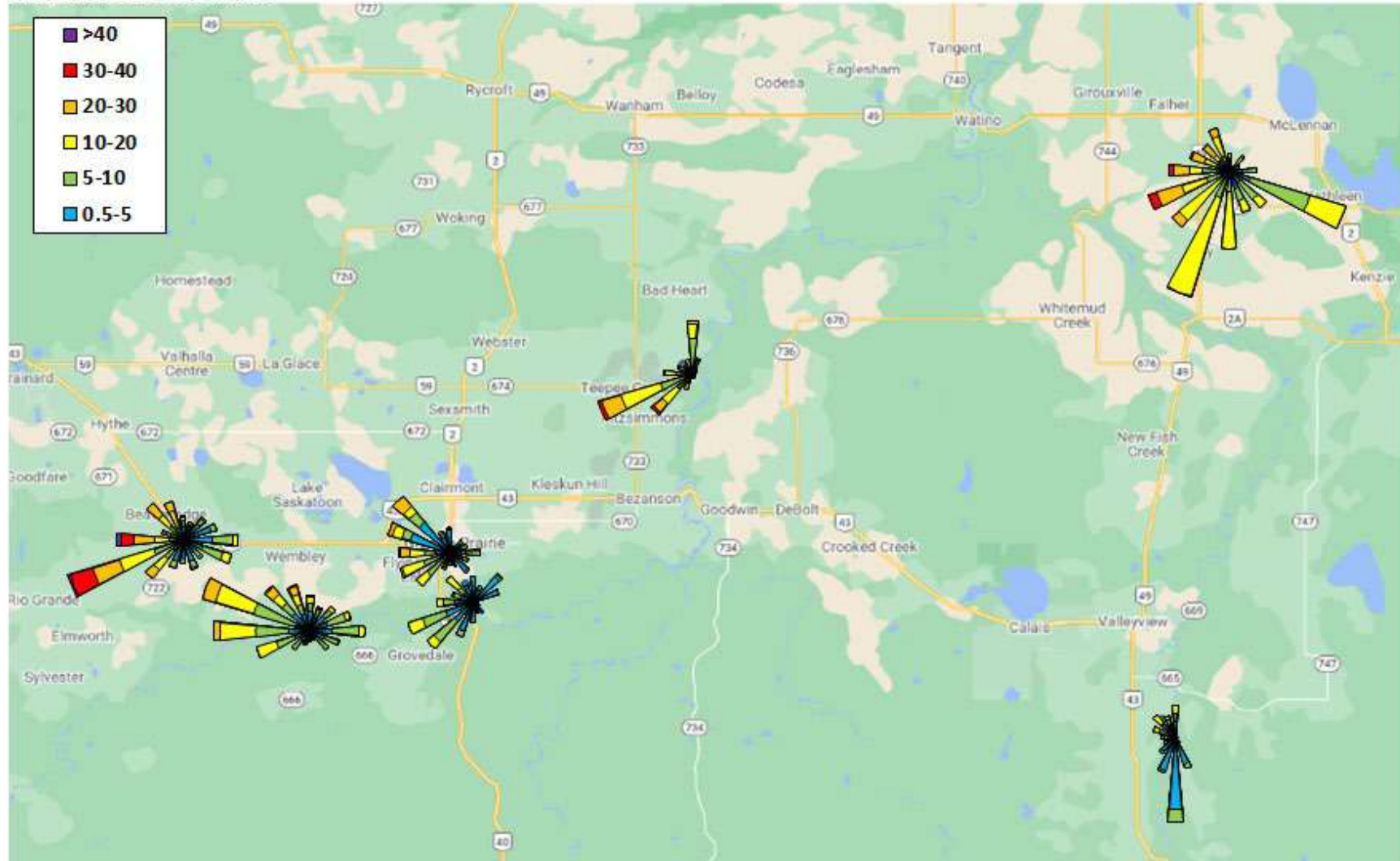


9 Concentration Summaries and Roses for PAZA



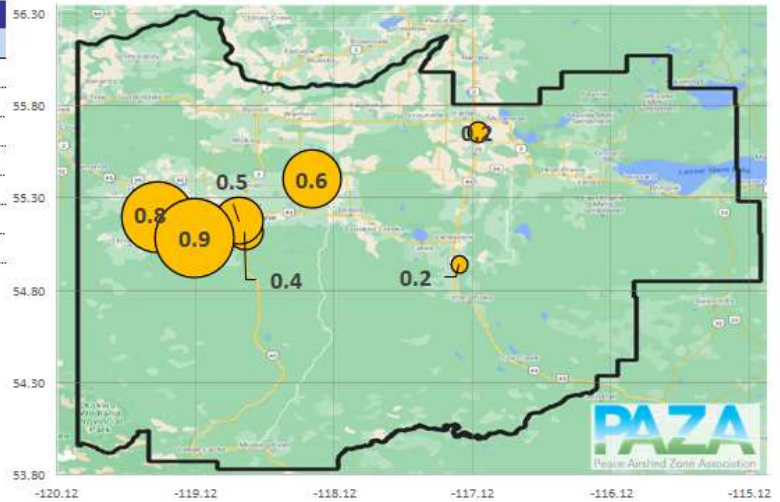
9.1 Wind Roses

Wind Roses in km/hr

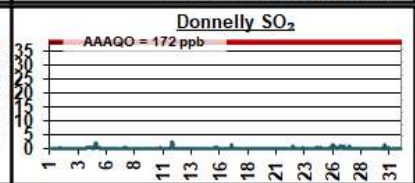
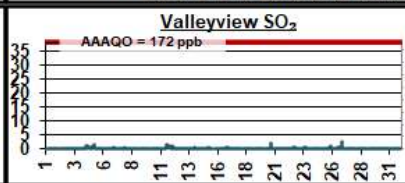
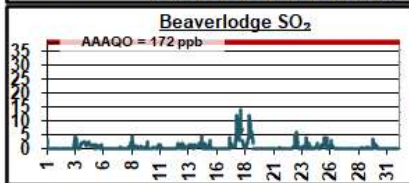
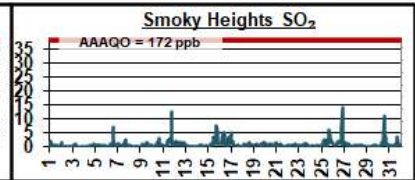
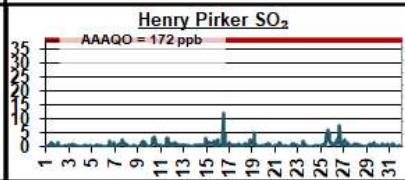
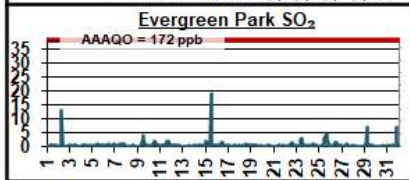
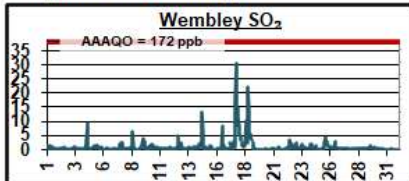


9.2 Sulphur Dioxide (SO₂) Plots

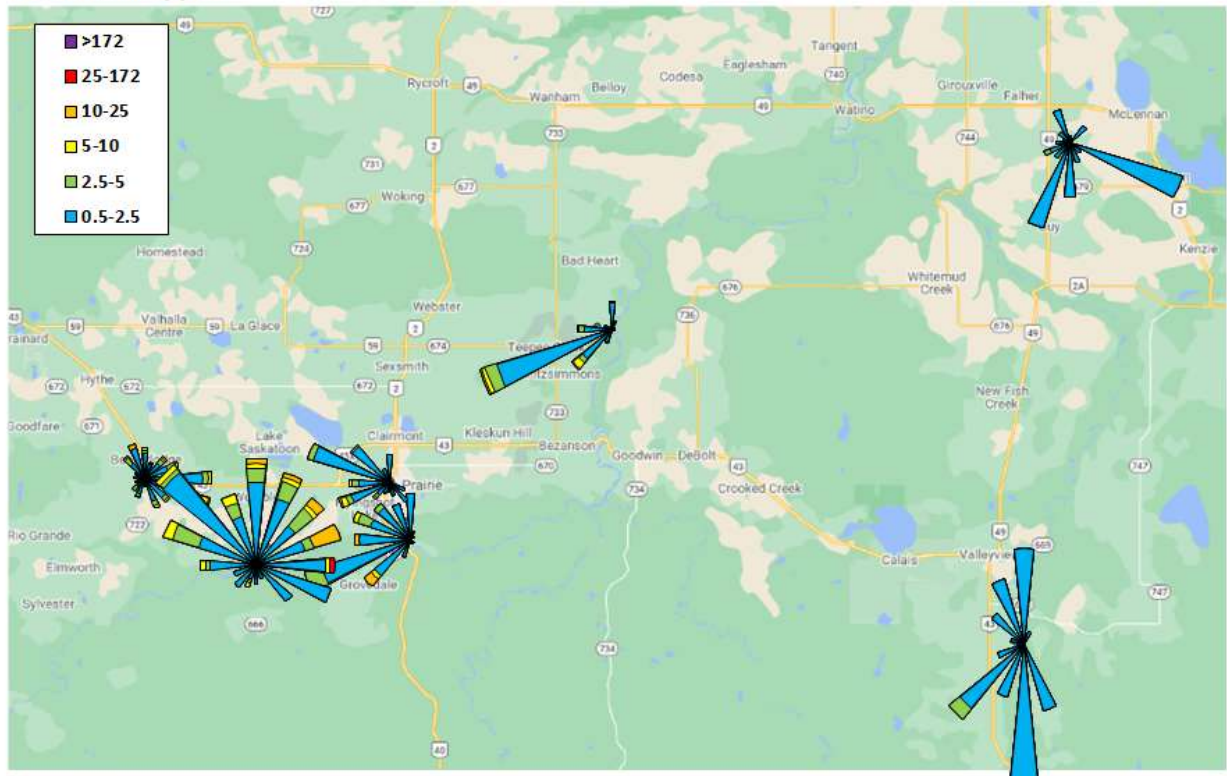
March 2021 SO ₂ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park SO ₂	0.4	19.0
Henry Pirker SO ₂	0.5	12.2
Smoky Heights SO ₂	0.6	14.2
Beaverlodge SO ₂	0.8	14.0
Valleyview SO ₂	0.2	2.6
Donnelly SO ₂	0.2	2.6
Wembley SO ₂	0.9	30.4



Sulphur Dioxide in ppb

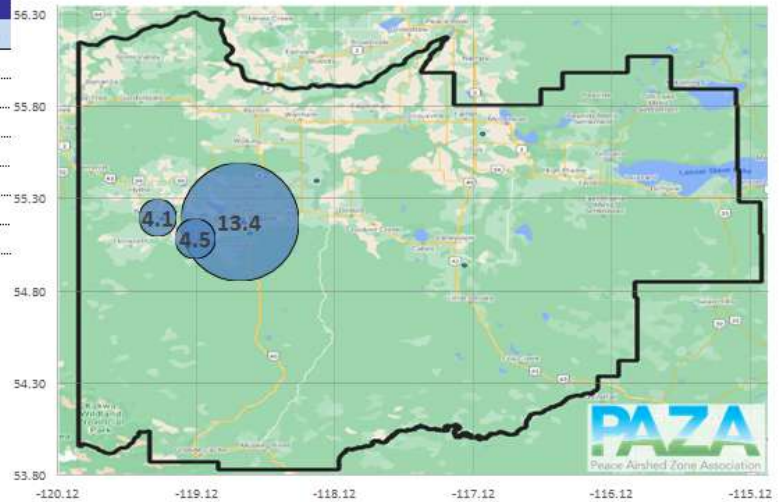


SO₂ Roses in ppb

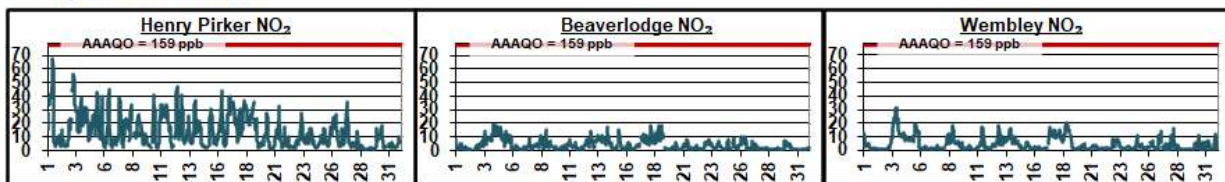


9.3 Nitrogen Dioxide (NO₂) Plots

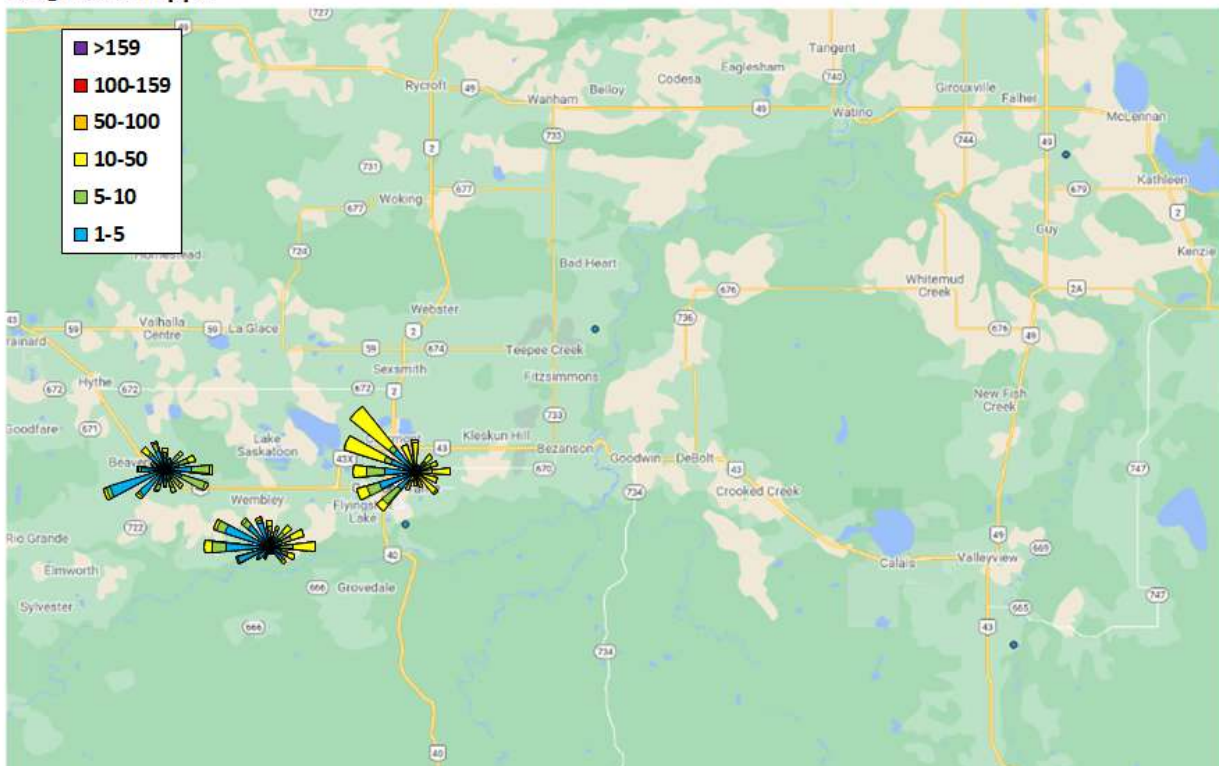
March 2021 NO ₂ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park NO ₂	-	-
Henry Pirkler NO ₂	13.4	67.3
Smoky Heights NO ₂	-	-
Beaverlodge NO ₂	4.1	19.2
Valleyview NO ₂	-	-
Donnelly NO ₂	-	-
Wembley NO ₂	4.5	31.8



Nitrogen Dioxide in ppb

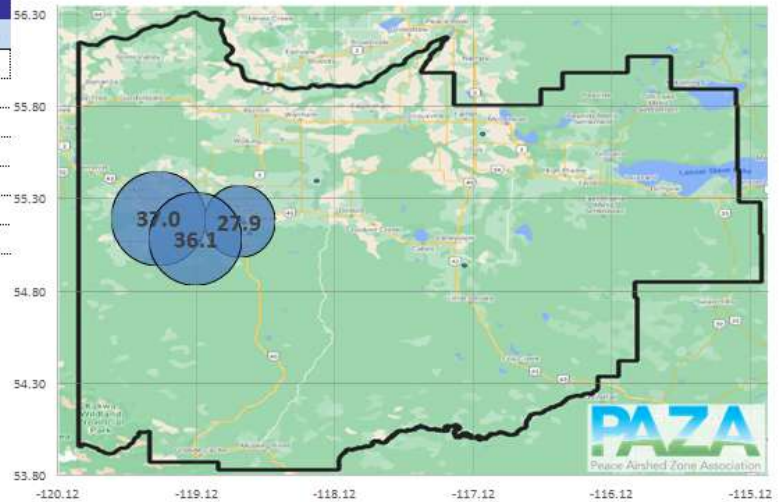


NO₂ Roses in ppb

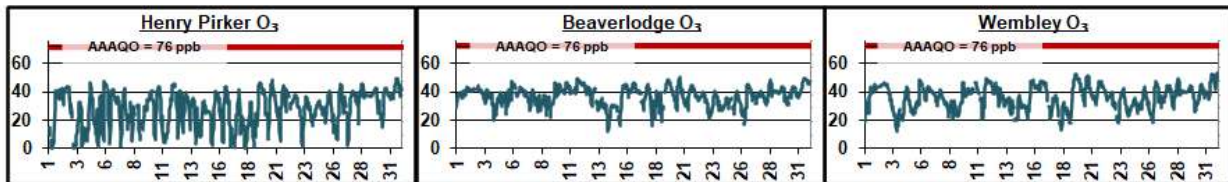


9.4 Ozone (O₃) Plots

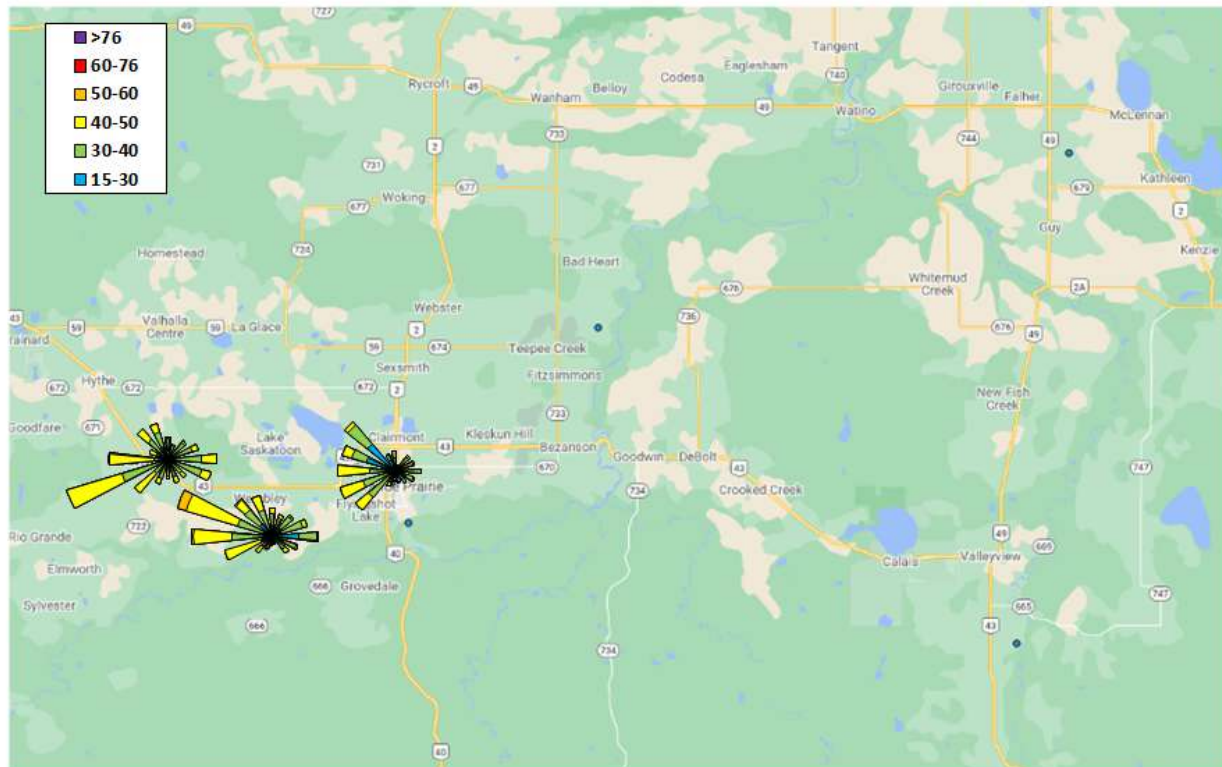
March 2021 O ₃ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park O ₃	-	-
Henry Pirkler O ₃	27.9	49.3
Smoky Heights O ₃	-	-
Beaverlodge O ₃	37.0	50.3
Valleyview O ₃	-	-
Donnelly O ₃	-	-
Wembley O ₃	36.1	53.7



Ozone in ppb



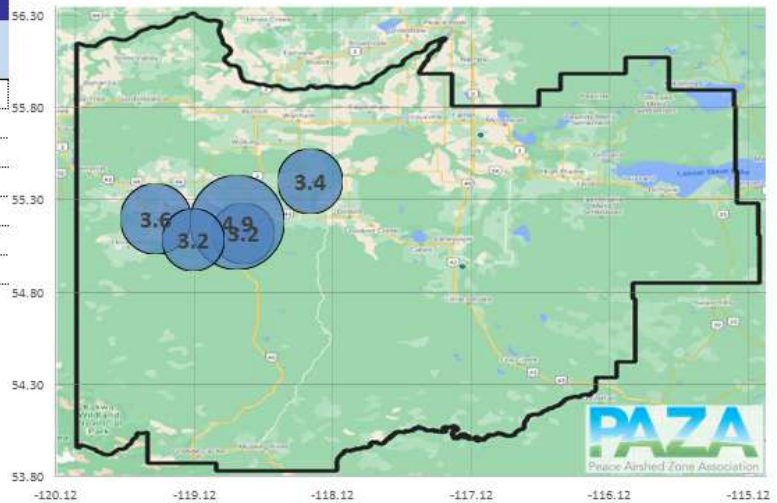
O₃ Roses in ppb



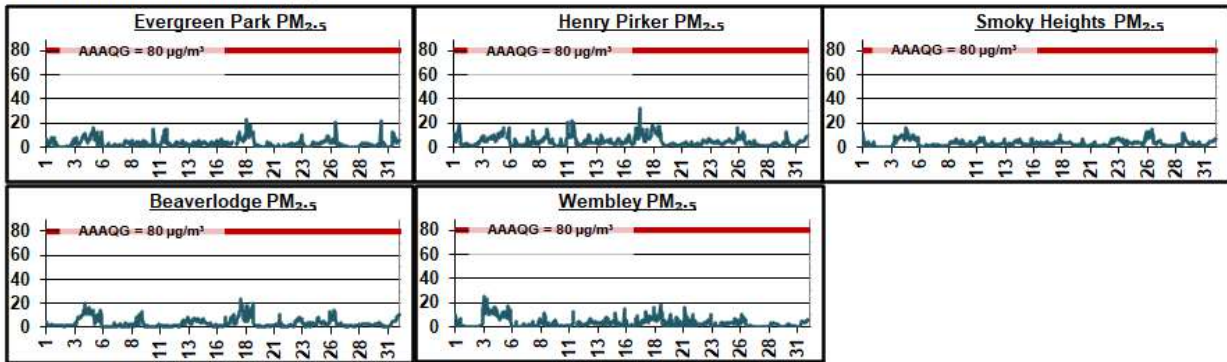
9.5 Fine Particulate Matter (PM_{2.5}) Plots

March 2021 PM_{2.5} Station Summary

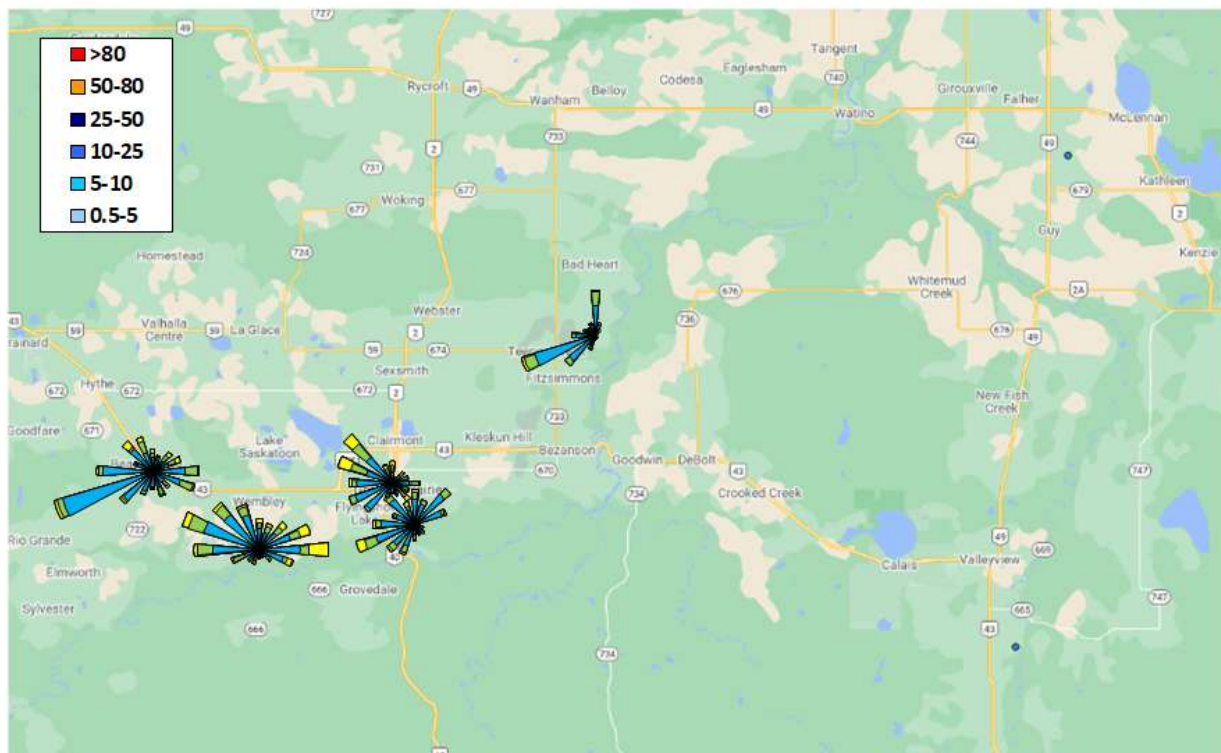
Station	Avg µg/m ³	Max µg/m ³
Evergreen Park PM _{2.5}	3.2	23.2
Henry Pirkler PM _{2.5}	4.9	32.7
Smoky Heights PM _{2.5}	3.4	15.9
Beaverlodge PM _{2.5}	3.6	23.9
Valleyview PM _{2.5}	-	-
Donnelly PM _{2.5}	-	-
Wembley PM _{2.5}	3.2	25.5



Fine Particulate Matter in µg/m³



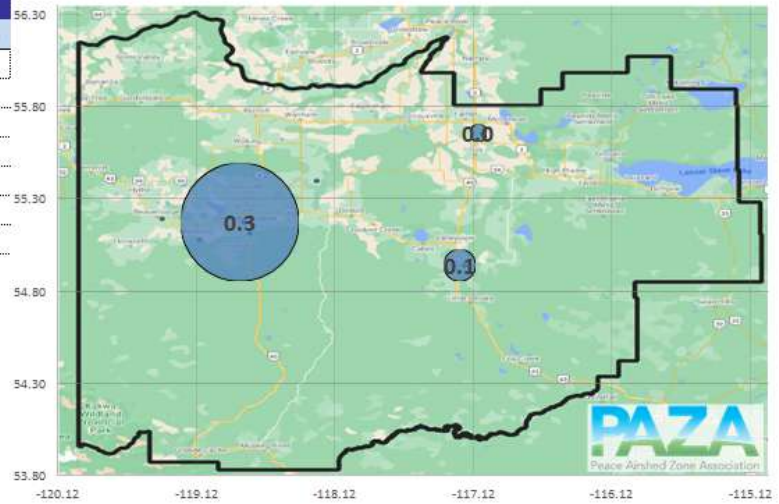
PM_{2.5} Roses in µg/m³



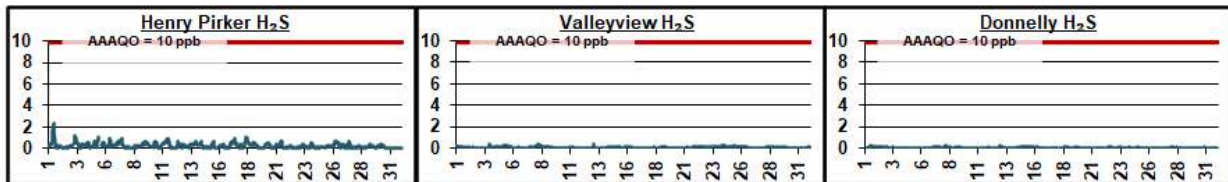
9.6 Hydrogen Sulphide (H₂S) Plots

March 2021 H₂S Station Summary

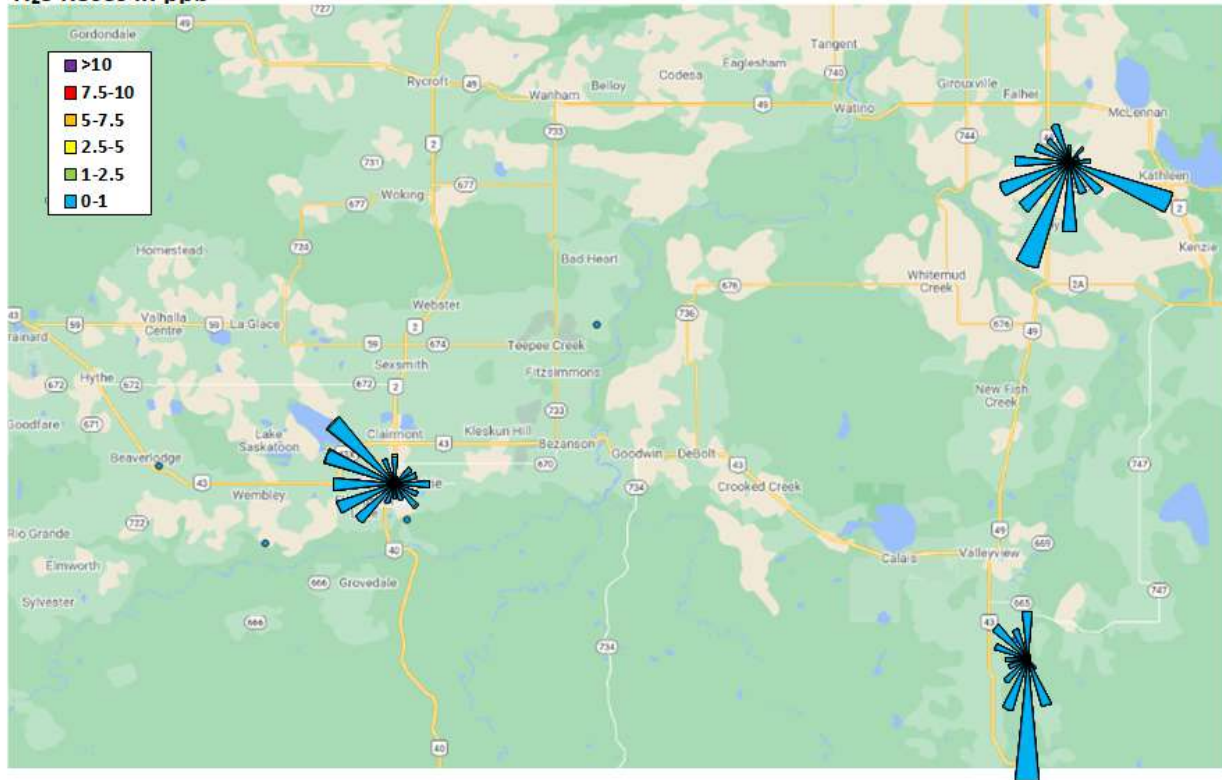
Station	Avg (ppb)	Max (ppb)
Evergreen Park H ₂ S	-	-
Henry Pirker H ₂ S	0.3	2.3
Smoky Heights H ₂ S	-	-
Beaverlodge H ₂ S	-	-
Valleyview H ₂ S	0.1	0.4
Donnelly H ₂ S	0.0	0.3
Wembley H ₂ S	-	-



Hydrogen Sulphide in ppb

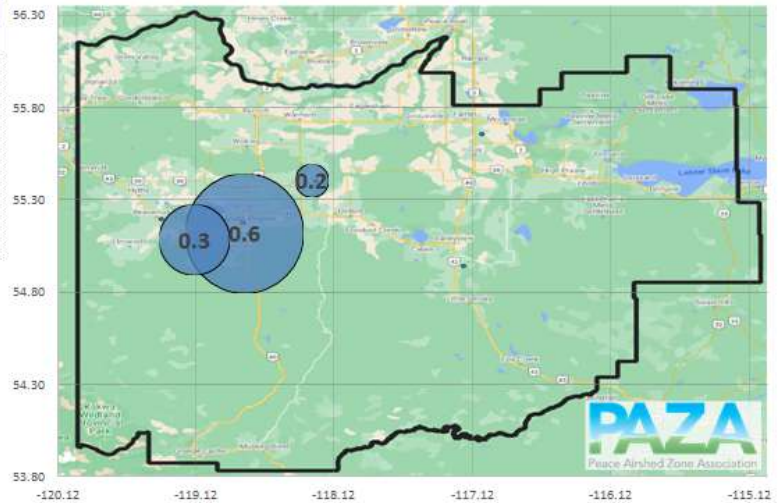


H₂S Roses in ppb

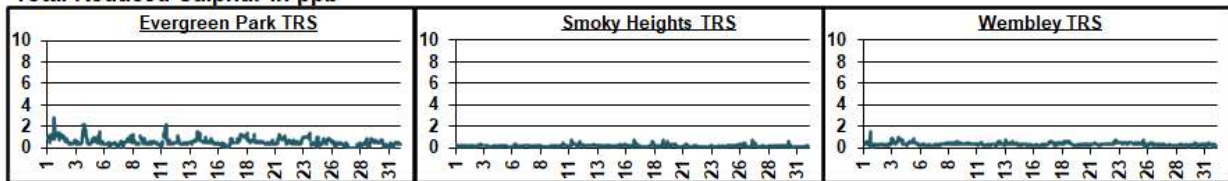


9.7 Total Reduced Sulphur (TRS) Plots

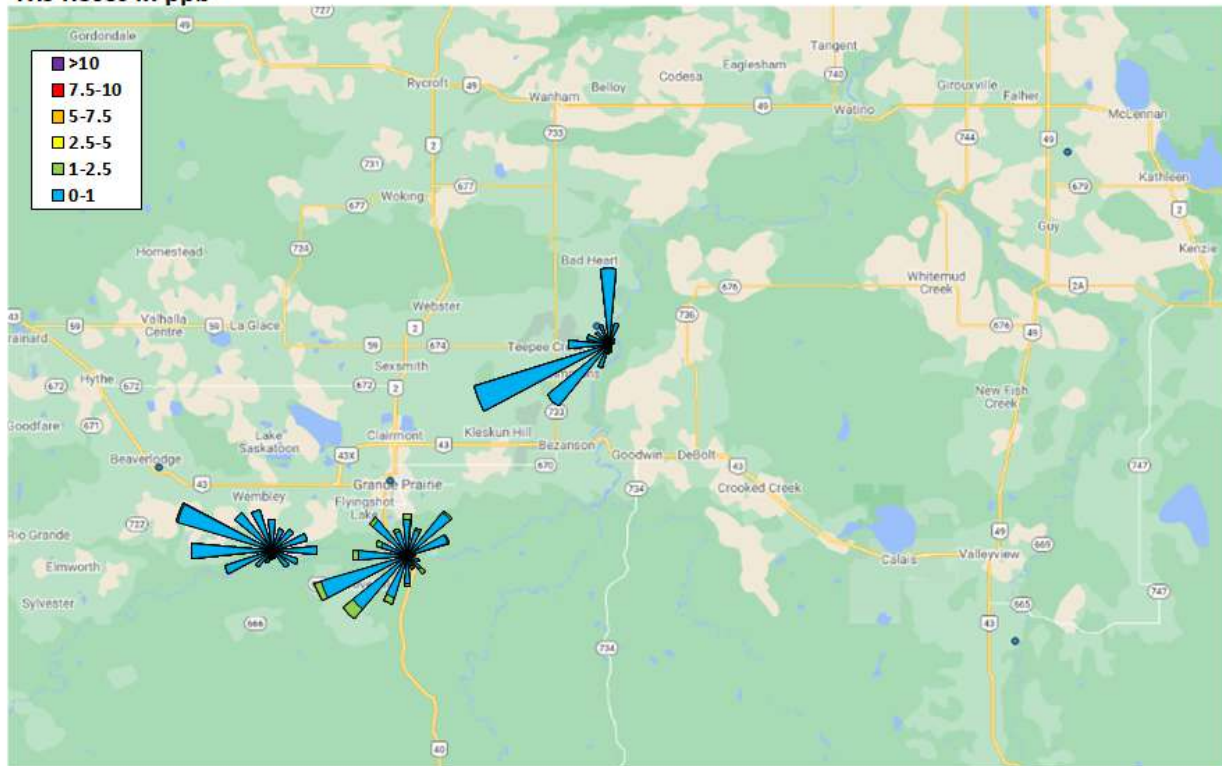
March 2021 TRS Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park TRS	0.6	2.8
Henry Pirker TRS	-	-
Smoky Heights TRS	0.2	0.7
Beaverlodge TRS	-	-
Valleyview TRS	-	-
Donnelly TRS	-	-
Wembley TRS	0.3	1.5



Total Reduced Sulphur in ppb



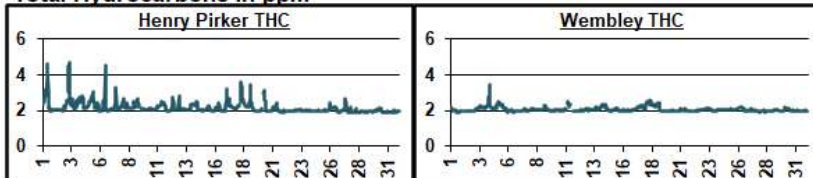
TRS Roses in ppb



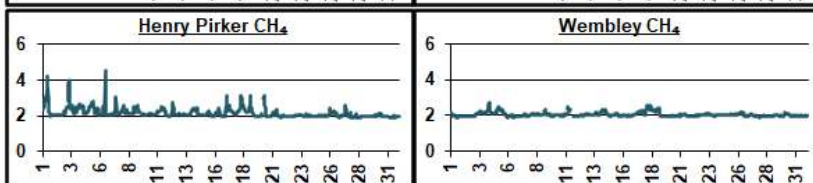
9.8 Total Hydrocarbon (THC) Plots

March 2021 THC Station Summary						
Station	Total Hydrocarbons		Methane		Non-Methane HCs	
	Avg (ppm)	Max (ppm)	Avg (ppm)	Max (ppm)	Avg (ppm)	Max (ppm)
Evergreen Park THC	-	-	-	-	-	-
Henry Pirker THC	2.2	4.7	4.6	4.6	0.7	0.7
Smoky Heights THC	-	-	-	-	-	-
Beaverlodge THC	-	-	-	-	-	-
Valleyview THC	-	-	-	-	-	-
Donnelly THC	-	-	-	-	-	-
Wembley THC	2.1	3.4	2.7	2.7	0.8	0.8

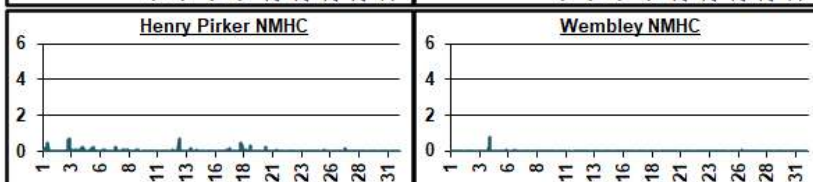
Total Hydrocarbons in ppm



Total Hydrocarbons (THC)

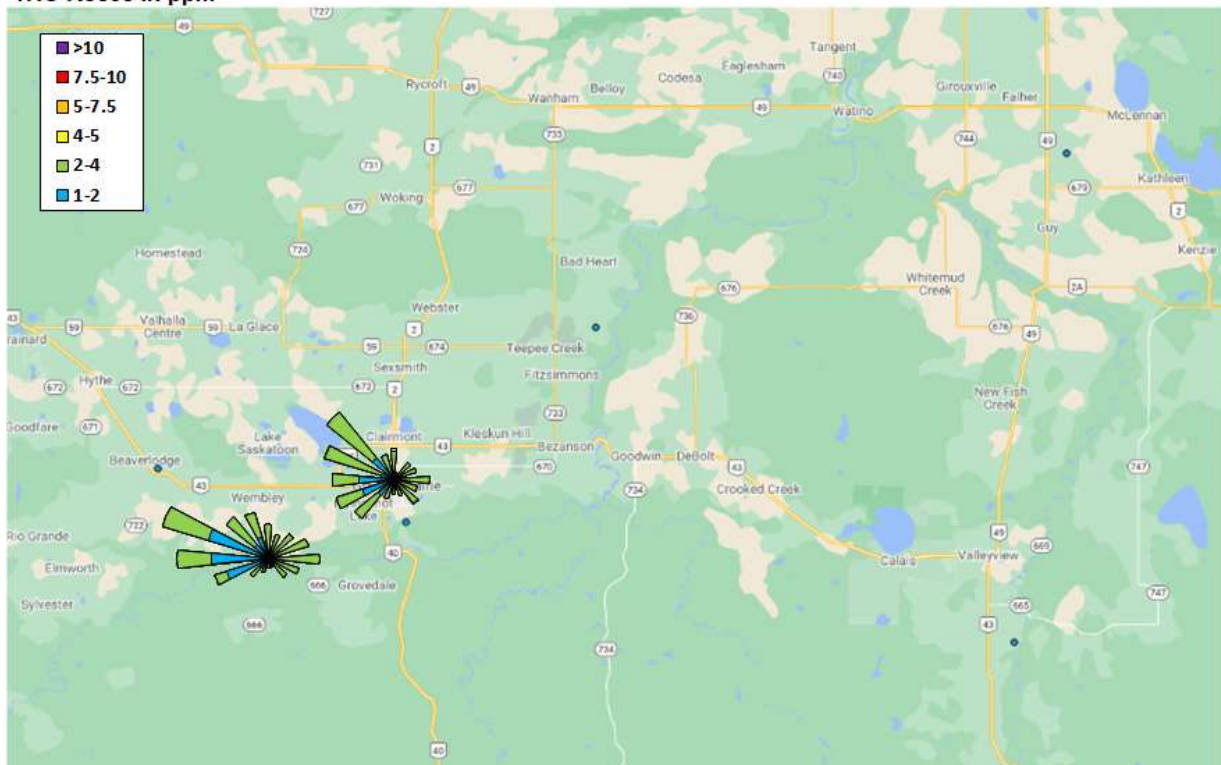


Methane (CH₄)



Non-Methane Hydrocarbons (NMHC)

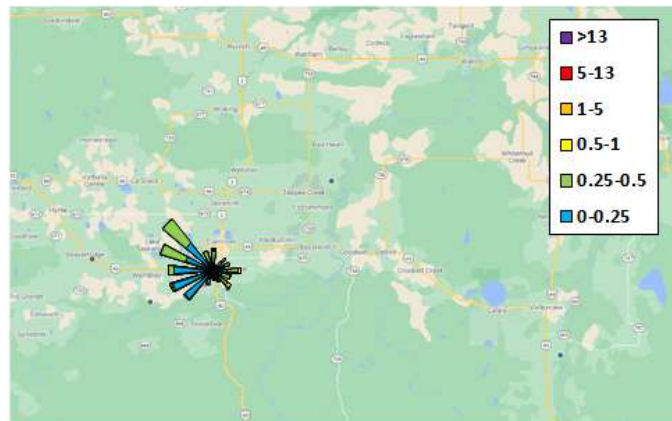
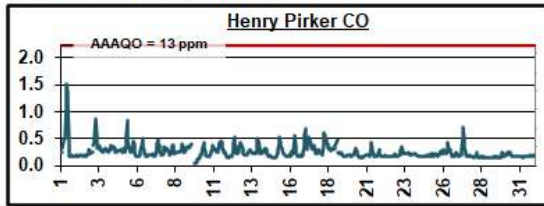
THC Roses in ppm



9.9 Carbon Monoxide (CO) Plots

March 2021 CO Station Summary		
Station	Avg (ppm)	Max (ppm)
Henry Pirker CO	0.25	1.52

Carbon Monoxide in ppm



10 Passive Monitoring Data

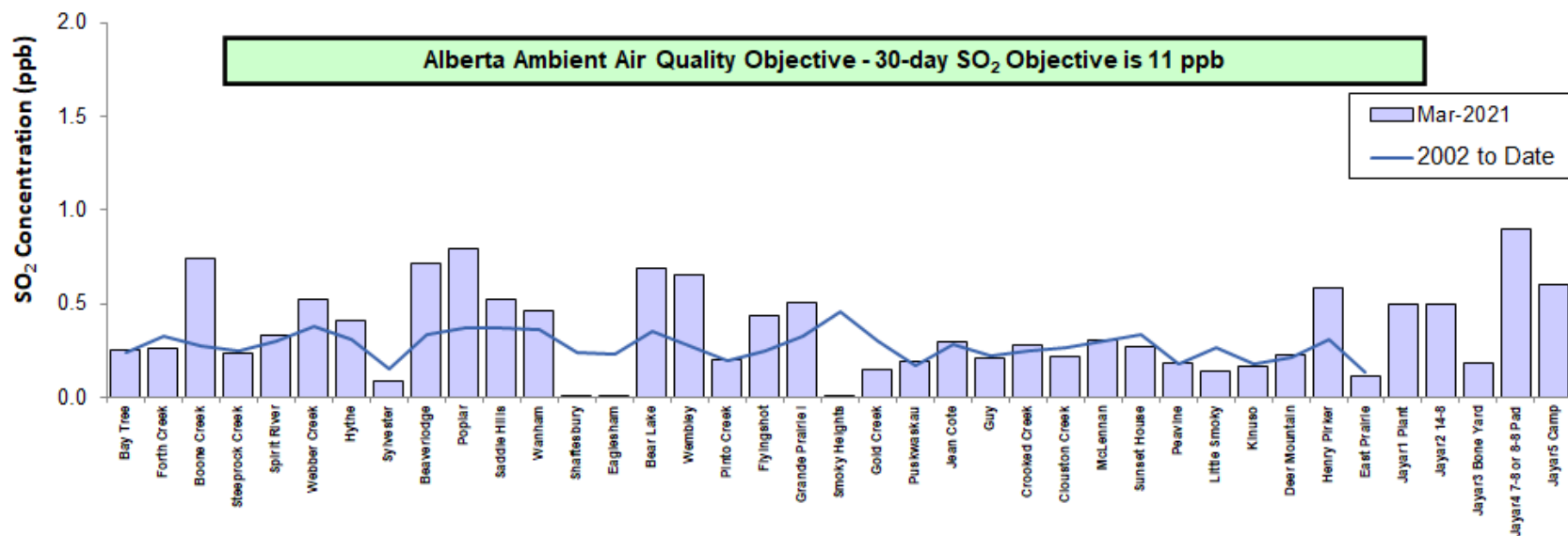
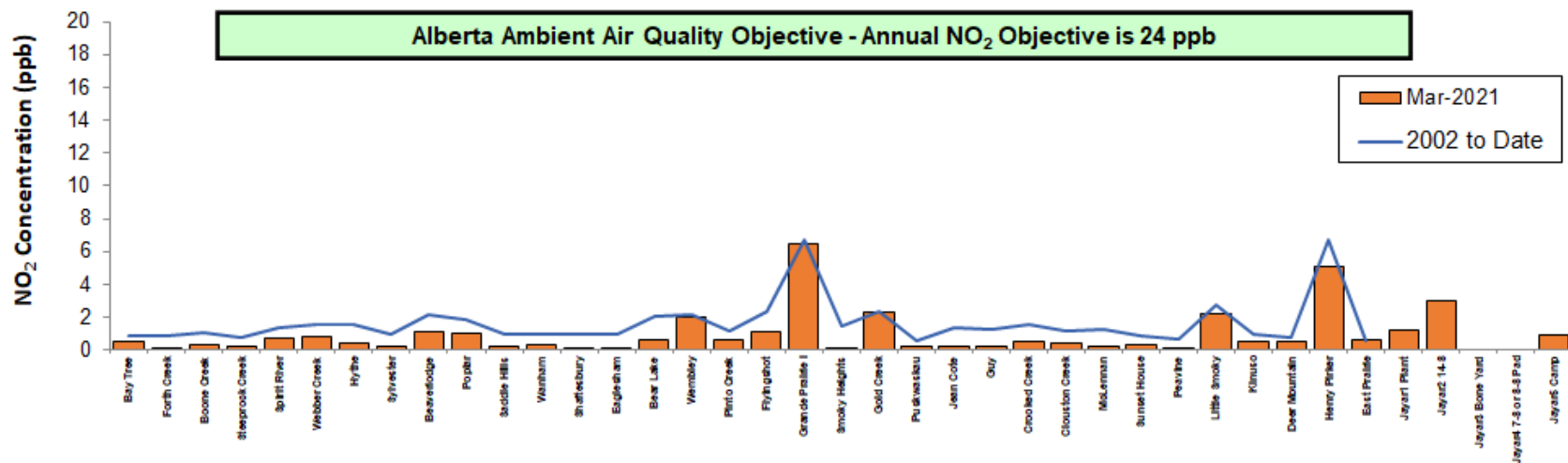
Peace Airshed Zone Association - PAZA Passive Stations for March 2021

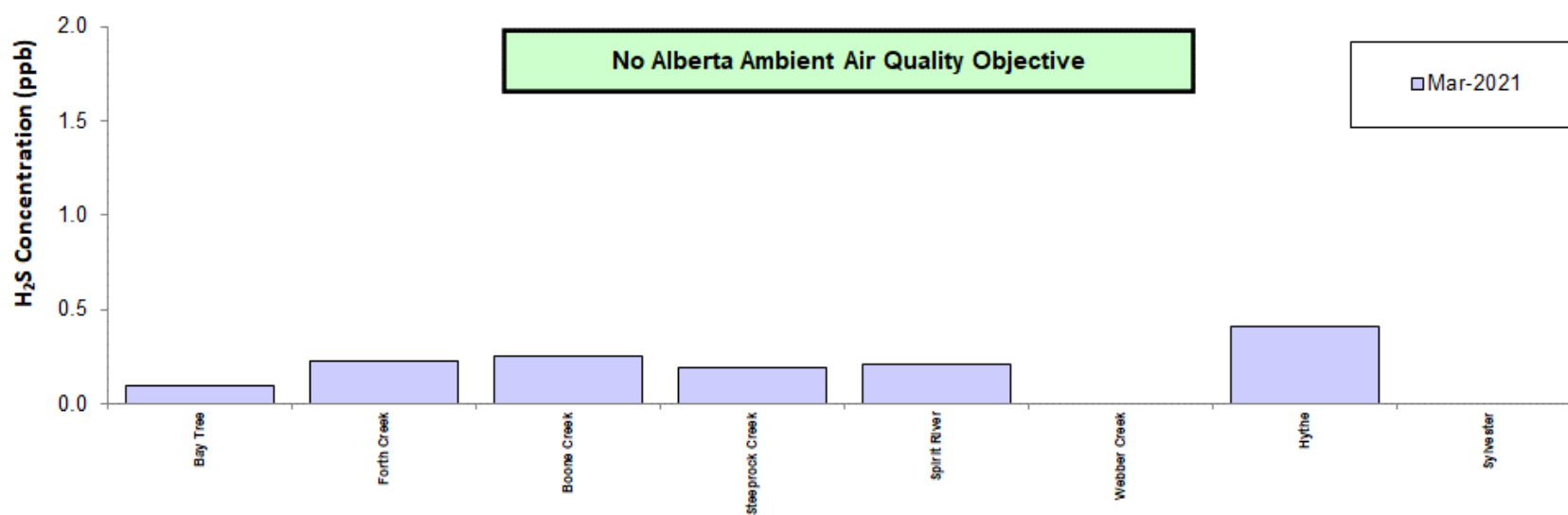
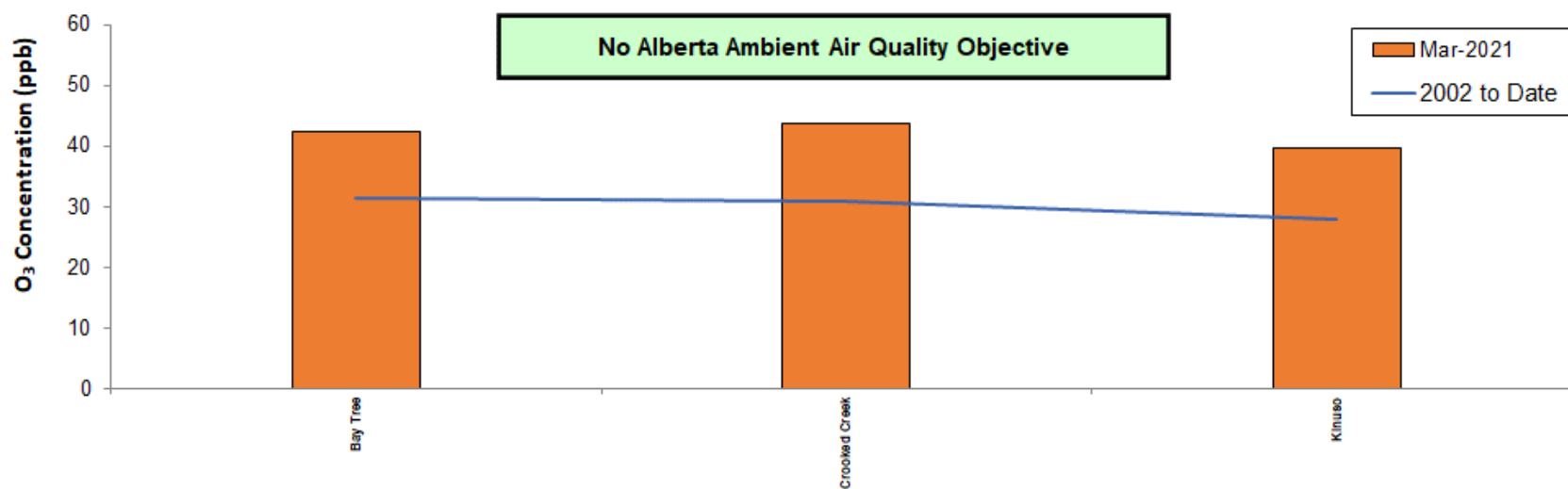
Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
Duplicates						
7a	Steeprock Creek			0.2		
7b	Steeprock Creek			0.3		
9a	Spirit River			0.7		
9b	Spirit River			0.8		
19a	Wanham			0.4		
19b	Wanham			0.3		
24a	Wembley	0.7				
24b	Wembley	0.6				
27a	Grande Prairie I			6.5		
27b	Grande Prairie I			6.5		
32a	Gold Creek	0.2				
32b	Gold Creek	0.2				
37a	Crooked Creek		44.5			
37b	Crooked Creek		42.8			
40a	McLennan	0.3				
40b	McLennan	0.3				
44a	Peavine	0.2			0.2	
44b	Peavine	0.2			0.2	
59a	Jayar3 Bone Yard	0.0		0.0		
59b	Jayar3 Bone Yard	0.0		0.0		
61a	Jayar5 Camp				0.0	
61b	Jayar5 Camp				0.0	
64a	Girouxville 4				-	
64b	Girouxville 4				-	

2	Bay Tree	0.3	42.2	0.5	-	13-16-078-13 W6M
3	Forth Creek	0.3	-	0.2	-	04-13-082-07 W6M
5	Boone Creek	0.7	-	0.3	-	01-23-076-11 W6M
7	Steeprock Creek	0.2	-	0.2	-	09-35-072-13 W6M
9	Spirit River	0.3	-	0.7	-	08-12-079-07 W6M
11	Webber Creek	0.5	-	0.9	-	09-36-074-09 W6M
12	Hythe	0.4	-	0.4	-	14-36-072-11 W6M
14	Sylvester	0.1	-	0.2	-	08-06-069-12 W6M
16	Beaverlodge	0.7	-	1.2	-	15-36-071-10 W6M
17	Poplar	0.8	-	1.0	-	13-06-073-08 W6M
18	Saddle Hills	0.5	-	0.2	-	04-25-074-07 W6M
19	Wanham	0.5	-	0.3	-	16-22-077-03 W6M
20	Shaftesbury	0.0	-	0.0	-	04-03-082-23 W5M
21	Eaglesham	0.0	-	0.0	-	16-21-079-25 W5M
23	Bear Lake	0.7	-	0.6	-	15-31-072-06 W6M
24	Wembley	0.7	-	2.0	-	12-31-070-08 W6M
25	Pinto Creek	0.2	-	0.6	-	04-24-069-11 W6M
26	Flyingshot	0.4	-	1.1	-	15-36-070-07 W6M
27	Grande Prairie I	0.5	-	6.5	-	08-15-071-06 W6M
29	Smoky Heights	0.0	-	0.0	-	04-06-075-02 W6M
32	Gold Creek	0.2	-	2.3	-	06-33-067-05 W6M
34	Puskwaskau	0.2	-	0.2	-	15-35-074-25 W5M
35	Jean Cote	0.3	-	0.2	-	12-35-079-21 W5M
36	Guy	0.2	-	0.2	0.1	03-04-076-22 W5M
37	Crooked Creek	0.3	43.7	0.5	-	16-01-071-26 W5M
39	Clouston Creek	0.2	-	0.4	-	12-01-073-22 W5M
40	McLennan	0.3	-	0.2	-	03-29-077-19 W5M
42	Sunset House	0.3	-	0.3	-	05-32-070-19 W5M
44	Peavine	0.2	-	0.1	-	03-05-079-15 W5M
46	Little Smoky	0.1	-	2.2	-	12-01-065-21 W5M
47	Kinuso	0.2	39.8	0.5	-	12-10-073-10 W5M
48	Deer Mountain	0.2	-	0.5	-	15-22-068-09 W5M
49	Henry Pirkner	0.6	-	5.0	-	17-26-071-06 W6M
50	East Prairie	0.1	-	0.6	-	11-13-079-08 W6M
57	Jayar1 Plant	0.5	-	1.2	0.2	06-08-062-03 W6M
58	Jayar2 14-8	0.5	-	3.0	0.3	07-08-062-03 W6M
59	Jayar3 Bone Yard	0.2	-	0.0	0.2	14-08-062-03 W6M
60	Jayar4 7-8 or 8-8 Pad	0.9	-	0.0	0.2	10-08-062-03 W6M
61	Jayar5 Camp	0.6	-	0.9	0.0	11-08-062-03 W6M
63	Girouxville 3	-	-	-	0.4	14-02-077-23 W5M
64	Girouxville 4	-	-	-	-	04-08-077-22 W5M

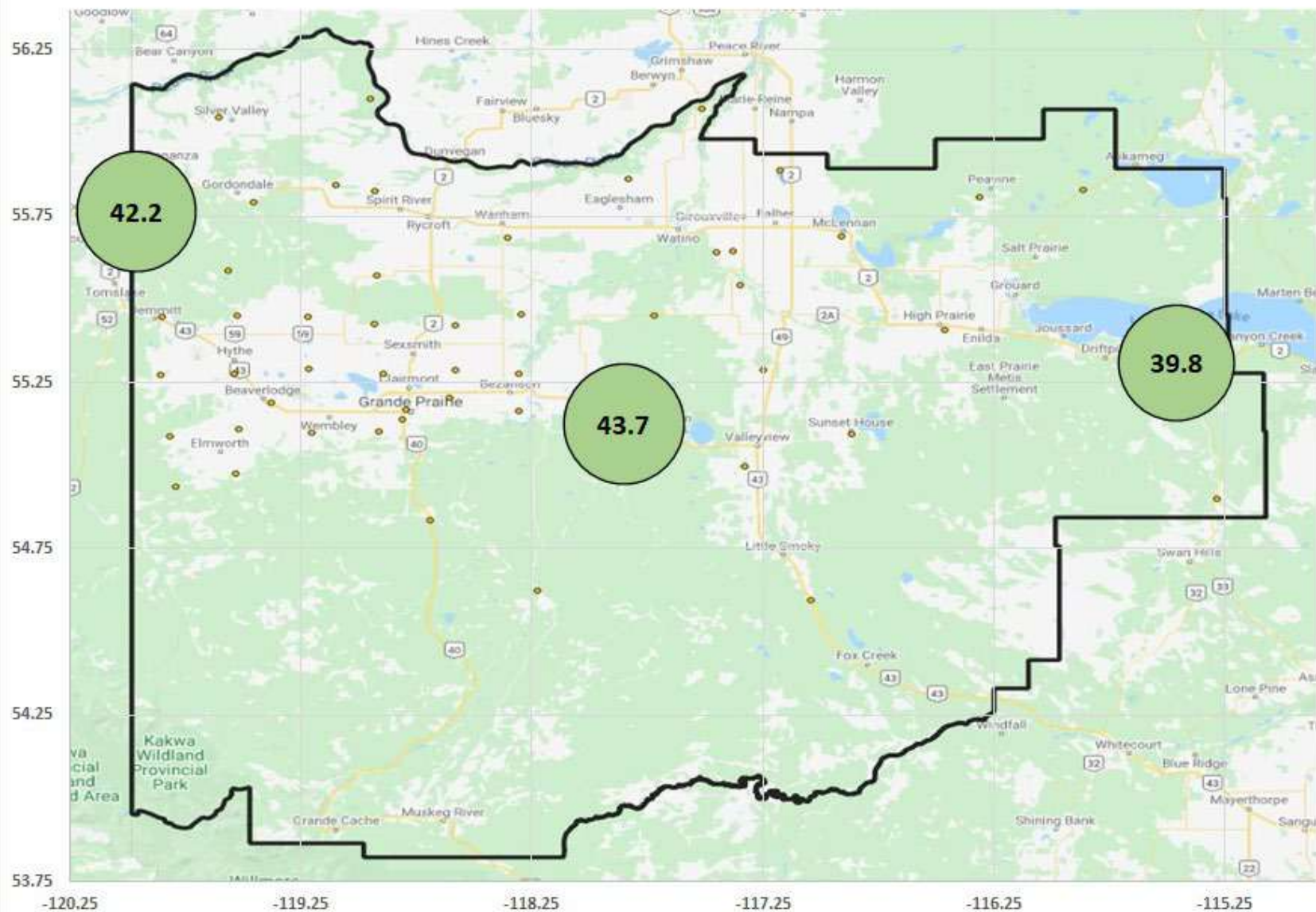
Passive Summary for March 2021

Stats	Sulphur Dioxide SO ₂	Ozone O ₃	Nitrogen Dioxide NO ₂	Hydrogen Sulphide H ₂ S
	ppb	ppb	ppb	ppb
Passive Summary for March 2021 (PAZA)				
Mean	0.4	41.9	0.9	0.2
Standard Deviation	0.2	2.0	1.3	0.1
Minimum	0.0	39.8	0.0	0.0
Maximum	Eaglesham (#21)	Kinuso (#47)	Jayar3 Bone Yard (#59)	Jayar5 Camp (#61)
	Jayar4 7-8 or 8-8 Pad (#60)	Crooked Creek (#37)	Grande Prairie 1 (#27)	Girouxville 3 (#63)
Continuous and Passive Monitoring Comparison				
PAZA Beaverlodge Station	0.8	37.0	19.2	-
Beaverlodge Passive (#16)	0.7	-	1.2	-
PAZA Henry Pirker Station	0.9	22.1	15.7	0.3
Henry Pirker passive (#49)	0.5	-	6.5	-





O₃ Monthly Average (units in ppb)



End of Report



Peace Airshed Zone Association

Ambient Air Monitoring Report

March 2021