



Peace Airshed Zone Association

Ambient Air Monitoring Network Summary

Ambient Air Quality Monitoring Program

Monthly Report

October 2021

November 30, 2021

Alberta Environment and Parks

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

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

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

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

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This report was prepared by Dr. Kevin McCullum and reviewed by Mandeep Dhaliwal.

PAZA has retained the services of WSP Canada Inc. to conduct continuous ambient monitoring and Dr Kevin McCullum 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. The Wembley-Portable station was moved to the Poplar Portable station for the beginning of the month.

Continuous Monitoring:

Seven (7) Stations including Henry Pirker (Grande Prairie), Evergreen Park, Smoky Heights, Beaverlodge, Valleyview, Donnelly and Poplar-Portable (started at beginning of the month of October 2021).
Detailed Summaries are included in the report

Calibration and Data Submission:

Monthly report, hourly data and calibration reports for October 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
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
KANATA Energy Group Ltd.	Valhalla	13-21-076-09-W6	00017620-02-02
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
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
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
Strathcona Resources Ltd.	Jayar Sour Gas Processing Plant	06-08-062-03 W6	3612040
Suncor Energy Inc.	Progress	07-22-078-09-W6	00011428-02-00
Tidewater Midstream and Infrastructure Ltd.	Pipestone Sour Gas Plant	NW-35-70-9 W6	00403309-00-00
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 was one reading above the AAAQG (1hr PM_{2.5}), results are summarized below:

There was one, 1hr PM_{2.5} readings above 80 µg/m³ (AAAQG) as follows:

Reference Number	Pollutant	Station	Date	From MST	To MST	Hour avg µg/m ³	WS km/h	WD degrees
384866	PM _{2.5}	Smoky Heights	21-Oct-21	16:00	17:00	81.4	11.7	28.4

Operational times less than 90 percent:

Poplar station monitoring began at start of month, valid data was >75% and operational time >90%.

Air Incidents

None were reported

Deviations from Authorized Monitoring Methods

None to report.

Passive Monitoring

- 45 Stations throughout the PAZA zone
 - Passive sample analyses were performed by Bureau Veritas Laboratories, there was an issue at lab and results were not received until early December
 - Passive at Girouxville 3 was noted to have a puncture in the filter, results were reported as damaged
- There were 14 duplicates sampled in the month of October
 - Six SO₂ duplicates located at Spirit River, Hythe, Wanham, Henry Pirker, Duvernay 4, and 7-8 or 8-8 Pad; RPD ranging from 2% to 142% (2 fails, Henry Pirker & 7-8 or 8-8 Pad)
 - One O₃ duplicate at Bay Tree; RPD at 6%
 - Five NO₂ duplicates at Bay Tree, Grande Prairie I, Boone Creek, East Prairie, Plant; RPD ranging from 0% to 35% (no fails)
 - Three H₂S duplicates, Girouxville 4, Duvernay 4, Bone Yard; RPD ranging from 11% to 43% (no fails)
- 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.

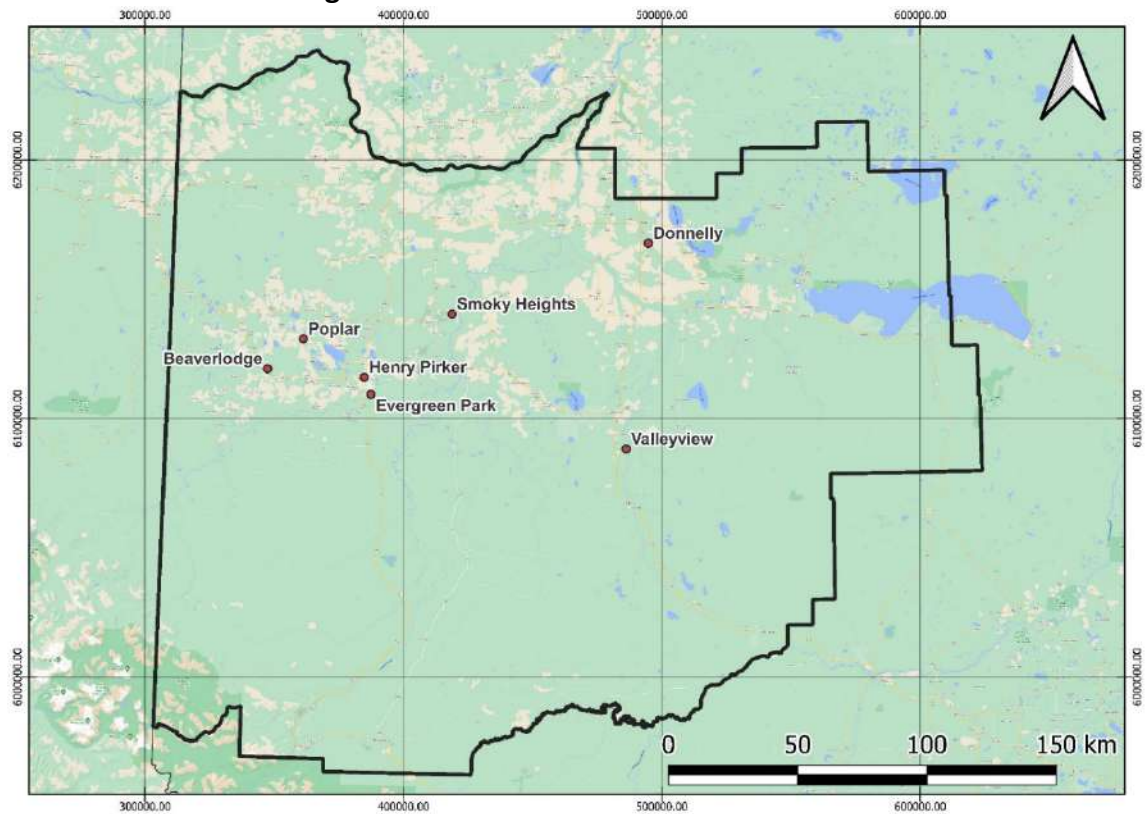


Mandeep Dhaliwal, B.Sc., P.Chem.
Program Manager

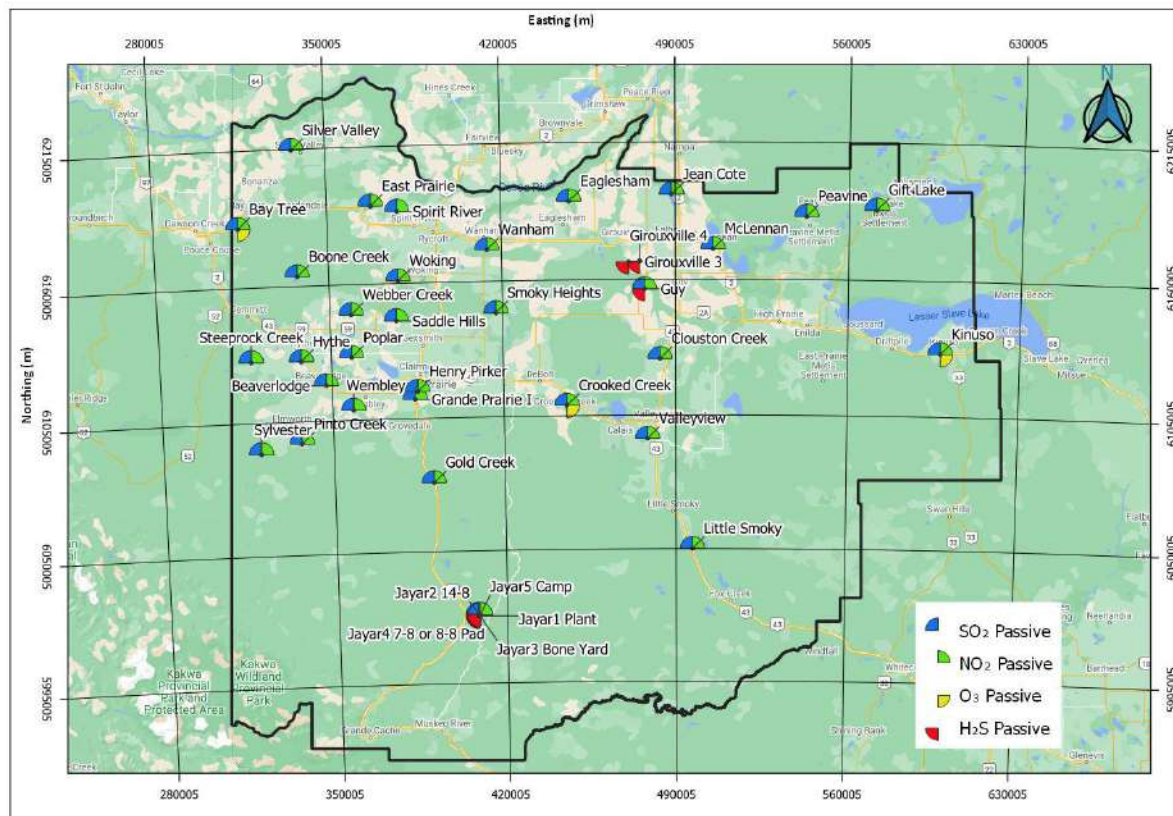
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PAZA Continuous Monitoring Station Locations



PAZA Passive Monitoring Station Locations



1 October 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 - October 2021 Beaverlodge Station Report

Parameter	October				Max	1-hour		Max	24-hour		Exceedance				Calibration Date
	Average	Minimum	Valid	Operational		Objective	Max Day and Time		Objective	Max Day	1hr	8hr	24hr	30d	
NO (ppb)	1.1	0.0	95.0%	100.0%	22.3	-	Oct-21 09:00	7.0	-	Oct-23	-	-	-	-	Oct 05, 2021
NO ₂ (ppb)	3.9	0.2	95.0%	100.0%	15.3	159	Oct-22 19:00	10.3	-	Oct-22	0	-	-	-	Oct 05, 2021
NO _x (ppb)	5.0	0.2	95.0%	100.0%	27.7	-	Oct-21 09:00	16.5	-	Oct-23	-	-	-	-	Oct 05, 2021
O ₃ (ppb)	23.8	0.5	95.2%	100.0%	50.1	76	Oct-02 15:00	36.7	-	Oct-03	0	-	-	-	Oct 05, 2021
PM _{2.5} (µg/m ³)	3.6	0.0	99.7%	100.0%	16.1	80	Oct-20 18:00	8.6	29	Oct-20	0	-	0	-	Oct 12, 2021
SO ₂ (ppb)	0.3	0.0	95.3%	100.0%	6.3	172	Oct-31 19:00	1.0	48	Oct-31	0	-	0	0	Oct 12, 2021
Average	3.2	-7.1	100.0%	100.0%	13.0	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
Temp (°C)	71.7	26.7	100.0%	100.0%	100.0										
RH (%)	9.8	0.2	100.0%	100.0%	48.0										
WS (km/hr)	249	3.6	100.0%	100.0%	359.8										
WD (deg)						Average Wind Direction		249	WSW						

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	Thermo	42i	No Operational issues noted
O ₃	Thermo	49iQ	No Operational issues noted; replaced zero air canister
PM _{2.5}	Sharp	5030	No Operational issues noted
SO ₂	Thermo	43i-TLE	No Operational issues noted
Met Equip	MetOne	50.5	No Operational issues noted

1.2 Evergreen Park Air Monitoring Station

PAZA - October 2021 Evergreen Park Station Report

Parameter	October				Max	1-hour		Max	24-hour		Exceedance				Calibration Date
	Average	Minimum	Valid	Operational		Objective	Max Day and Time		Objective	Max Day	1hr	8hr	24hr	30d	
PM _{2.5} (µg/m ³)	3.0	0.0	97.0%	97.7%	45.6	80	Oct-27 16:00	7.3	29	Oct-25	0	-	0	-	Oct-31-2021
SO ₂ (ppb)	0.3	0.0	93.8%	98.4%	50.5	172	Oct-29 12:00	3.6	48	Oct-29	0	-	0	0	Oct-31-2021
TRS (ppb)	0.2	0.0	93.6%	98.4%	1.1	-	Oct-21 13:00	0.4	-	Oct-11	-	-	-	-	Oct-31-2021
Average	3.3	-10.7	98.3%	98.3%	15.3	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
Temp (°C)	73.1	21.1	98.3%	98.3%	98.6										
RH (%)	3.4	0.0	98.3%	98.3%	16.8										
WS (km/hr)	252	1.9	98.3%	98.3%	358.0										
WD (deg)						Average Wind Direction		252	WSW						

Update Summary:

Parameter	Make	Model	Equipment summary
PM _{2.5}	Thermo	TEOM AB	Oct 3 power failure 1hr; Station shut down for relocation 11hrs not in service; 4hrs not valid (Oct 26, 27)
SO ₂	TECO	43i	Oct 3 power failure 1hr; Station shut down for relocation 11hrs not in service
TRS	TECO	43C	Oct 3 power failure 1hr; Station shut down for relocation 11hrs not in service; TRS removal cal >5%
Met Equip	Gil/RMYoung	MetPak/RMY86004	Oct 3 power failure 1hr; Station shut down for relocation 12hrs not in service

1.3 Grande Prairie - Henry Pirker Air Monitoring Station

PAZA - October 2021 Henry Pirker Station Report

Parameter	October				1-hour			8-hour / 24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	
NO (ppb)	4.3	0.0	95.0%	100.0%	57.0	-	Oct-31 08:00	17.4	-	Oct-31	-	-	-	-	Oct 05, 2021
NO ₂ (ppb)	8.8	0.5	95.0%	100.0%	34.4	159	Oct-15 07:00	16.9	-	Oct-31	0	-	-	-	Oct 05, 2021
NO _x (ppb)	13.3	0.7	95.0%	100.0%	82.2	-	Oct-15 07:00	34.7	-	Oct-31	-	-	-	-	Oct 05, 2021
O ₃ (ppb)	17.3	0.0	95.4%	100.0%	44.9	76	Oct-02 16:00	30.9	-	Oct-03	0	-	-	-	Oct 05, 2021
PM _{2.5} (µg/m ³)	4.1	0.0	99.5%	100.0%	41.0	80	Oct-30 20:00	9.1	29	Oct-31	0	-	0	-	Oct 07, 2021
SO ₂ (ppb)	0.4	0.0	95.3%	100.0%	14.5	172	Oct-06 11:00	1.3	48	Oct-28	0	-	0	0	Oct 05, 2021
H ₂ S (ppb)	0.2	0.0	95.2%	100.0%	1.6	10	Oct-27 00:00	0.5	3	Oct-31	0	-	0	-	Oct 07, 2021
CH ₄ (ppm)	2.1	1.9	95.2%	100.0%	3.4	-	Oct-31 06:00	2.4	-	Oct-31	-	-	-	-	Oct 06, 2021
THC (ppm)	2.1	1.9	95.2%	100.0%	3.4	-	Oct-31 06:00	2.4	-	Oct-31	-	-	-	-	Oct 06, 2021
NMHC (ppm)	0.0	0.0	95.2%	100.0%	0.5	-	Oct-30 22:00	0.0	-	Oct-23	-	-	-	-	Oct 06, 2021
CO (ppm)	0.2	0.1	95.3%	100.0%	0.9	13	Oct-30 20:00	0.3	5	Oct-31	0	0	-	-	Oct 06, 2021
Average					Maximum										
Temp (°C)	3.9	-10.2	100.0%	100.0%	16.3	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
RH (%)	66.0	24.7	100.0%	100.0%	88.7										
SR (W/m ²)	58.2	0.0	100.0%	100.0%	432.1										
WS (km/hr)	6.7	0.1	100.0%	100.0%	33.3										
WD (deg)	237	1.7	100.0%	100.0%	359.7										
Average Wind Direction									237	WSW					

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	Thermo	42IQ	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; replaced nitrogen tank at station
CO	TEI	48I-TLE	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.4 Smoky Heights Air Monitoring Station

PAZA - October 2021 Smoky Heights Station Report

Parameter	October				1-hour			24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	
PM _{2.5} (µg/m ³)	3.7	0.0	99.1%	99.6%	81.4	80	Oct-21 17:00	12.0	29	Oct-21	1	-	0	-	Oct 21, 2021
SO ₂ (ppb)	0.3	0.0	95.0%	99.6%	6.9	172	Oct-25 18:00	1.0	48	Oct-25	0	-	0	0	Oct 21, 2021
TRS (ppb)	0.2	0.0	94.9%	99.6%	0.6	-	Oct-21 18:00	0.3	-	Oct-23	-	-	-	-	Oct 21, 2021
Average					Maximum										
Temp (°C)	3.2	-8.9	99.6%	99.6%	14.5	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
WS (km/hr)	12.1	0.2	99.6%	99.6%	54.4										
WD (deg)	238	0.1	99.6%	99.6%	359.7										
Average Wind Direction									238	WNW					

Update Summary:

Parameter	Make	Model	Equipment summary
PM _{2.5}	Sharp	5030	Power failure Oct 6 (3hrs removed), one reading above AAAQG on Oct 21, 16:00-17:00
SO ₂	TECO	43I	Power failure Oct 6 (3hrs removed)
TRS	TEI	43I APSAA	Power failure Oct 6 (3hrs removed)
Met Equip	MetOne	50.5	Power failure Oct 6 (3hrs removed)

1.5 Valleyview Air Monitoring Station

PAZA - October 2021 Valleyview Station Report

AAQ - October 2021 Valleyview Station Report															
Parameter	October				Max	1-hour		24-hour			Exceedance				Calibration
	Average	Minimum	Valid	Operational		Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	Date
SO ₂ (ppb)	0.1	0.0	95.3%	100.0%	3.8	172	Oct-29 16:00	0.7	48	Oct-29	0	-	0	0	Oct 07, 2021
H ₂ S (ppb)	0.1	0.0	95.3%	100.0%	0.3	10	Oct-25 22:00	0.2	3	Oct-28	0	-	0	-	Oct 07, 2021
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	4.1	-11.0	100.0%	100.0%	18.5	<div>Note: Valid hours must be greater than 75% Operational hours must be greater than 90%</div>									
RH (%)	73.9	21.8	100.0%	100.0%	100.2										
WS (km/hr)	4.0	0.1	100.0%	100.0%	16.2										
WD (deg)	210	2.3	100.0%	100.0%	360.0	<div>Average Wind Direction210NW</div>									

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	TEI	43i-APSCB	No Operational issues noted during the month
H ₂ S	TEI	450i-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 - October 2021 Donnelly Station Report

AZA - October 2021 Biweekly Station Report															
October					1-hour			24-hour			Exceedance				Calibration
Parameter	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	Date
SO ₂ (ppb)	0.2	0.0	94.6%	99.2%	1.0	172	Oct-03 09:00	0.5	48	Oct-30	0	-	0	0	Oct 25, 2021
H ₂ S (ppb)	0.1	0.0	94.6%	99.2%	0.8	10	Oct-16 07:00	0.2	3	Oct-06	0	-	0	-	Oct 25, 2021
Average		Minimum	Valid	Operational	Maximum										
Temp (°C)	4.5	-9.7	99.2%	99.2%	16.2	<div>Note: Valid hours must be greater than 75% Operational hours must be greater than 90%</div>									
WS (km/hr)	12.9	0.4	99.2%	99.2%	45.1										
WD (deg)	222	1.4	99.2%	99.2%	352.7	Average Wind Direction		222		SW					

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	Teco	43i	Communication data acquisition loss of 6 hours (Oct 17, 24)
H ₂ S	Thermo	45C	Communication data acquisition loss of 6 hours (Oct 17, 24)
Met Equip	RMYoung	5103	Communication data acquisition loss of 6 hours (Oct 17, 24)

1.7 Poplar Air Monitoring Station

PAZA - October 2021 Poplar Station Report

October					1-hour			24-hour			Exceedance				Calibration
Parameter	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	Date
NO (ppb)	1.6	0.0	89.4%	98.3%	20.8	-	Oct-23 13:00	8.5	-	Oct-23	-	-	-	-	Oct 02, 2021
NO ₂ (ppb)	4.4	0.0	89.4%	98.3%	21.1	159	Oct-31 02:00	11.6	-	Oct-31	0	-	-	-	Oct 02, 2021
NO _x (ppb)	6.1	0.2	89.4%	98.3%	36.6	-	Oct-31 02:00	16.7	-	Oct-31	-	-	-	-	Oct 02, 2021
O ₃ (ppb)	19.4	0.1	85.5%	94.4%	47.4	76	Oct-02 16:00	33.4	-	Oct-03	0	-	-	-	Oct 02, 2021
PM _{2.5} (µg/m³)	2.1	0.0	94.1%	99.6%	16.1	80	Oct-05 02:00	5.4	29	Oct-25	0	-	0	-	Oct 02, 2021
SO ₂ (ppb)	0.8	0.0	90.9%	99.6%	15.5	172	Oct-20 14:00	2.9	48	Oct-20	0	-	0	0	Oct 02, 2021
TRS (ppb)	0.5	0.0	91.0%	99.6%	20.1	-	Oct-20 18:00	2.6	-	Oct-20	-	-	-	-	Oct 02, 2021
CH ₄ (ppm)	2.1	1.9	90.7%	99.6%	3.0	-	Oct-20 02:00	2.4	-	Oct-31	-	-	-	-	Oct 02, 2021
THC (ppm)	2.1	1.9	90.7%	99.6%	3.5	-	Oct-31 22:00	2.5	-	Oct-31	-	-	-	-	Oct 02, 2021
NMHC (ppm)	0.0	0.0	90.7%	99.6%	0.7	-	Oct-31 22:00	0.0	-	Oct-31	-	-	-	-	Oct 02, 2021
Average	Minimum	Valid	Operational	Maximum											
Temp (°C)	2.7	-11.0	94.2%	99.6%	12.9	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
WS (km/hr)	12.0	0.4	89.1%	94.2%	46.1										
WD (deg)	252	7.7	89.1%	94.2%	359.4	Average Wind Direction 252 WSW									

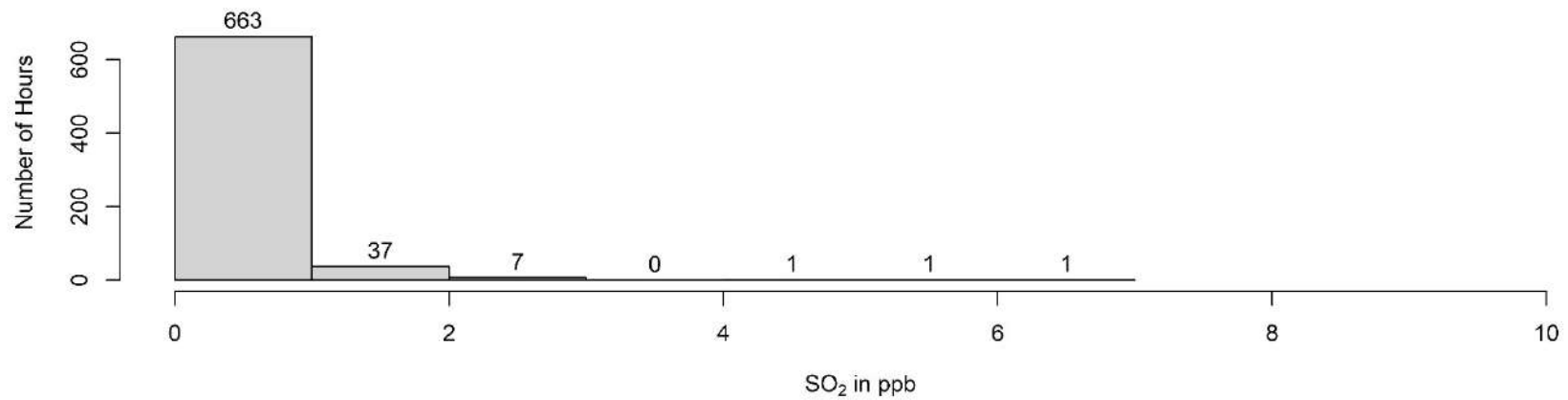
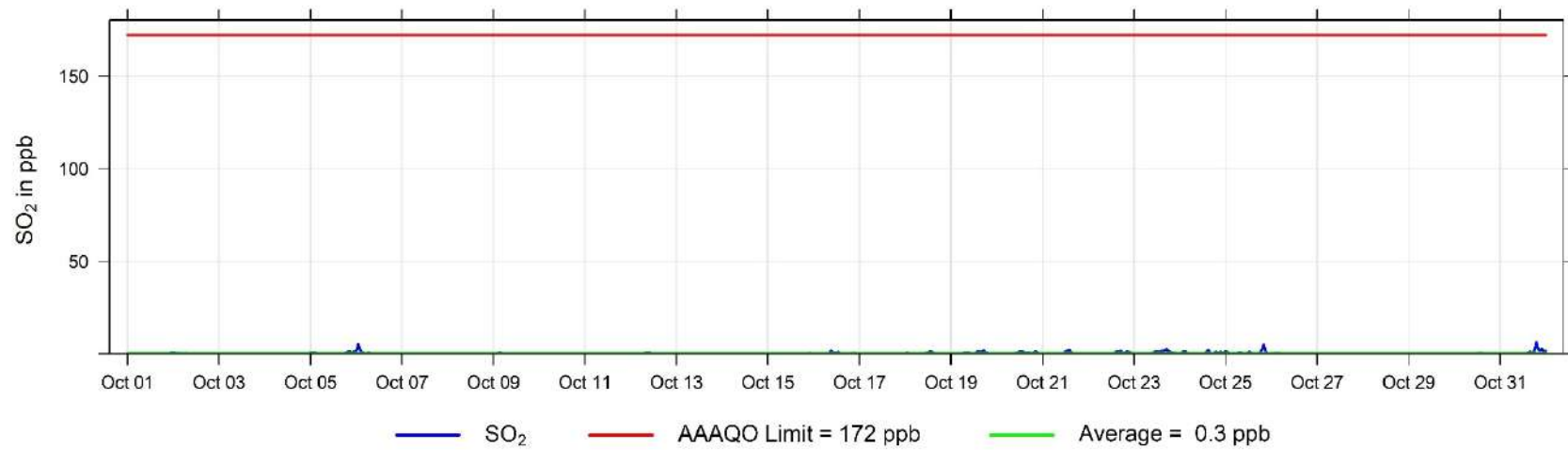
Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	TEI	42i	Not-in-service (Oct 1-2, 32hrs); loss of communications (Oct 15, 3hrs); Maintenance (Oct 6, 15, 9hrs)
O ₃	TEI	49i	Not-in-service (Oct 1-2, 36hrs); communications (Oct 15, 3hrs); Maintenance (Oct 15, 6hrs); Invalid (31hrs)
PM _{2.5}	Thermo	TEOM AB	Not-in-service (Oct 1-2, 32hrs); loss of communications (Oct 15, 3hrs)
SO ₂	TEI	43i	Not-in-service (Oct 1-2, 32hrs); loss of communications (Oct 15, 3hrs)
TR5	TEI	43i	Not-in-service (Oct 1-2, 31hrs); loss of communications (Oct 15, 3hrs)
THC/CH ₄ /NMHC	TEI	55i-A3PHAA	Not-in-service (Oct 1-2, 34hrs); loss of communications (Oct 15, 3hrs)
Met Equip	MetOne	50.5	Not-in-service (Oct 1-2, 33hrs); communications (Oct 15, 3hrs); Maintenance (Oct 6, 20hrs); Invalid (18hrs)

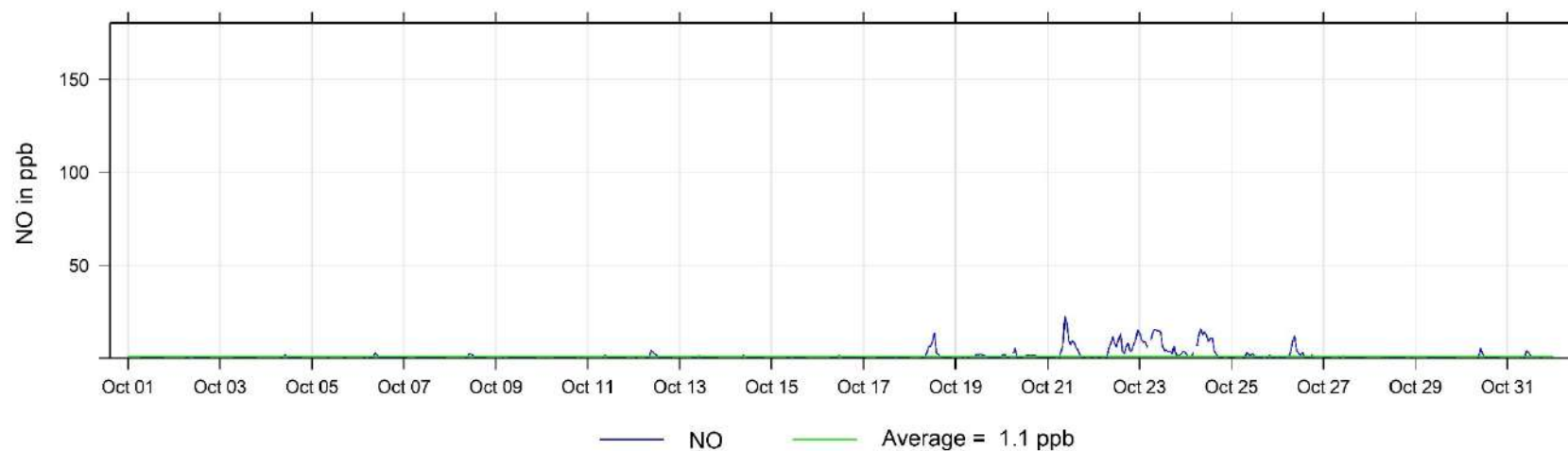
2 Beaverlodge Charts

The following pages include the charts and histograms for Beaverlodge Station

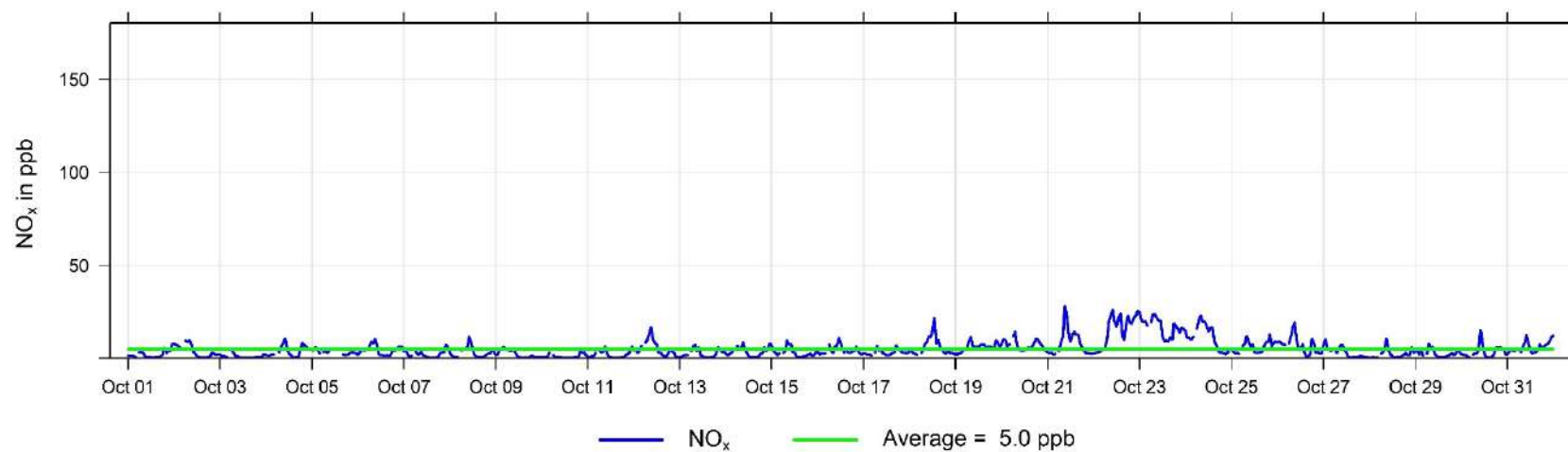
October Hourly Concentration Readings of SO₂ (in ppb) at Beaverlodge



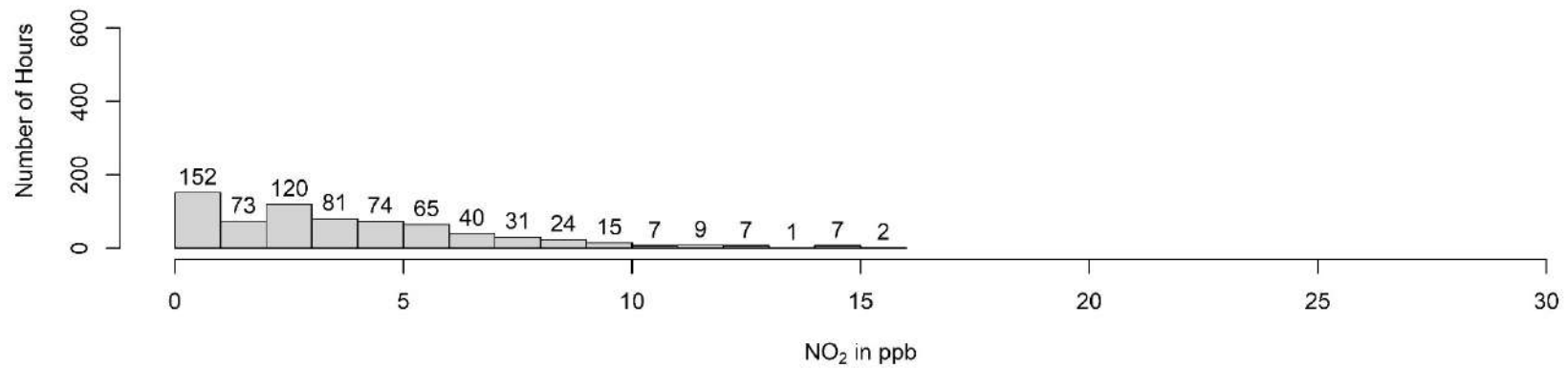
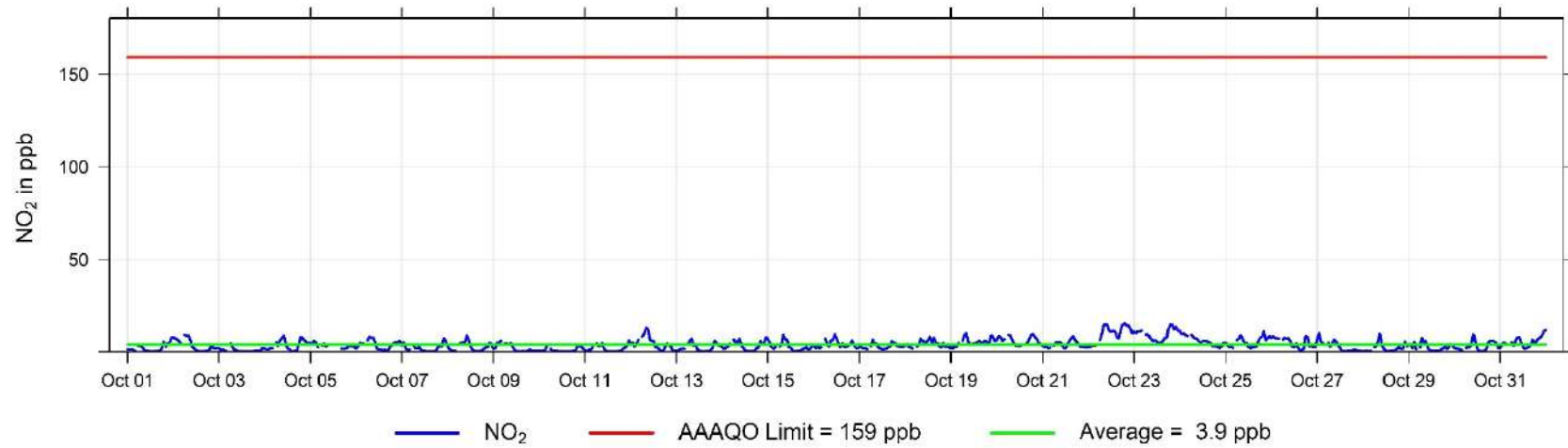
October Hourly Concentration Readings of NO (in ppb) at Beaverlodge



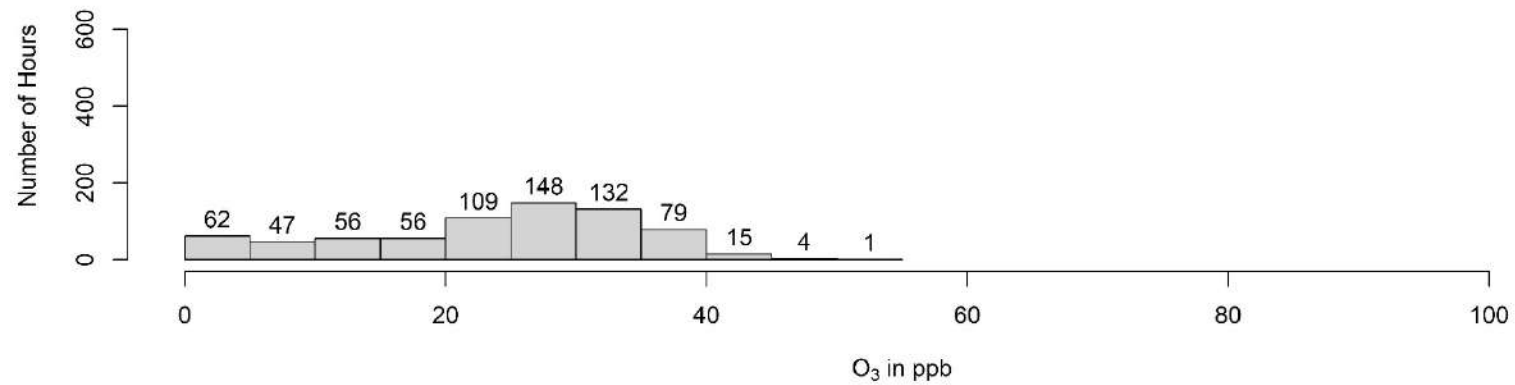
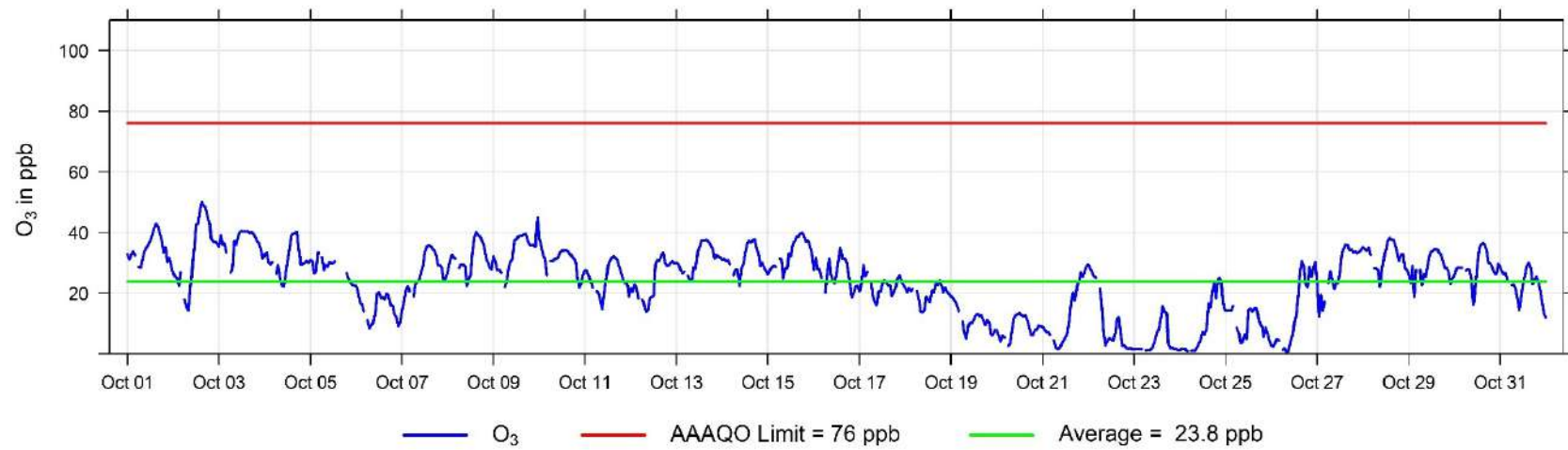
October Hourly Concentration Readings of NO_x (in ppb) at Beaverlodge



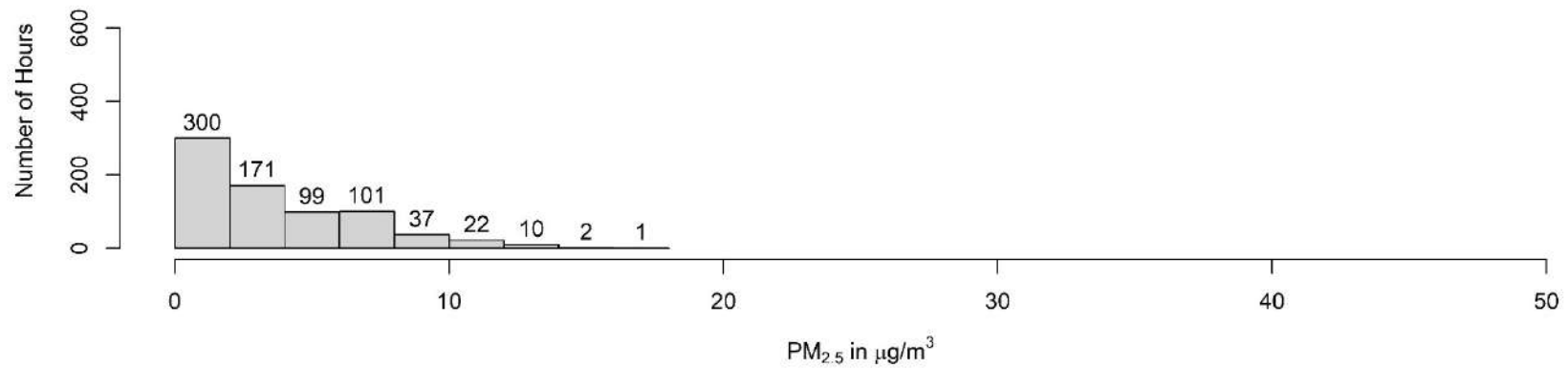
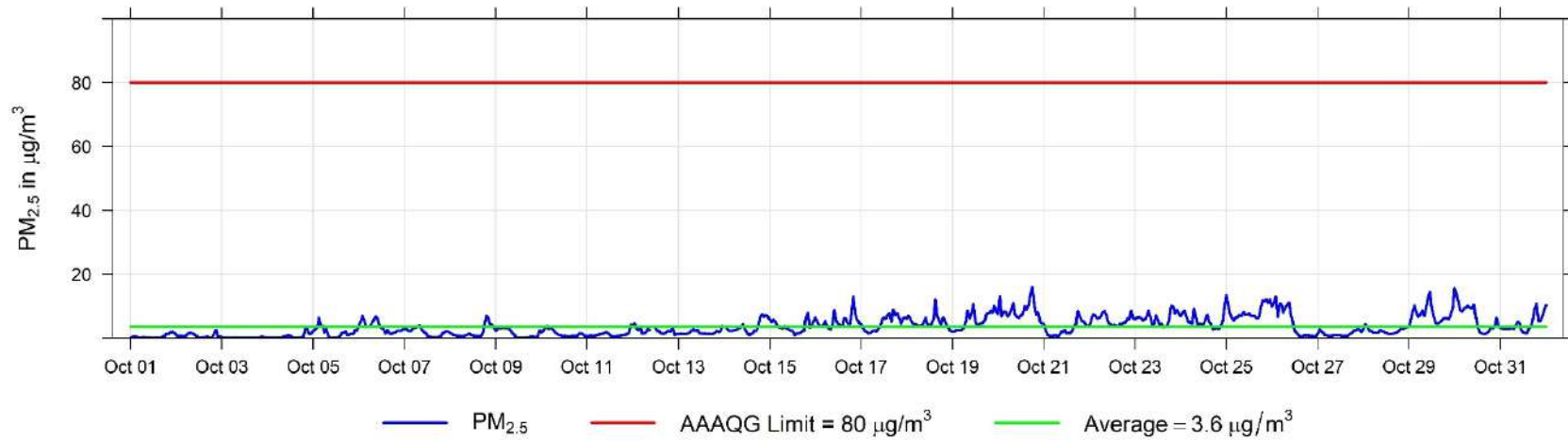
October Hourly Concentration Readings of NO₂ (in ppb) at Beaverlodge



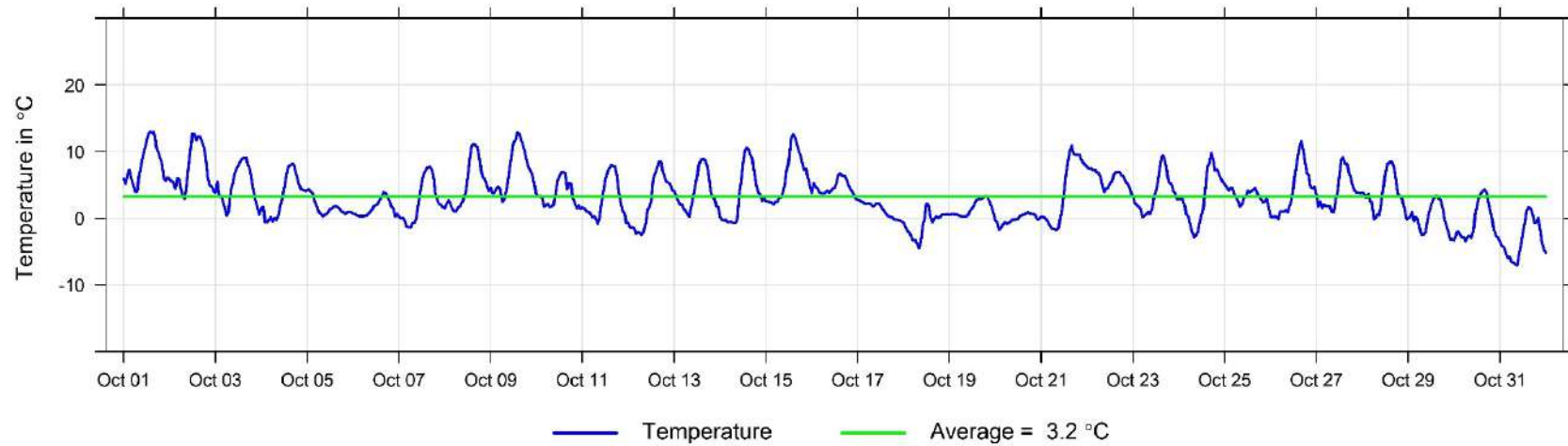
October Hourly Concentration Readings of O₃ (in ppb) at Beaverlodge



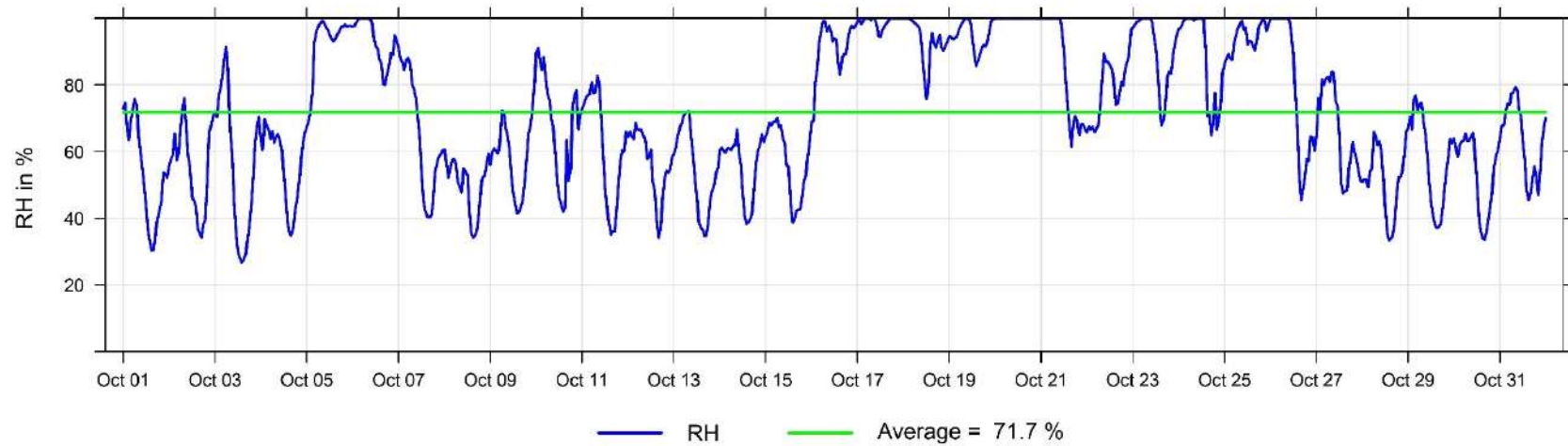
October Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Beaverlodge



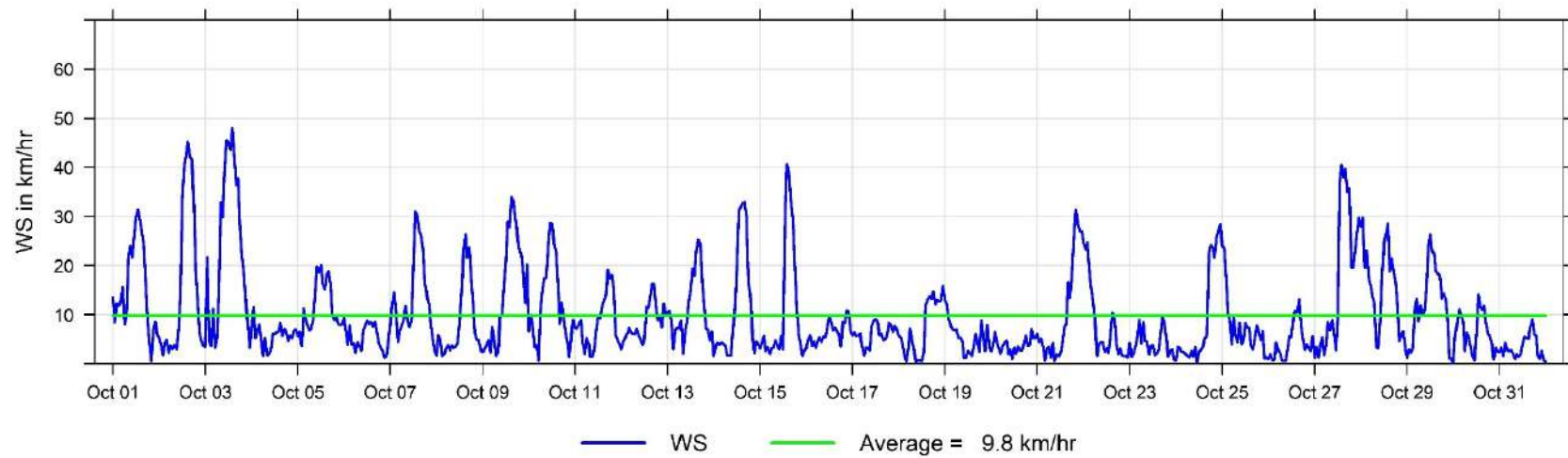
October Hourly Temperature Readings (in °C) at Beaverlodge



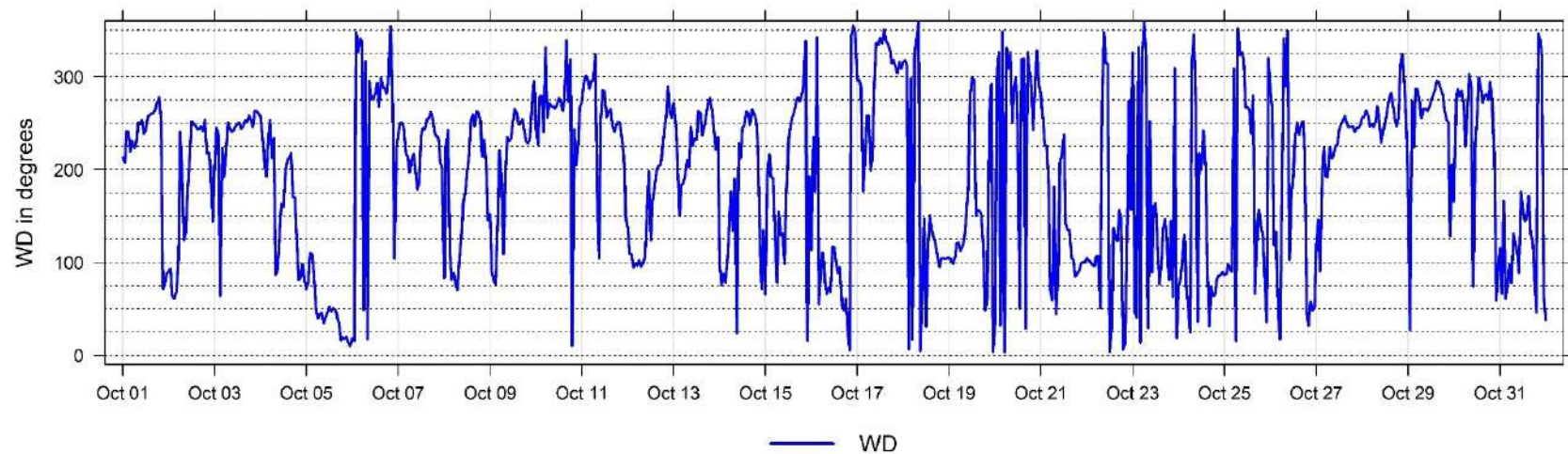
October Hourly Readings of Relative Humidity (in %) at Beaverlodge



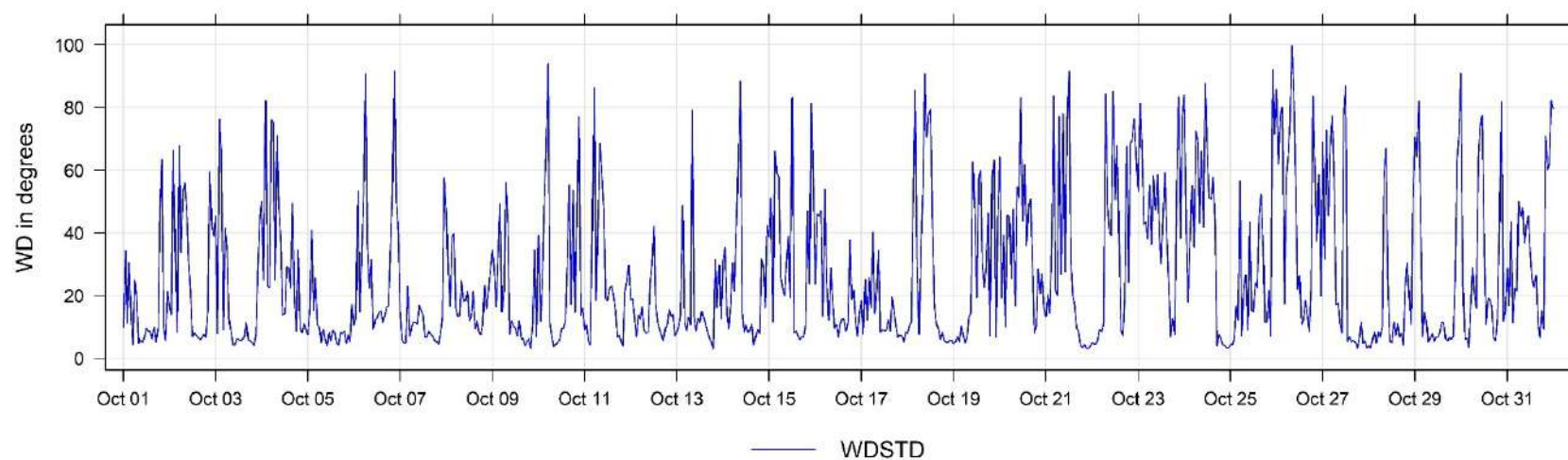
October Hourly Readings of Wind Speed (in km/hr) at Beaverlodge



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



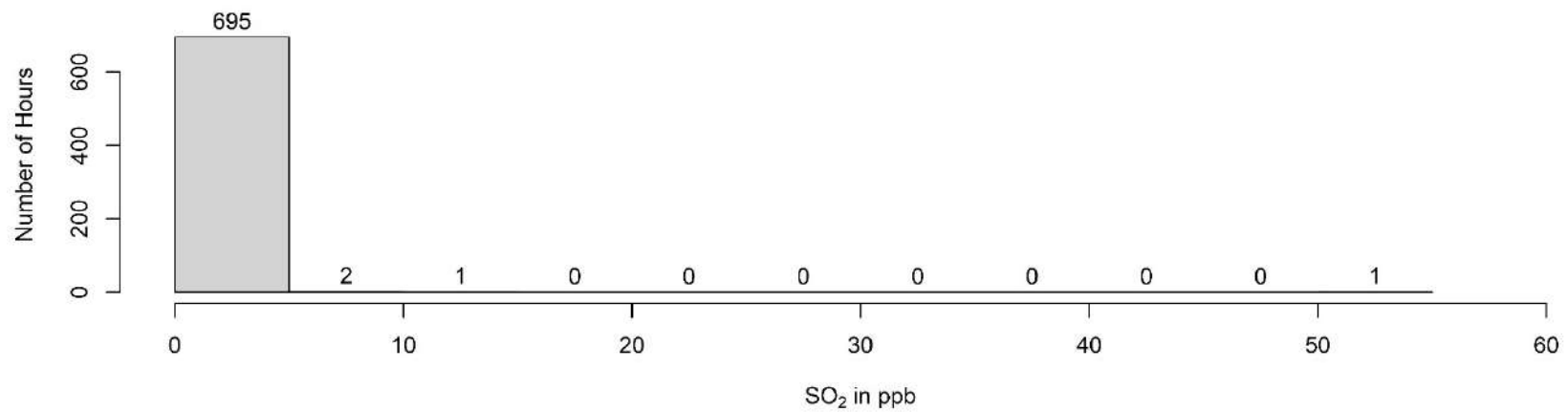
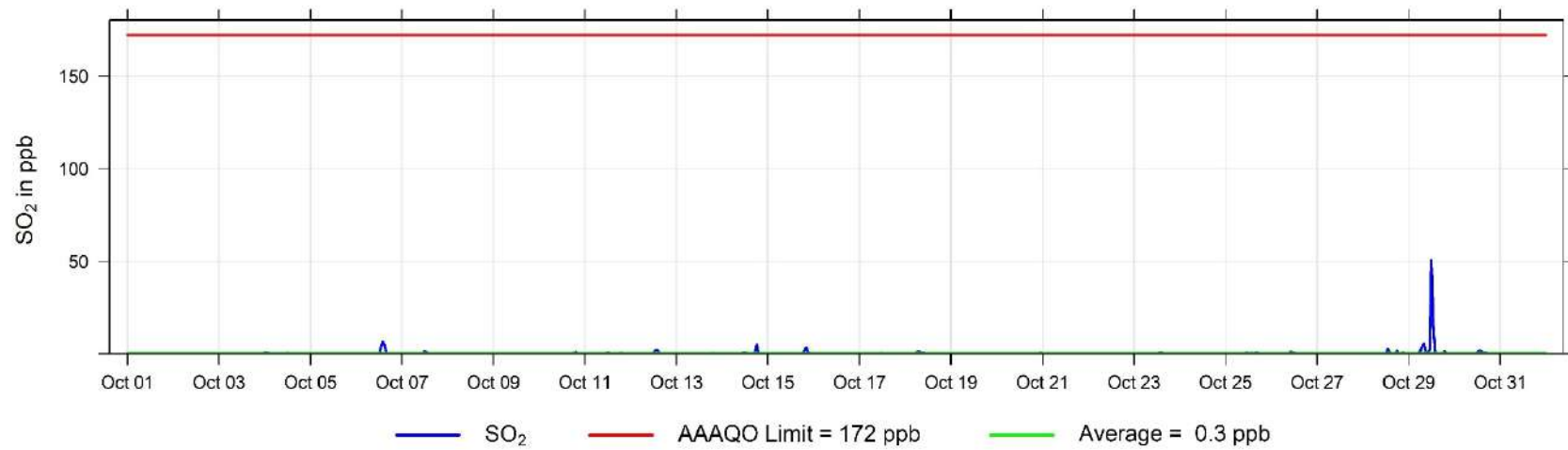
October Hourly Readings of Wind Direction Standard Deviation (in degrees) at Beaverlodge



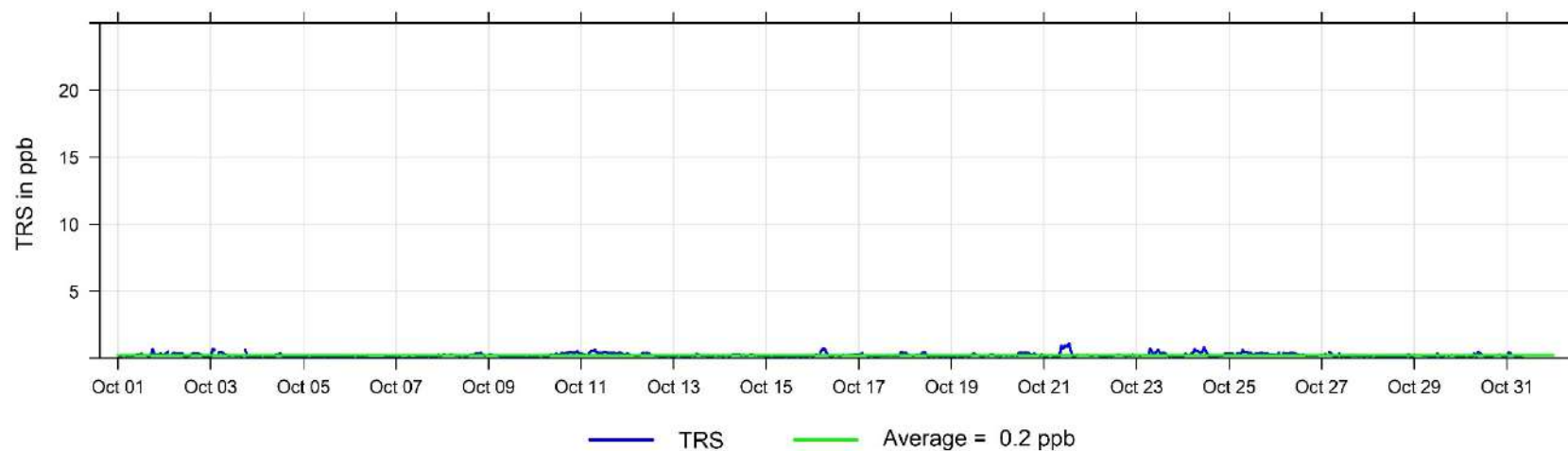
3 Evergreen Park Charts

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

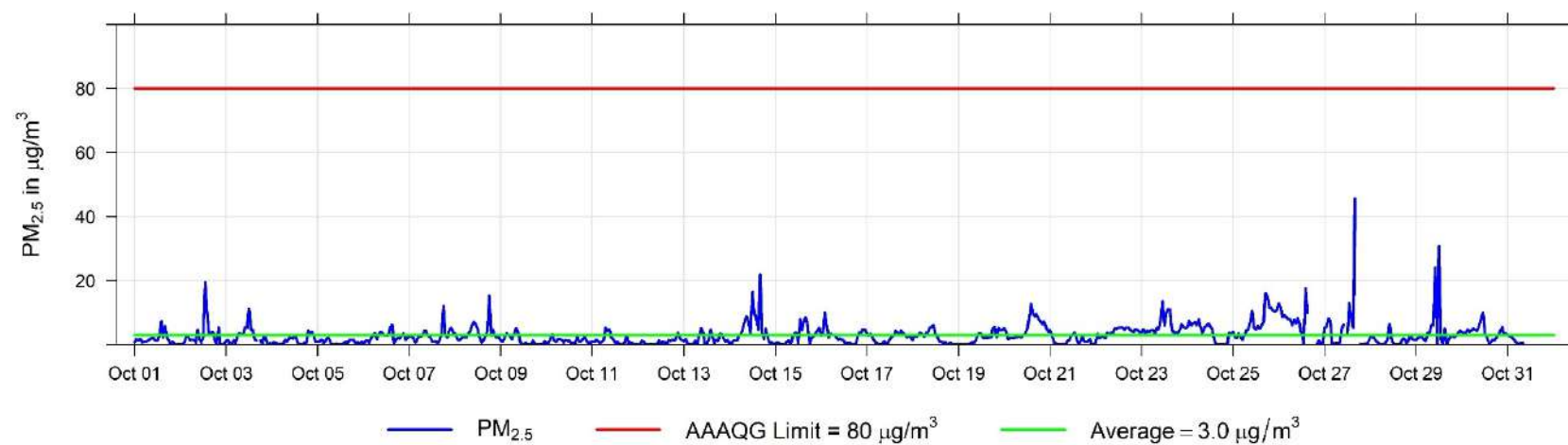
October Hourly Concentration Readings of SO₂ (in ppb) at Evergreen Park

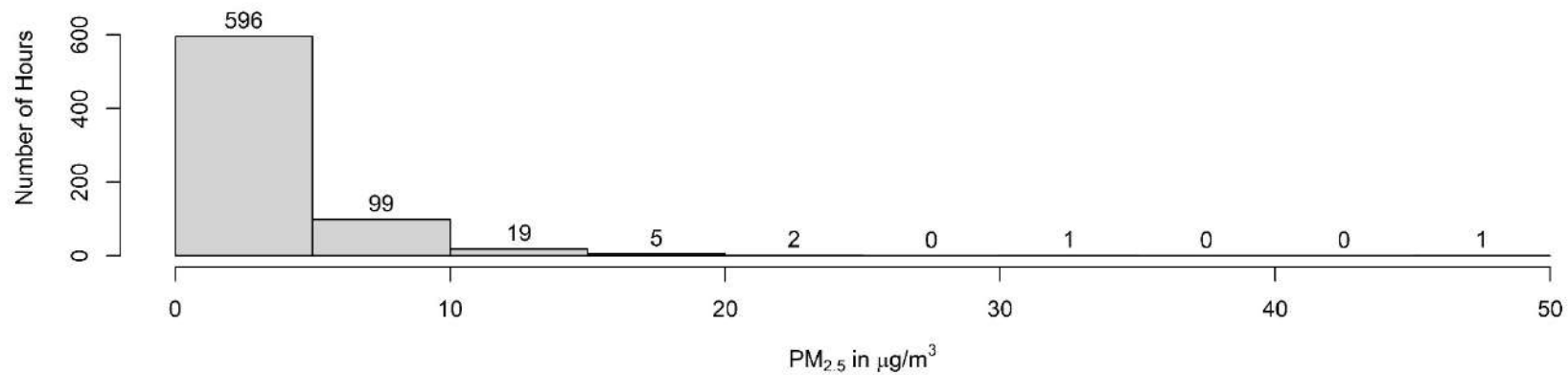


October Hourly Concentration Readings of TRS (in ppb) at Evergreen Park

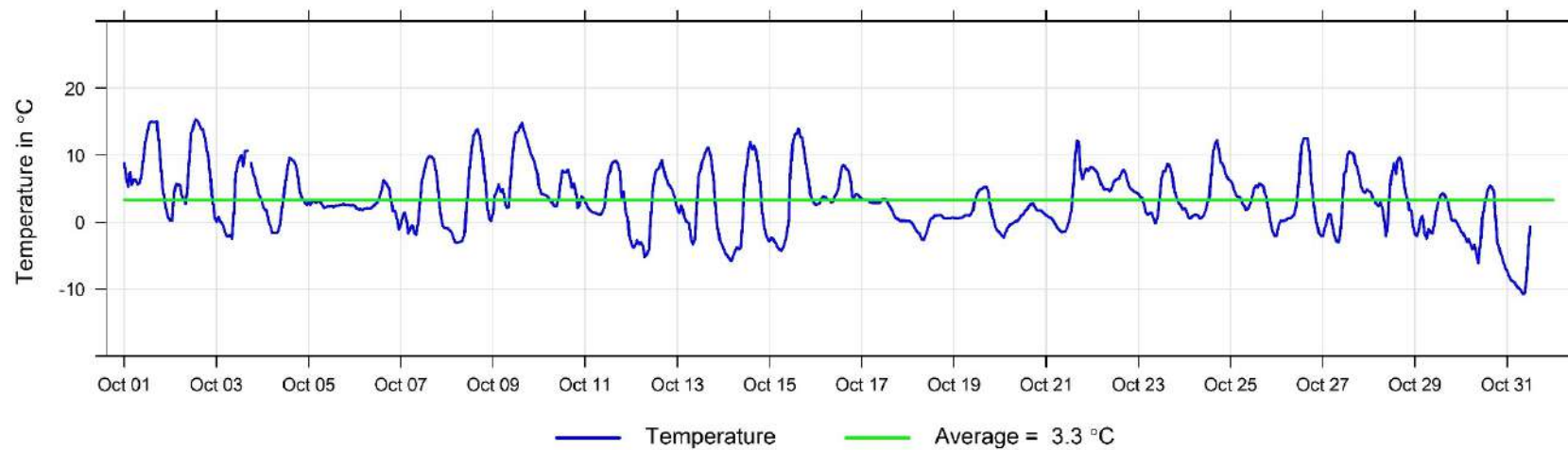


October Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Evergreen Park

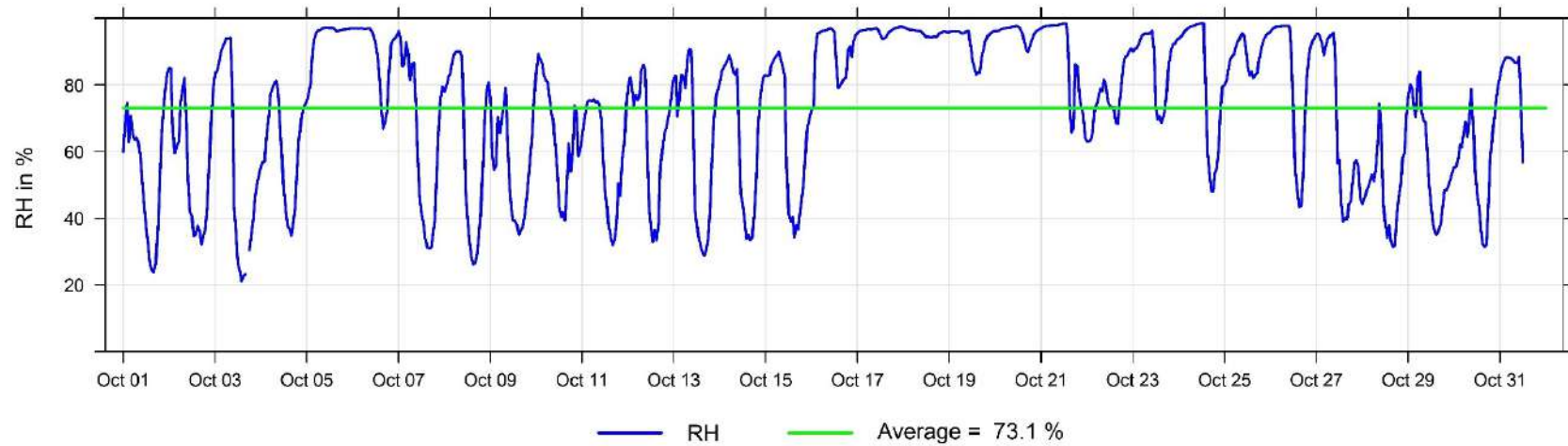




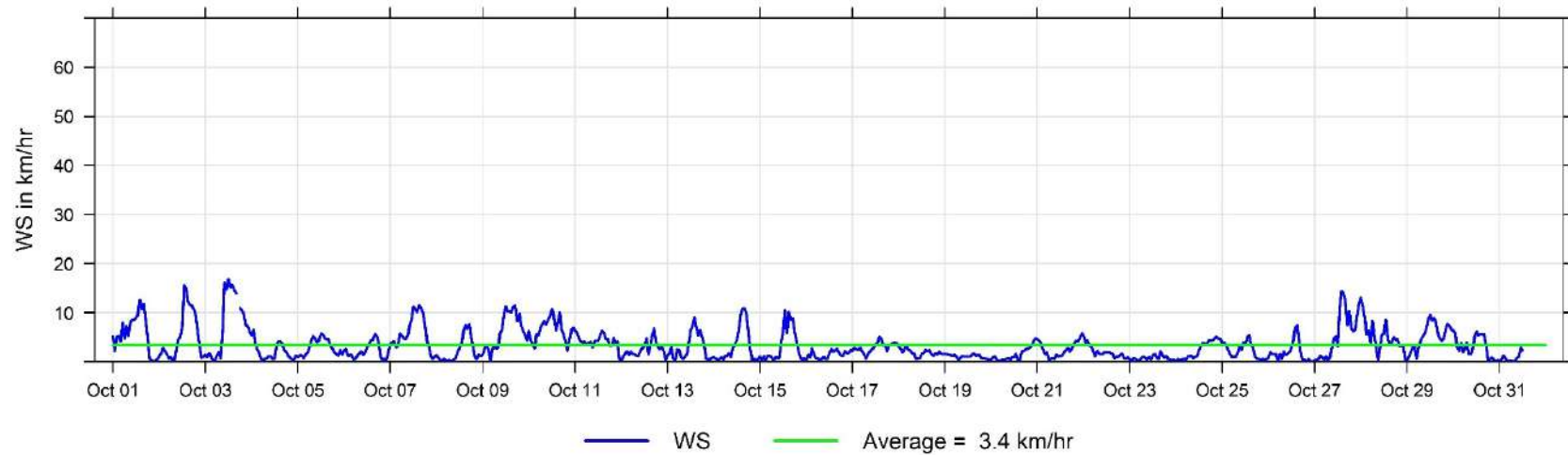
October Hourly Temperature Readings (in °C) at Evergreen Park



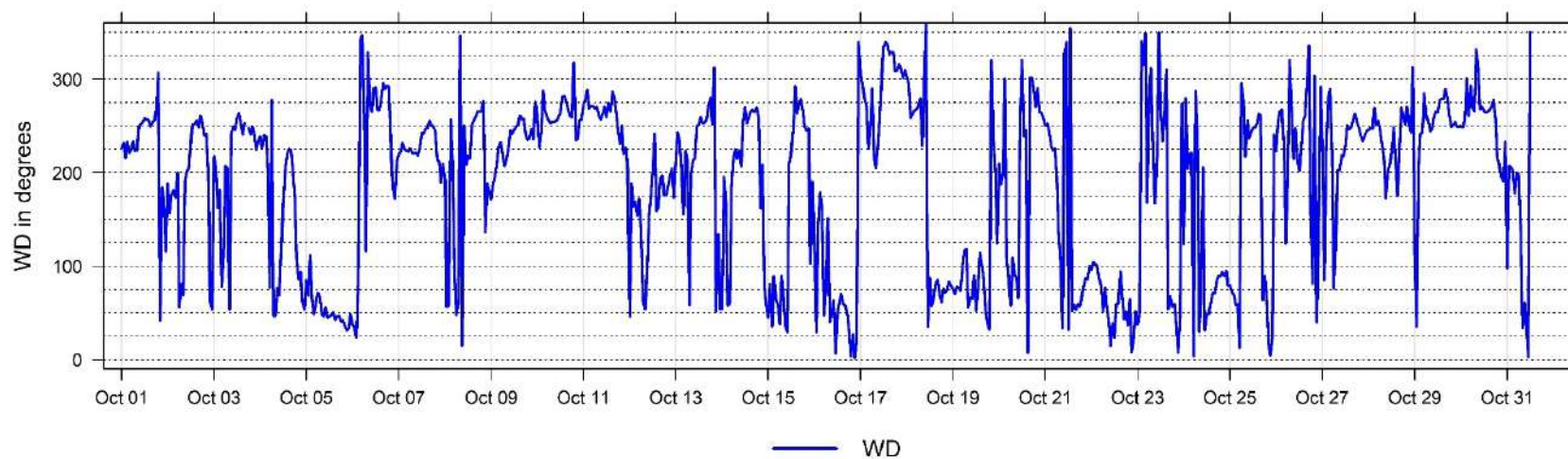
October Hourly Readings of Relative Humidity (in %) at Evergreen Park



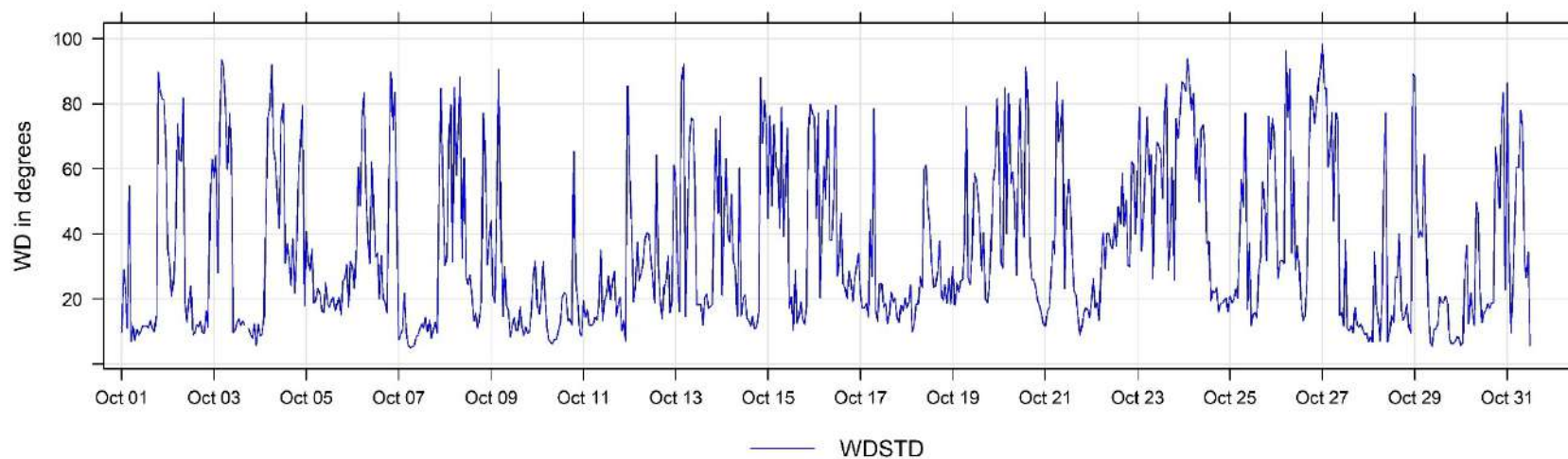
October Hourly Readings of Wind Speed (in km/hr) at Evergreen Park



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



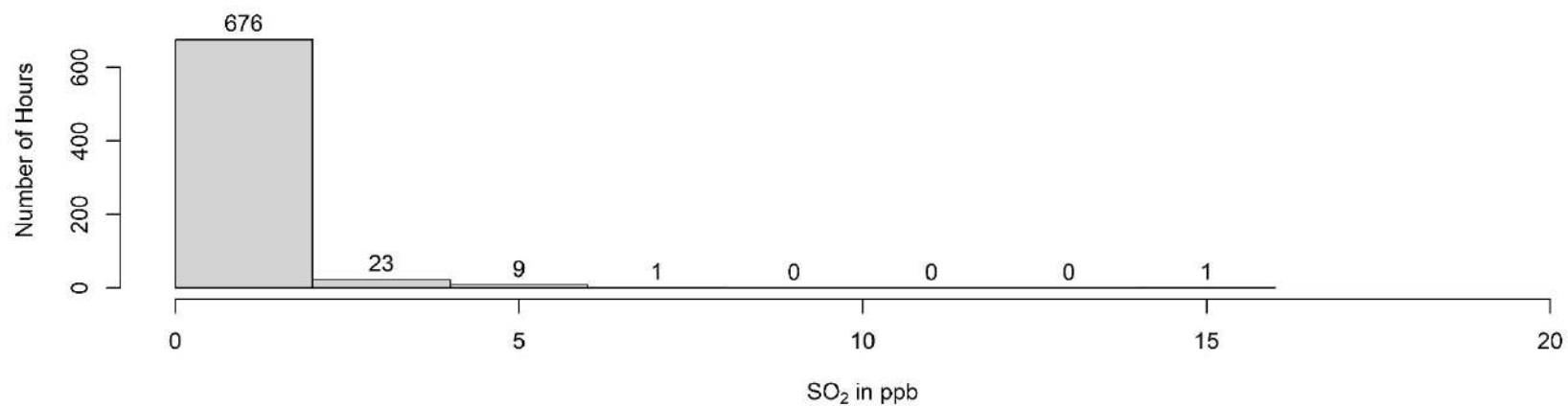
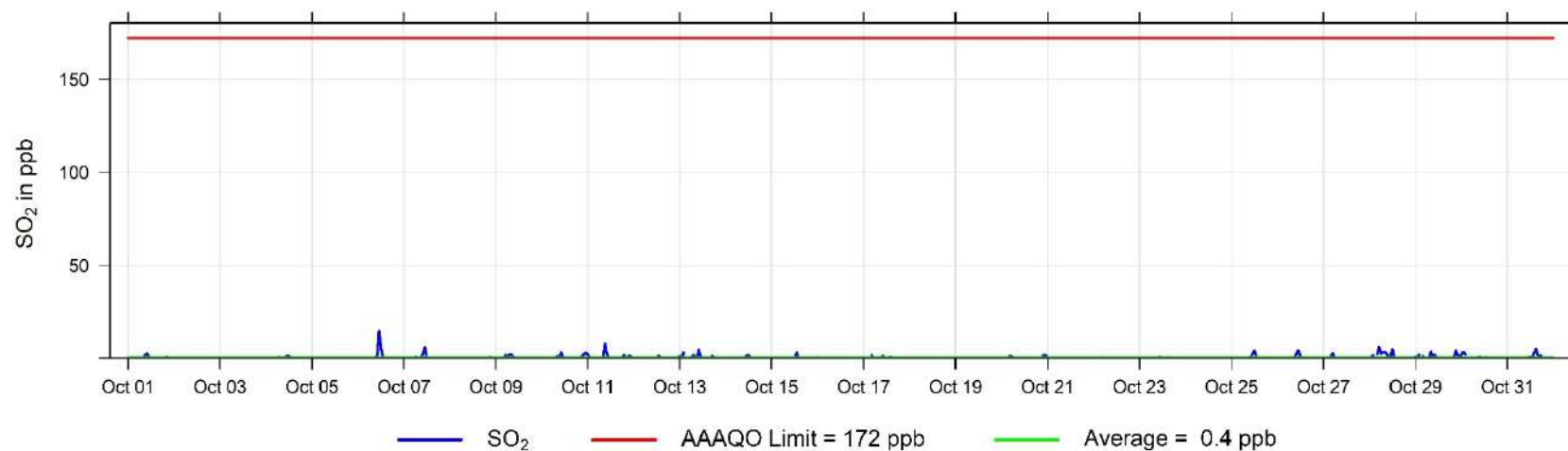
October Hourly Readings of Wind Direction Standard Deviation (in degrees) at Evergreen Park



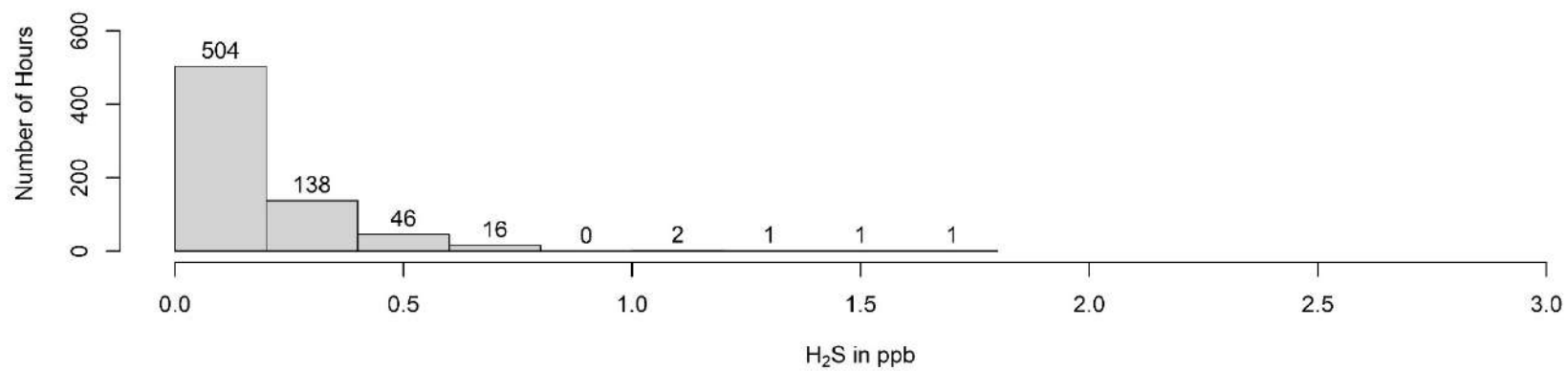
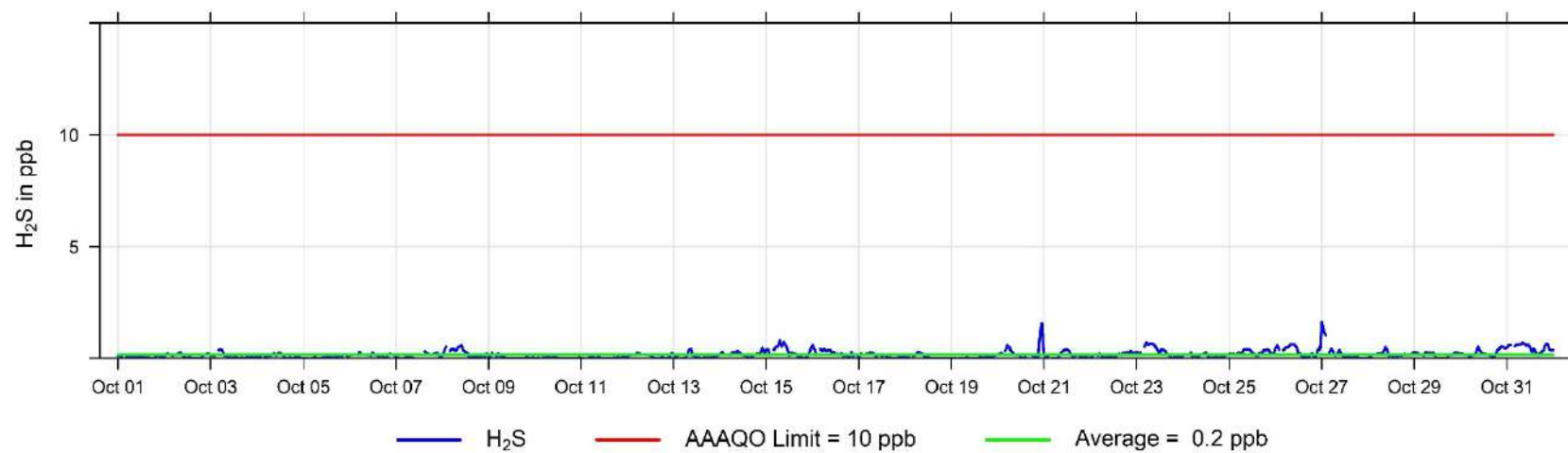
4 Grande Prairie - Henry Pirker Charts

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

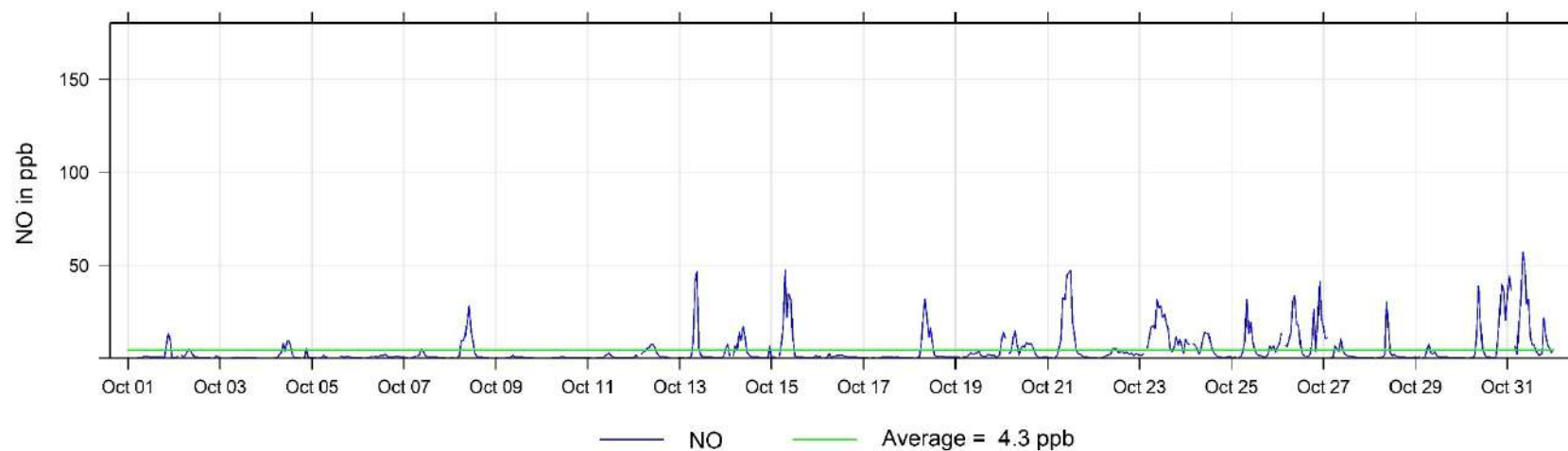
October Hourly Concentration Readings of SO₂ (in ppb) at Henry Pirker



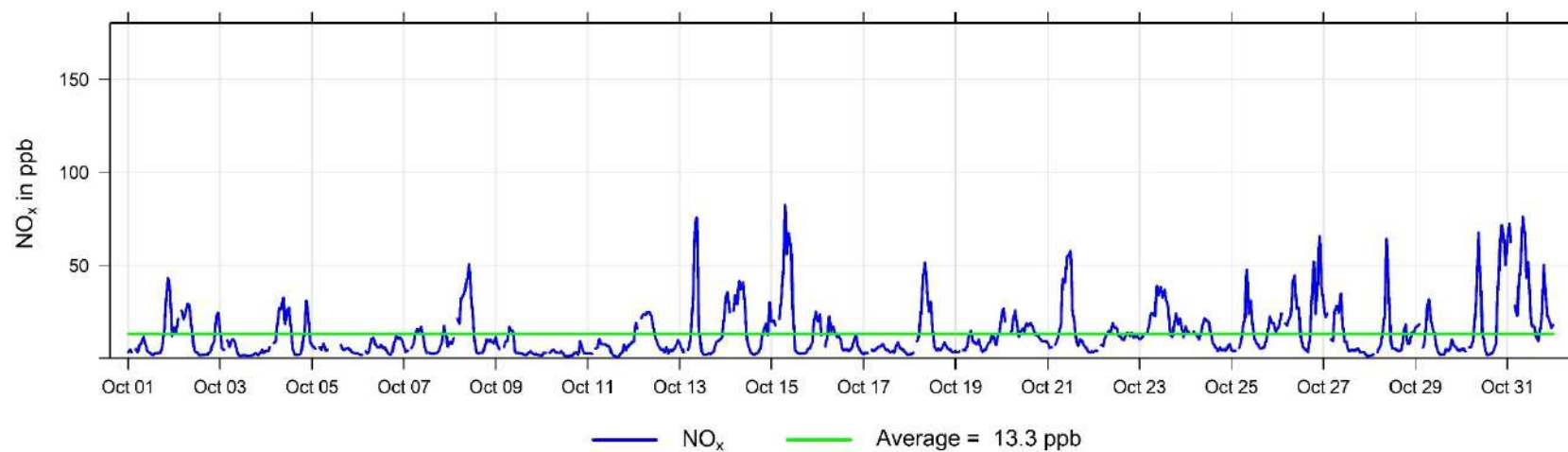
October Hourly Concentration Readings of H₂S (in ppb) at Henry Pirker



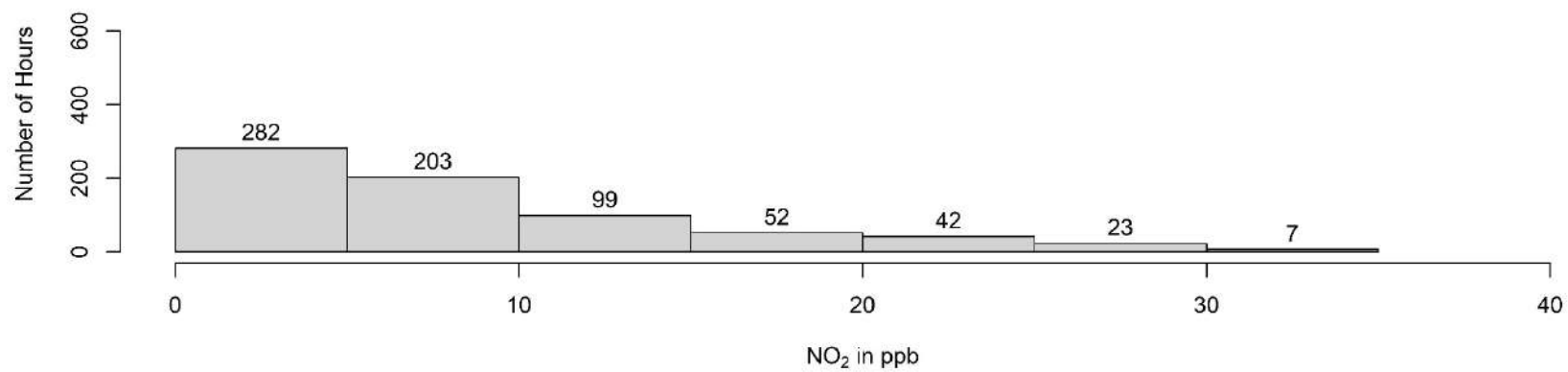
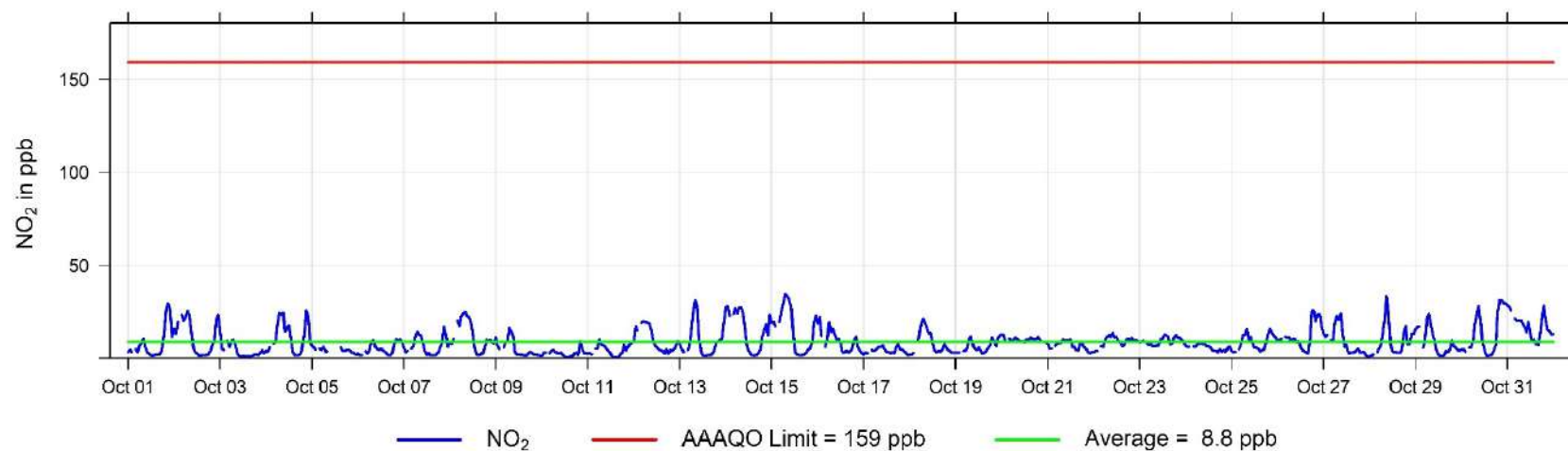
October Hourly Concentration Readings of NO (in ppb) at Henry Pirker



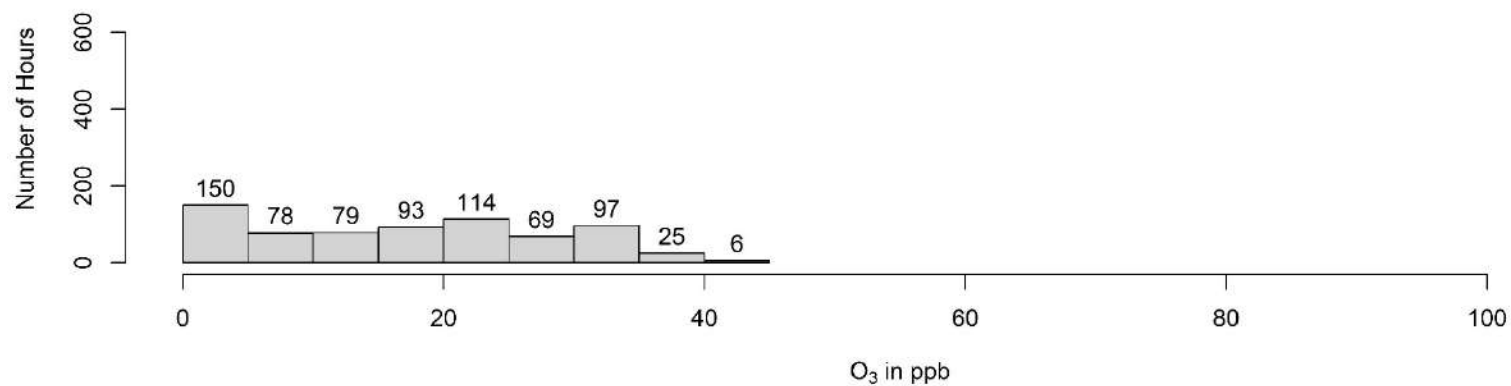
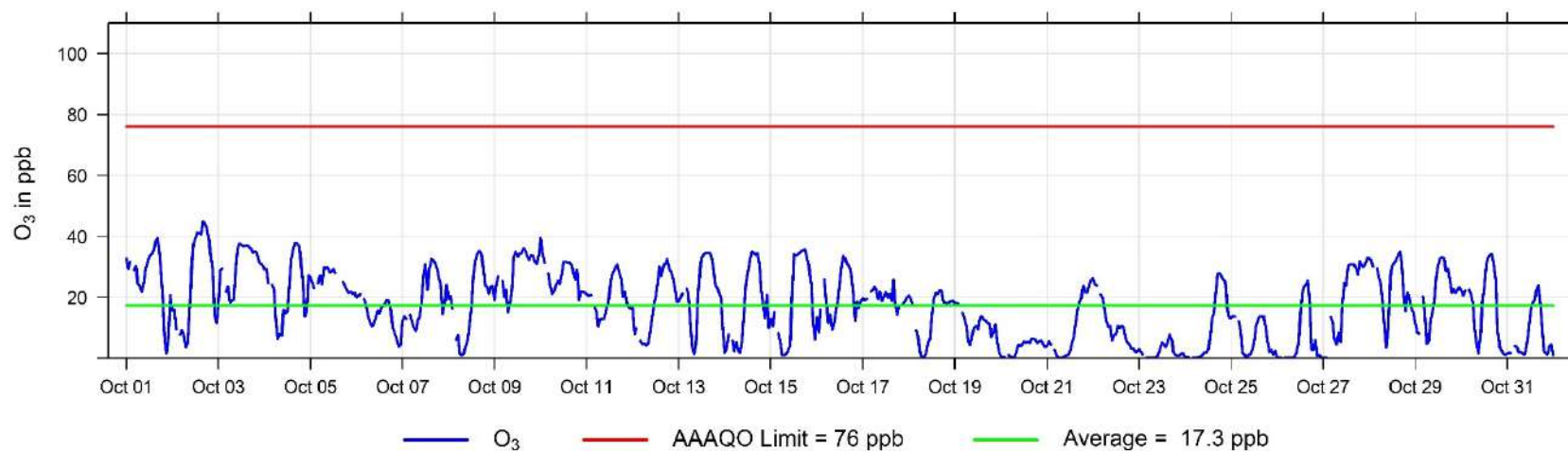
October Hourly Concentration Readings of NO_x (in ppb) at Henry Pirker



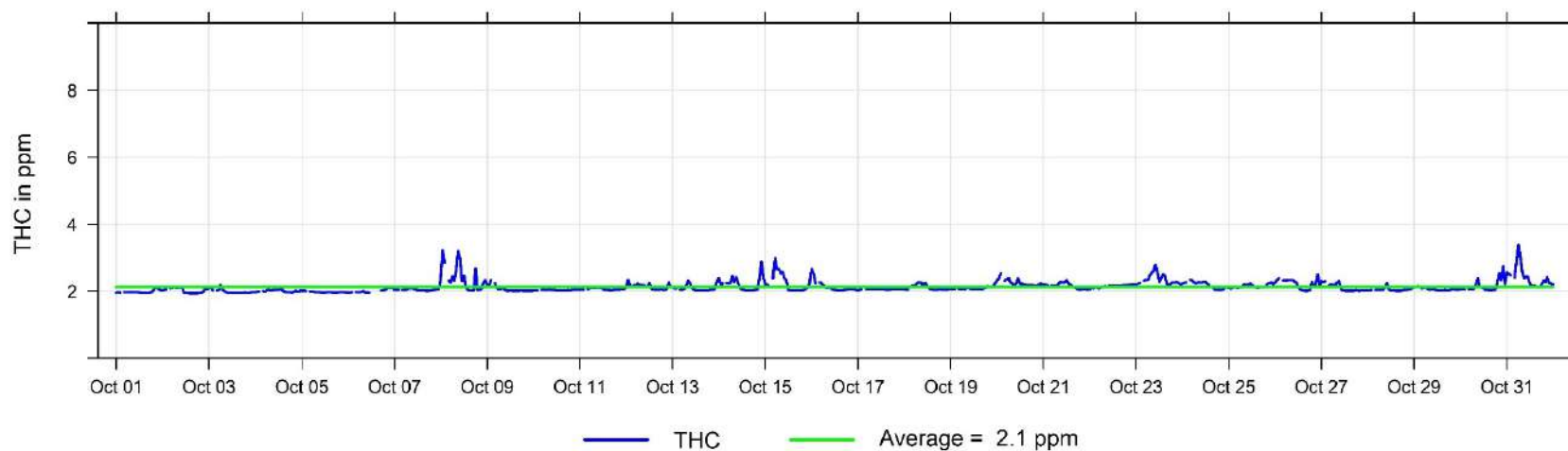
October Hourly Concentration Readings of NO₂ (in ppb) at Henry Pirker



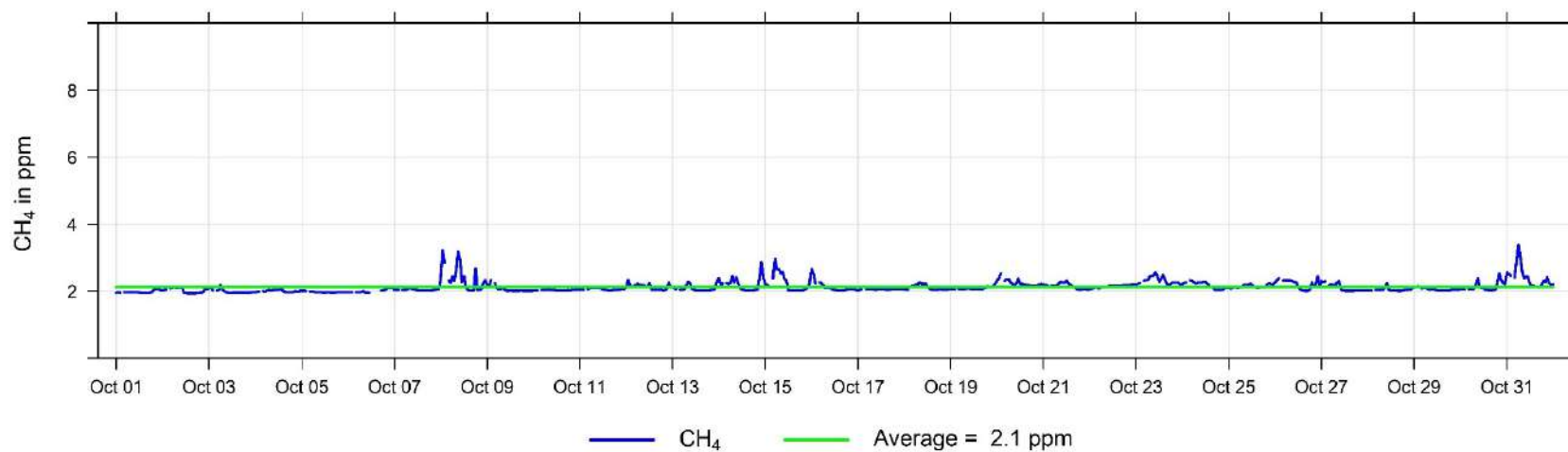
October Hourly Concentration Readings of O₃ (in ppb) at Henry Pirker



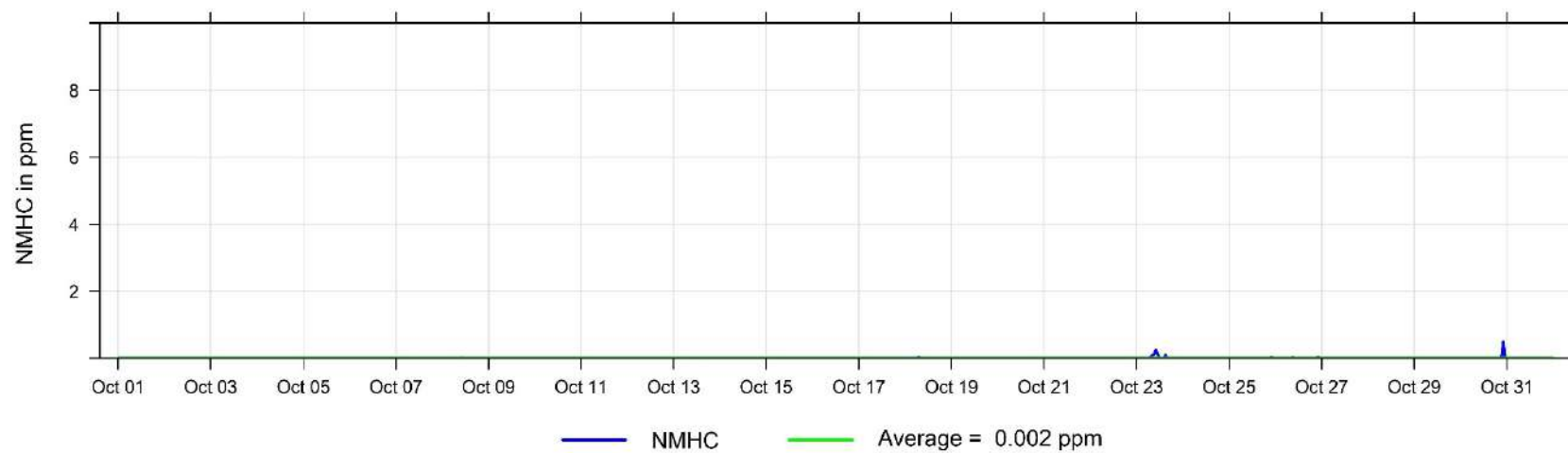
October Hourly Concentration Readings of THC (in ppm) at Henry Pirker



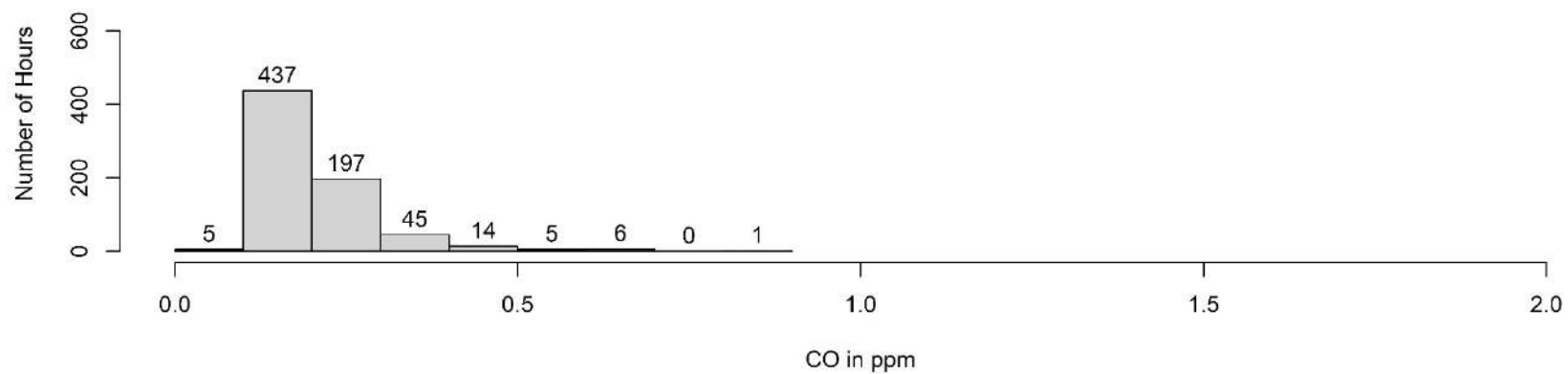
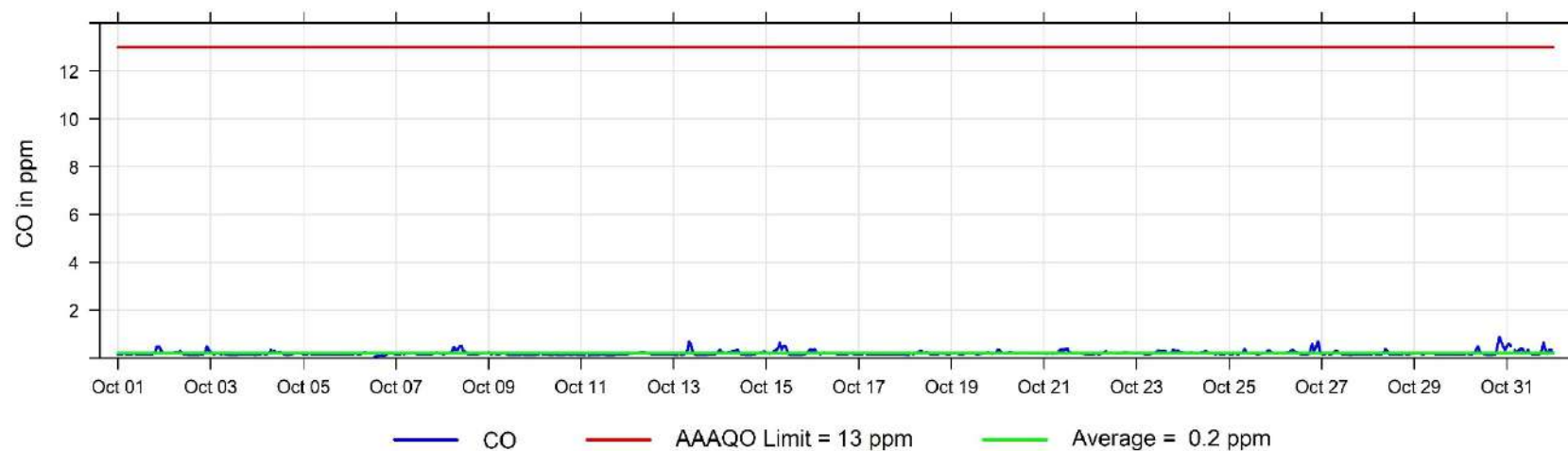
October Hourly Concentration Readings of CH₄ (in ppm) at Henry Pirker



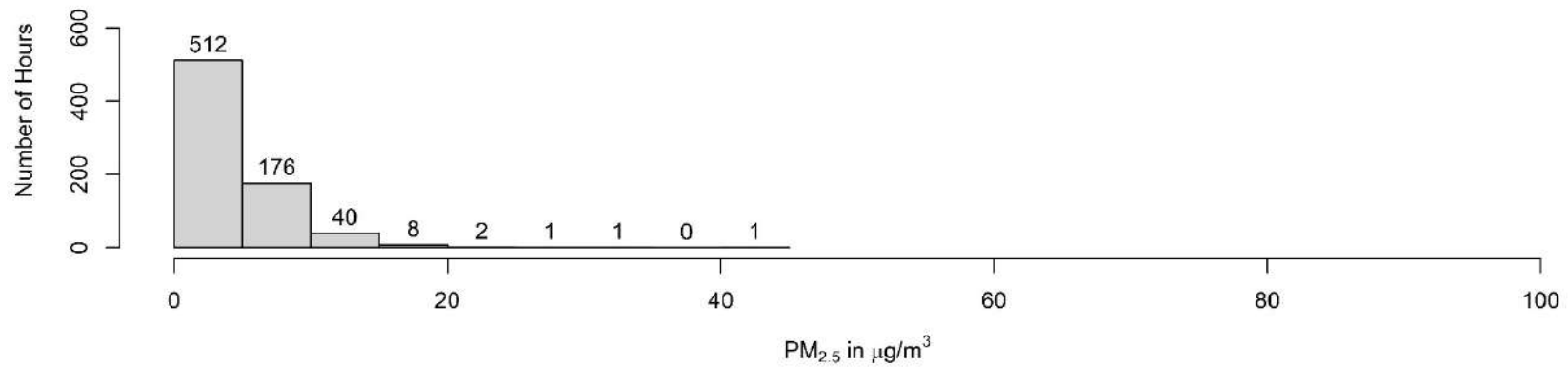
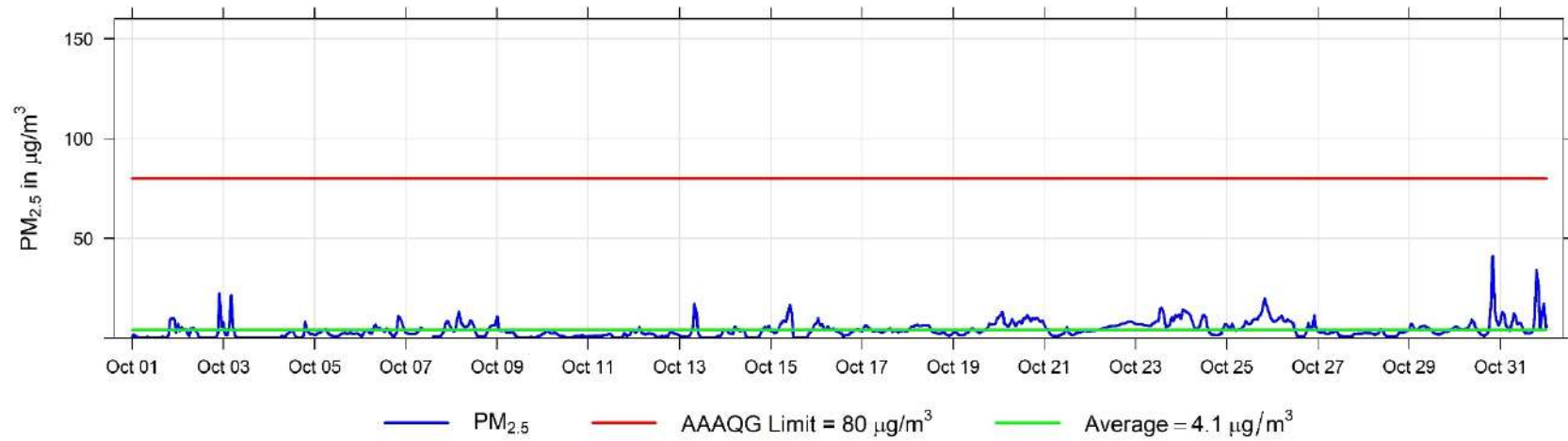
October Hourly Concentration Readings of NMHC (in ppm) at Henry Pirker



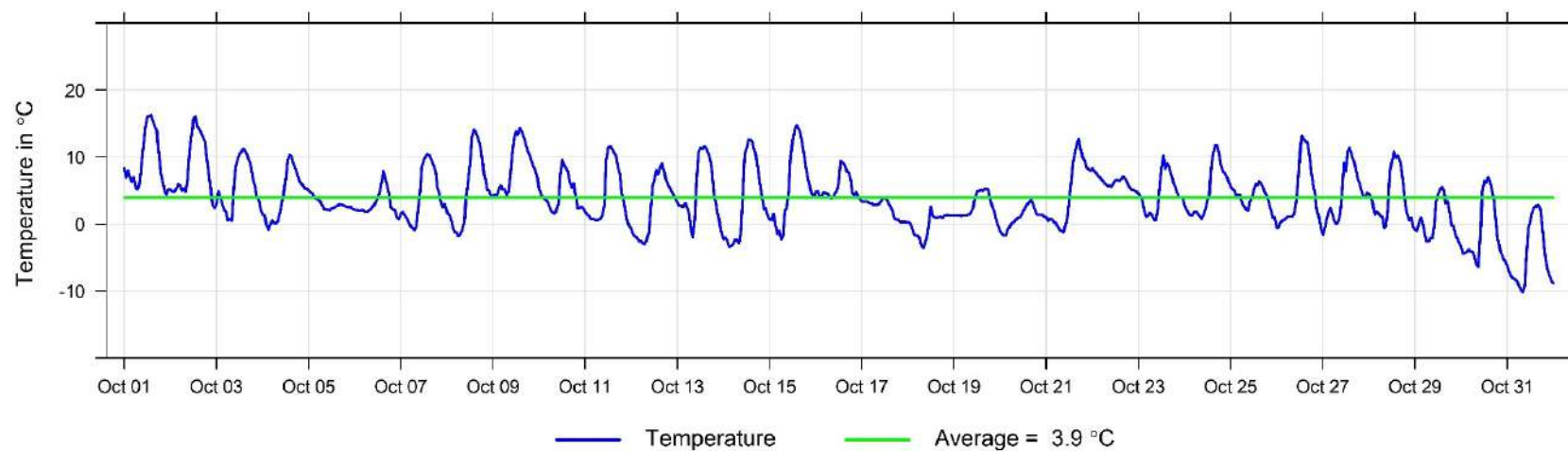
October Hourly Concentration Readings of CO (in ppm) at Henry Pirker



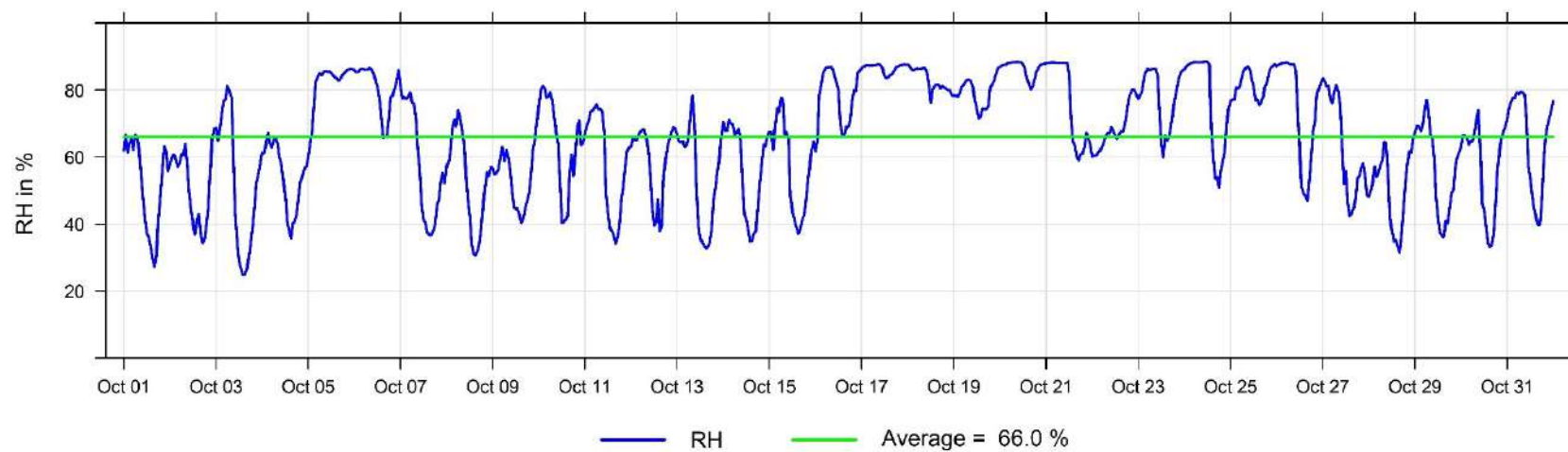
October Hourly Concentration Readings of PM_{2.5} in µg/m³ at Henry Pirker



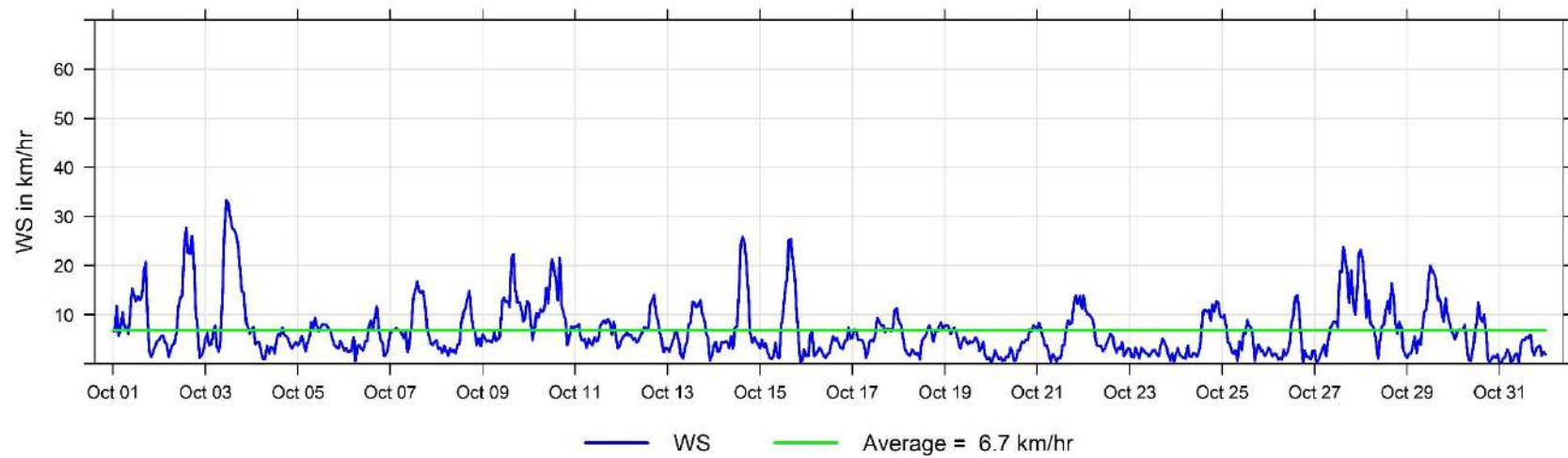
October Hourly Temperature Readings (in °C) at Henry Pirker



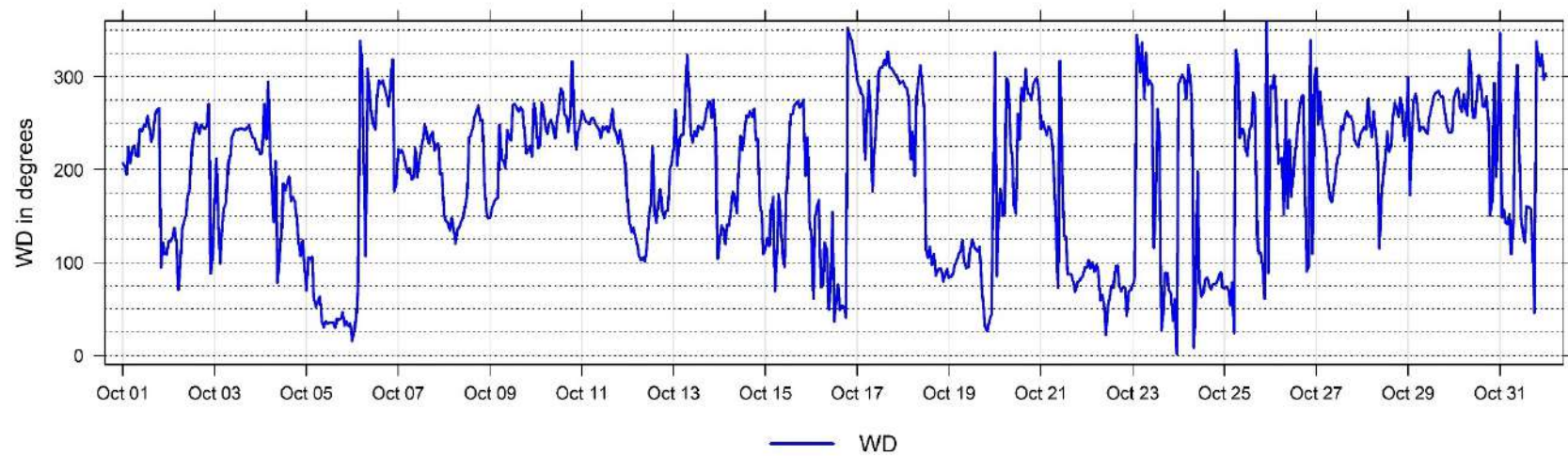
October Hourly Readings of Relative Humidity (in %) at Henry Pirker



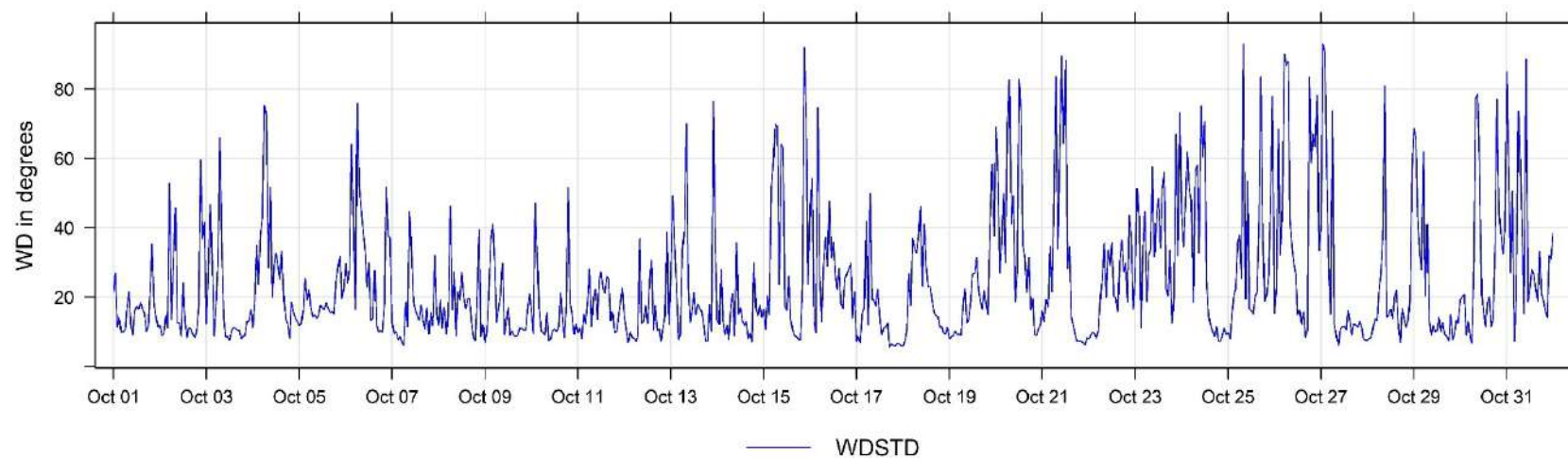
October Hourly Readings of Wind Speed (in km/hr) at Henry Pirker

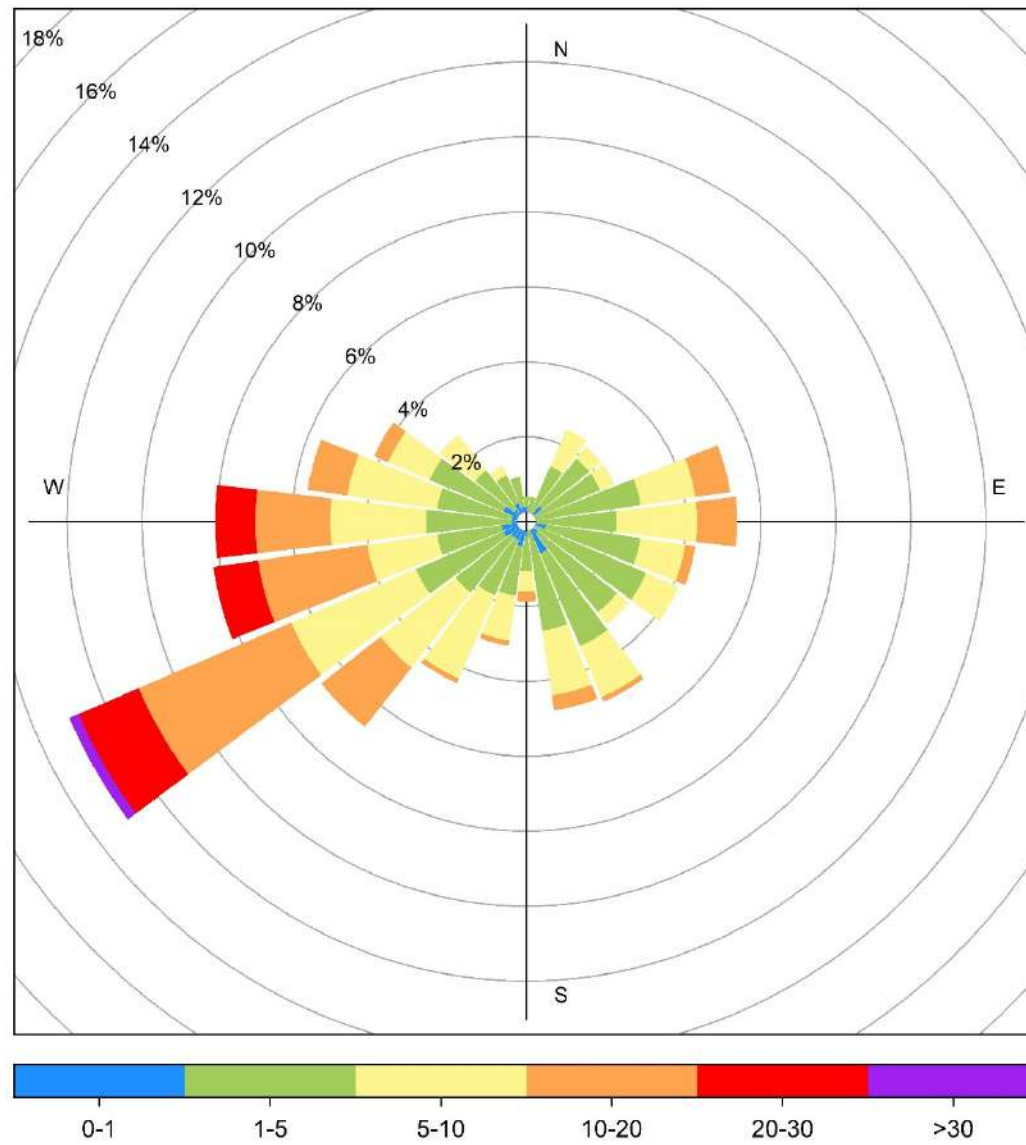


October Hourly Readings of Wind Direction (in degrees) at Henry Pirker



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



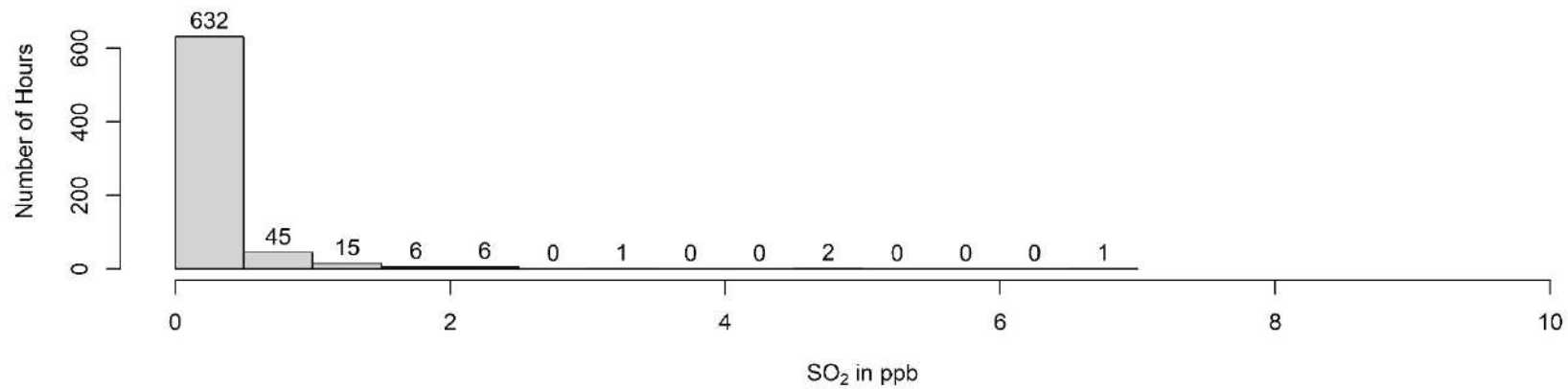
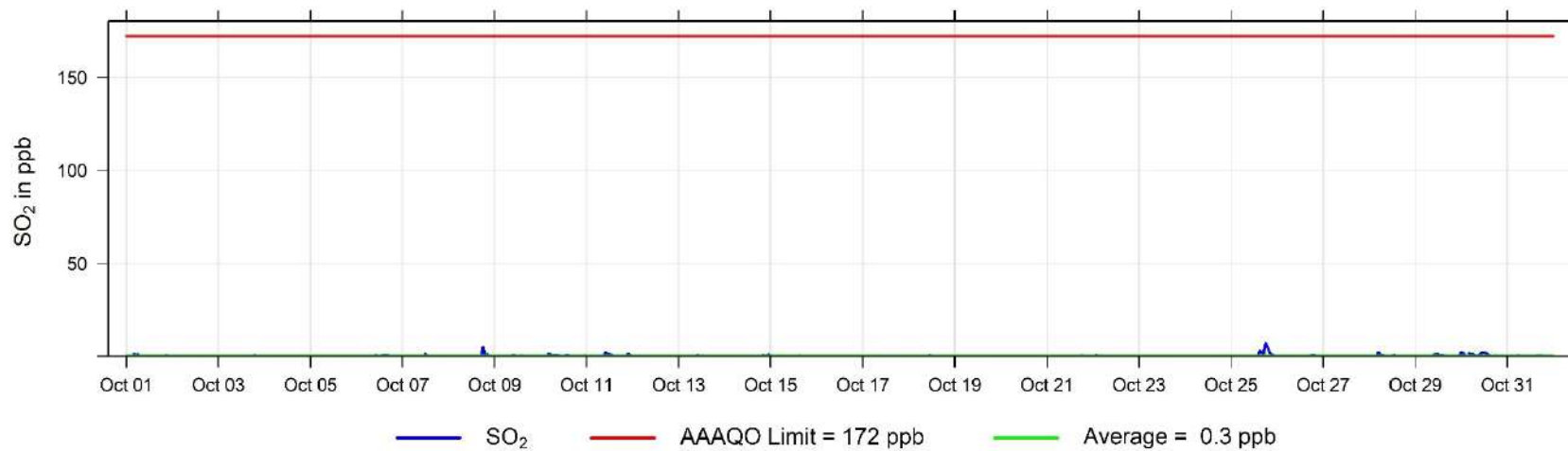


Henry Pirker October Wind Rose, wind speed in km/hr

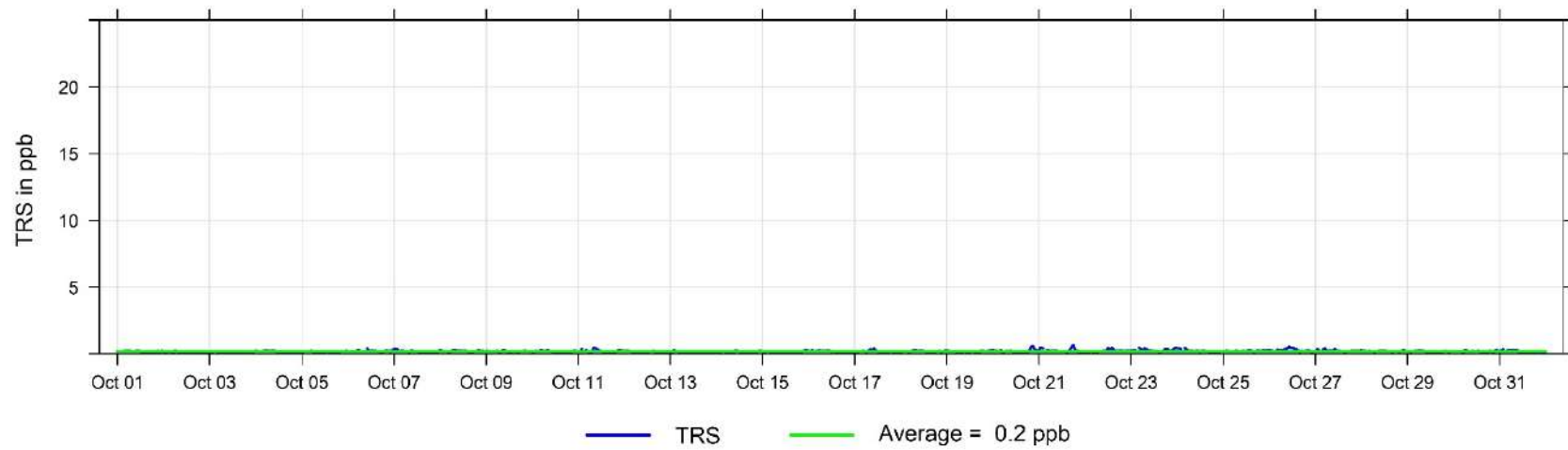
5 Smoky Heights Charts

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

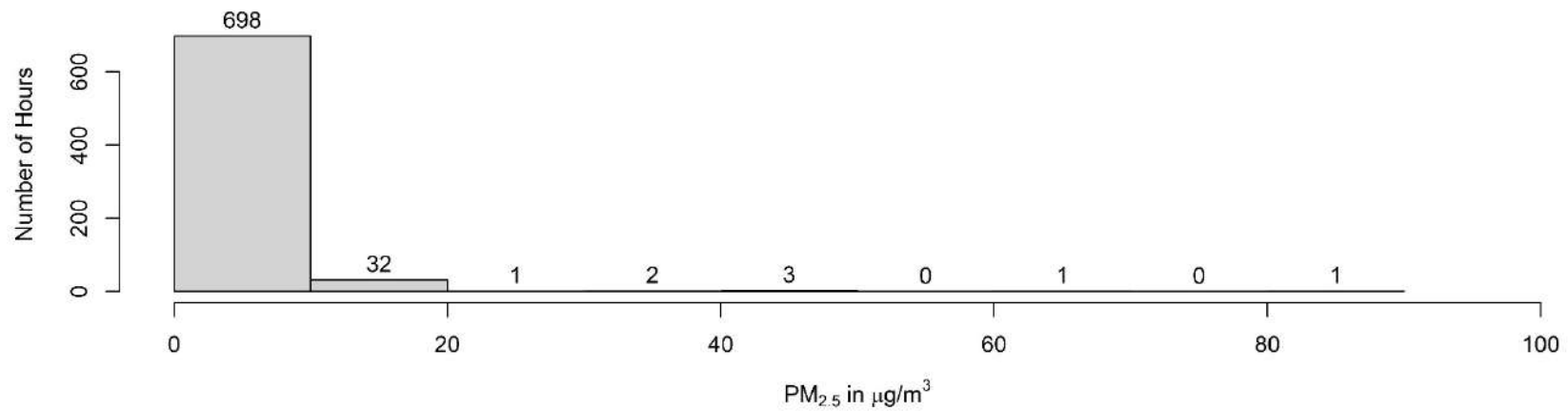
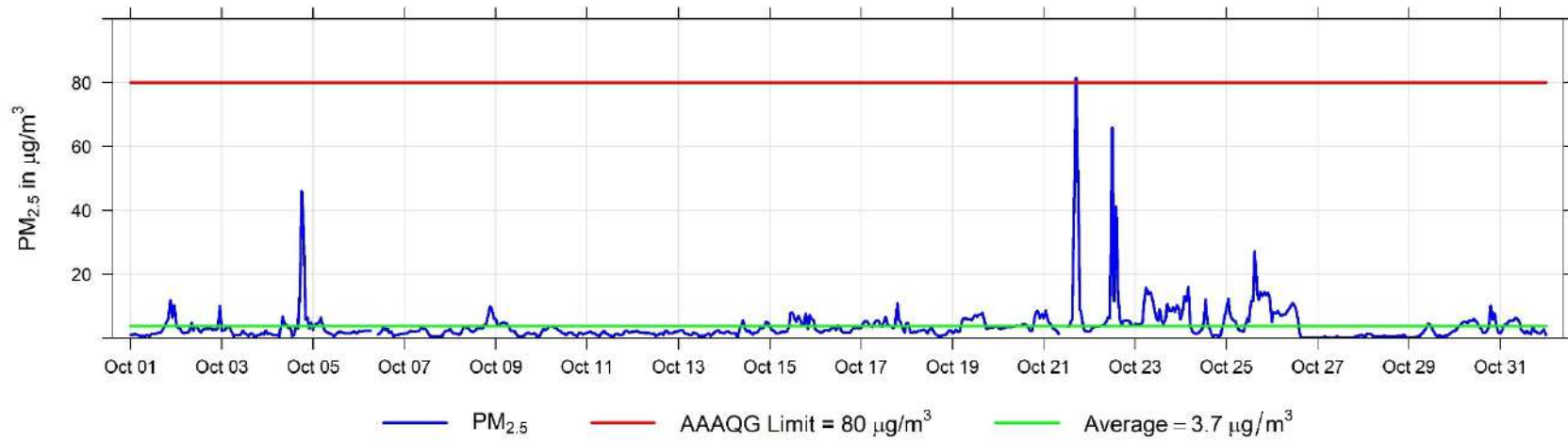
October Hourly Concentration Readings of SO₂ (in ppb) at Smoky Heights



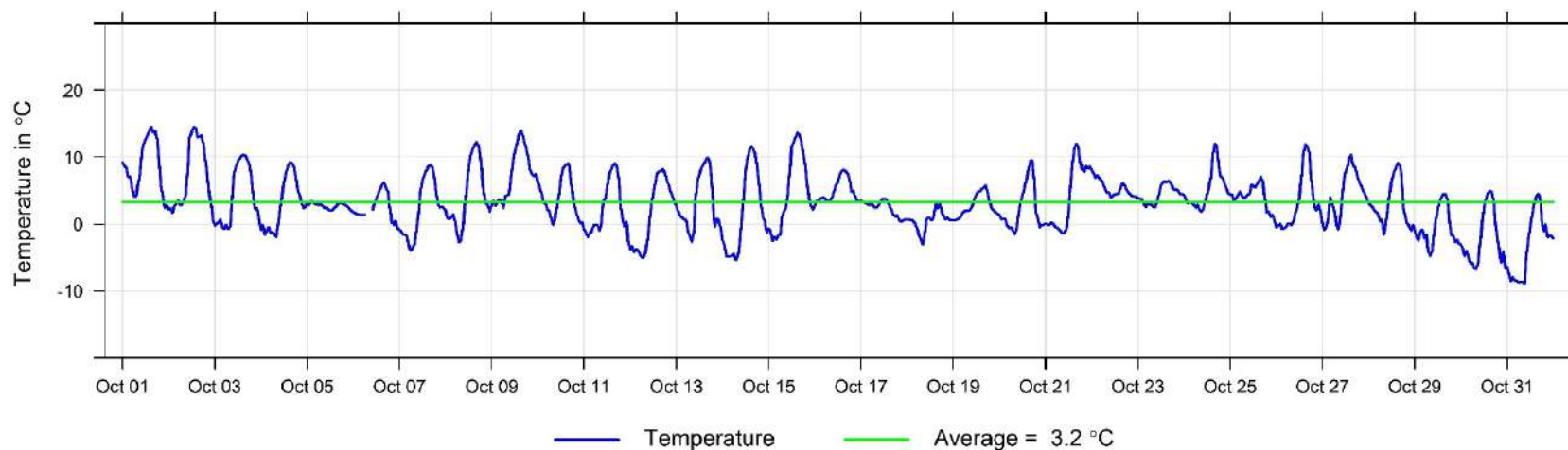
October Hourly Concentration Readings of TRS (in ppb) at Smoky Heights



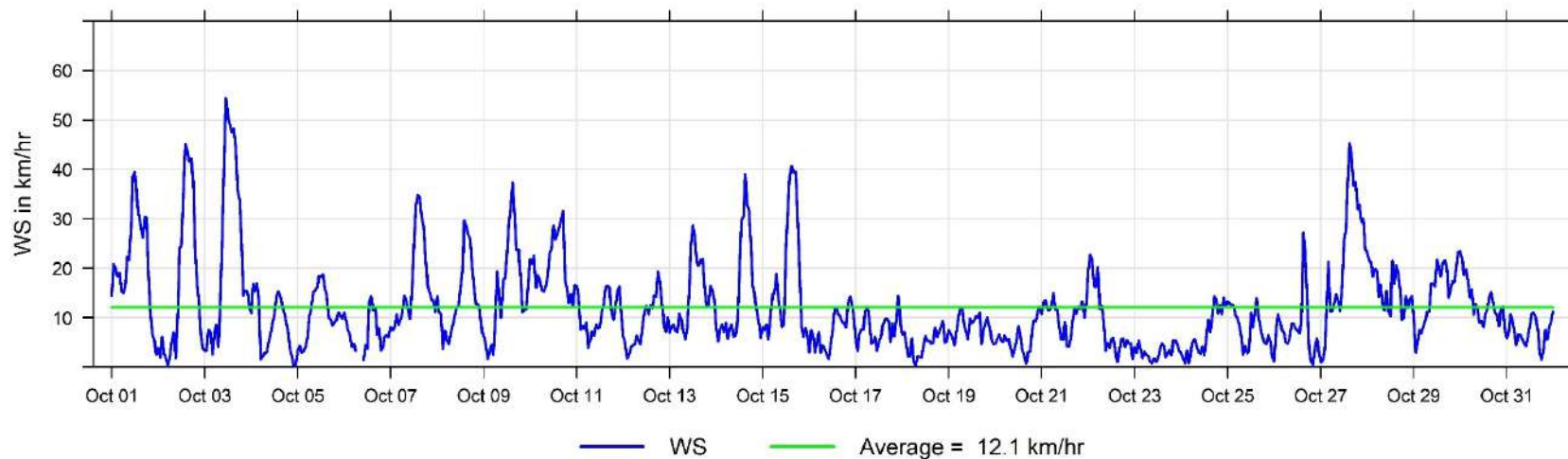
October Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Smoky Heights



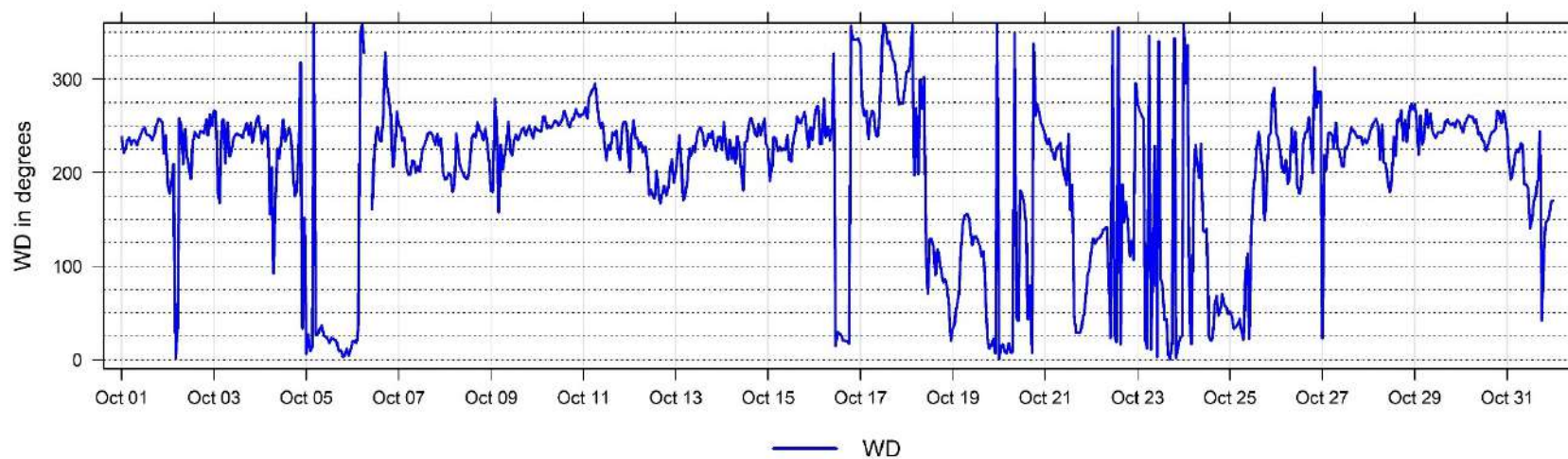
October Hourly Temperature Readings (in °C) at Smoky Heights



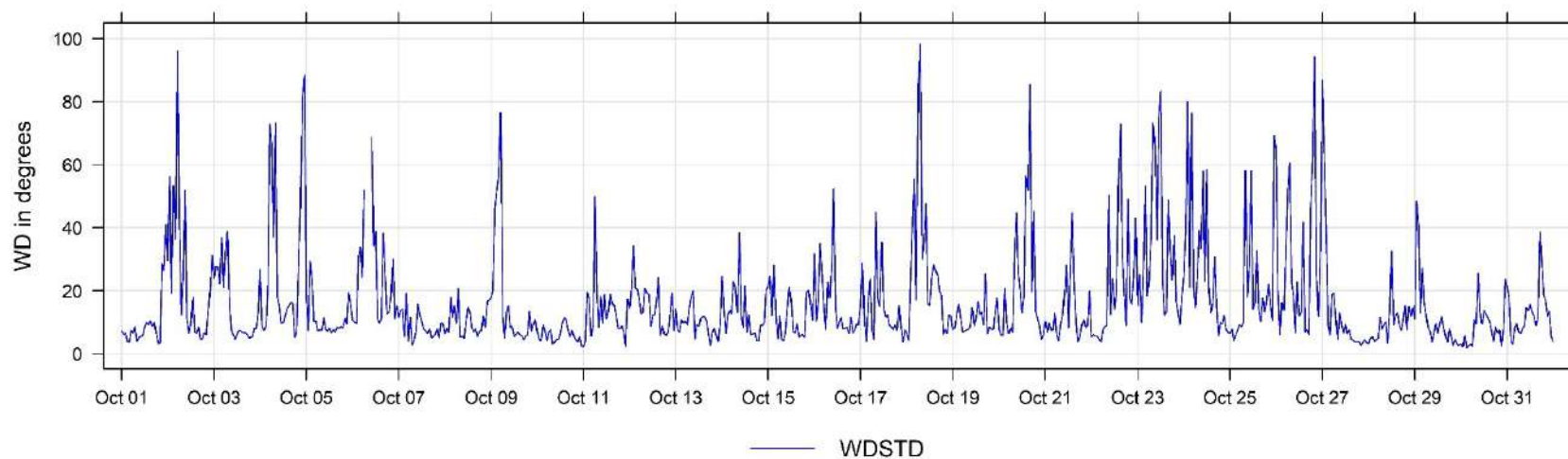
October Hourly Readings of Wind Speed (in km/hr) at Smoky Heights

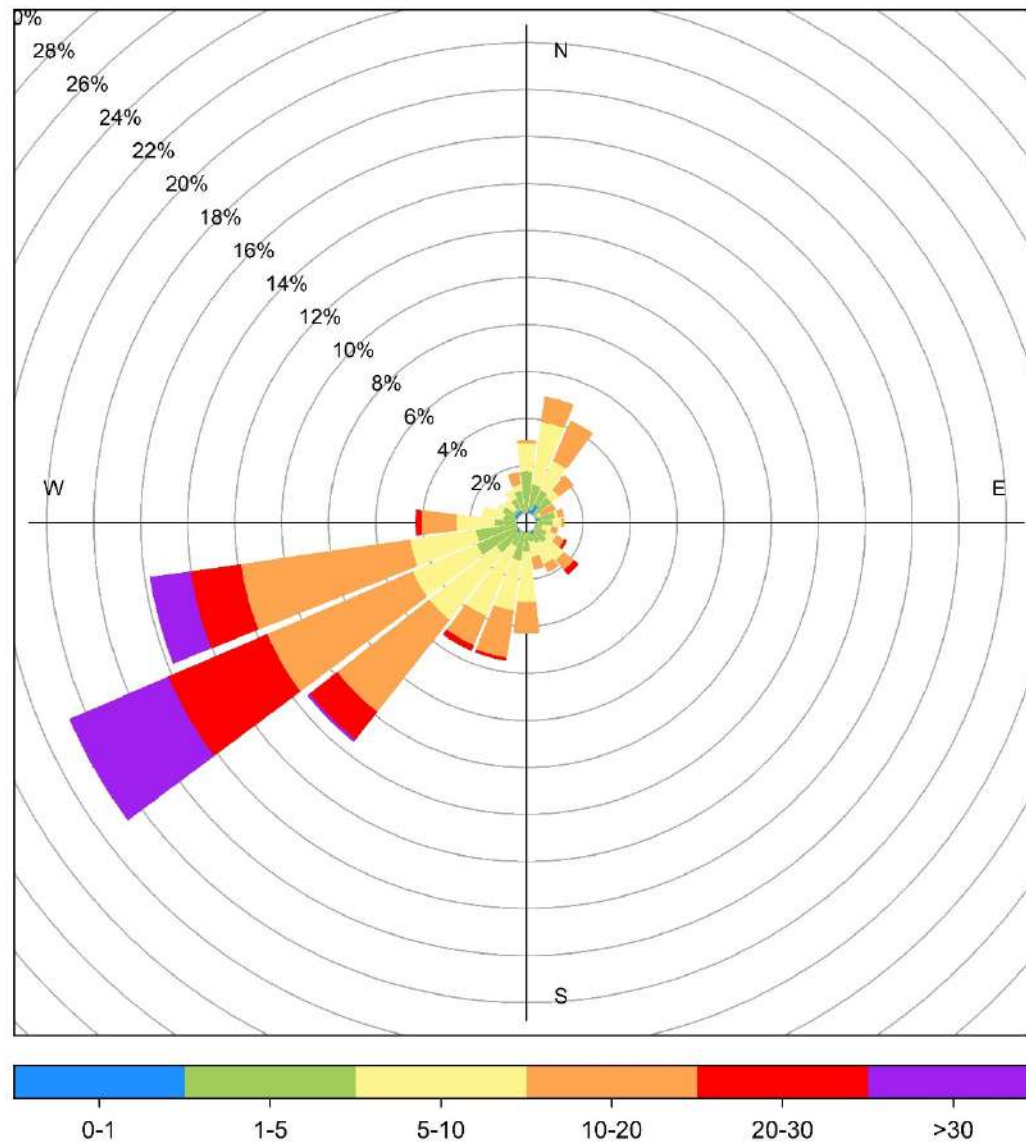


October Hourly Readings of Wind Direction (in degrees) at Smoky Heights



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



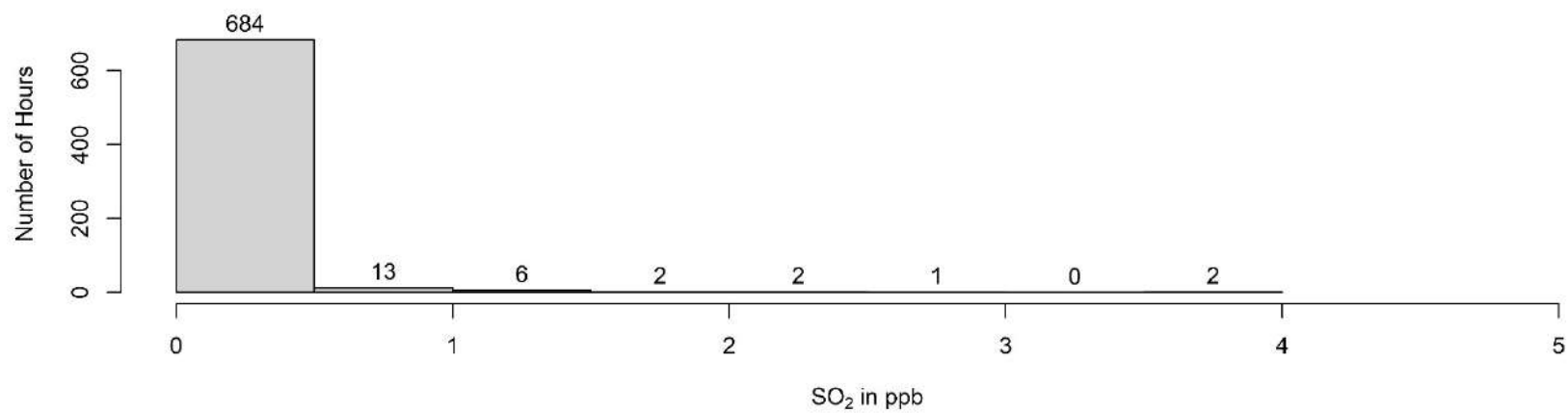
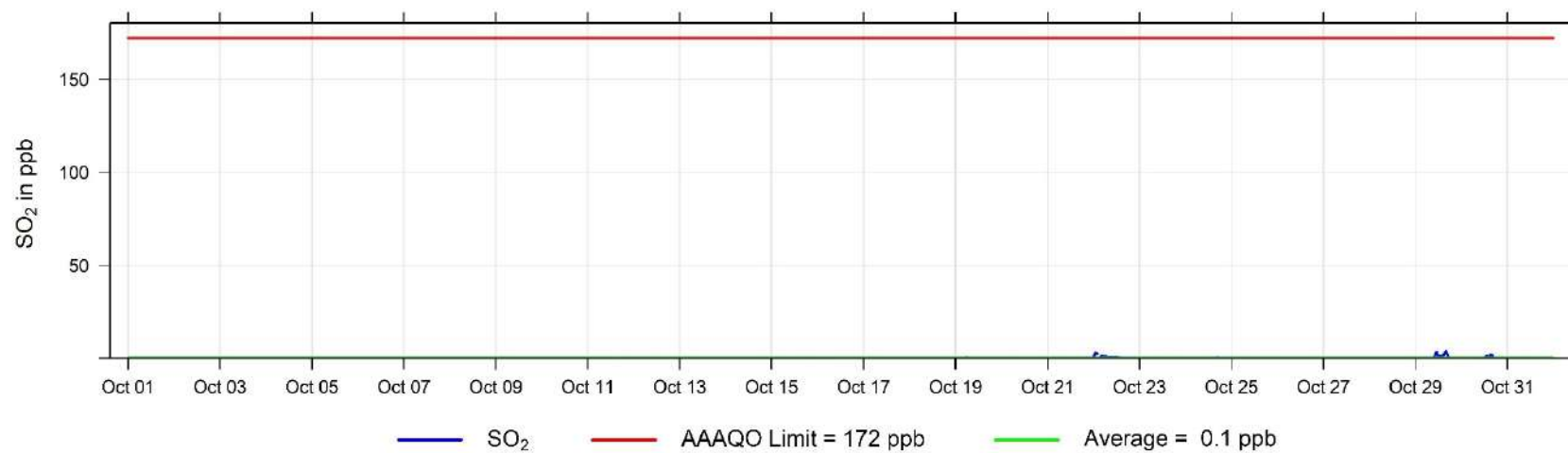


Smoky Heights October Wind Rose, wind speed in km/hr

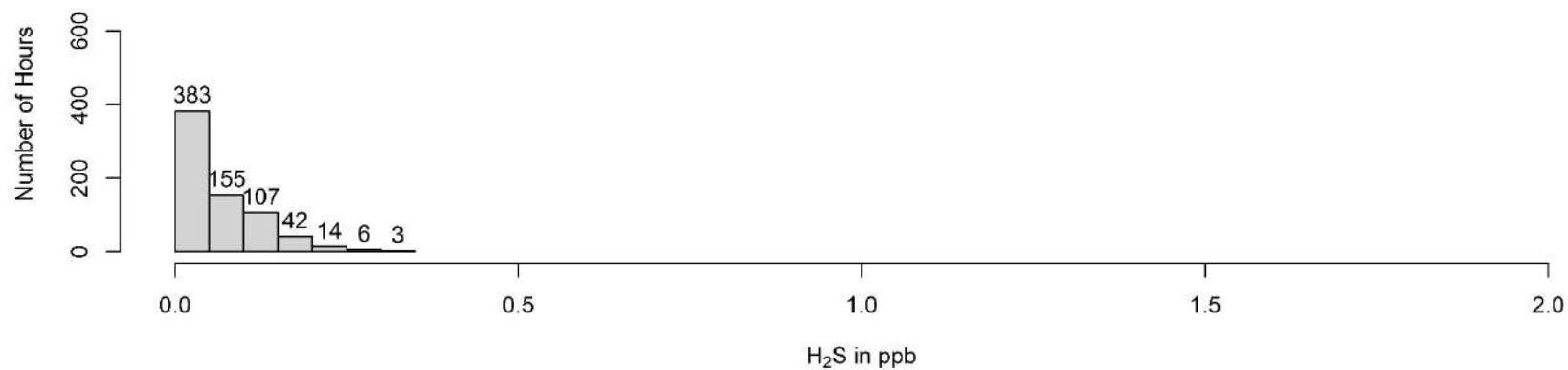
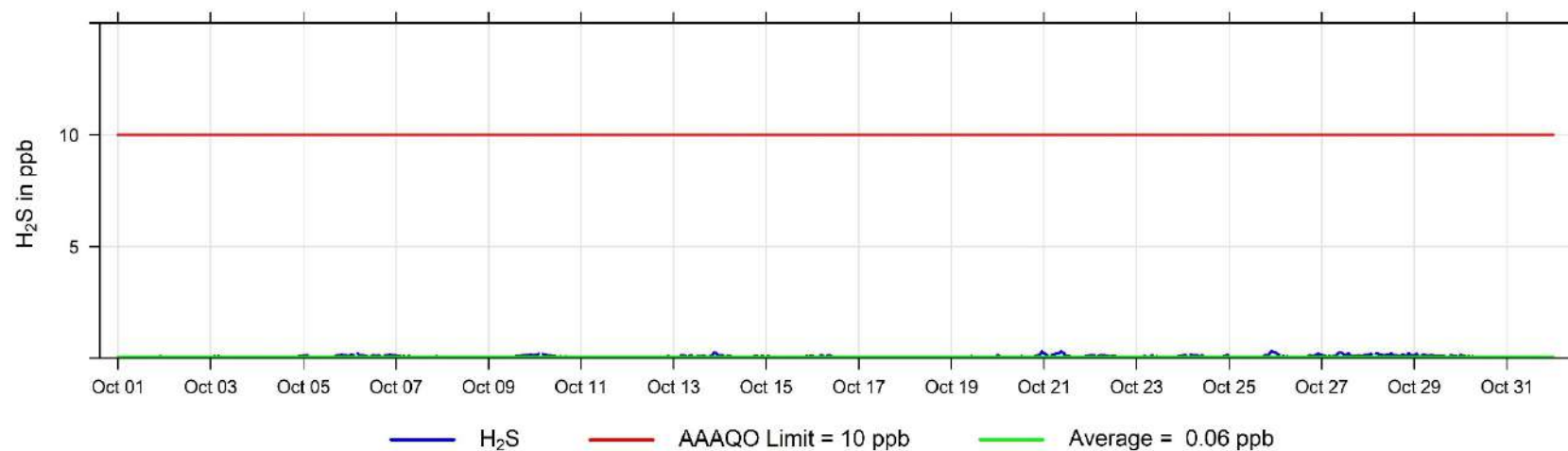
6 Valleyview Charts

The following pages include the charts and histograms for Valleyview Station

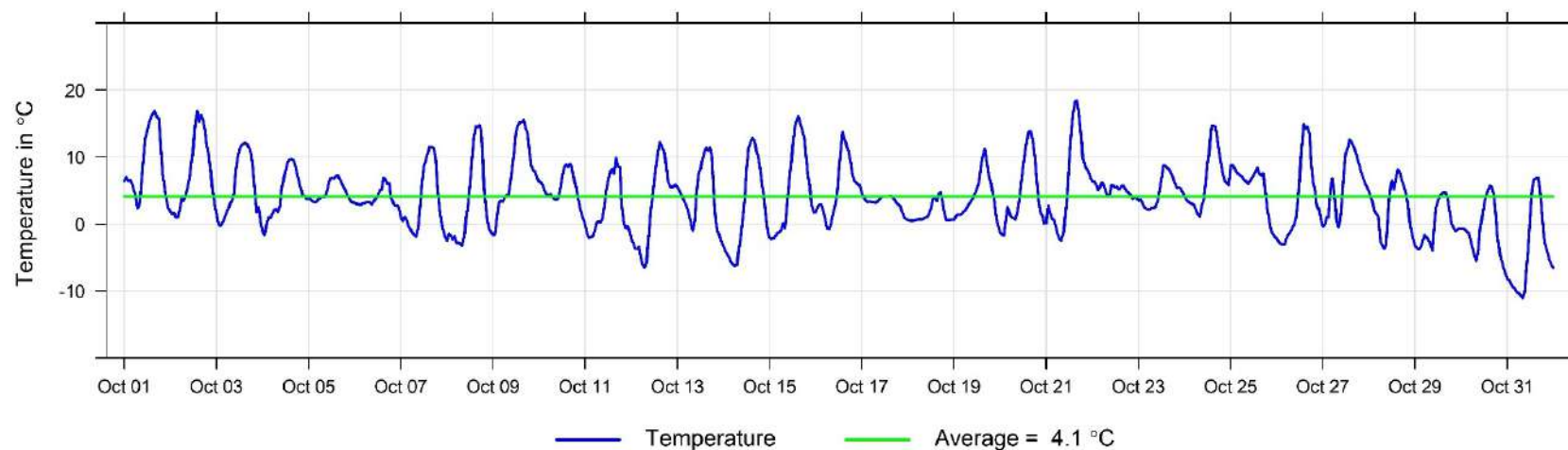
October Hourly Concentration Readings of SO₂ (in ppb) at Valleyview



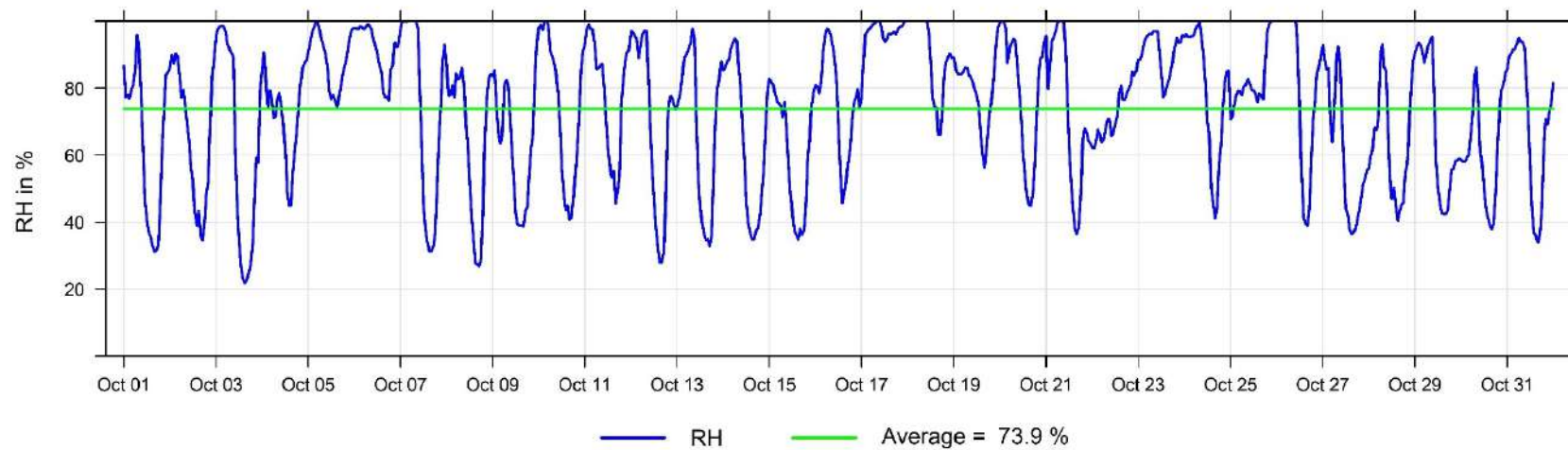
October Hourly Concentration Readings of H₂S (in ppb) at Valleyview



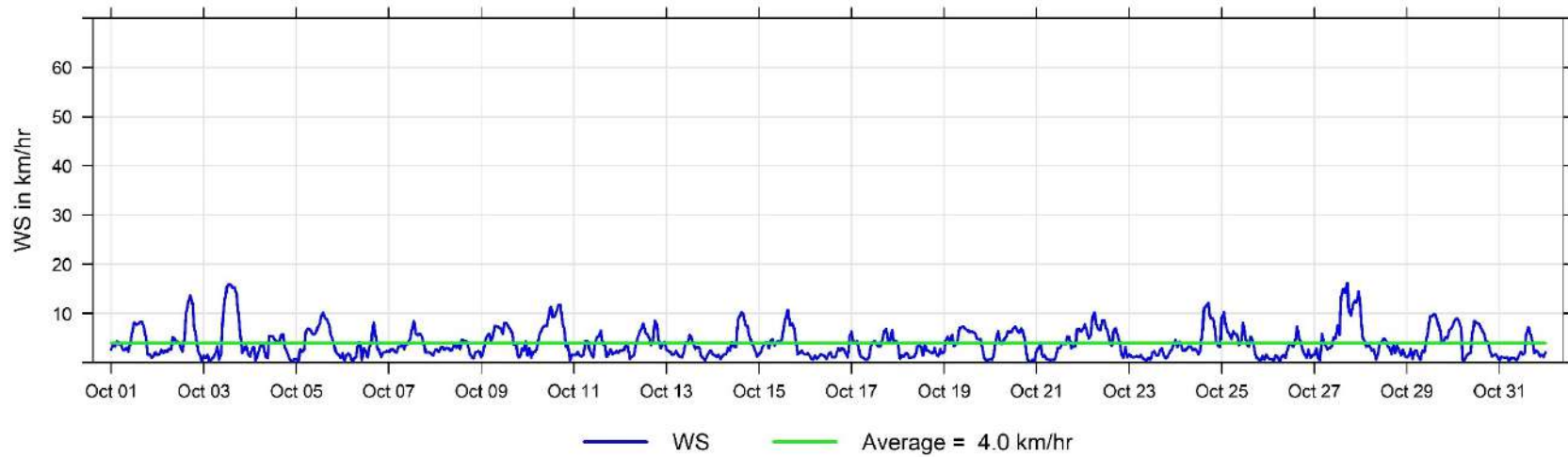
October Hourly Temperature Readings (in °C) at Valleyview



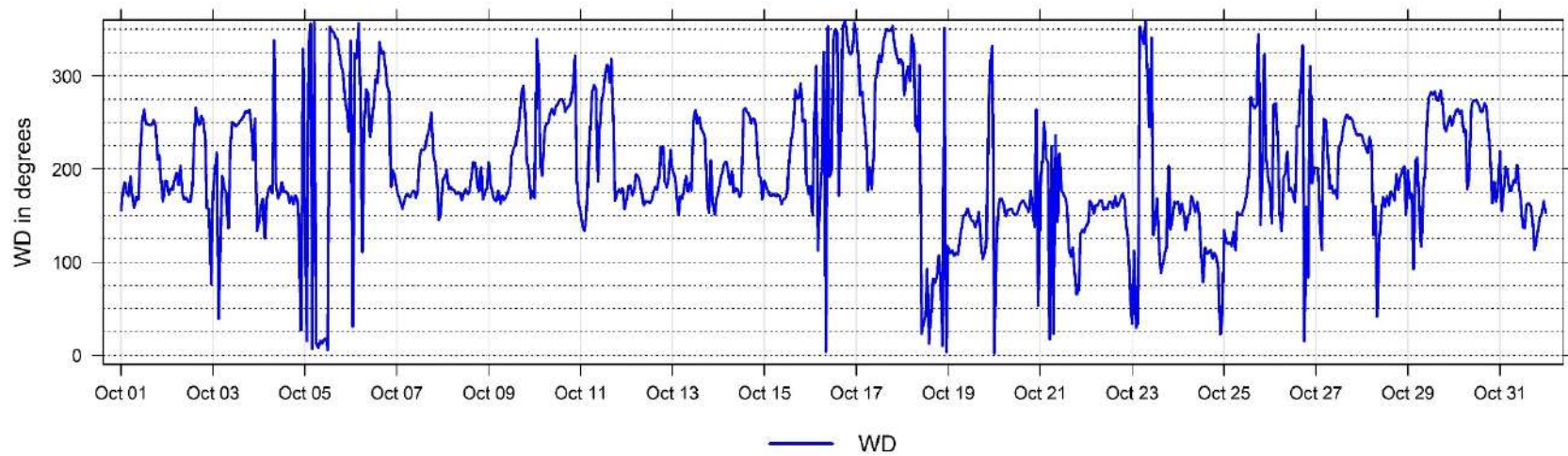
October Hourly Readings of Relative Humidity (in %) at Valleyview



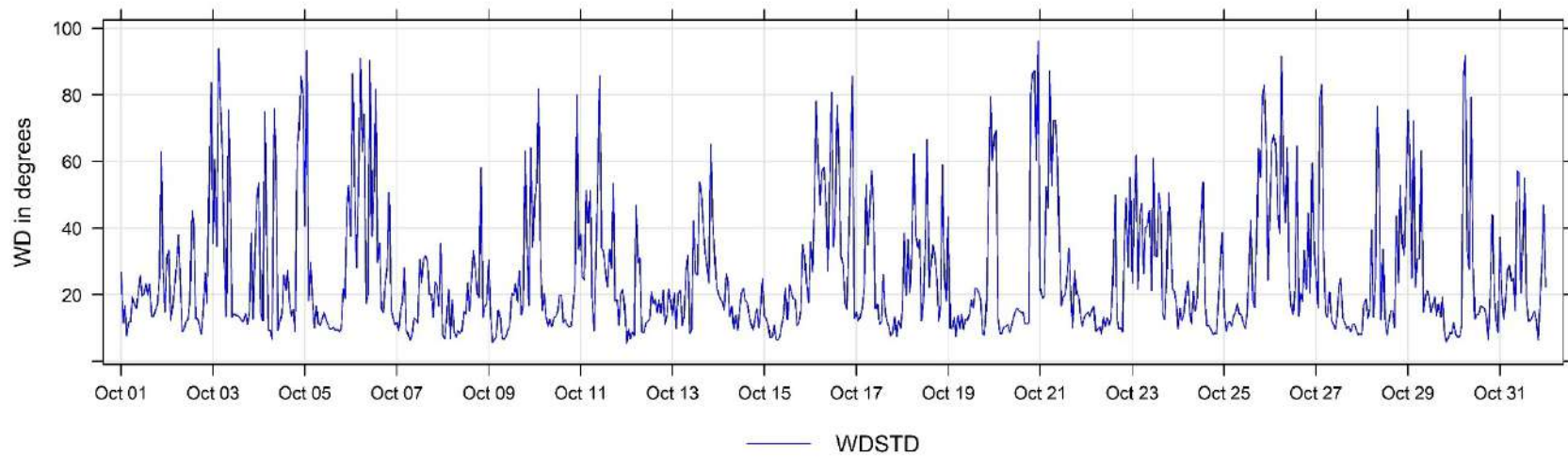
October Hourly Readings of Wind Speed (in km/hr) at Valleyview

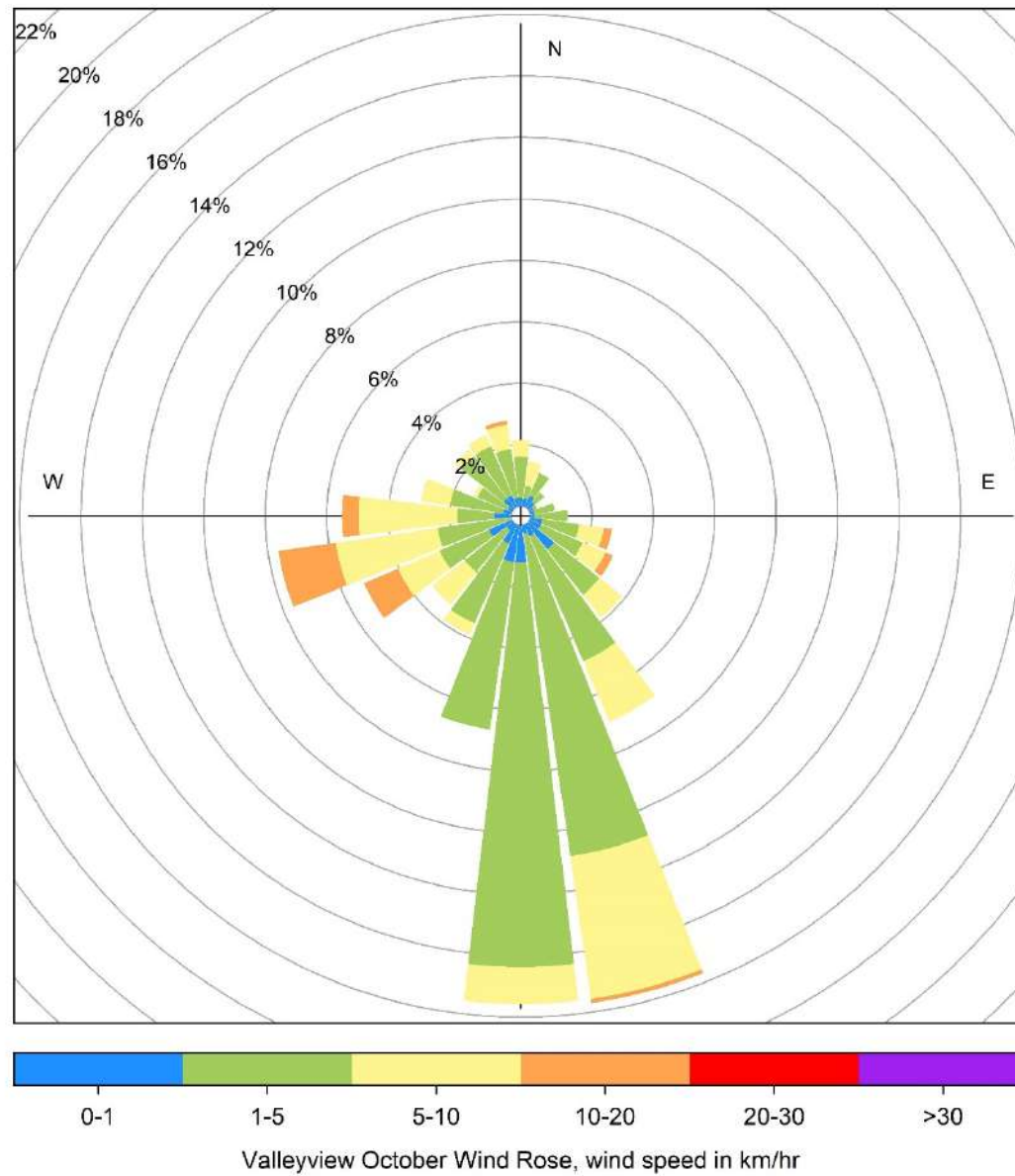


October Hourly Readings of Wind Direction (in degrees) at Valleyview



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

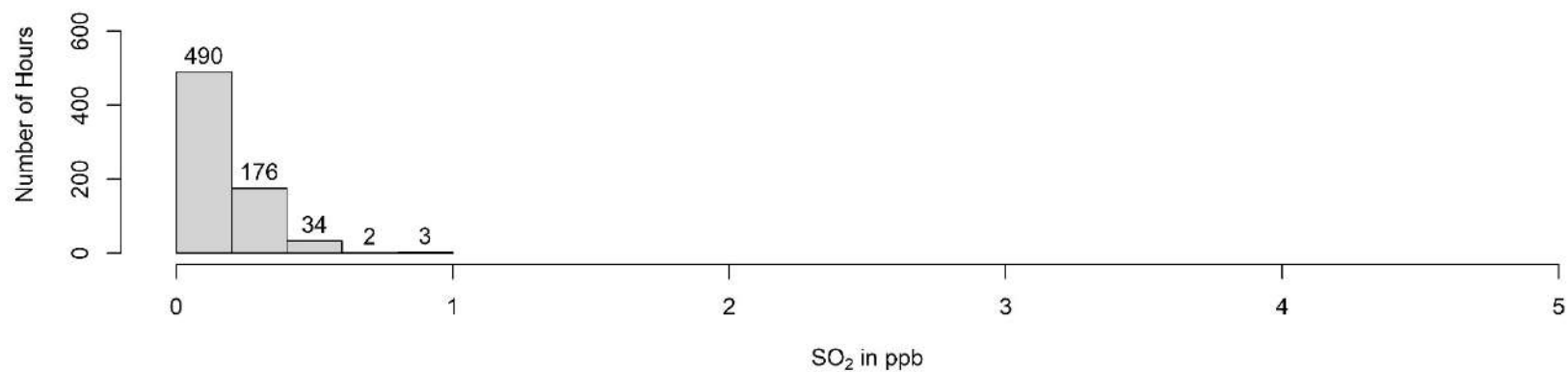
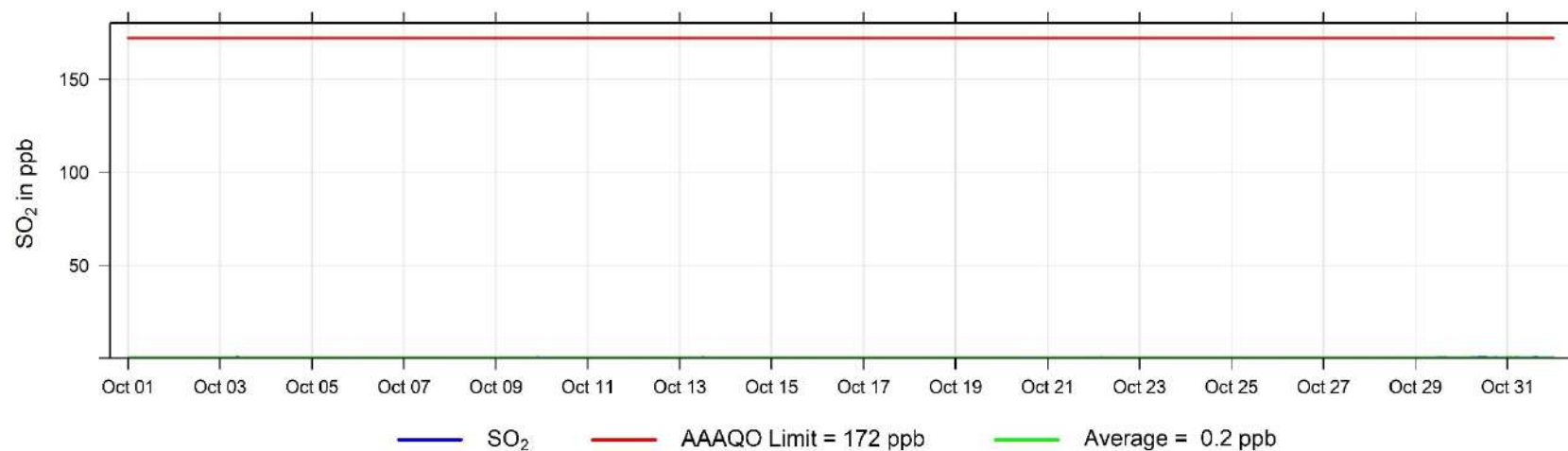




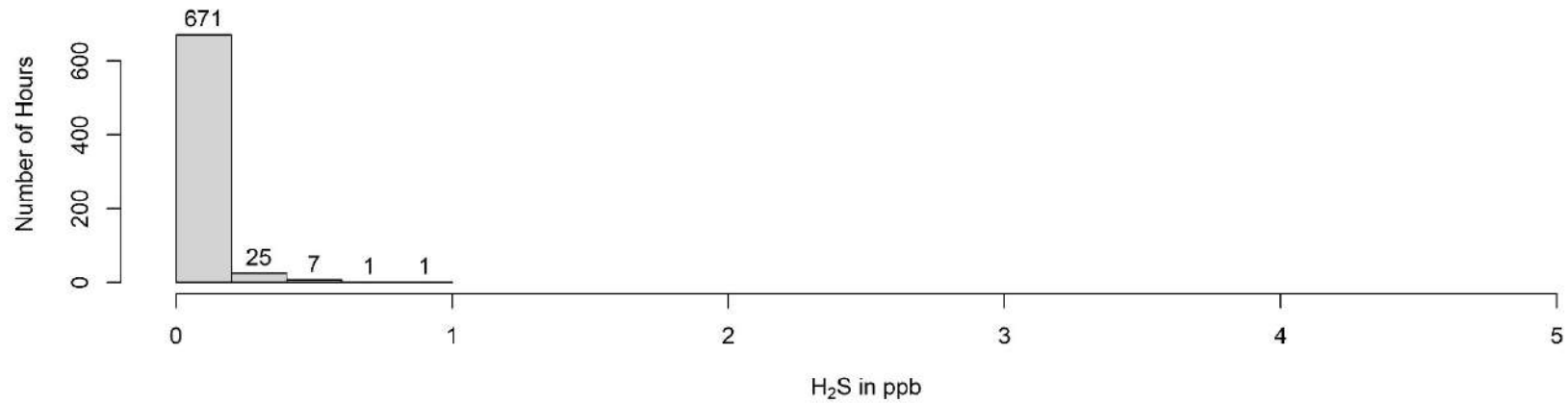
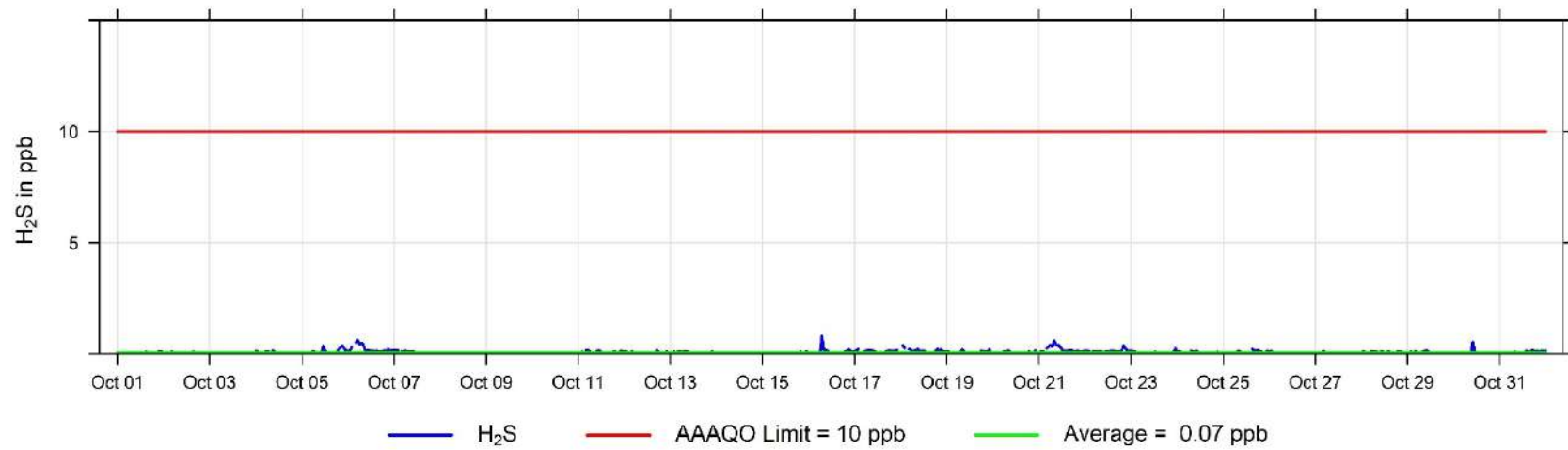
7 Donnelly Charts

The following pages include the charts and histograms for Donnelly Station

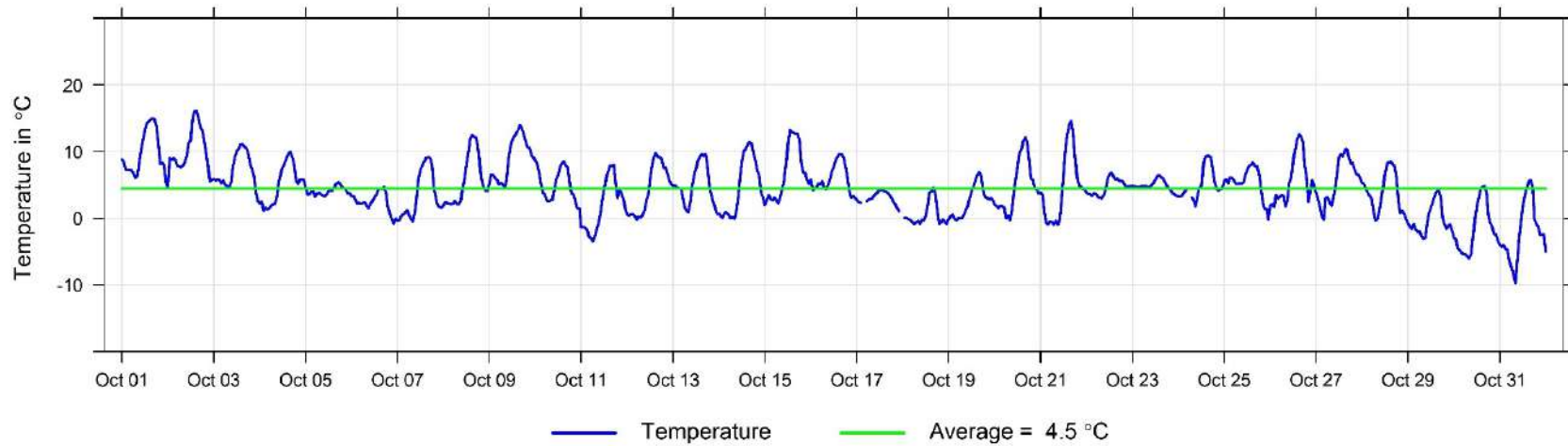
October Hourly Concentration Readings of SO₂ (in ppb) at Donnelly



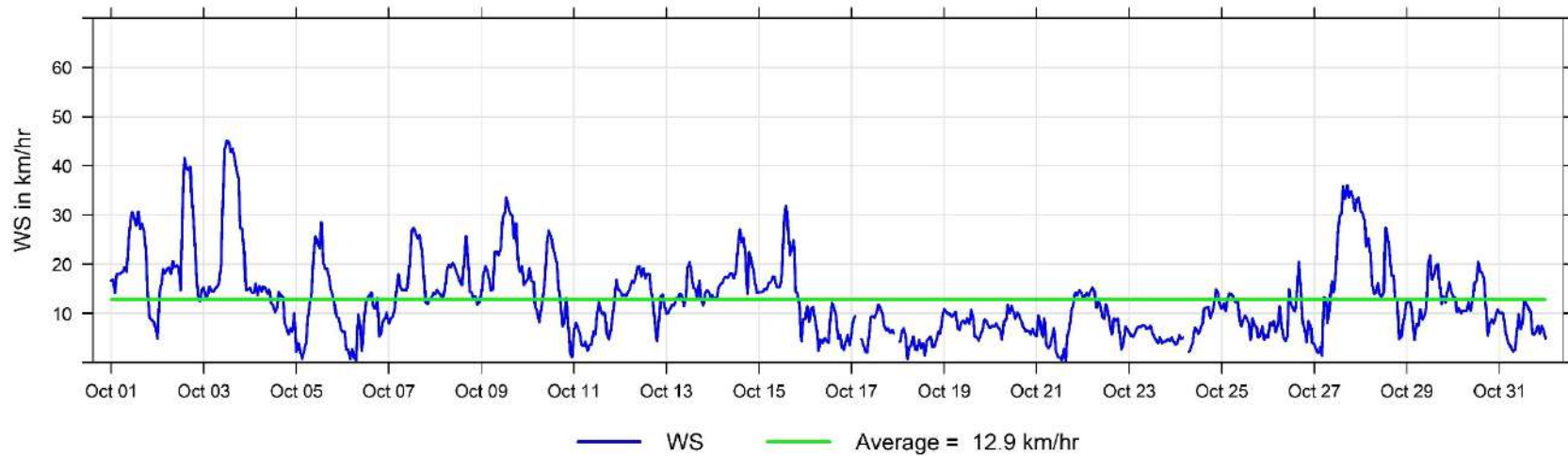
October Hourly Concentration Readings of H₂S (in ppb) at Donnelly



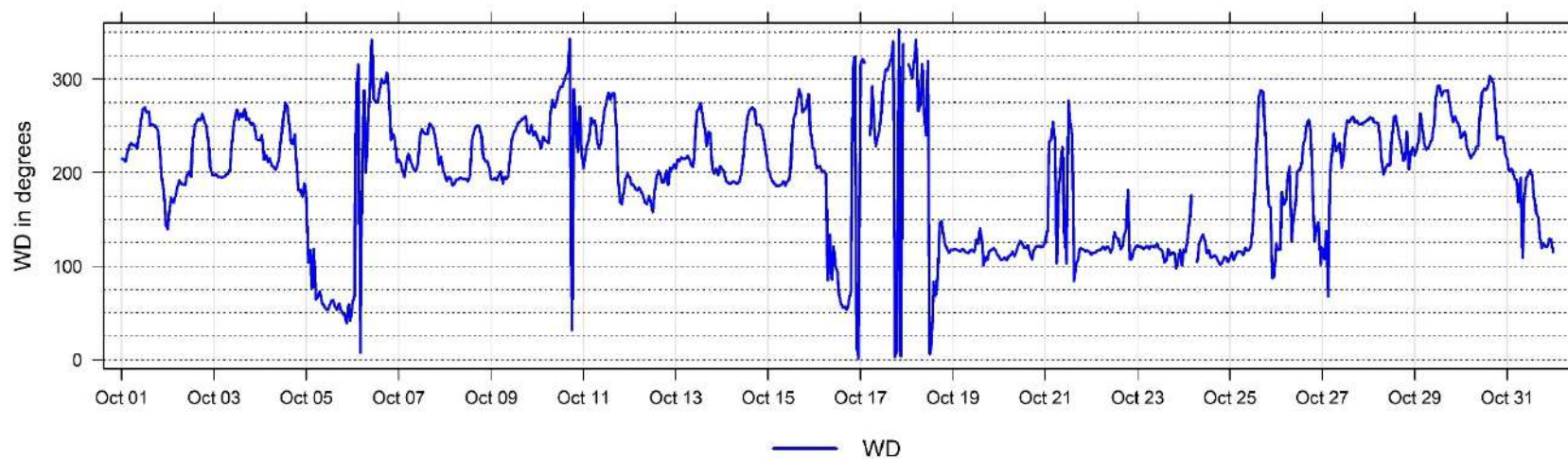
October Hourly Temperature Readings (in °C) at Donnelly



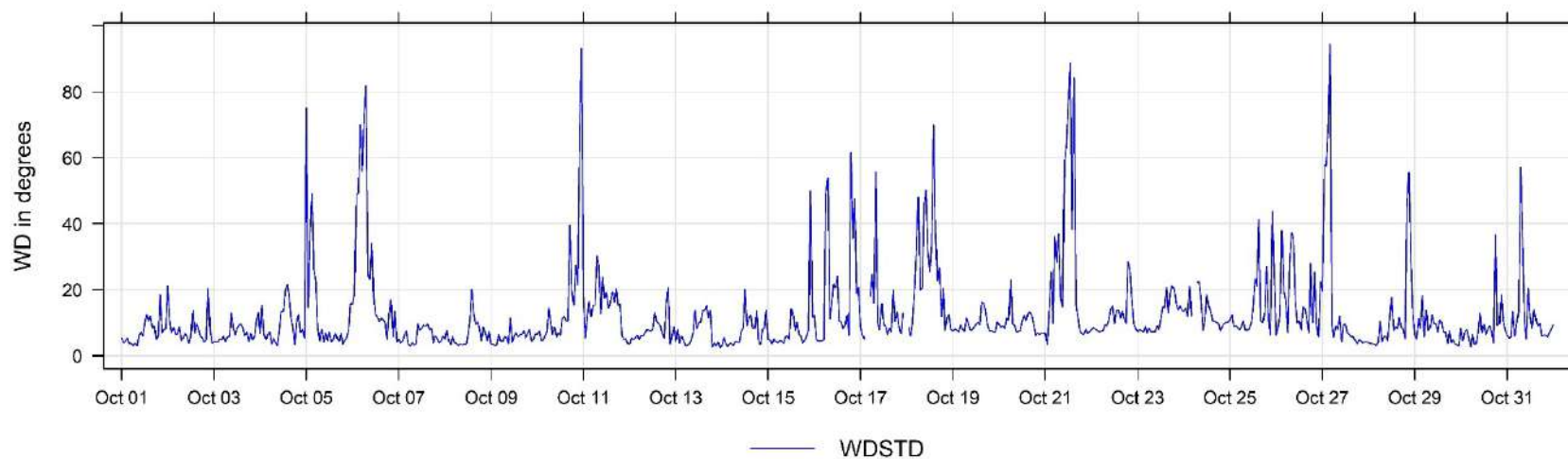
October Hourly Readings of Wind Speed (in km/hr) at Donnelly



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



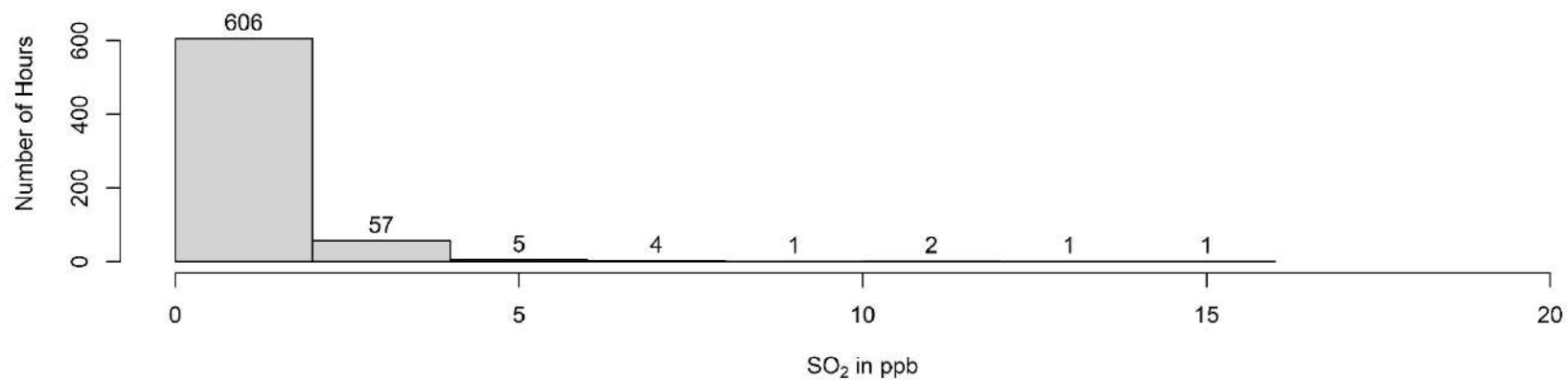
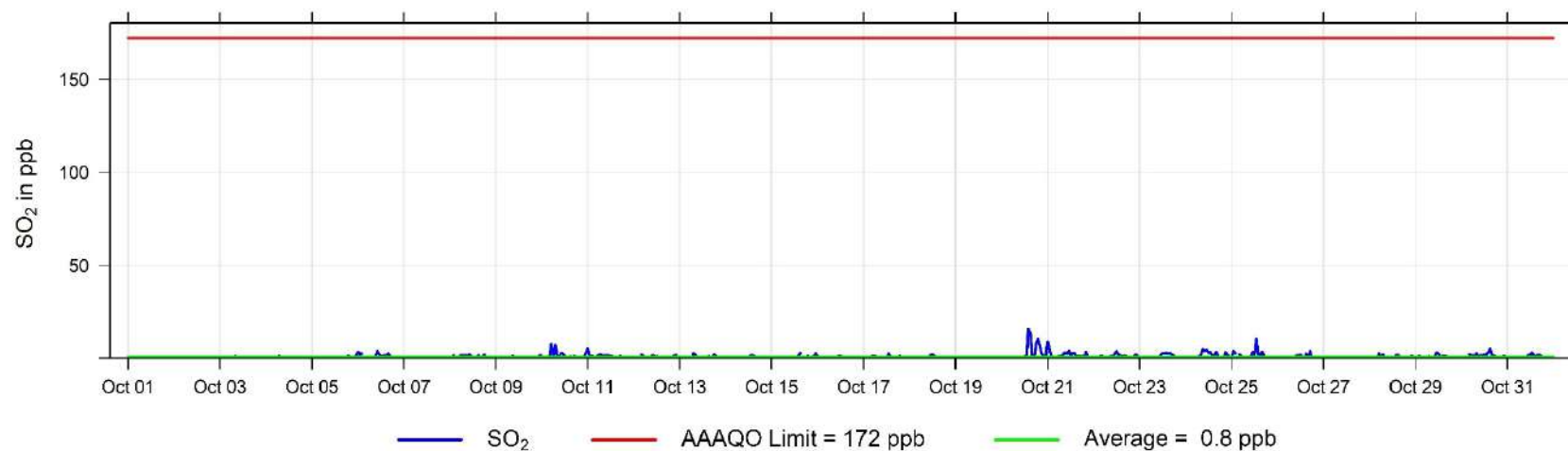
October Hourly Readings of Wind Direction Standard Deviation (in degrees) at Donnelly



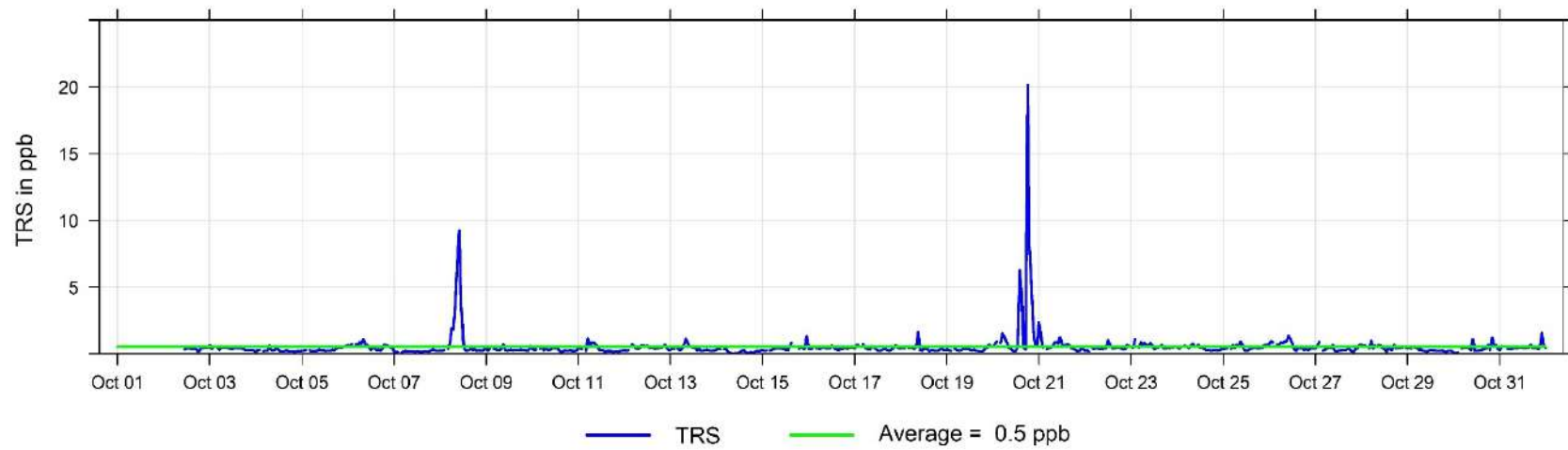
8 Poplar (Portable) Charts

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

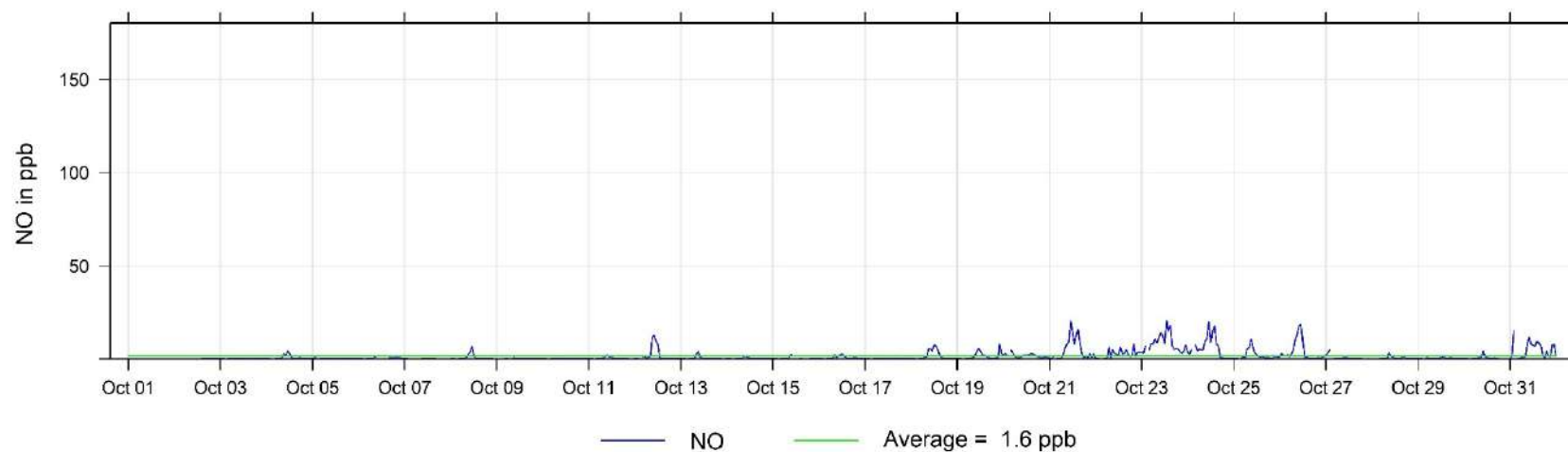
October Hourly Concentration Readings of SO₂ (in ppb) at Poplar



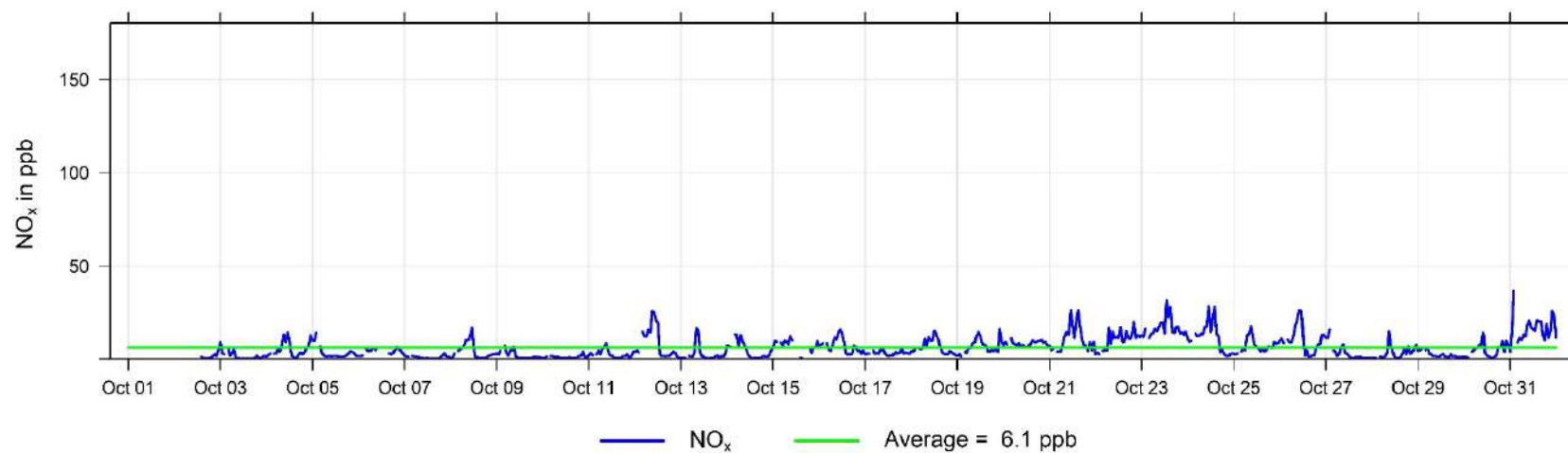
October Hourly Concentration Readings of TRS (in ppb) at Poplar



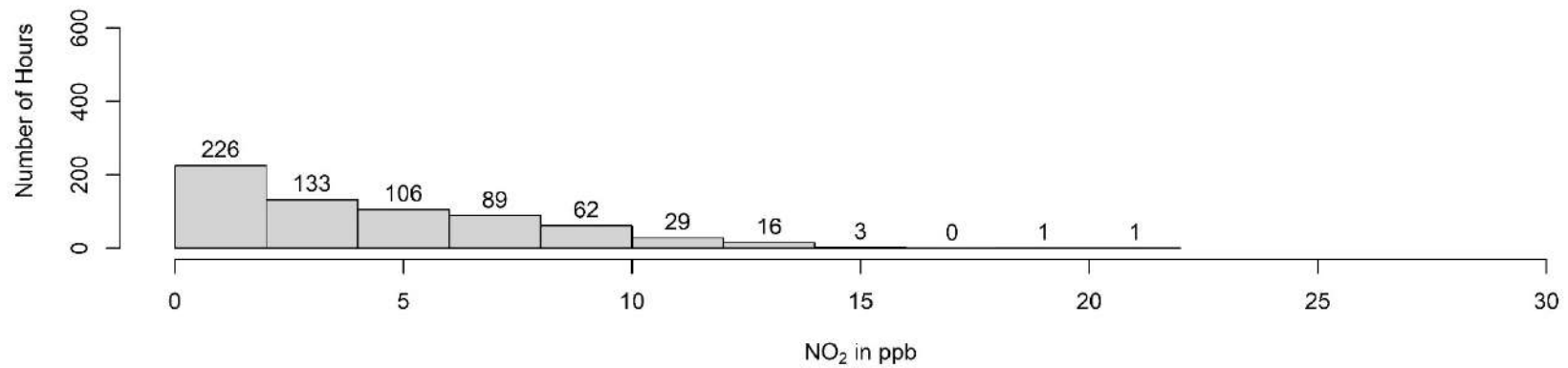
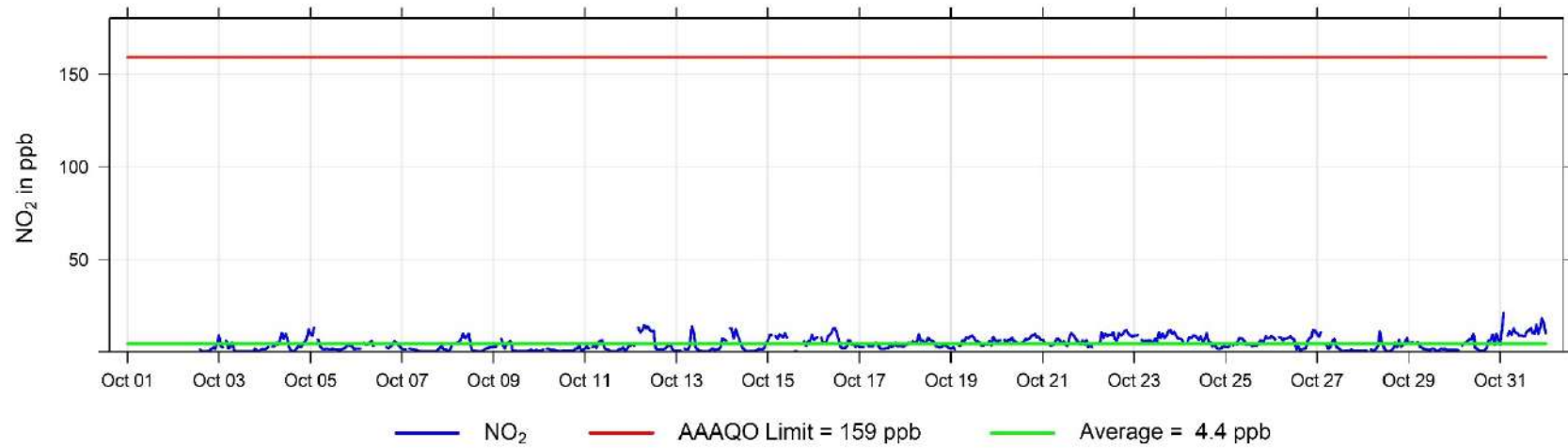
October Hourly Concentration Readings of NO (in ppb) at Poplar



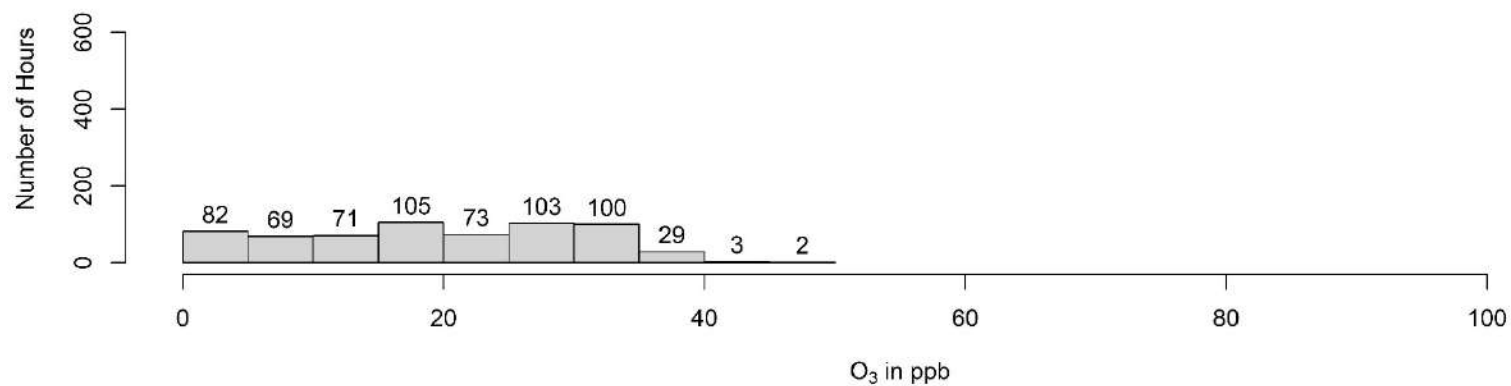
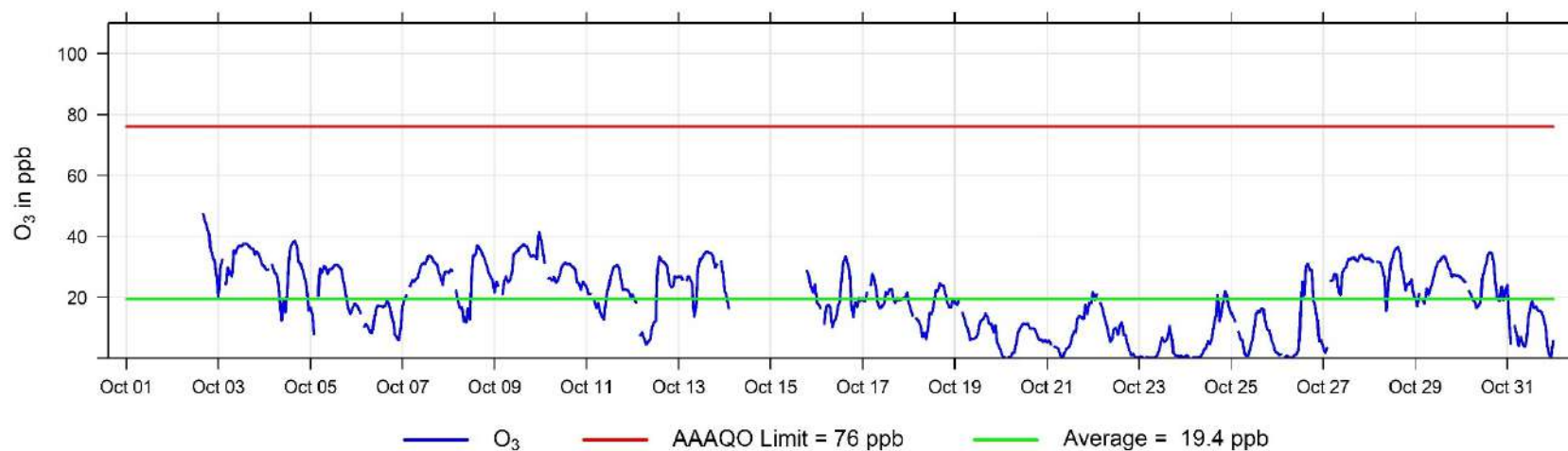
October Hourly Concentration Readings of NO_x (in ppb) at Poplar



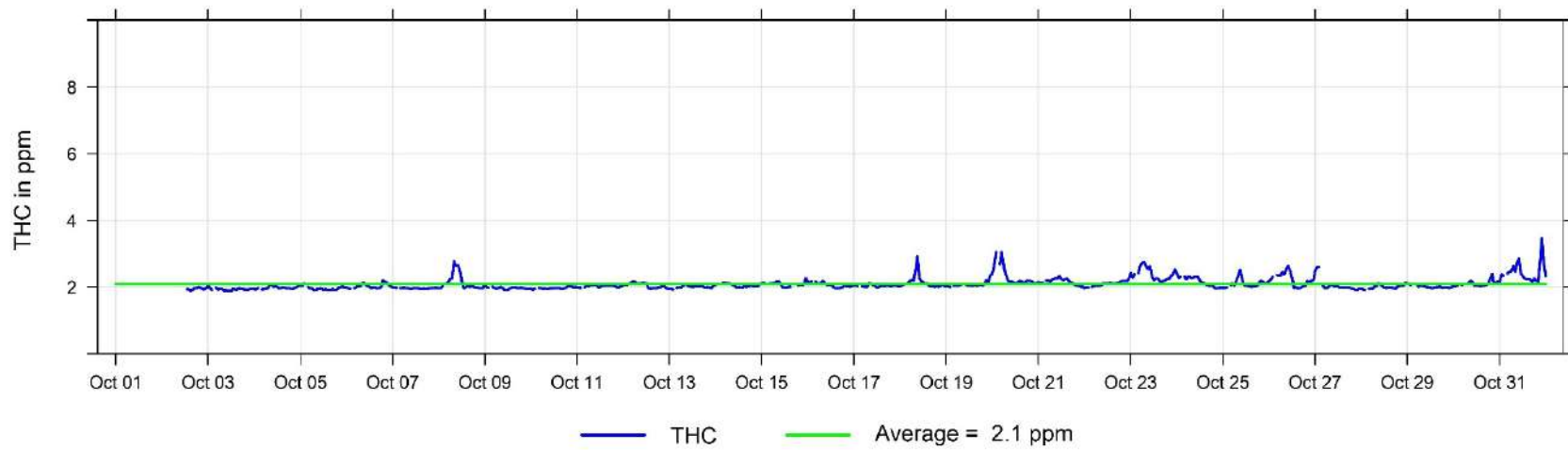
October Hourly Concentration Readings of NO₂ (in ppb) at Poplar



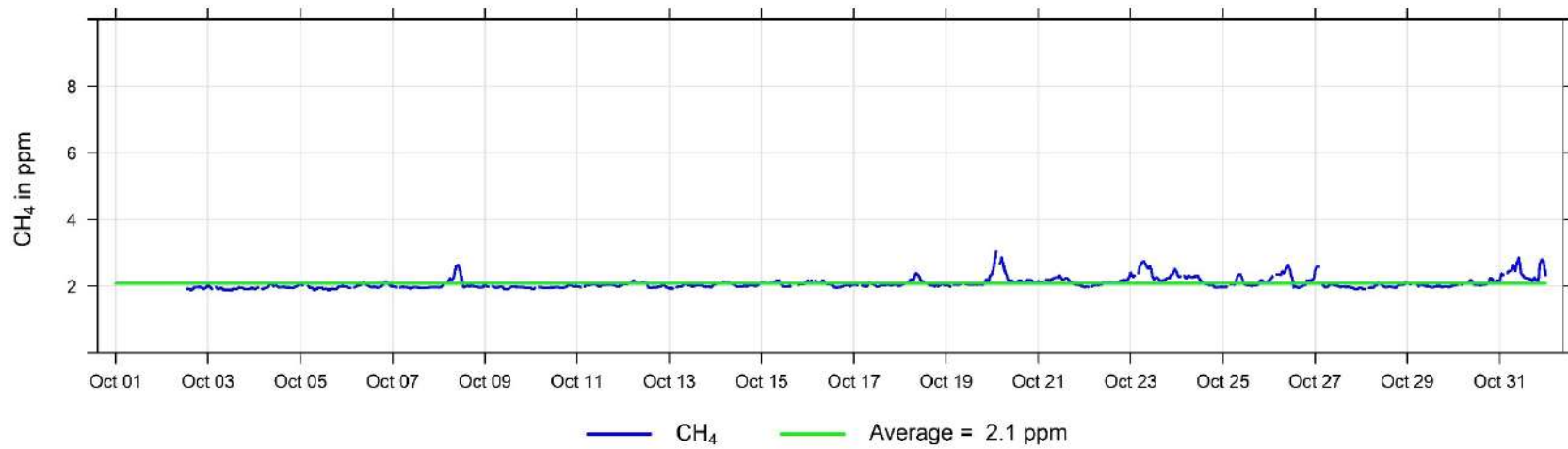
October Hourly Concentration Readings of O₃ (in ppb) at Poplar



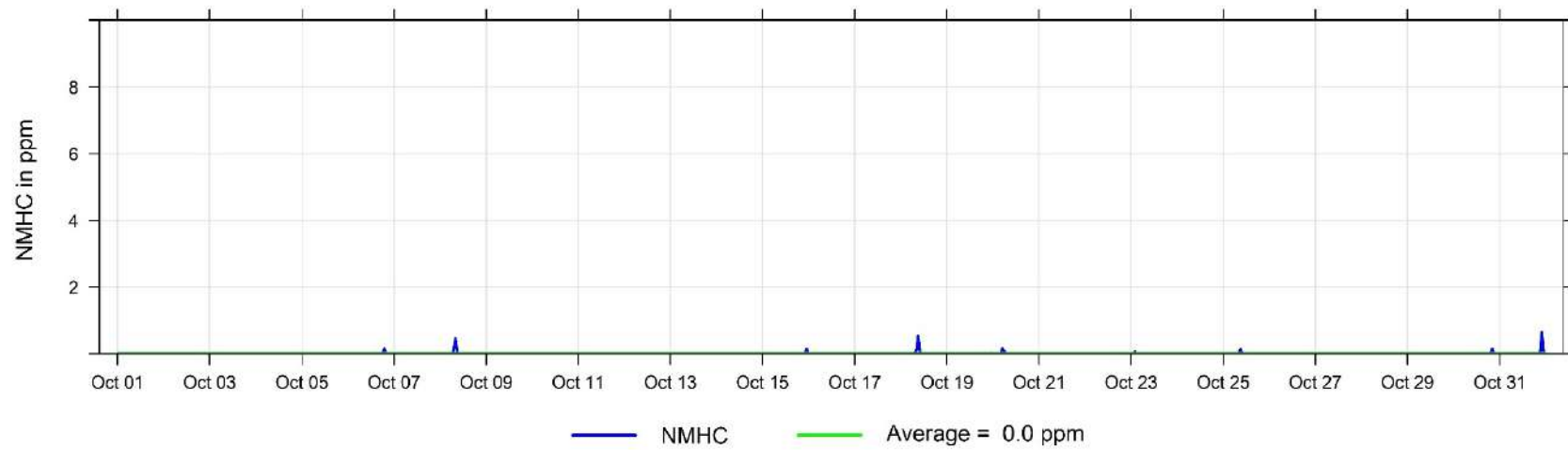
October Hourly Concentration Readings of THC (in ppm) at Poplar



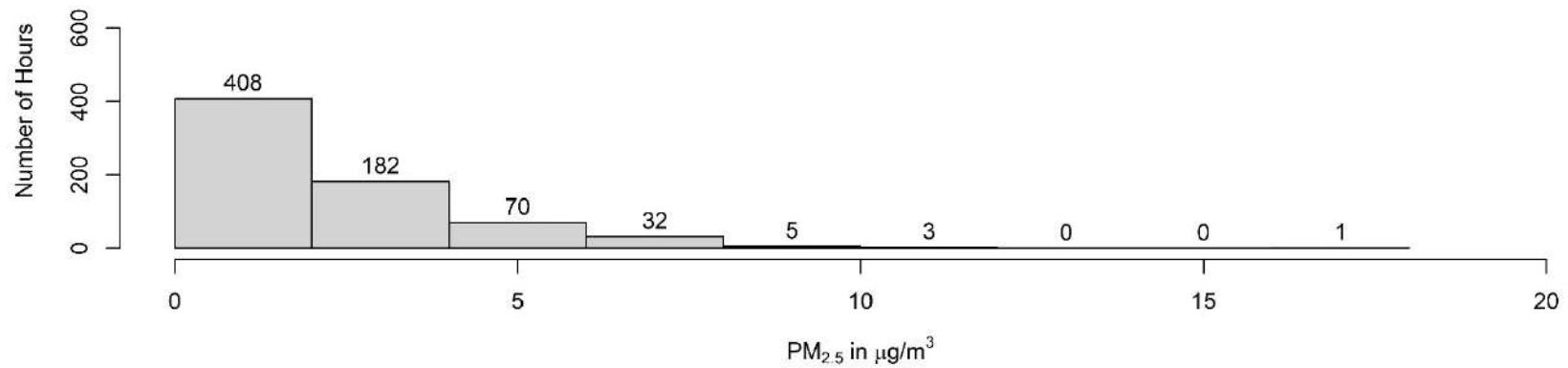
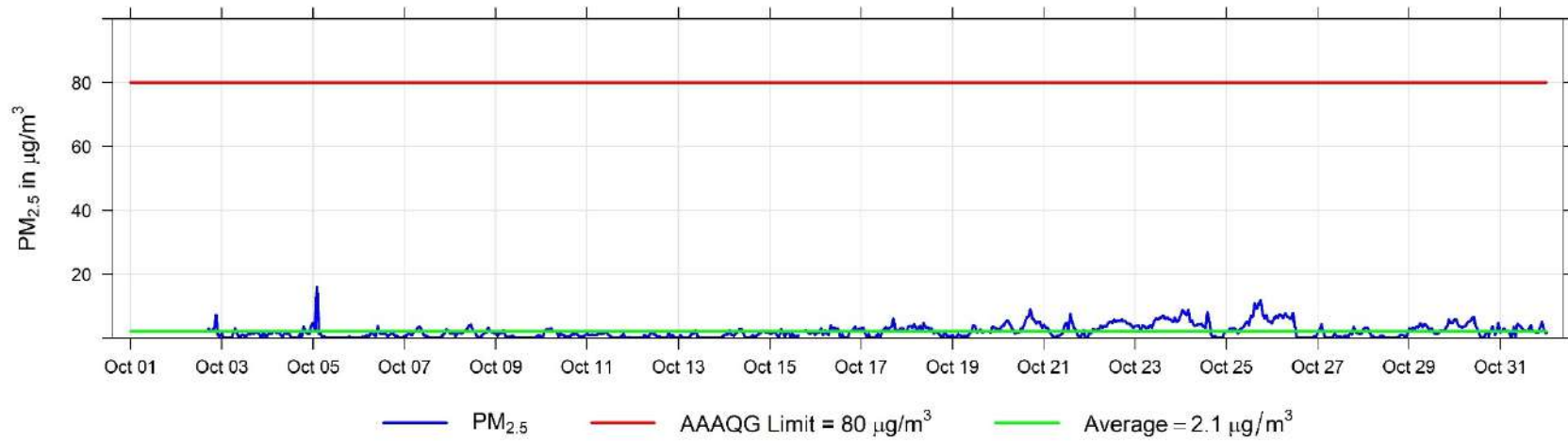
October Hourly Concentration Readings of CH₄ (in ppm) at Poplar



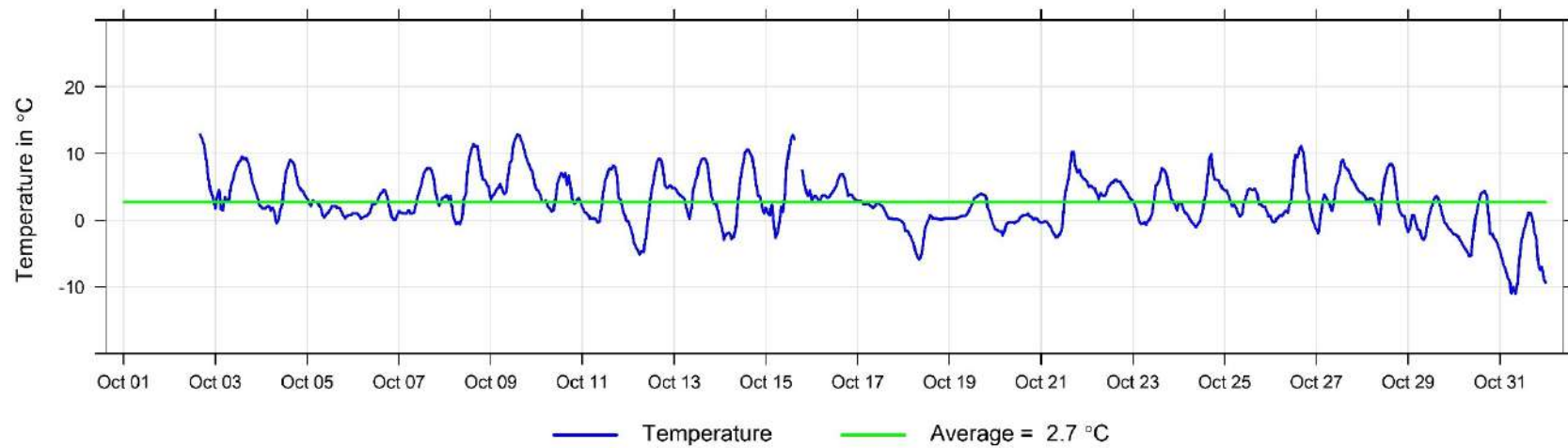
October Hourly Concentration Readings of NMHC (in ppm) at Poplar



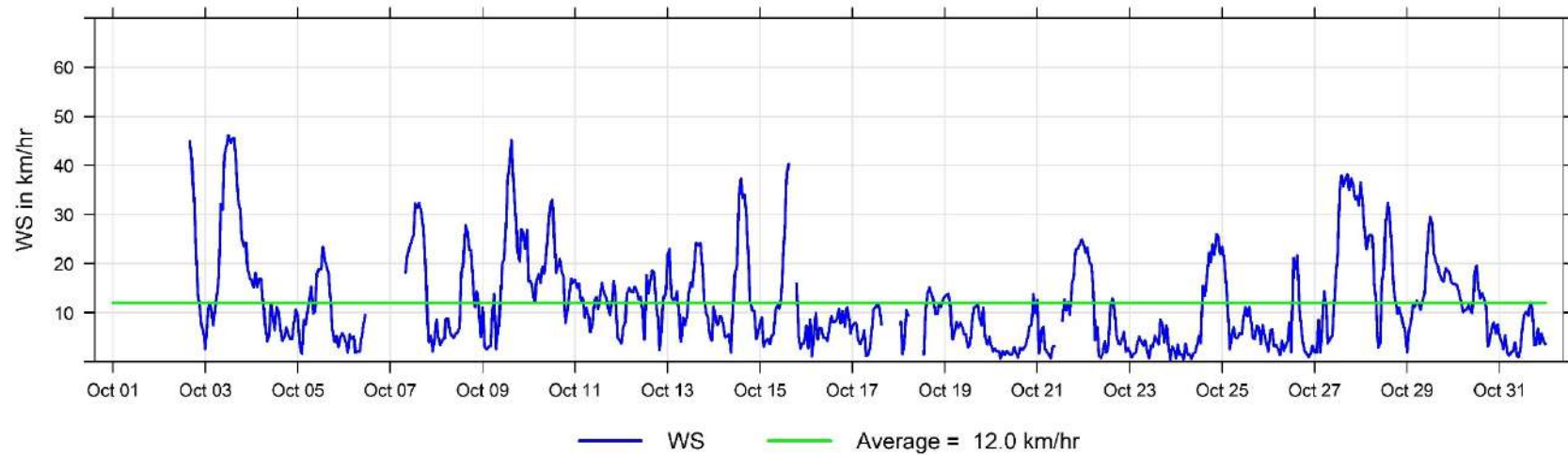
October Hourly Concentration Readings of PM_{2.5} in $\mu\text{g}/\text{m}^3$ at Poplar



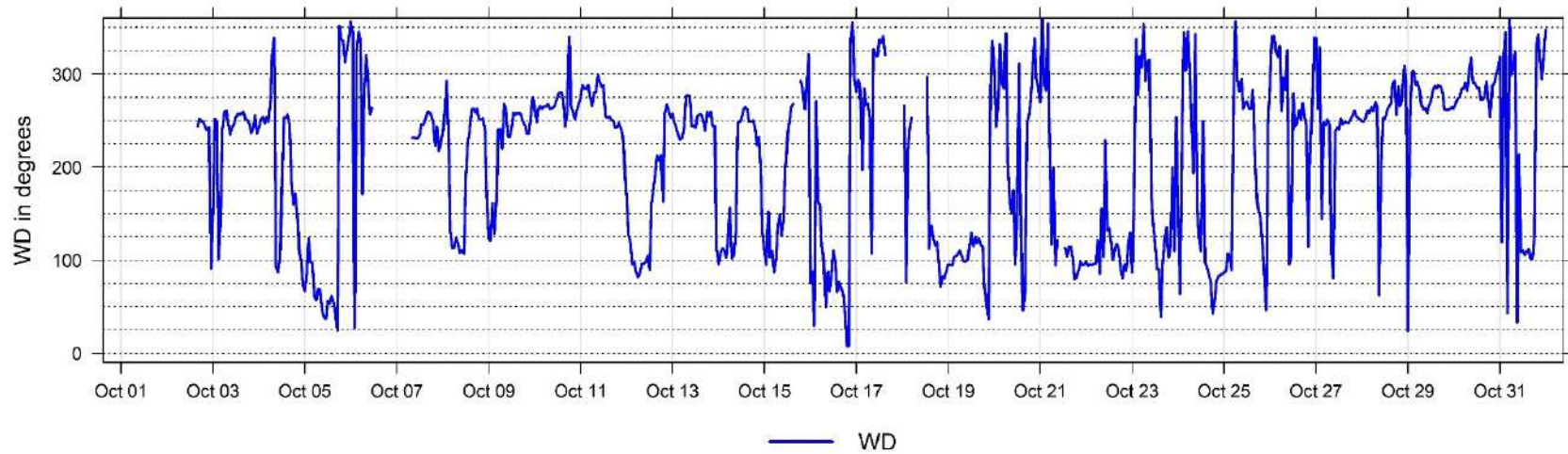
October Hourly Temperature Readings (in °C) at Poplar



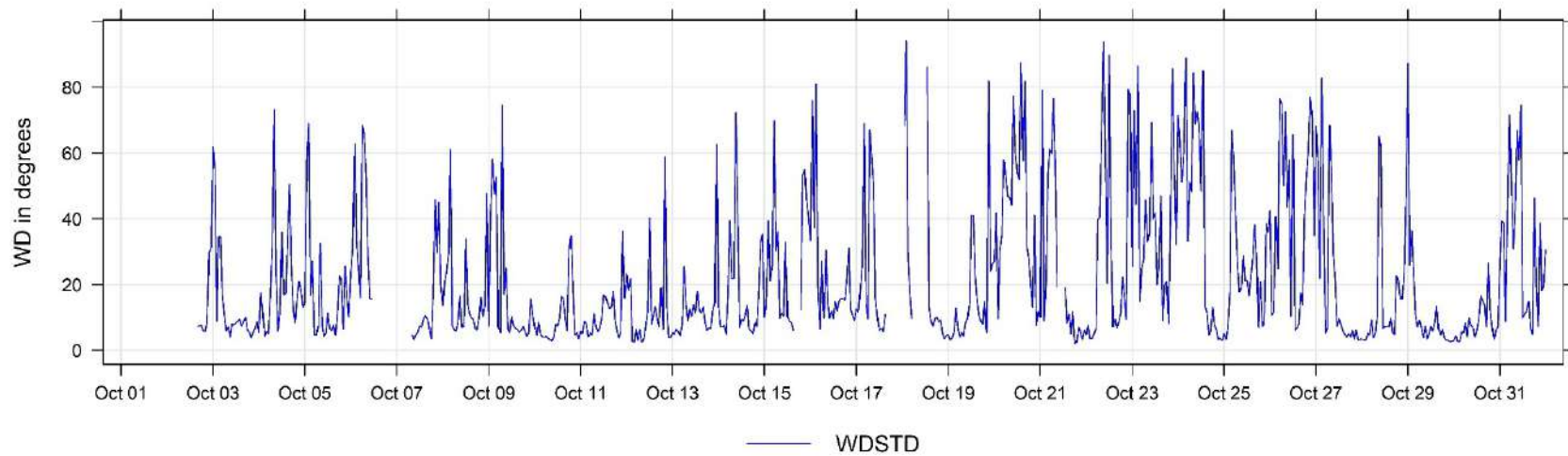
October Hourly Readings of Wind Speed (in km/hr) at Poplar

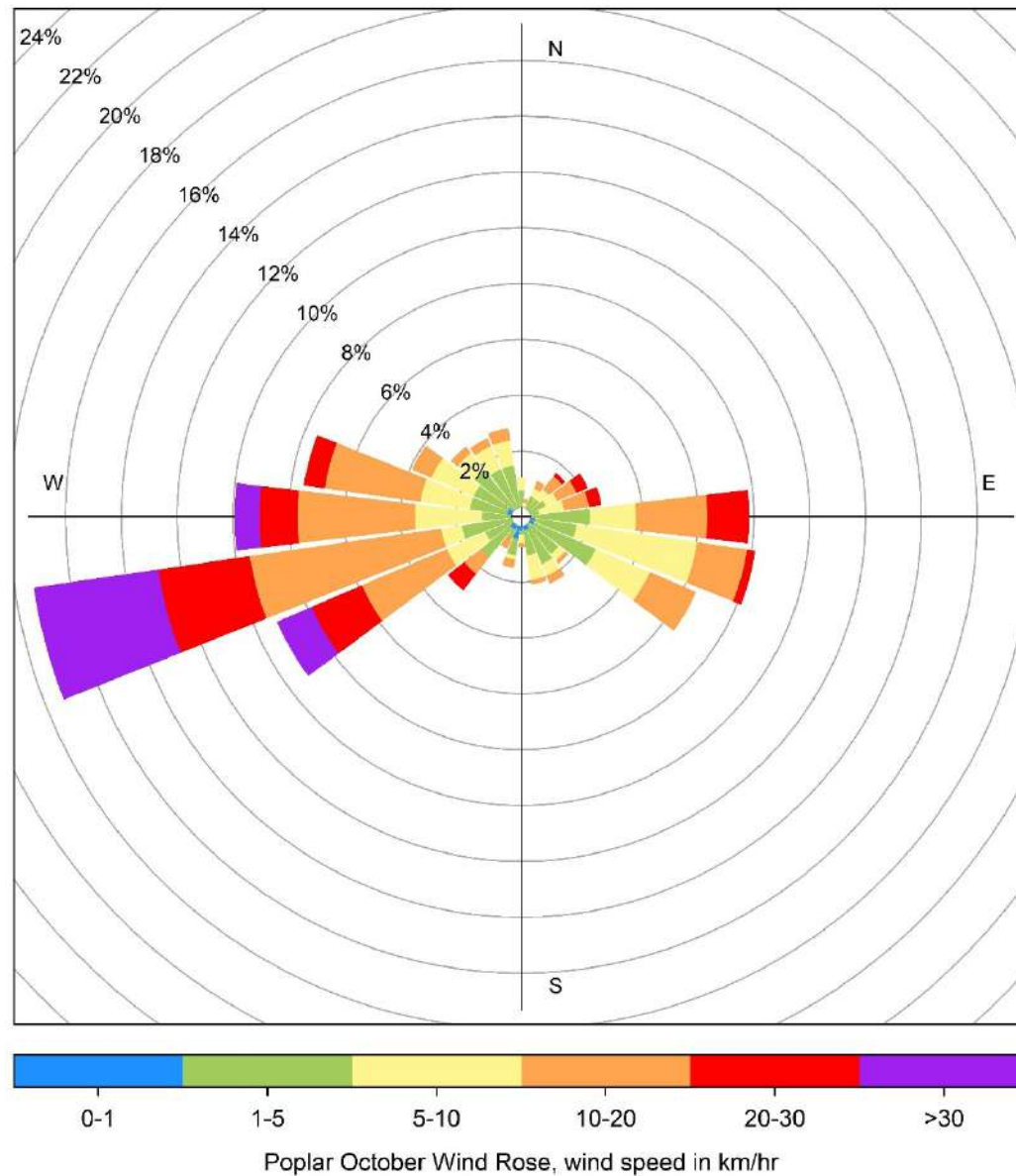


October Hourly Readings of Wind Direction (in degrees) at Poplar

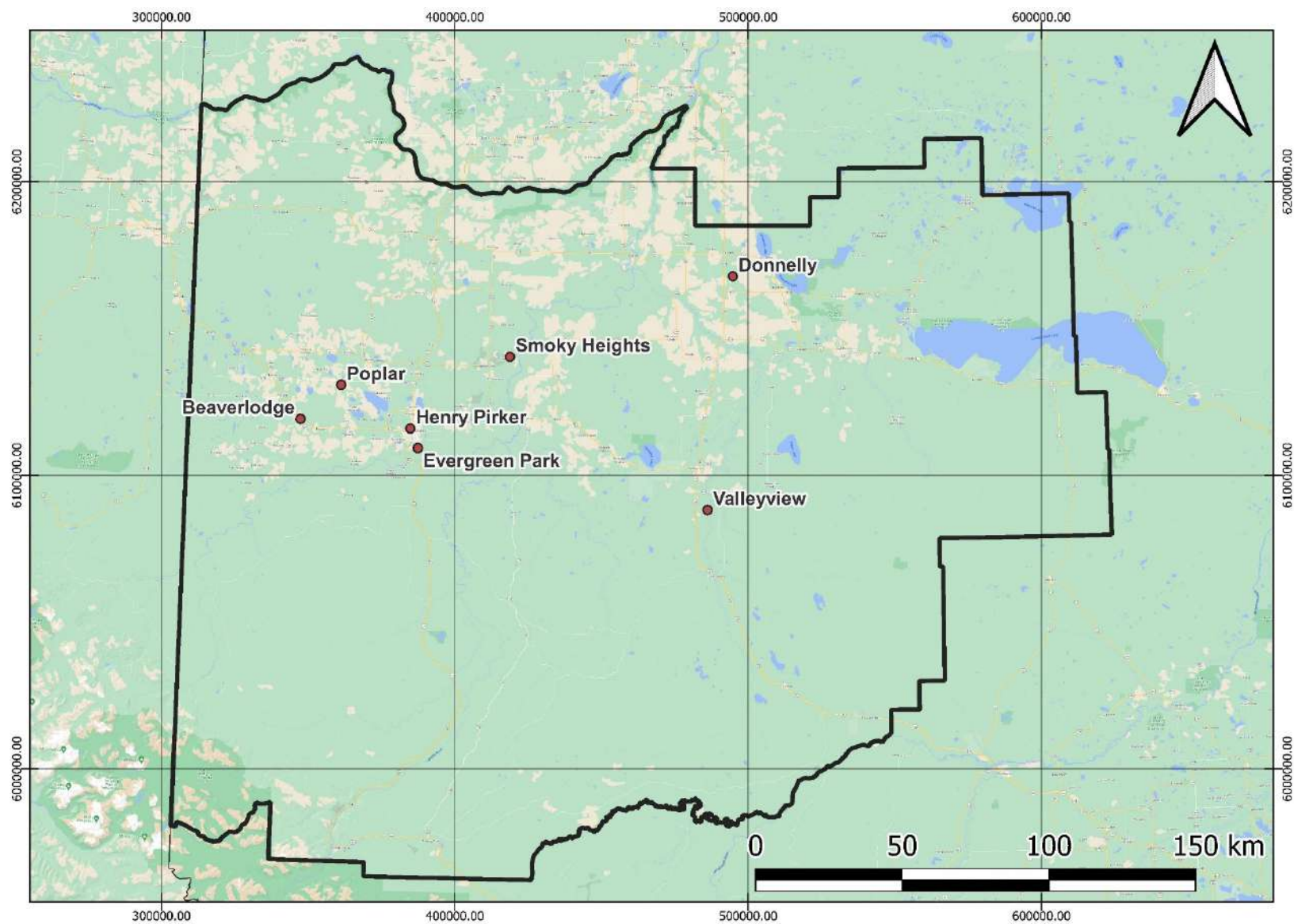


October Hourly Readings of Wind Direction Standard Deviation (in degrees) at Poplar

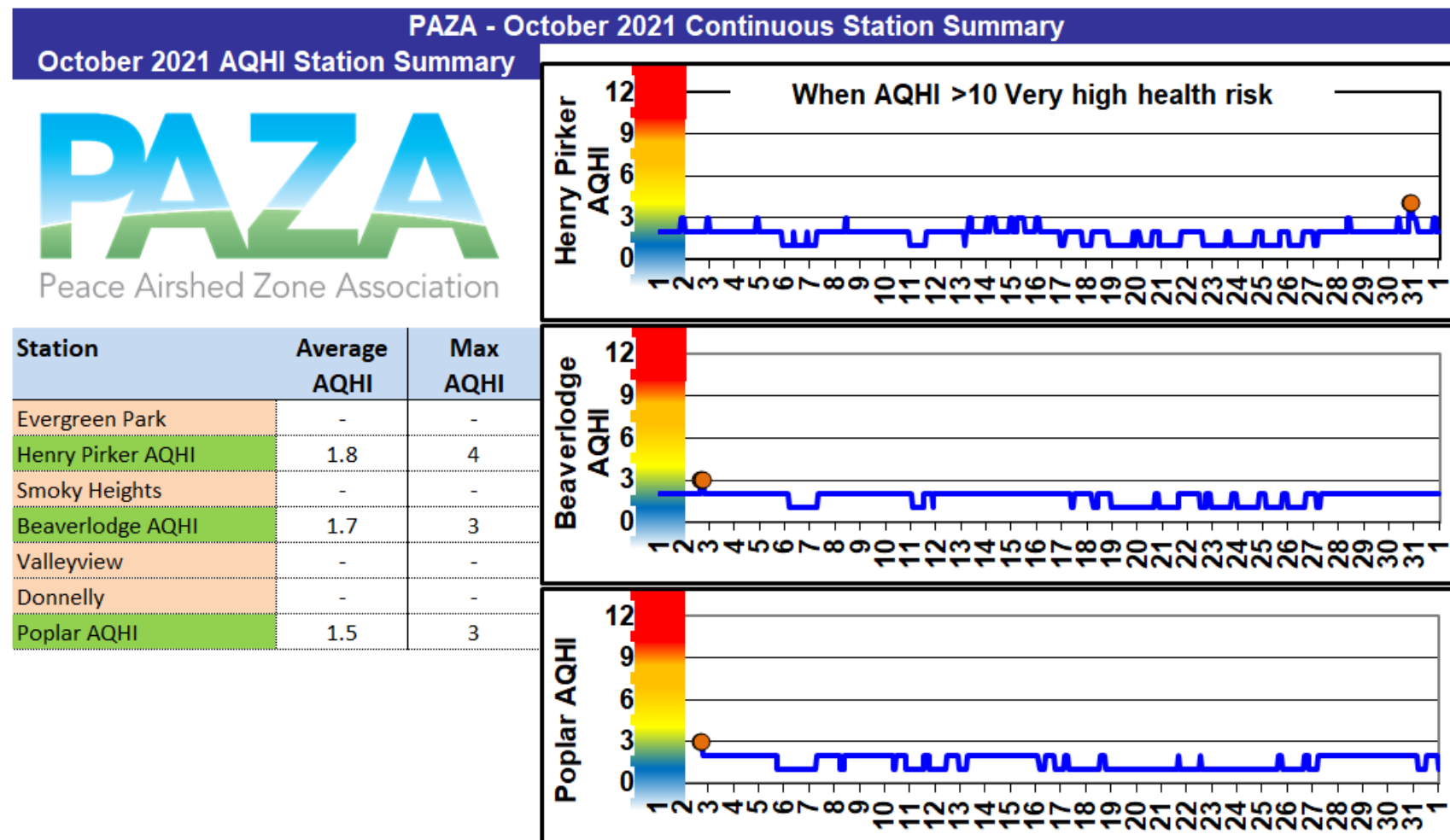




9 Concentration Summaries and Roses for PAZA

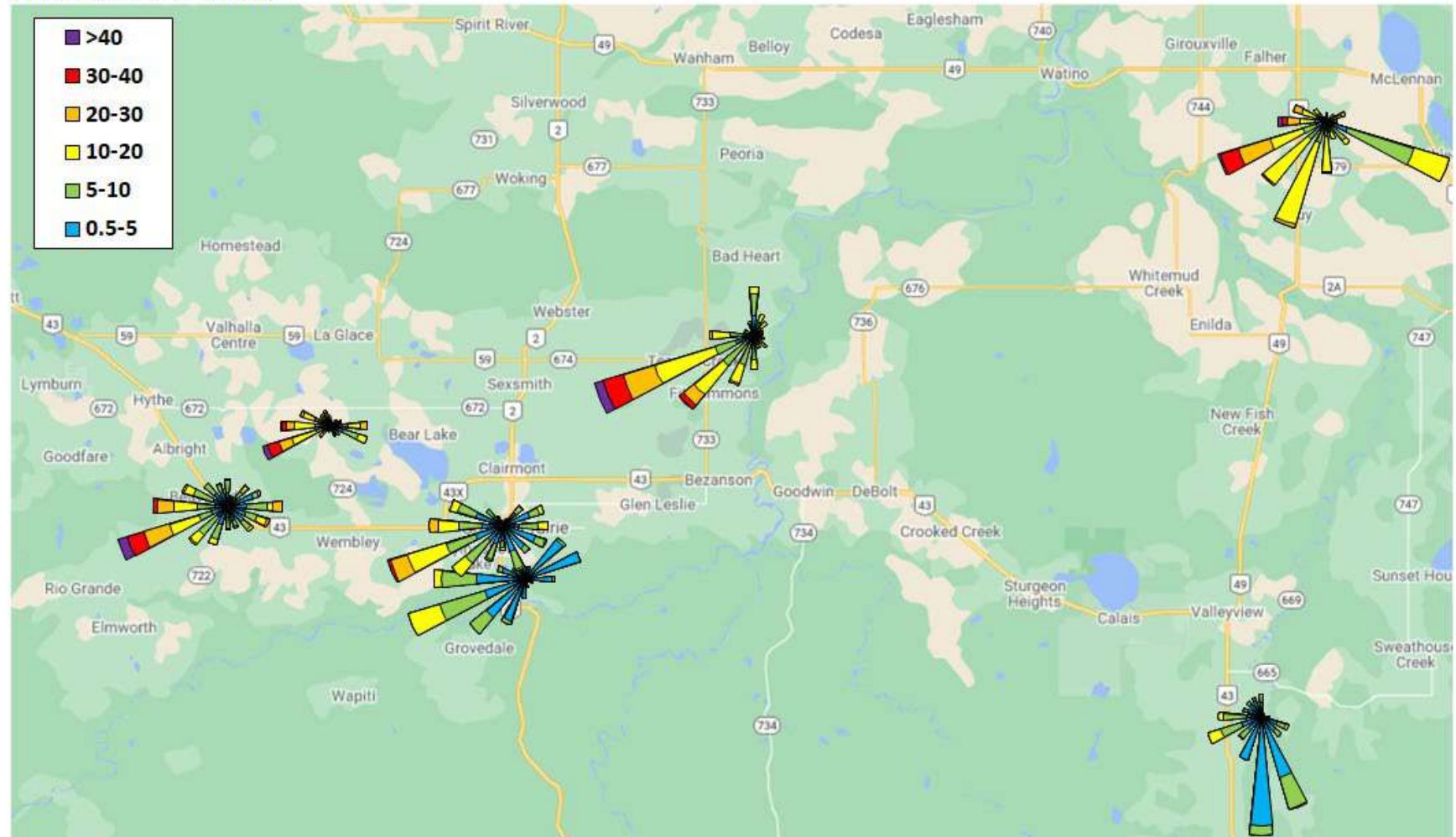


9.1 Air Quality Health Index (AQHI) Plots



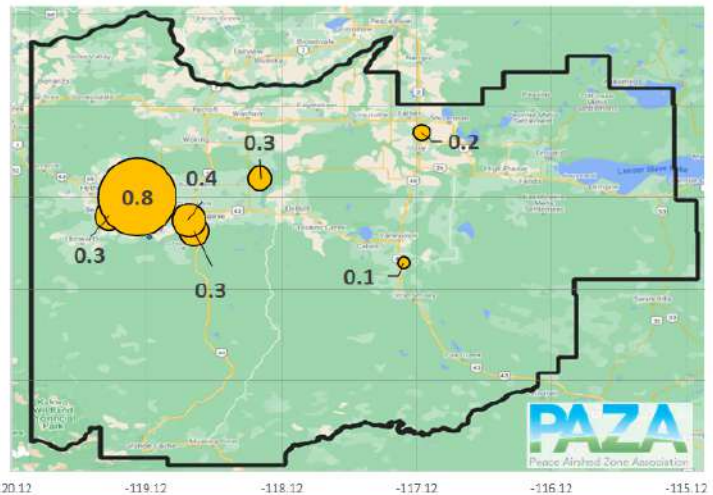
9.2 Wind Roses

Wind Roses in km/hr

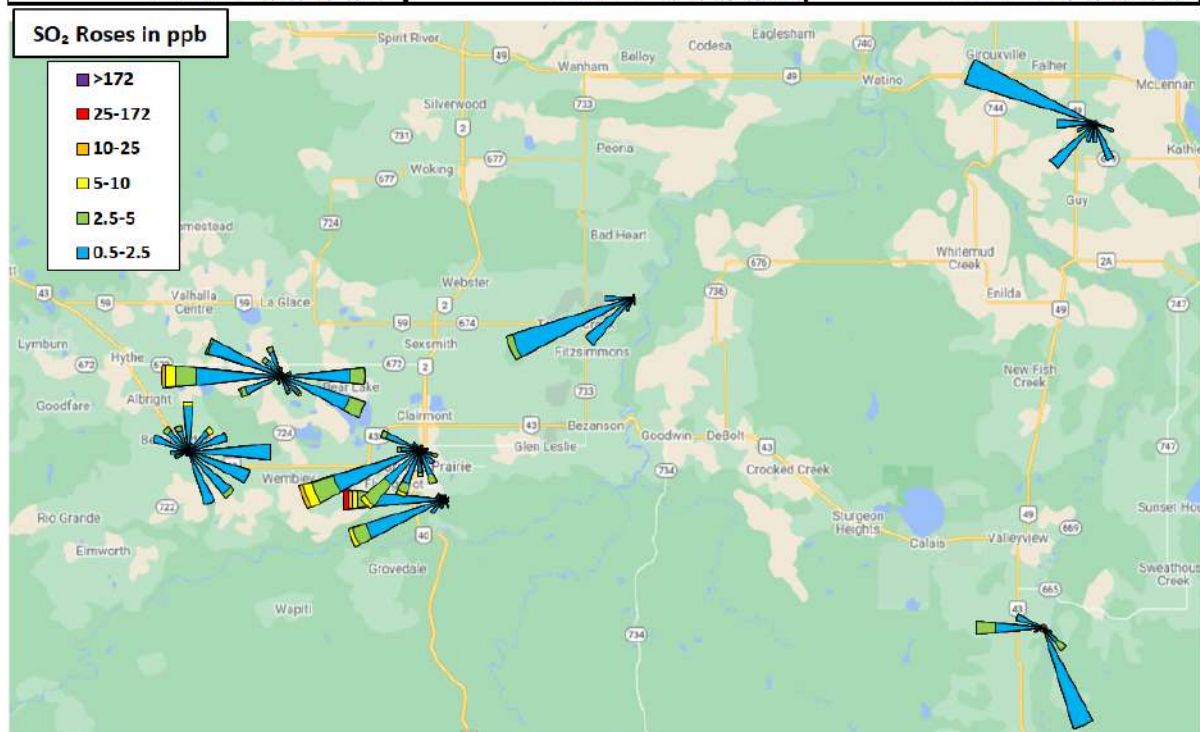
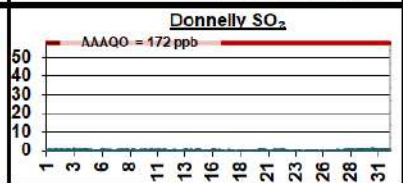
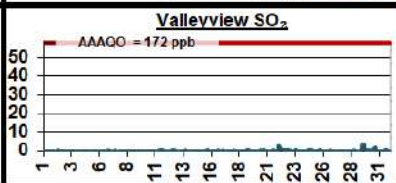
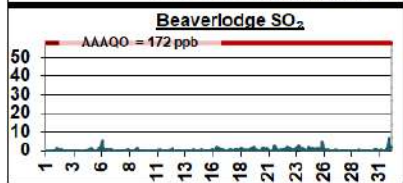
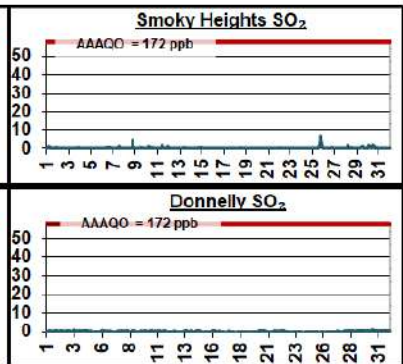
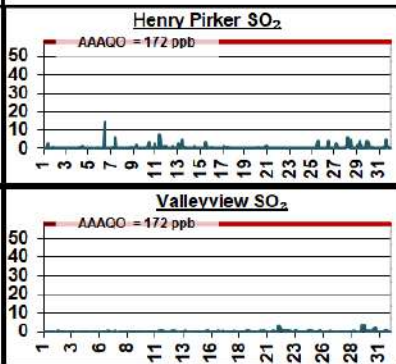
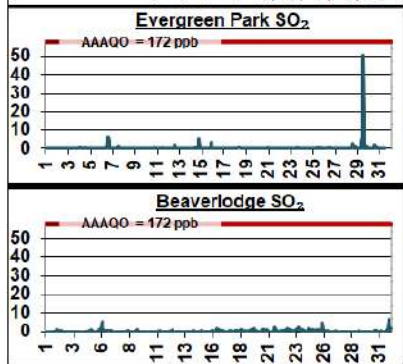
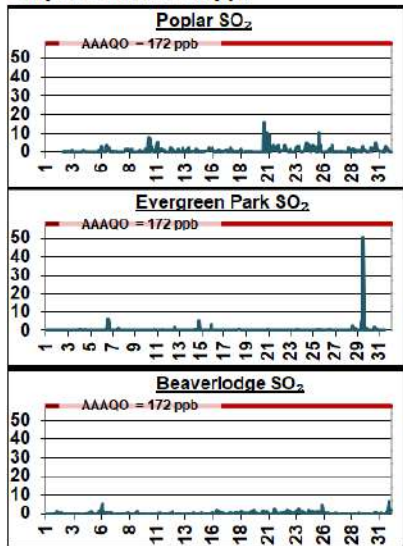


9.3 Sulphur Dioxide (SO₂) Plots

October 2021 SO ₂ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park SO ₂	0.3	50.5
Henry Pirkler SO ₂	0.4	14.5
Smoky Heights SO ₂	0.3	6.9
Beaverlodge SO ₂	0.3	6.3
Valleyview SO ₂	0.1	3.8
Donnelly SO ₂	0.2	1.0
Poplar SO ₂	0.8	15.5

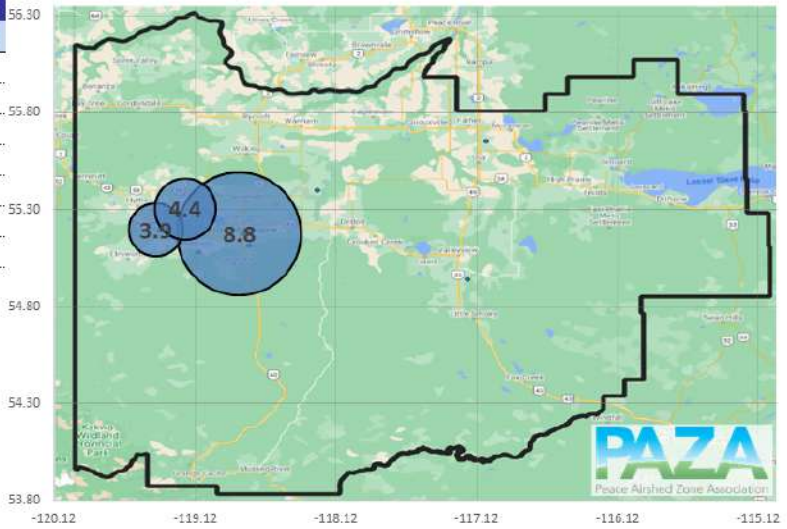


Sulphur Dioxide in ppb

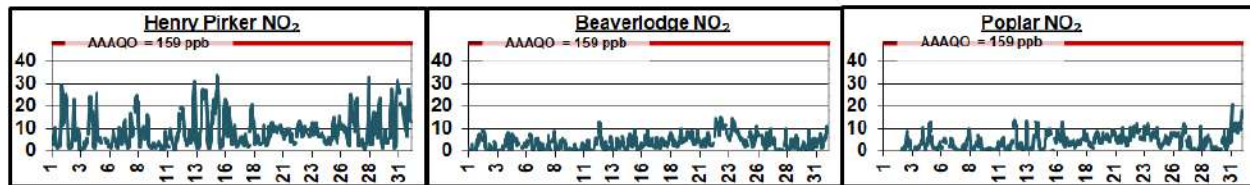


9.4 Nitrogen Dioxide (NO₂) Plots

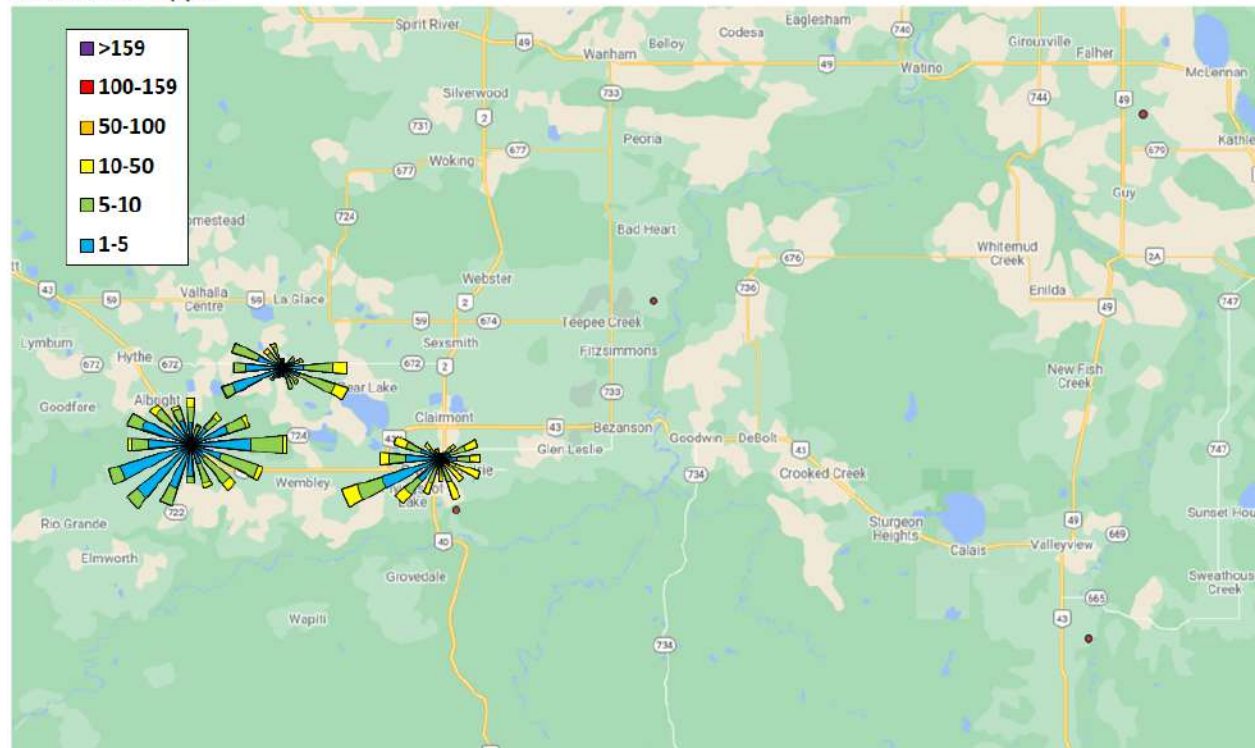
October 2021 NO ₂ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park NO ₂	-	-
Henry Pirkler NO ₂	8.8	34.4
Smoky Heights NO ₂	-	-
Beaverlodge NO ₂	3.9	15.3
Valleyview NO ₂	-	-
Donnelly NO ₂	-	-
Poplar NO ₂	4.4	21.1



Nitrogen Dioxide in ppb

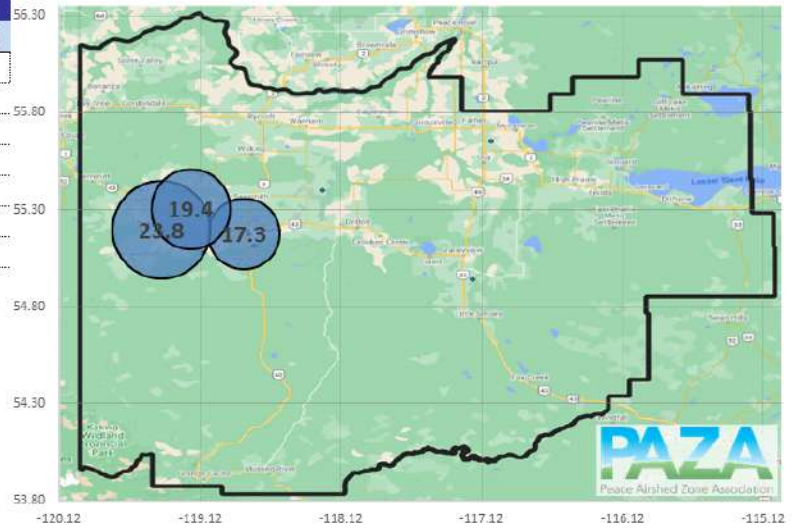


NO₂ Roses in ppb

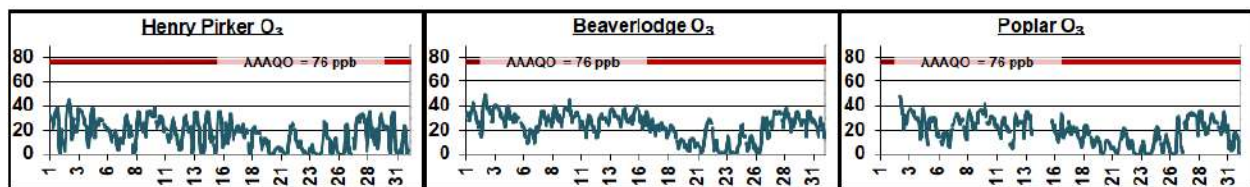


9.5 Ozone (O₃) Plots

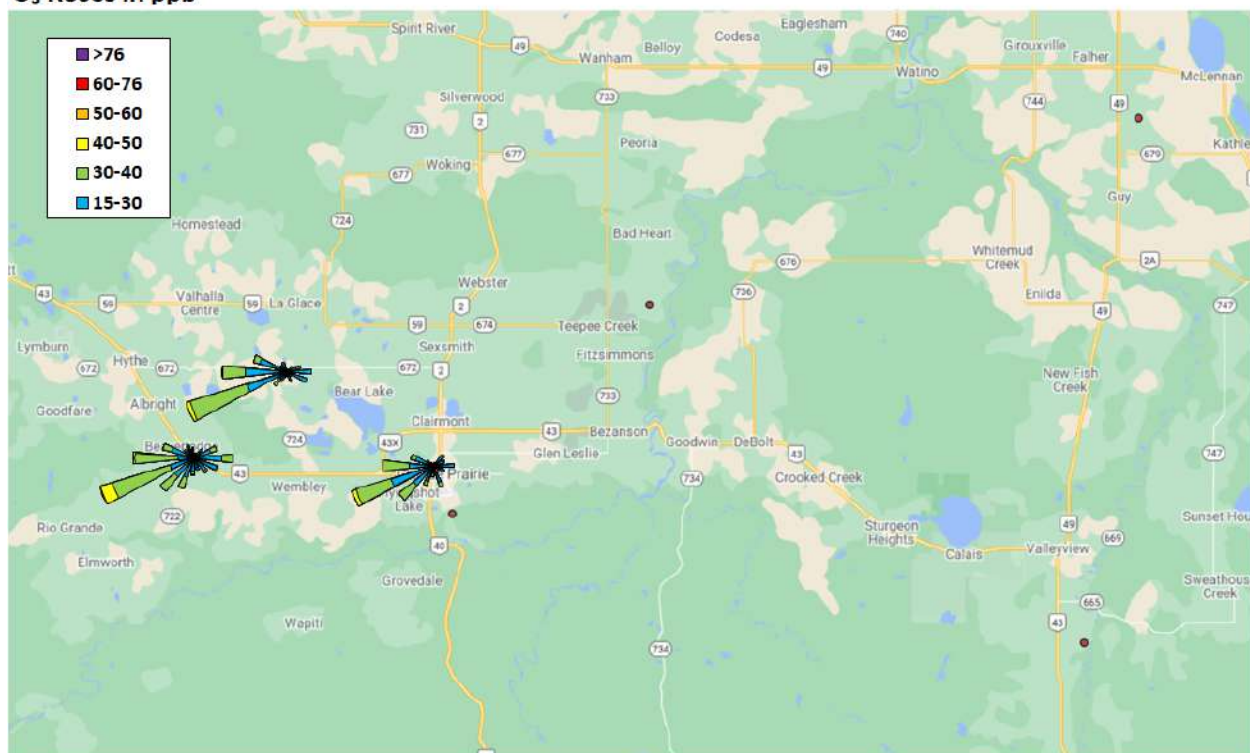
October 2021 O ₃ Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park O ₃	-	-
Henry Pirkir O ₃	17.3	44.9
Smoky Heights O ₃	-	-
Beaverlodge O ₃	23.8	50.1
Valleyview O ₃	-	-
Donnelly O ₃	-	-
Poplar O ₃	19.4	47.4



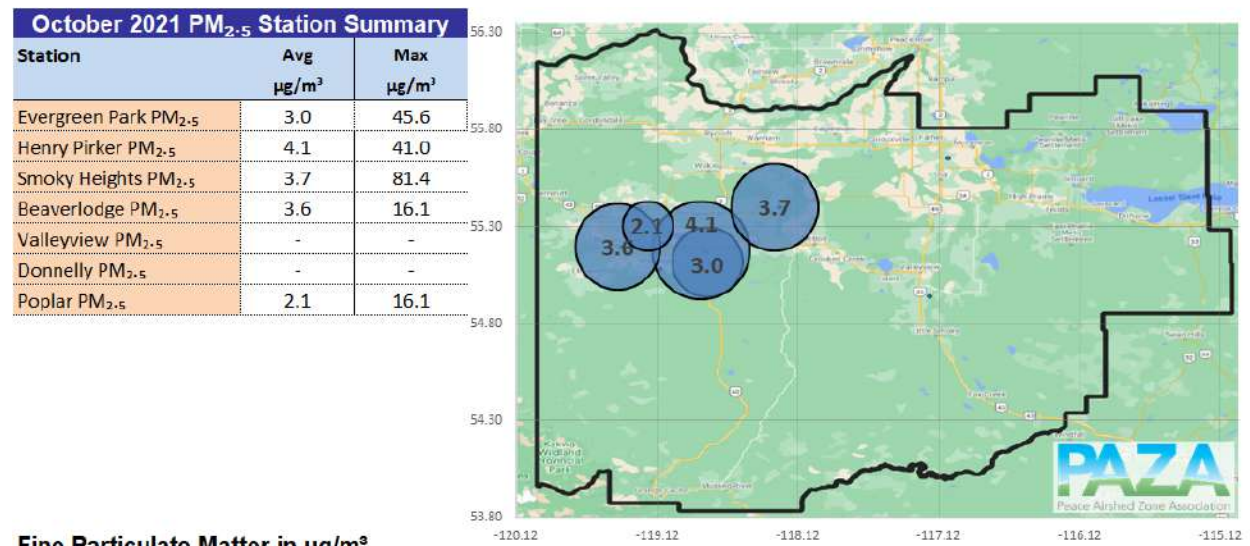
Ozone in ppb



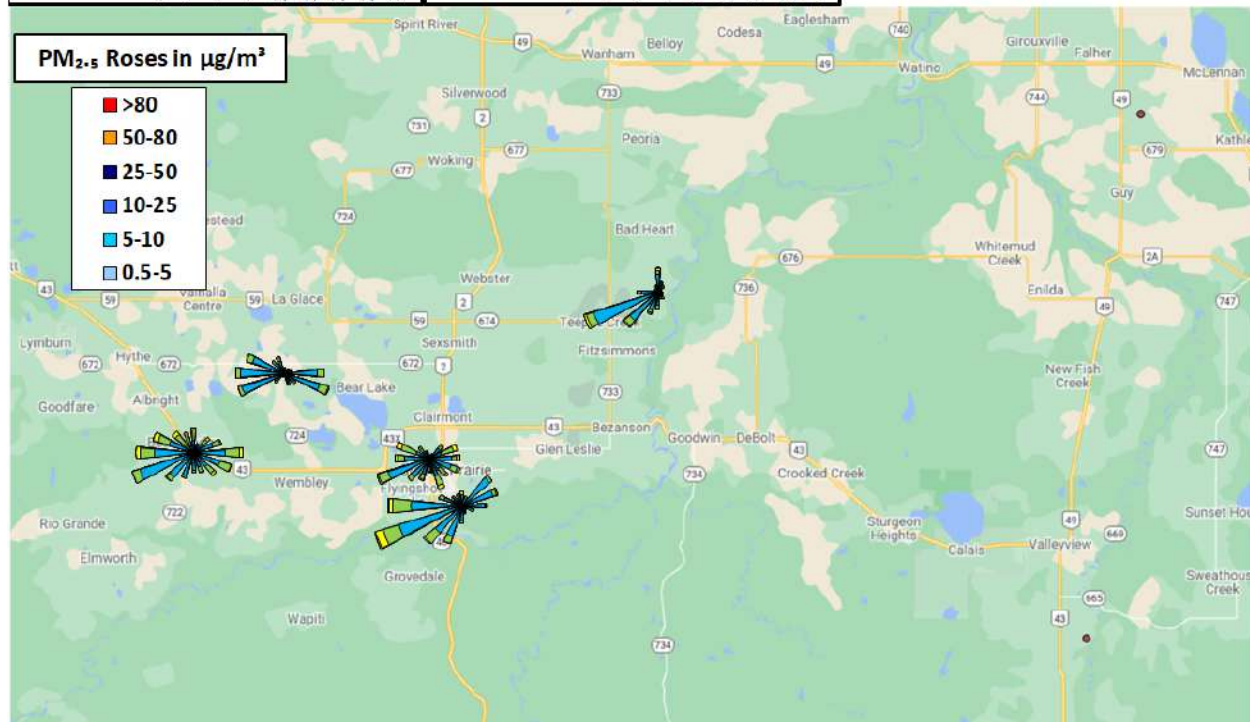
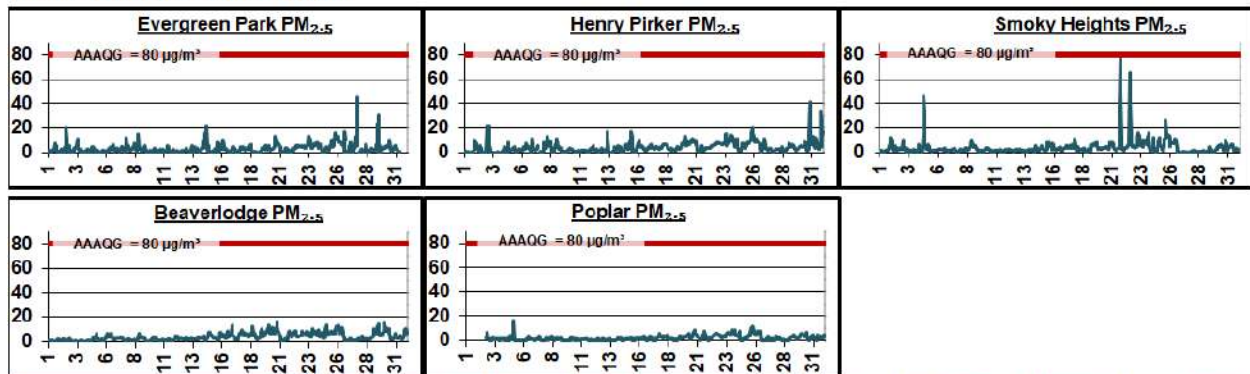
O₃ Roses in ppb



9.6 Fine Particulate Matter (PM_{2.5}) Plots



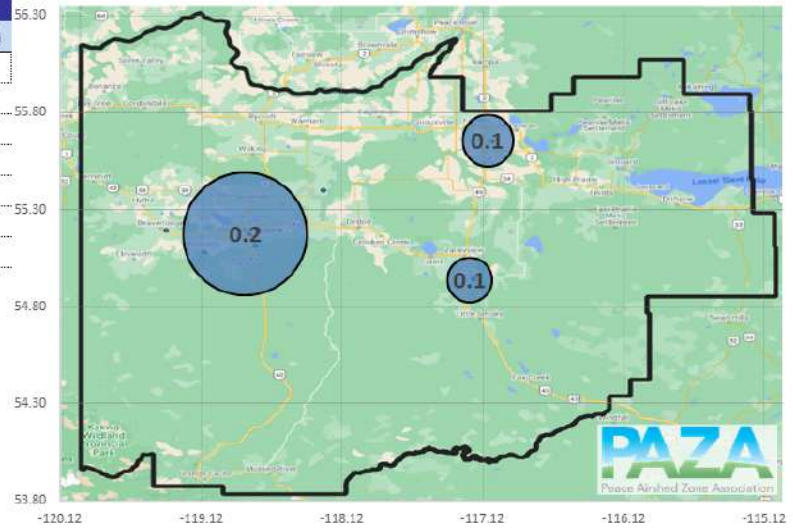
Fine Particulate Matter in µg/m³



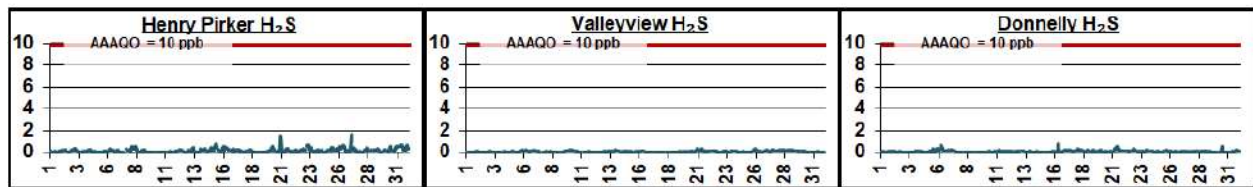
9.7 Hydrogen Sulphide (H₂S) Plots

October 2021 H₂S Station Summary

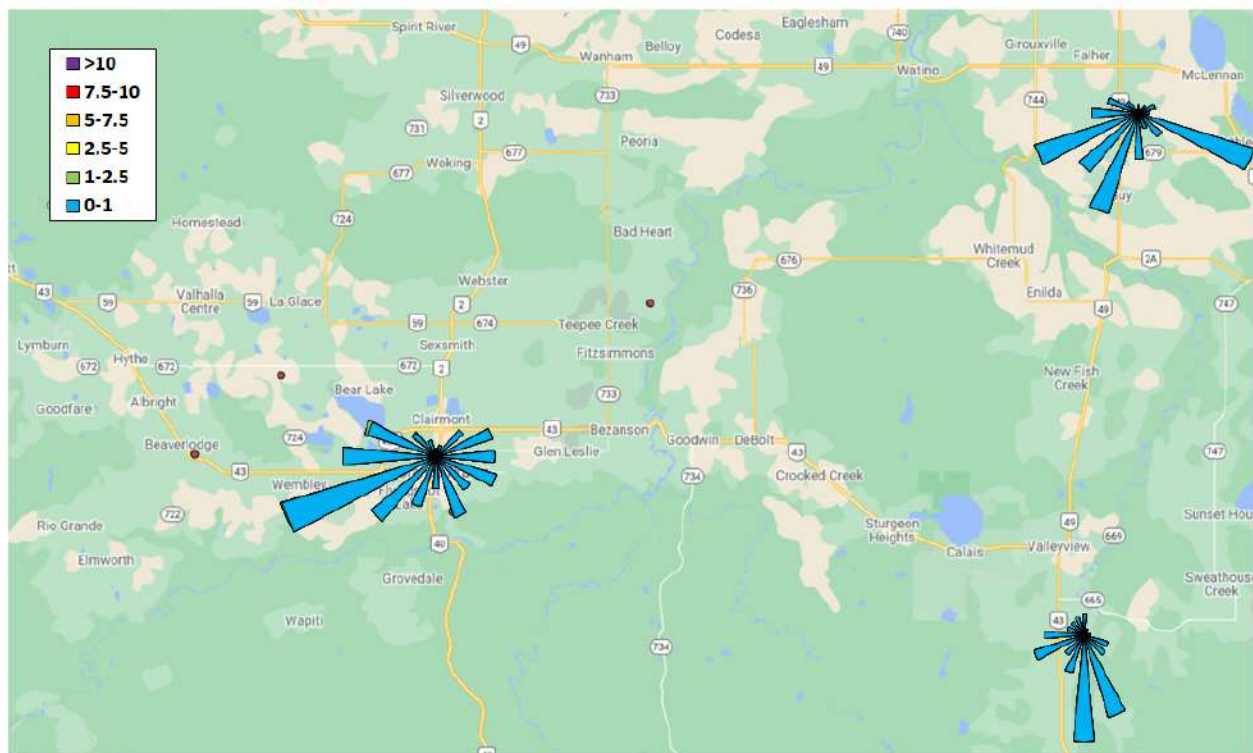
Station	Avg (ppb)	Max (ppb)
Evergreen Park H ₂ S	-	-
Henry Pirker H ₂ S	0.2	1.6
Smoky Heights H ₂ S	-	-
Beaverlodge H ₂ S	-	-
Valleyview H ₂ S	0.1	0.3
Donnelly H ₂ S	0.1	0.8
Poplar H ₂ S	-	-



Hydrogen Sulphide in ppb

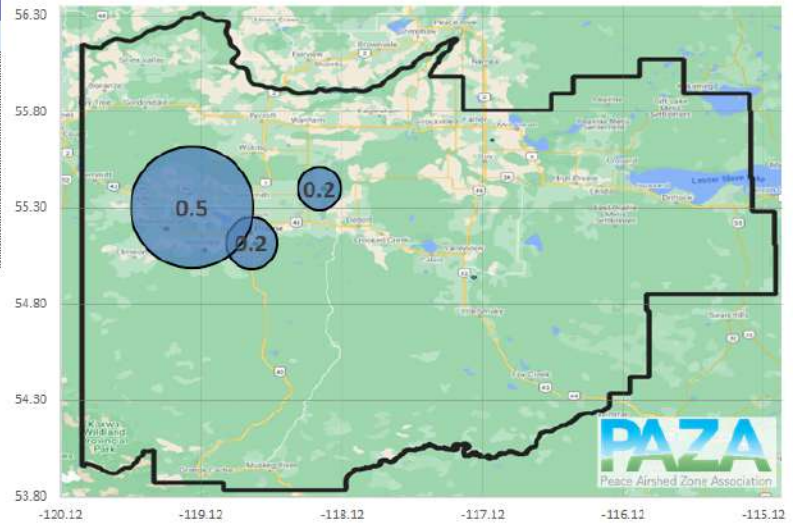


H₂S Roses in ppb

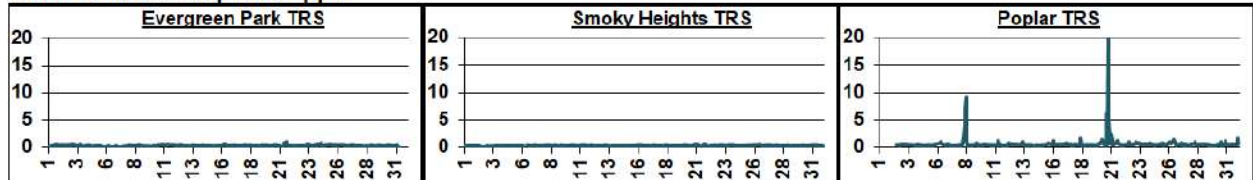


9.8 Total Reduced Sulphur (TRS) Plots

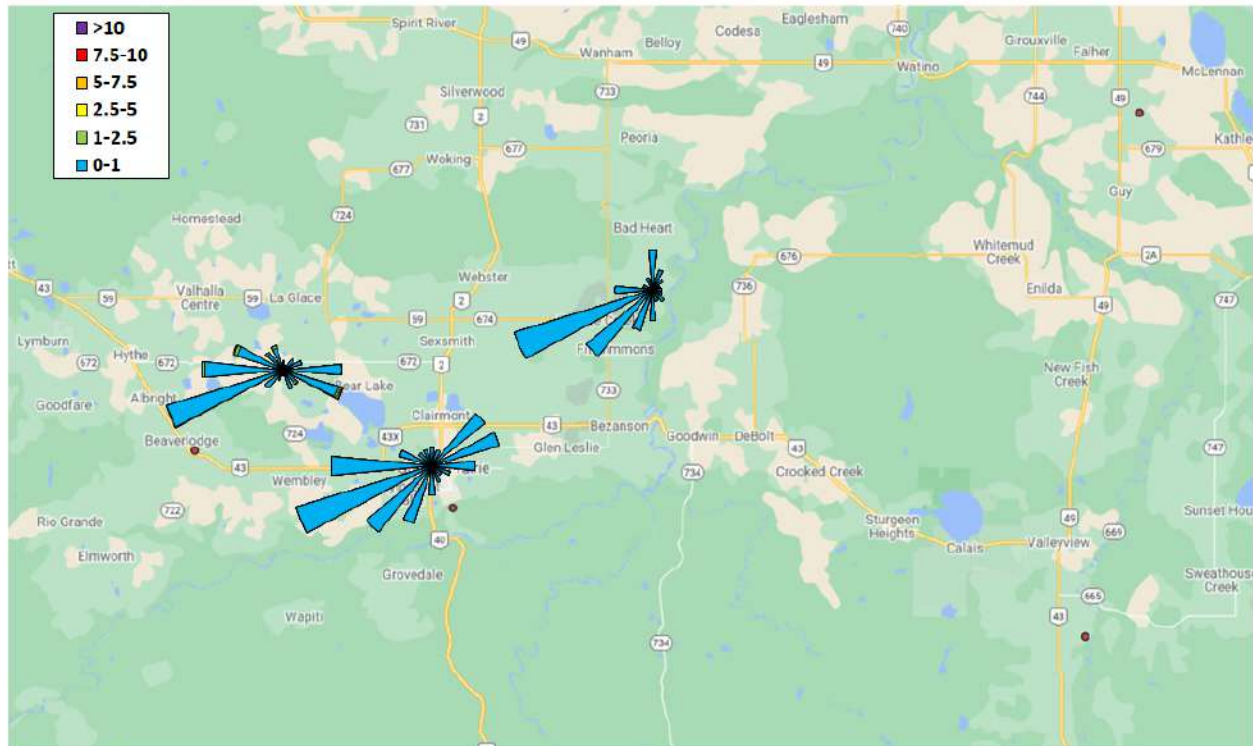
October 2021 TRS Station Summary		
Station	Avg (ppb)	Max (ppb)
Evergreen Park TRS	0.2	1.1
Henry Pirkre TRS	-	-
Smoky Heights TRS	0.2	0.6
Beaverlodge TRS	-	-
Valleyview TRS	-	-
Donnelly TRS	-	-
Poplar TRS	0.5	20.1



Total Reduced Sulphur in ppb



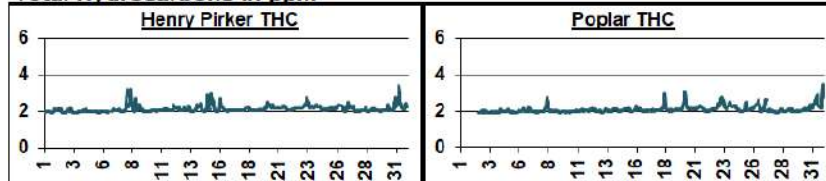
TRS Roses in ppb



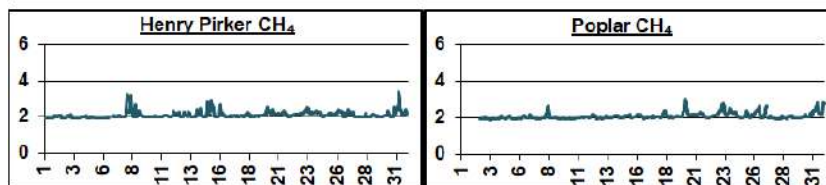
9.9 Total Hydrocarbon (THC) Plots

October 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	2.1	3.4	2.1	3.4	0.0	0.5
Smoky Heights THC	-	-	-	-	-	-
Beaverlodge THC	-	-	-	-	-	-
Valleyview THC	-	-	-	-	-	-
Donnelly THC	-	-	-	-	-	-
Poplar THC	2.1	3.5	2.1	3.0	0.0	0.7

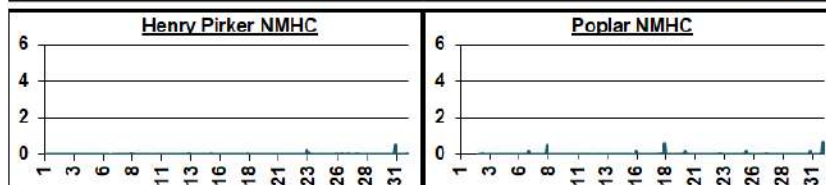
Total Hydrocarbons in ppm



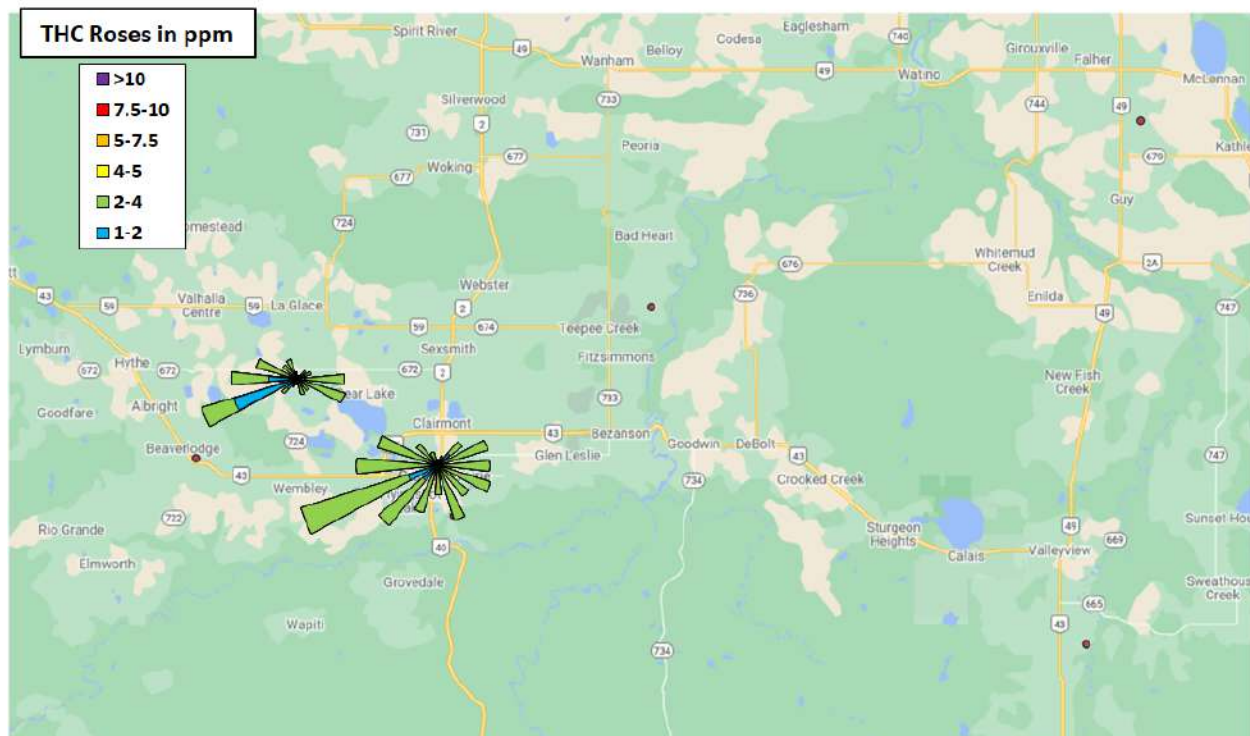
Total Hydrocarbons (THC)



Methane (CH₄)



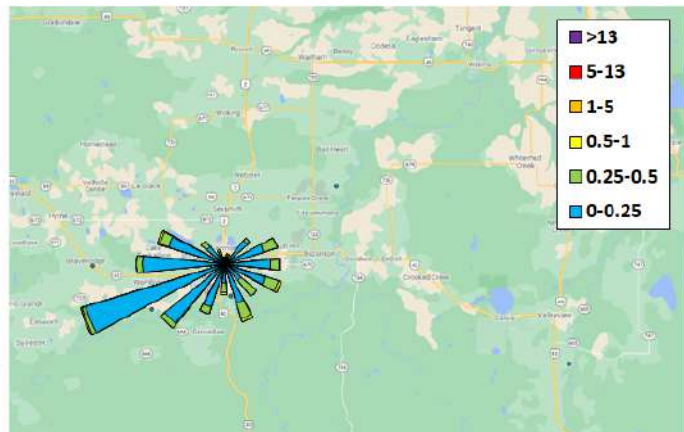
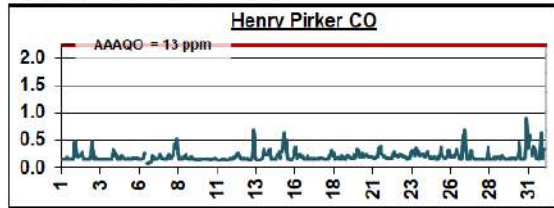
Non-Methane Hydrocarbons (NMHC)



9.10 Carbon Monoxide (CO) Plots

October 2021 CO Station Summary		
Station	Avg (ppm)	Max (ppm)
Henry Pirkler CO	0.21	0.88

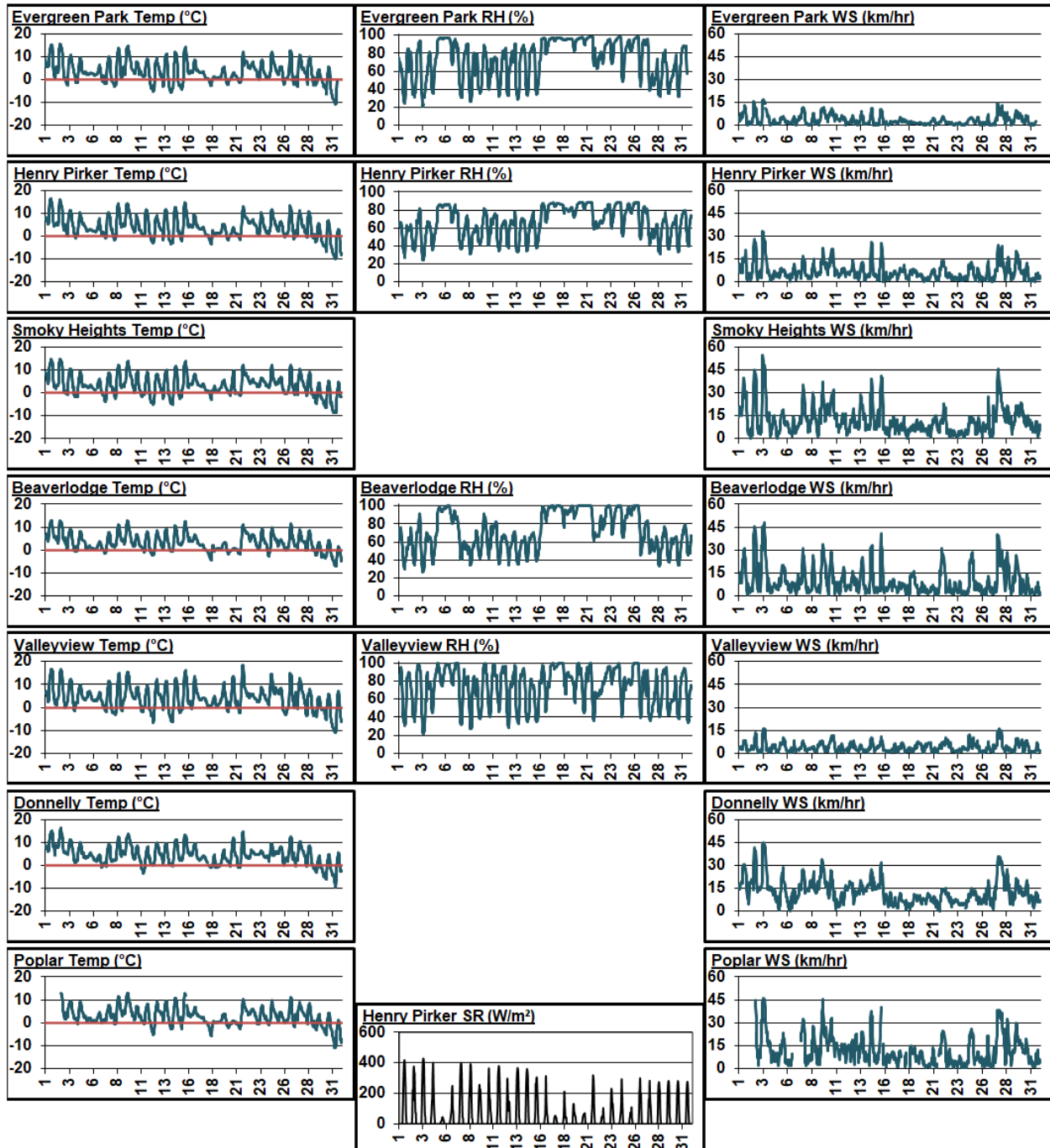
Carbon Monoxide in ppm



9.11 Meteorology Summary

October 2021 Meteorological Summary						
Station	Temp (°C)	RH (%)	SR (W/m ²)	WS (km/hr)	WD (deg)	WD
Evergreen Park	3.3	73.1	-	3.4	251.5	WSW
Henry Pirker	3.9	66.0	58.2	6.7	237	WSW
Smoky Heights	3.2	-	-	12.1	238	WSW
Beaverlodge	3.2	71.7	-	9.8	249	WSW
Valleyview	4.1	73.9	-	4.0	210	SSW
Donnelly	4.5	-	-	12.9	222	SW
Poplar	2.7	-	-	12.0	252	WSW

Temp (°C) Outside Temperature
 RH (%) Relative Humidity
 SR (W/m²) Solar Radiation
 WS (km/hr) Wind Speed
 WD (deg) Wind Direction
 WD Wind Direction



10 Passive Monitoring Data

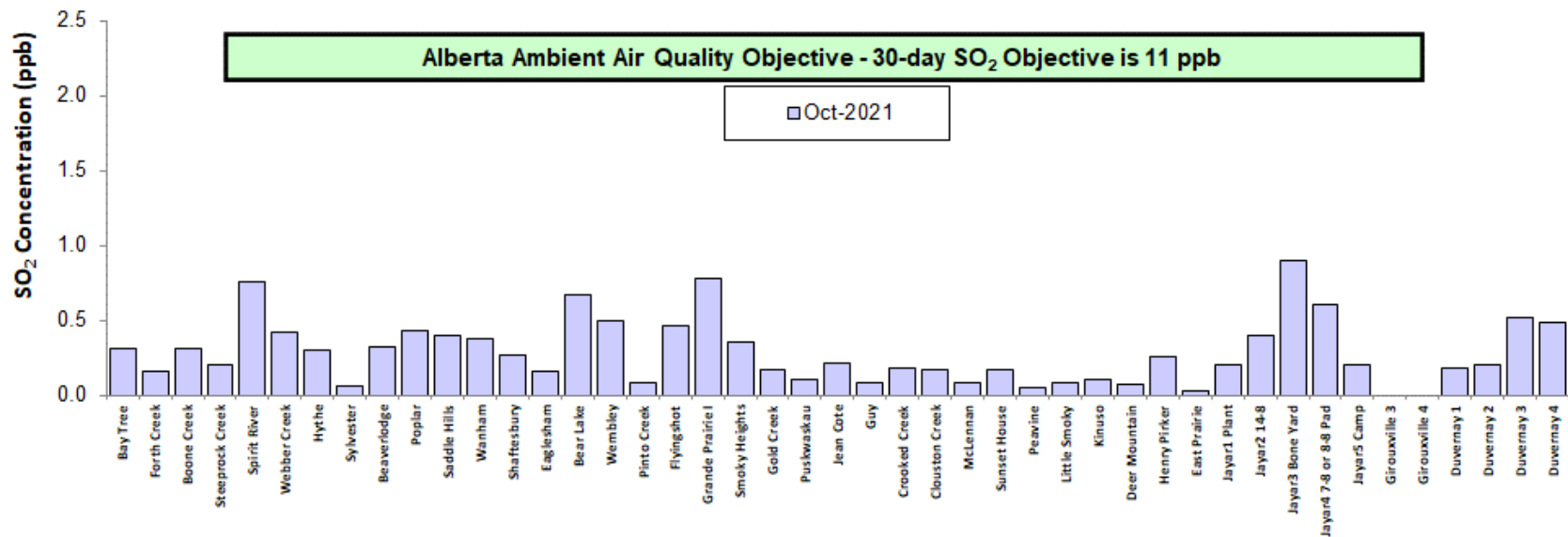
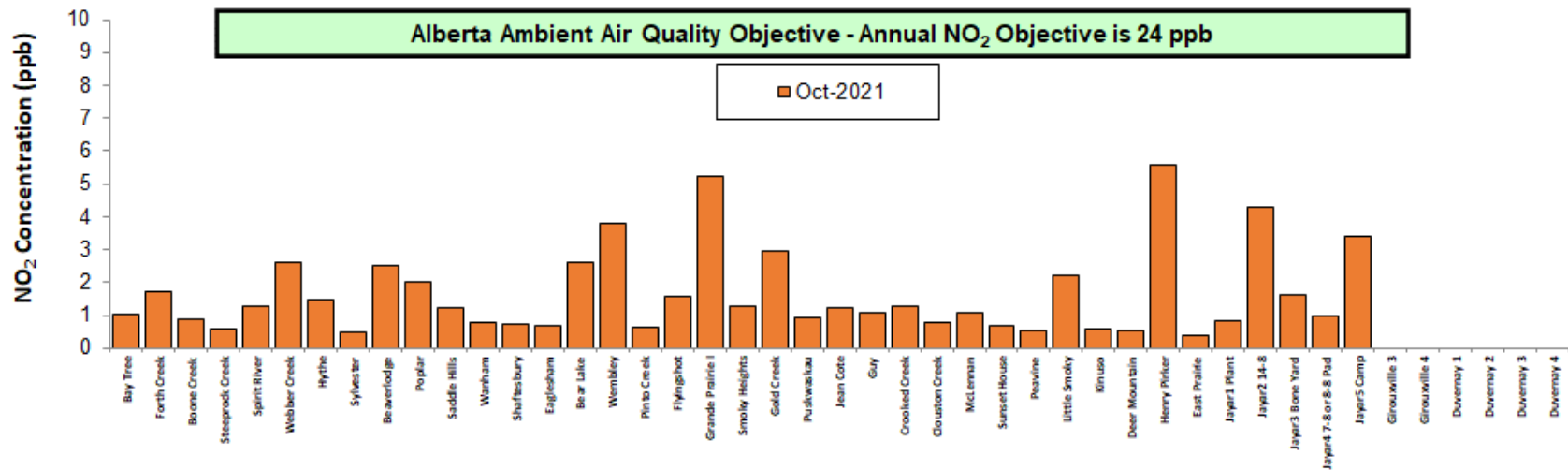
Peace Airshed Zone Association - PAZA Passive Stations for October 2021

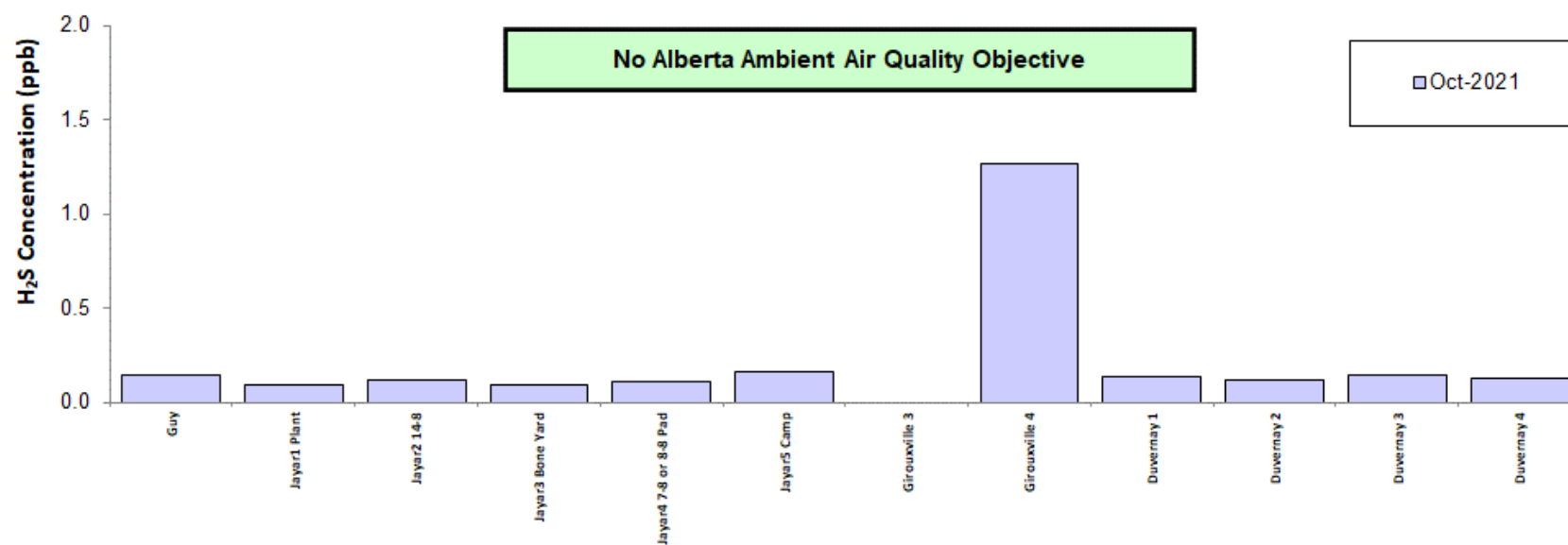
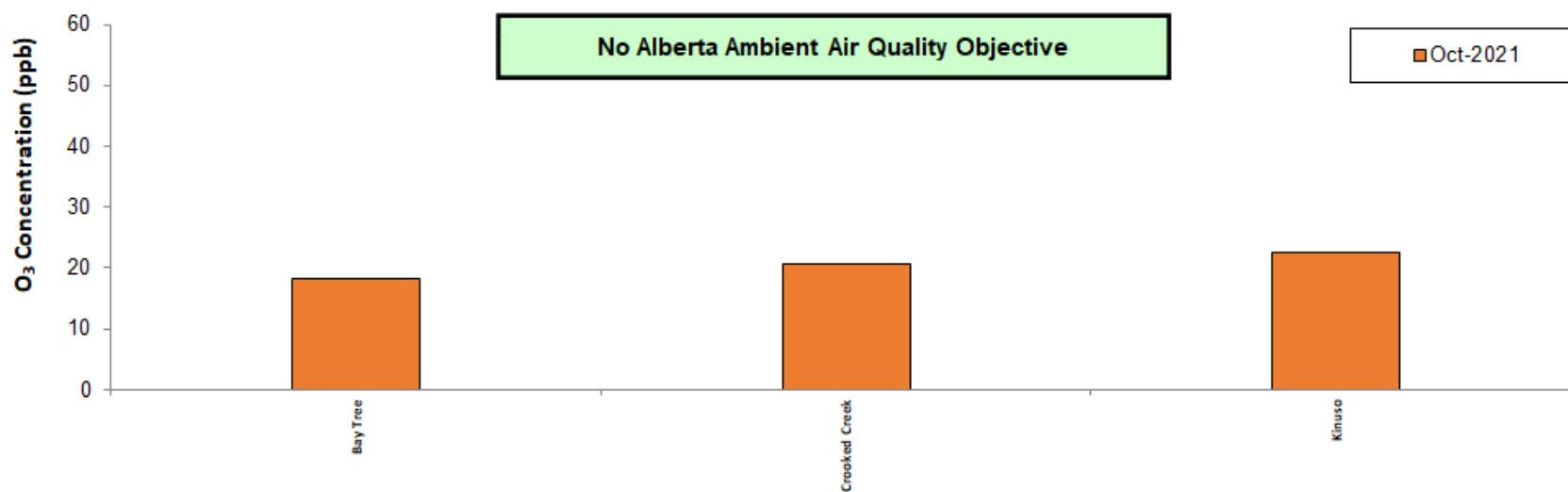
Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
Duplicates						
2a	Bay Tree		18.7	1.1		
2b	Bay Tree		17.6	0.9		
5a	Boone Creek			0.9		
5b	Boone Creek			0.9		
9a	Spirit River	0.8				
9b	Spirit River	0.7				
12a	Hythe	0.3				
12b	Hythe	0.3				
19a	Wanham	0.3				
19b	Wanham	0.4				
27a	Grande Prairie I			5.2		
27b	Grande Prairie I			5.2		
49a	Henry Pirker	0.4				
49b	Henry Pirker	0.1				
50a	East Prairie			0.4		
50b	East Prairie			0.4		
G4a	Girouxville 4				1.5	
G4b	Girouxville 4				1.0	
D4a	Duvernay 4	0.4			0.1	
D4b	Duvernay 4	0.6			0.1	
J1a	Plant			0.7		
J1b	Plant			1.0		
J3a	Bone Yard				0.1	
J3b	Bone Yard				0.1	
J4a	7-8 or 8-8 Pad	0.3				
J4b	7-8 or 8-8 Pad	0.9				

2	Bay Tree	0.3	18.1	1.0	-	13-16-078-13 W6M
3	Forth Creek	0.2	-	1.7	-	04-13-082-07 W6M
5	Boone Creek	0.3	-	0.9	-	01-23-076-11 W6M
7	Steeprock Creek	0.2	-	0.6	-	09-35-072-13 W6M
9	Spirit River	0.8	-	1.3	-	08-12-079-07 W6M
11	Webber Creek	0.4	-	2.6	-	09-36-074-09 W6M
12	Hythe	0.3	-	1.5	-	14-36-072-11 W6M
14	Sylvester	0.1	-	0.5	-	08-06-069-12 W6M
16	Beaverlodge	0.3	-	2.5	-	15-36-071-10 W6M
17	Poplar	0.4	-	2.0	-	13-06-073-08 W6M
18	Saddle Hills	0.4	-	1.2	-	04-25-074-07 W6M
19	Wanham	0.4	-	0.8	-	16-22-077-03 W6M
20	Shaftesbury	0.3	-	0.7	-	04-03-082-23 W5M
21	Eaglesham	0.2	-	0.7	-	16-21-079-25 W5M
23	Bear Lake	0.7	-	2.6	-	15-31-072-06 W6M
24	Wembley	0.5	-	3.8	-	12-31-070-08 W6M
25	Pinto Creek	0.1	-	0.6	-	04-24-069-11 W6M
26	Flyingshot	0.5	-	1.6	-	15-36-070-07 W6M
27	Grande Prairie I	0.8	-	5.2	-	08-15-071-06 W6M
29	Smoky Heights	0.4	-	1.3	-	04-06-075-02 W6M
32	Gold Creek	0.2	-	3.0	-	06-33-067-05 W6M
34	Puskwaskau	0.1	-	0.9	-	15-35-074-25 W5M
35	Jean Cote	0.2	-	1.2	-	12-35-079-21 W5M
36	Guy	0.1	-	1.1	0.1	03-04-076-22 W5M
37	Crooked Creek	0.2	20.7	1.3	-	16-01-071-26 W5M
39	Clouston Creek	0.2	-	0.8	-	12-01-073-22 W5M
40	McLennan	0.1	-	1.1	-	03-29-077-19 W5M
42	Sunset House	0.2	-	0.7	-	05-32-070-19 W5M
44	Peavine	0.1	-	0.5	-	03-05-079-15 W5M
46	Little Smoky	0.1	-	2.2	-	12-01-065-21 W5M
47	Kinuso	0.1	22.4	0.6	-	12-10-073-10 W5M
48	Deer Mountain	0.1	-	0.5	-	15-22-068-09 W5M
49	Henry Pirker	0.3	-	5.6	-	17-26-071-06 W6M
50	East Prairie	0.0	-	0.4	-	11-13-079-08 W6M
57	Jayar1 Plant	0.2	-	0.9	0.1	06-08-062-03 W6M
58	Jayar2 14-8	0.4	-	4.3	0.1	07-08-062-03 W6M
59	Jayar3 Bone Yard	0.9	-	1.6	0.1	14-08-062-03 W6M
60	Jayar4 7-8 or 8-8 Pad	0.6	-	1.0	0.1	10-08-062-03 W6M
61	Jayar5 Camp	0.2	-	3.4	0.2	11-08-062-03 W6M
G3	Girouxville 3	-	-	-	damaged	14-02-077-23 W5M
G4	Girouxville 4	-	-	-	1.3	04-08-077-22 W5M
D1	Duvernay 1	0.2	-	-	0.1	04-33-062-20 W5M
D2	Duvernay 2	0.2	-	-	0.1	04-33-062-20 W5M
D3	Duvernay 3	0.5	-	-	0.1	04-33-062-20 W5M
D4	Duvernay 4	0.5	-	-	0.1	04-33-062-20 W5M

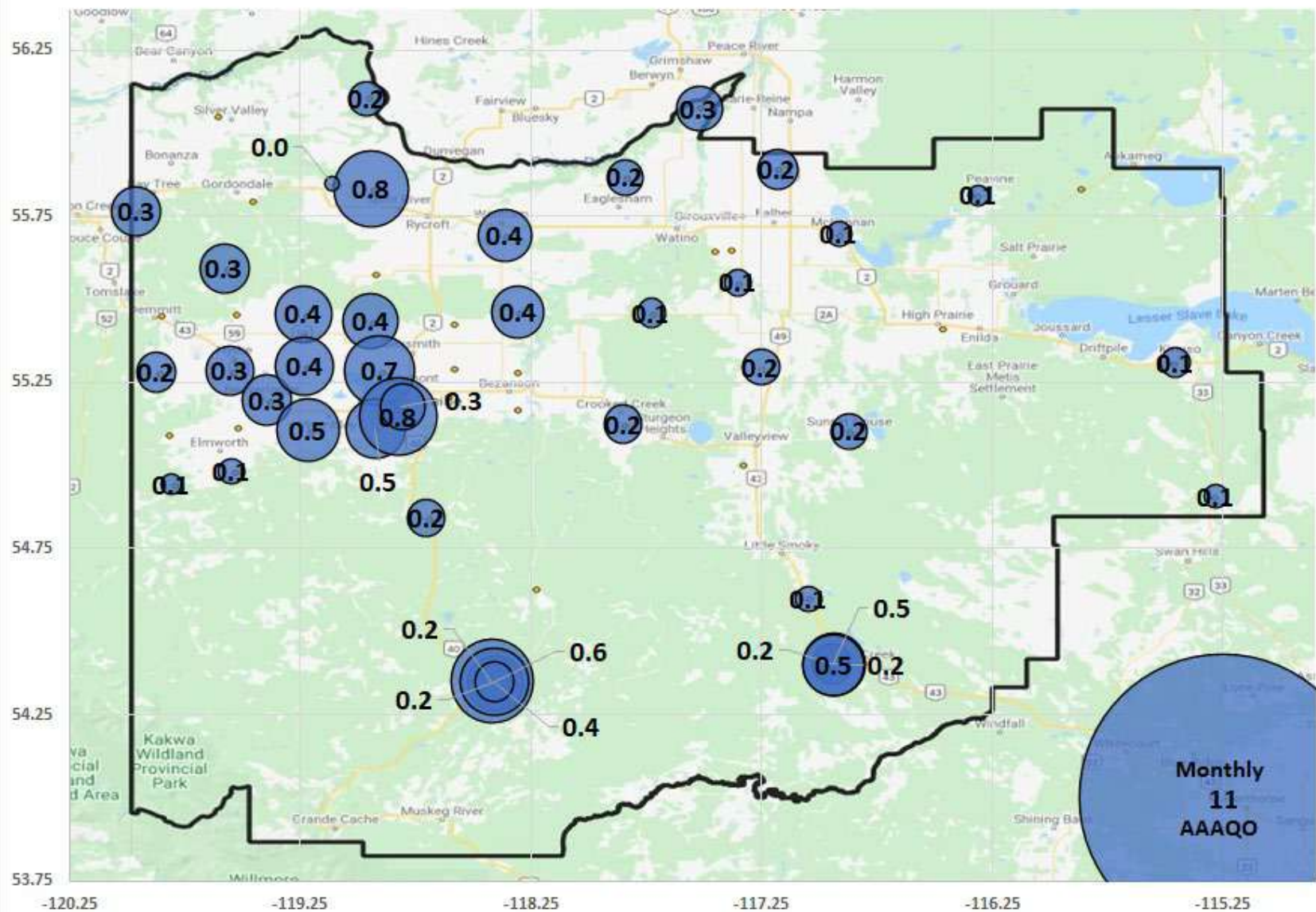
Passive Summary for October 2021

Stats	Sulphur Dioxide SO ₂	Ozone O ₃	Nitrogen Dioxide NO ₂	Hydrogen Sulphide H ₂ S
	ppb	ppb	ppb	ppb
Passive Summary for August 2021 (PAZA)				
Mean	0.3	20.4	1.6	0.3
Standard Deviation	0.2	2.1	1.3	0.4
Minimum	0.0	18.1	0.4	0.1
	East Prairie (#50)	Bay Tree (#2)	East Prairie (#50)	Jayar1 Plant (#57)
Maximum	0.9	22.4	5.6	1.3
	Jayar3 Bone Yard (#59)	Kinuso (#47)	Henry Pirker (#49)	Girouxville 4 (#G4)
Continuous and Passive Monitoring Comparison				
PAZA Beaverlodge Station	0.3	23.8	15.3	-
Beaverlodge Passive (#16)	0.3	-	2.5	-
PAZA Henry Pirker Station	0.4	17.3	34.4	0.2
Henry Pirker passive (#49)	0.3	-	5.6	-

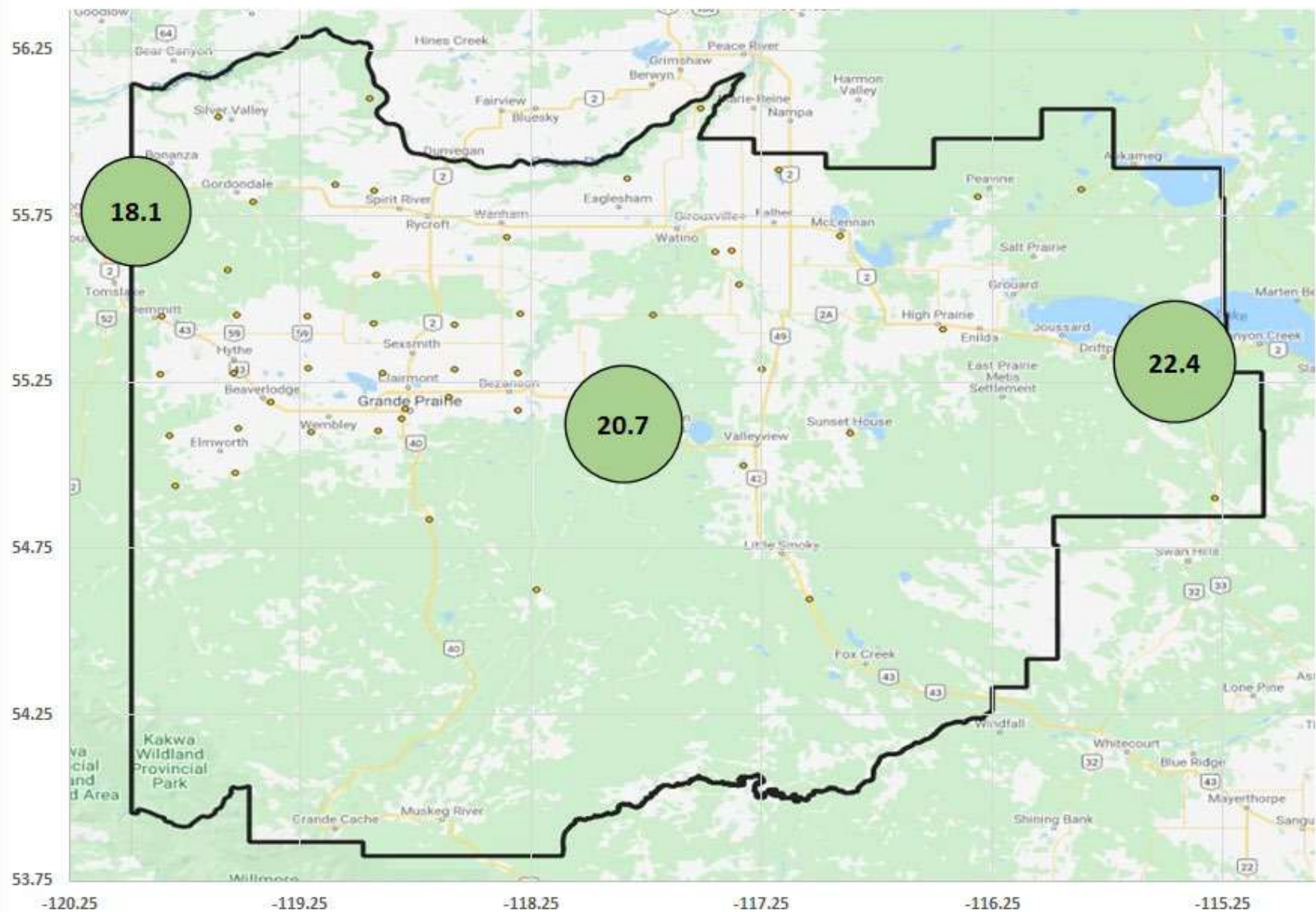




SO₂ Monthly Average (units in ppb)



O₃ Monthly Average (units in ppb)



End of Report



Peace Airshed Zone Association

Ambient Air Monitoring Report

October 2021