



# **Peace Airshed Zone Association**

## **Ambient Air Monitoring Network Summary**

**Ambient Air Quality Monitoring Program**

**Monthly Report**

**December 2023**

January 31, 2024

**Alberta Environment and Protected Areas**

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

Subject: **Peace Airshed Zone Association (PAZA)  
December 2023 Ambient Air Quality Monitoring Report**

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Please find enclosed the PAZA Ambient Air Quality Monitoring Network Report for the month of December 2023.

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

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

PAZA has retained the services of WSP Canada Inc. to conduct continuous ambient monitoring and Dr. Kevin McCullum, P.Eng. 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 Milner station is being reported under the PAZA Monthly report.

**Continuous Monitoring:**

Eight (8) Stations including Henry Pirker (Grande Prairie), Dunes, Smoky Heights, Beaverlodge, Valleyview, Fox Creek, Poplar-Portable and Milner.  
Detailed Summaries are included in the report.

**Calibration and Data Submission:**

Monthly report, hourly data and calibration reports for December 2023 were submitted to the ETS data system.

**Table A. PAZA members with Facility Operating Approvals**

<b>Company</b>	<b>Facility</b>	<b>LSD</b>	<b>EPEA Approval No.</b>
Advantage Oil & Gas Ltd.	Glacier	05-02-076-13-W6	00262479-00-00
Alberta Power (2000) Ltd. (an ATCO company)	Sturgeon	SW-06-069-21-W5	00010283-02-02
ATCO Power Canada	Poplar Hill	11-19-073-08-W6	00067774-01-01
ATCO Power Canada	Valleyview	SW-06-069-21-W5	00147709-01-01
AltaGas Ltd.	Pouce Coupe	03-03-081-13-W6	00247673-00-00
	Ante Creek	02-26-068-25-W5	00266694-00-00
	Gordondale	02-26-068-25-W5	00287474-00-00
Apache Canada Ltd.	House Mountain	01-08-070-10-W5	00010137-02-02
Birchcliff Energy Ltd.	Pouce Coupe	03-22-078-12-W6	00252529-00-00
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	00001633-02-00
Canfor Forest Products	Grande Prairie	SW-23-071-06-W6	00152645-01-00
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	00001464-02-03
Exshaw Oil Corporation	Spirit River	03-10-077-07-W6	00344521-00-00
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
	Sunset House	06-22-070-20-W5	00138884-01-00
Milner Power Limited Partnership	H.R. Milner thermal electric power plant	SE-15-058-08-W6	00009814-03-03
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
Pembina Pipeline Corporation	Kakwa River	08-13-063-05 W6	00335342-01-00
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	00011351-02-00
	Spirit River	08-34-077-06-W6	00011096-02-00
Strathcona Resources Ltd.	Jayar Sour Gas Processing Plant	06-08-062-03 W6	03612040-00-00
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:**

- One PM<sub>2.5</sub> 1hr readings above AAAQG (80 µg/m<sup>3</sup>) as follows:

Site	Reference Number	Date	From MST	To MST	Average (µg/m <sup>3</sup> )	WS km/hr	WD degrees
Henry Pirker	423459	Dec 31-2023	23:00	00:00	708.2	0.9	169

- One 24-hr reading above the daily PM<sub>2.5</sub> AAAQO (29 µg/m<sup>3</sup>) as follows:

Site	Reference Number	Date	Day average (µg/m <sup>3</sup> )	WS km/hr	WD degrees
Henry Pirker	423459	Dec 31-2023	43.2	3.9	246

**Operational times less than 90 percent:**

Poplar CH<sub>4</sub>/NMHC are not in operation.

All other instruments were in operation >90% during the month.

**Air Incidents**

None were reported.

**Deviations from Authorized Monitoring Methods**

None were reported.

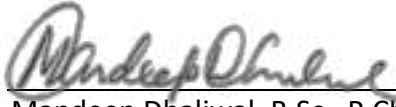
**Passive Monitoring**

- 52 Stations throughout the PAZA zone
  - Passive sample analyses were performed by Bureau Veritas Laboratories
- There were 20 duplicates sampled in the month of December.
  - Eight SO<sub>2</sub> duplicates located at Steeprock Creek, Spirit River, Jean Cote, Sunset House, Duvernay 3, Kakwa 2, Milner Wanyandie, Jayar5 Camp
  - RPD ranging from 0% to 44% (no fail)
  - Milner Wanyandie duplicate consisted of both less than detection (<0.1ppb)
- One O<sub>3</sub> duplicate located at Crooked Creek
  - RPD 2% (no fails)
- Seven NO<sub>2</sub> duplicates at Hythe, Sylvester, Guy, McLennan, Kakwa 4, Milner Powerline, Jayar1 Plant
  - RPD ranging from 0% to 25% (no fail)
  - Guy duplicate resulted in one sample at 1.7ppb and the other listed as damaged from the lab (no field notes indicating issues with this sample)
- Four H<sub>2</sub>S duplicates at Girouxville 4, Duvernay 3, Kakwa 1, Jayar4 7-8 or 8-8 Pad
  - RPD 11% to 33% (no fail)

**Dustfall Monitoring**

- Five Stations collected Total Dustfall and Fixed Dustfall
- There was one duplicate sampled collected for each in the month of December.
  - RPD ranged from 17% to 22%
- Total dustfall ranged from 30.3 to 84.0 mg/100cm<sup>2</sup>/30day.

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.



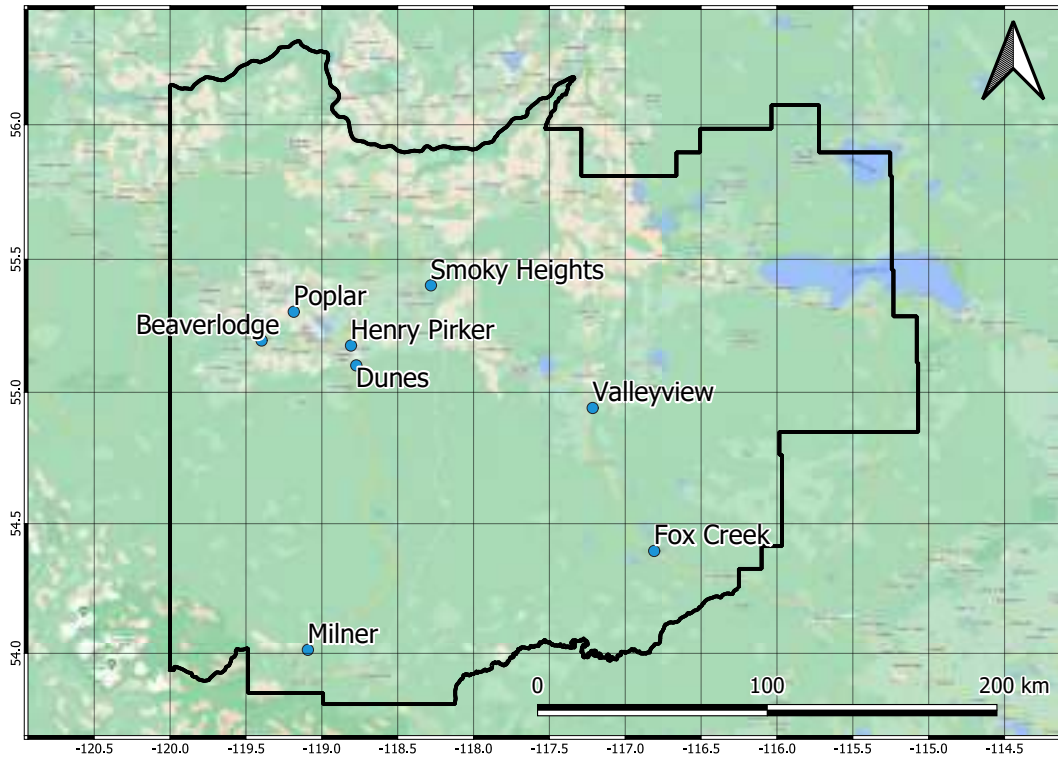
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Mandeep Dhaliwal, B.Sc., P.Chem.  
Program Manager

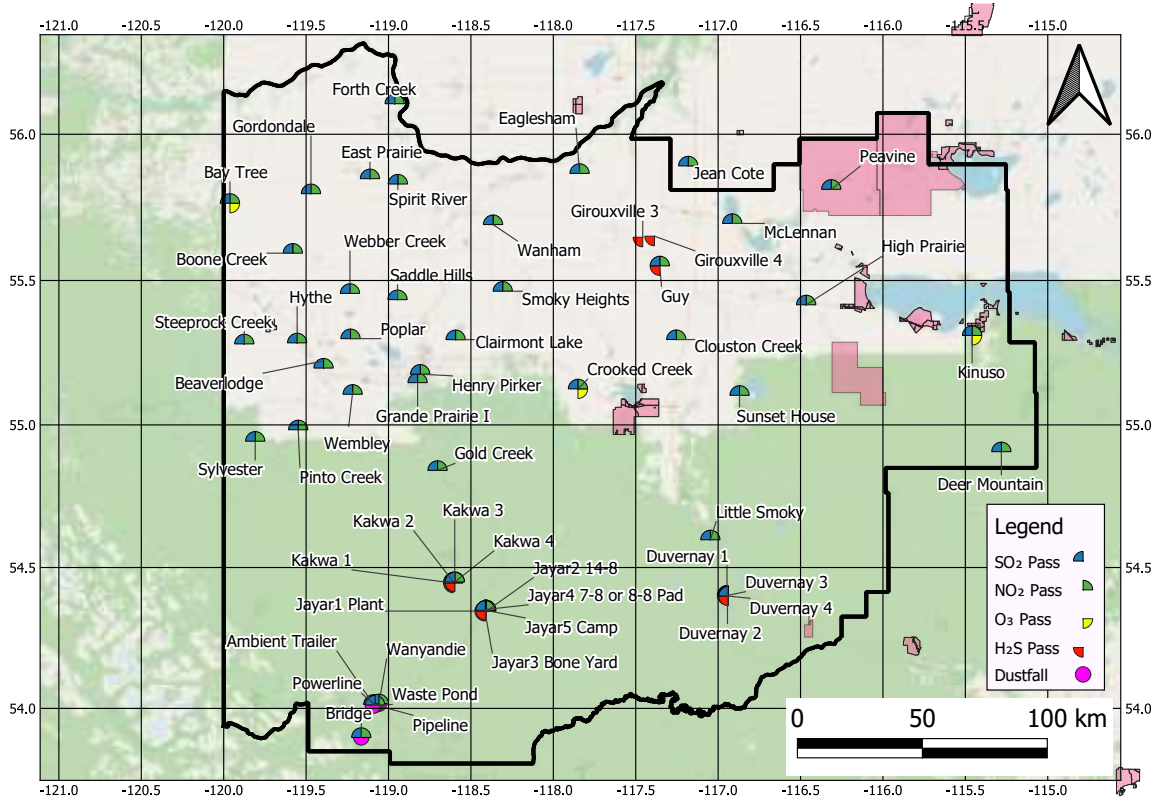
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## PAZA Continuous Monitoring Station Locations



## PAZA Passive Monitoring Station Locations



# 1 December 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 - December 2023 Beaverlodge Station Report

Parameter	December					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		
NO (ppb)	1.7	0.0	95.2%	100.0%	43.4	-	Dec-03 10:00	9.8	-	Dec-29	-	-	-	-	Dec 05, 2023	
NO <sub>2</sub> (ppb)	7.0	0.3	95.2%	100.0%	26.5	150	Dec-09 19:00	16.4	-	Dec-29	0	-	-	-	Dec 05, 2023	
NO <sub>x</sub> (ppb)	8.7	0.4	95.2%	100.0%	60.7	-	Dec-03 10:00	26.3	-	Dec-29	-	-	-	-	Dec 05, 2023	
O <sub>3</sub> (ppb)	22.5	0.0	95.3%	100.0%	41.4	78	Dec-11 22:00	35.6	-	Dec-25	0	-	-	-	Dec 05, 2023	
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	3.5	0.0	96.6%	97.2%	27.9	80	Dec-12 21:00	10.8	25	Dec-30	0	-	0	-	Dec 04, 2023	
SO <sub>2</sub> (ppb)	0.6	0.0	95.0%	99.7%	10.0	172	Dec-22 09:00	2.4	48	Dec-21	0	-	0	0	Dec 04, 2023	
<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>												
Temp (°C)	-2.5	-14.7	95.3%	95.3%	9.5	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Note:</b> Valid hours must be greater than 75%                      Operational hours must be greater than 90%                 </div> <div style="border: 1px solid black; padding: 5px;"> <b>Average Wind Direction</b>      261      W                 </div>										
RH (%)	65.1	27.2	100.0%	100.0%	98.0											
WS (km/hr)	6.6	0.3	100.0%	100.0%	43.2											
WD (deg)	241	0.5	100.0%	100.0%	299.7											

**Update Summary:**

Parameter	Make	Model	Equipment summary
NO <sub>x</sub> /NO <sub>2</sub> /NO	Thermo	42IQ	No Operational issues noted
O <sub>3</sub>	Thermo	49HQ	No Operational issues noted
PM <sub>2.5</sub>	API	T640	Firmware update Dec 4 cal to Dec 5 (21hrs listed as maintenance), data adjustment made from Dec 1 to 4
SO <sub>2</sub>	Thermo	43-TLE	Dec 5 dropped flow in manifold during calibration of O <sub>3</sub> and NO <sub>x</sub> resulted in readings that were removed (2hrs)
Met Equip	MetOne	50.5	For ET, daily drop starting Aug 9, removed every day 04:21-04:45 (31hrs); Dec 4 extreme data shifts (4hrs removed)

## 1.2 Dunes Air Monitoring Station

PAZA - December 2023 Dunes Station Report

Parameter	December					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 <sub>2.5</sub> (µg/m <sup>3</sup> )	4.0	0.0	99.7%	100.0%	44.0	80	Dec-05 02:00	15.6	25	Dec-01	0	-	0	-	Dec-08-2023	
SO <sub>2</sub> (ppb)	0.3	0.0	95.5%	100.0%	4.9	172	Dec-22 14:00	0.8	48	Dec-31	0	-	0	0	Dec-08-2023	
THS (ppb)	0.5	0.0	95.3%	100.0%	4.8	-	Dec-08 10:00	1.3	-	Dec-18	-	-	-	-	Dec-08-2023	
<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>												
Temp (°C)	-5.4	-16.0	100.0%	100.0%	9.1	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Note:</b> Valid hours must be greater than 75%                      Operational hours must be greater than 90%                 </div> <div style="border: 1px solid black; padding: 5px;"> <b>Average Wind Direction</b>      239      WSW                 </div>										
RH (%)	77.8	30.8	100.0%	100.0%	99.8											
WS (km/hr)	2.0	0.0	100.0%	100.0%	11.2											
WD (deg)	239	0.9	100.0%	100.0%	393.5											

**Update Summary:**

Parameter	Make	Model	Equipment summary
PM <sub>2.5</sub>	Thermo	SHARP 5030	No Operational issues noted
SO <sub>2</sub>	Thermo	43i	No Operational Issues noted
THS	Thermo	43i	No Operational issues noted
Met Equip	Gill/VMYoung	MetPak/VMY85004	No Operational issues noted



### 1.3 Grande Prairie - Henry Pirker Air Monitoring Station

PAZA - December 2023 Henry Pirker Station Report

Parameter	December				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)	23.1	0.0	95.2%	100.0%	201.8	-	Jan-01 00:00	51.8	-	Dec-21	-	-	-	-	Dec 04, 2023	
NO <sub>2</sub> (ppb)	19.0	1.7	95.2%	100.0%	44.4	150	Jan-01 00:00	32.4	-	Dec-12	0	-	-	-	Dec 04, 2023	
NO <sub>x</sub> (ppb)	42.3	1.8	95.2%	100.0%	246.5	-	Jan-01 00:00	83.1	-	Dec-12	-	-	-	-	Dec 04, 2023	
O <sub>3</sub> (ppb)	10.1	0.1	95.3%	100.0%	40.1	78	Dec-28 21:00	27.0	-	Dec-19	0	-	-	-	Dec 04, 2023	
PM <sub>10</sub> (µg/m <sup>3</sup> )	10.1	0.2	99.7%	95.9%	708.2	80	Jan-01 00:00	48.2	25	Dec-31	1	-	1	-	Dec 05, 2023	
SO <sub>2</sub> (ppb)	0.6	0.0	95.3%	100.0%	7.8	172	Dec-13 12:00	1.5	48	Dec-25	0	-	0	0	Dec 05, 2023	
H <sub>2</sub> S (ppb)	0.5	0.0	95.3%	100.0%	3.3	38	Jan-01 00:00	1.0	3	Dec-12	0	-	0	-	Dec 05, 2023	
CH <sub>4</sub> (ppm)	2.4	2.0	95.3%	100.0%	3.8	-	Dec-15 12:00	2.9	-	Dec-12	-	-	-	-	Dec 01, 2023	
THC (ppm)	2.4	2.0	95.3%	100.0%	3.8	-	Dec-15 12:00	2.9	-	Dec-12	-	-	-	-	Dec 01, 2023	
NMHC (ppm)	0.0	0.0	95.3%	100.0%	0.7	-	Jan-01 00:00	0.1	-	Dec-21	-	-	-	-	Dec 01, 2023	
CO (ppm)	0.4	0.1	95.3%	100.0%	2.2	37	Jan-01 00:00	0.5	5	Dec-12	0	0	-	-	Dec 01, 2023	
<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>												
Temp (°C)	-4.4	-14.8	100.0%	100.0%	11.3	<div style="border: 1px solid black; padding: 5px;">                     Note: Valid hours must be greater than 75%                      Operational hours must be greater than 60%                 </div>										
RH (%)	70.4	41.2	100.0%	100.0%	86.0											
SR (W/m <sup>2</sup> )	17.0	0.0	100.0%	100.0%	187.5	<div style="border: 1px solid black; padding: 5px;">                     Average Wind Direction: 248 WSW                 </div>										
WS (km/hr)	3.7	0.2	100.0%	100.0%	21.4											
WD (deg)	248	0.1	100.0%	100.0%	359.6											

**Update Summary:**

Parameter	Make	Model	Equipment summary
NO/NO <sub>2</sub> /NO <sub>x</sub>	Thermo	42i	No operational issues
O <sub>3</sub>	TECO	49i	No operational issues
PM <sub>10</sub>	API	T640	Dec 8 firmware update (for maintenance), data adjustment made from Dec 1 to 8; elevated PM2.5 Dec 31 midnight due to fireworks, exceed hourly AAQGS and 24hr AAQGS
SO <sub>2</sub>	Thermo	43i-TLE	No operational issues
H <sub>2</sub> S	TEI	45Di	No operational issues
THC/CH <sub>4</sub> /NMHC	TEI	55i	Dec 27 loss of THC <10min; Hydrogen cylinder replaced during calibration
CO	Thermo	48i-TLE	No operational issues
Met Equip	MetOne	50.5	No operational issues

### 1.4 Smoky Heights Air Monitoring Station

PAZA - December 2023 Smoky Heights Station Report

Parameter	December				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 <sub>10</sub> (µg/m <sup>3</sup> )	5.1	0.0	93.6%	100.0%	38.5	80	Dec-01 07:00	21.2	29	Dec-01	0	-	0	-	Dec 11, 2023	
SO <sub>2</sub> (ppb)	0.5	0.0	94.8%	100.0%	3.4	172	Dec-12 18:00	0.6	48	Dec-14	0	-	0	0	Dec 11, 2023	
TRS (ppb)	0.2	0.0	95.3%	100.0%	1.1	-	Dec-30 15:00	0.5	-	Dec-30	-	-	-	-	Dec 11, 2023	
<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>												
Temp (°C)	-4.6	-17.7	100.0%	100.0%	9.0	<div style="border: 1px solid black; padding: 5px;">                     Note: Valid hours must be greater than 75%                      Operational hours must be greater than 50%                 </div>										
WS (km/hr)	10.1	0.4	100.0%	100.0%	44.1											
WD (deg)	238	0.1	100.0%	100.0%	359.7	<div style="border: 1px solid black; padding: 5px;">                     Average Wind Direction: 238 WNW                 </div>										

**Update Summary:**

Parameter	Make	Model	Equipment summary
PM <sub>10</sub>	Sharp	1030	No Operational issues noted during the month
SO <sub>2</sub>	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 - December 2023 Valleyview Station Report

Parameter	December				1-hour			24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	5hr	24hr	30d	
SO <sub>2</sub> (ppb)	0.1	0.0	93.3%	100.0%	0.5	172	Dec-30 19:00	0.1	48	Dec-30	0	-	0	0	Dec 11, 2023
H <sub>2</sub> S (ppb)	0.1	0.0	93.3%	100.0%	0.5	38	Dec-31 20:00	0.2	3	Dec-28	0	-	0	-	Dec 11, 2023
	<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>										
Temp (°C)	-4.3	-17.6	100.0%	100.0%	10.3	<b>Note:</b> Valid hours must be greater than 75% Operational hours must be greater than 50%									
RH (%)	79.8	35.6	100.0%	100.0%	98.2										
WS (km/hr)	2.9	0.1	100.0%	100.0%	15.0	<b>Average Wind Direction</b> 237 MW									
WD (deg)	197	1.9	100.0%	100.0%	356.1										

**Update Summary:**

Parameter	Make	Model	Equipment summary
SO <sub>2</sub>	TEI	43-AF5CB	No Operational issues noted
H <sub>2</sub> S	TEI	450-AP4AA / 43C	No Operational issues noted
Mkt Equip	RMYoung	RMY06004	No Operational issues noted

## 1.6 Fox Creek Air Monitoring Station

PAZA - December 2023 Fox Creek Station Report

Parameter	December				1-hour			5-hour / 24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	5hr	24hr	30d	
NO (ppb)	14.6	0.0	93.0%	100.0%	152.9	-	Dec-12 12:00	30.8	-	Dec-12	-	-	-	-	Dec 13, 2023
NO <sub>x</sub> (ppb)	13.0	0.2	93.0%	100.0%	45.0	159	Dec-12 12:00	25.3	-	Dec-12	0	-	-	-	Dec 13, 2023
NO <sub>y</sub> (ppb)	27.9	0.3	93.0%	100.0%	197.3	-	Dec-12 12:00	65.4	-	Dec-12	-	-	-	-	Dec 13, 2023
O <sub>3</sub> (ppb)	15.7	0.0	93.3%	100.0%	40.0	78	Dec-13 11:00	51.3	-	Dec-15	0	-	-	-	Dec 13, 2023
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	3.0	0.2	99.6%	99.9%	18.0	80	Dec-13 08:00	7.2	25	Dec-01	0	-	0	-	Dec 14, 2023
NO <sub>2</sub> (ppb)	0.6	0.0	87.4%	91.8%	29.0	172	Dec-12 08:00	2.2	46	Dec-12	0	-	0	0	Dec 14, 2023
H <sub>2</sub> S (ppb)	0.2	0.0	93.3%	100.0%	1.3	38	Dec-12 12:00	0.5	3	Dec-12	0	-	0	-	Dec 14, 2023
	<b>Average</b>	<b>Minimum</b>	<b>Valid</b>	<b>Operational</b>	<b>Maximum</b>										
Temp (°C)	-1.8	-16.5	100.0%	100.0%	13.7	<b>Note:</b> Valid hours must be greater than 75% Operational hours must be greater than 50%									
WS (km/hr)	5.0	0.1	100.0%	100.0%	18.1										
WD (deg)	179	1.1	100.0%	100.0%	351.8	<b>Average Wind Direction</b> 179 S									

**Update Summary:**

Parameter	Make	Model	Equipment summary
NO/NO <sub>2</sub> /NO <sub>x</sub>	Thermo	42IQ	No operational issues
O <sub>3</sub>	TECO	49I	No operational issues
PM <sub>2.5</sub>	API	T640	Dec 6 firmware update (1hr maintenance), data adjustment made from Dec 1 to 6
SO <sub>2</sub>	TEI	43I-TLE	Data invalidated between Dec 28 span to maintenance on Dec 21, 56 hours removed with 5 hours maintenance
H <sub>2</sub> S	TEI	450i	No operational issues
Mkt Equip	MelDrex	50.5	No operational issues

## 1.7 Poplar Air Monitoring Station

PAZA - December 2023 Poplar Station Report

Parameter	December				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	
NO (ppb)	2.1	0.0	94.9%	100.0%	24.3	-	Dec-02 08:00	9.2	-	Dec-02	-	-	-	-	Dec 07, 2023
NO <sub>2</sub> (ppb)	8.2	0.3	94.9%	100.0%	26.0	150	Dec-22 00:00	16.0	-	Dec-03	0	-	-	-	Dec 07, 2023
NO <sub>x</sub> (ppb)	10.4	0.4	94.9%	100.0%	41.8	-	Dec-20 13:00	23.3	-	Dec-02	-	-	-	-	Dec 07, 2023
O <sub>3</sub> (ppb)	19.3	0.1	93.3%	100.0%	43.0	78	Dec-22 15:00	36.2	-	Dec-25	0	-	-	-	Dec 07, 2023
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	4.7	0.1	99.6%	99.9%	41.7	80	Dec-15 07:00	18.3	29	Dec-15	0	-	0	-	Dec 07, 2023
SO <sub>2</sub> (ppb)	3.3	0.0	95.0%	100.0%	58.0	172	Dec-18 15:00	5.5	48	Dec-10	0	-	0	0	Dec 07, 2023
THS (ppb)	3.0	0.2	95.3%	100.0%	10.0	-	Dec-01 18:00	1.7	-	Dec-01	-	-	-	-	Dec 06, 2023
CH <sub>4</sub> (ppm)	removed Dec 12, 2022														
THC (ppm)	2.5	1.9	95.3%	100.0%	3.6	-	Dec-02 07:00	3.1	-	Dec-02	-	-	-	-	Dec 06, 2023
NVHC (ppm)	removed Dec 12, 2022														
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	-4.7	-17.1	100.0%	100.0%	7.5										
WS (km/hr)	8.8	0.2	100.0%	100.0%	43.8										
WD (deg)	277	0.4	100.0%	100.0%	357.0										

Note: Valid hours must be greater than 75%  
Operational hours must be greater than 50%

Average Wind Direction: 277 W

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO <sub>2</sub> /NO <sub>x</sub>	TEI	421	No issues noted
O <sub>3</sub>	TEI	491	No issues noted
PM <sub>2.5</sub>	API	T640	Dec 5 firmware update (1hr maintenance), data adjustment made from Dec 1 to 5
SO <sub>2</sub>	TEI	431	No issues noted
THS	TEI	431	No issues noted
THC	TEI	551 / 511-LT	No issues noted
Met Equip	MetOne	50.5	No issues noted

## 1.8 Milner Air Monitoring Station

PAZA - December 2023 Milner Station Report

Parameter	December				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	
NO (ppb)	0.6	0.0	95.0%	100.0%	24.0	-	Dec-20 09:00	5.5	-	Dec-20	-	-	-	-	Dec 17, 2023
NO <sub>2</sub> (ppb)	3.0	0.0	95.0%	100.0%	23.5	150	Dec-01 18:00	15.3	-	Dec-01	0	-	-	-	Dec 17, 2023
NO <sub>x</sub> (ppb)	4.6	0.0	95.0%	100.0%	40.5	-	Dec-01 20:00	22.2	-	Dec-01	-	-	-	-	Dec 17, 2023
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	2.5	0.1	99.3%	99.7%	23.6	80	Dec-22 09:00	7.0	29	Dec-24	0	-	0	-	Dec 17, 2023
	Average	Minimum	Valid	Operational	Maximum										
WS (km/hr)	7.4	0.0	100.0%	100.0%	36.2										
WD (deg)	284	0.1	100.0%	100.0%	393.0										

Note: Valid hours must be greater than 75%  
Operational hours must be greater than 50%

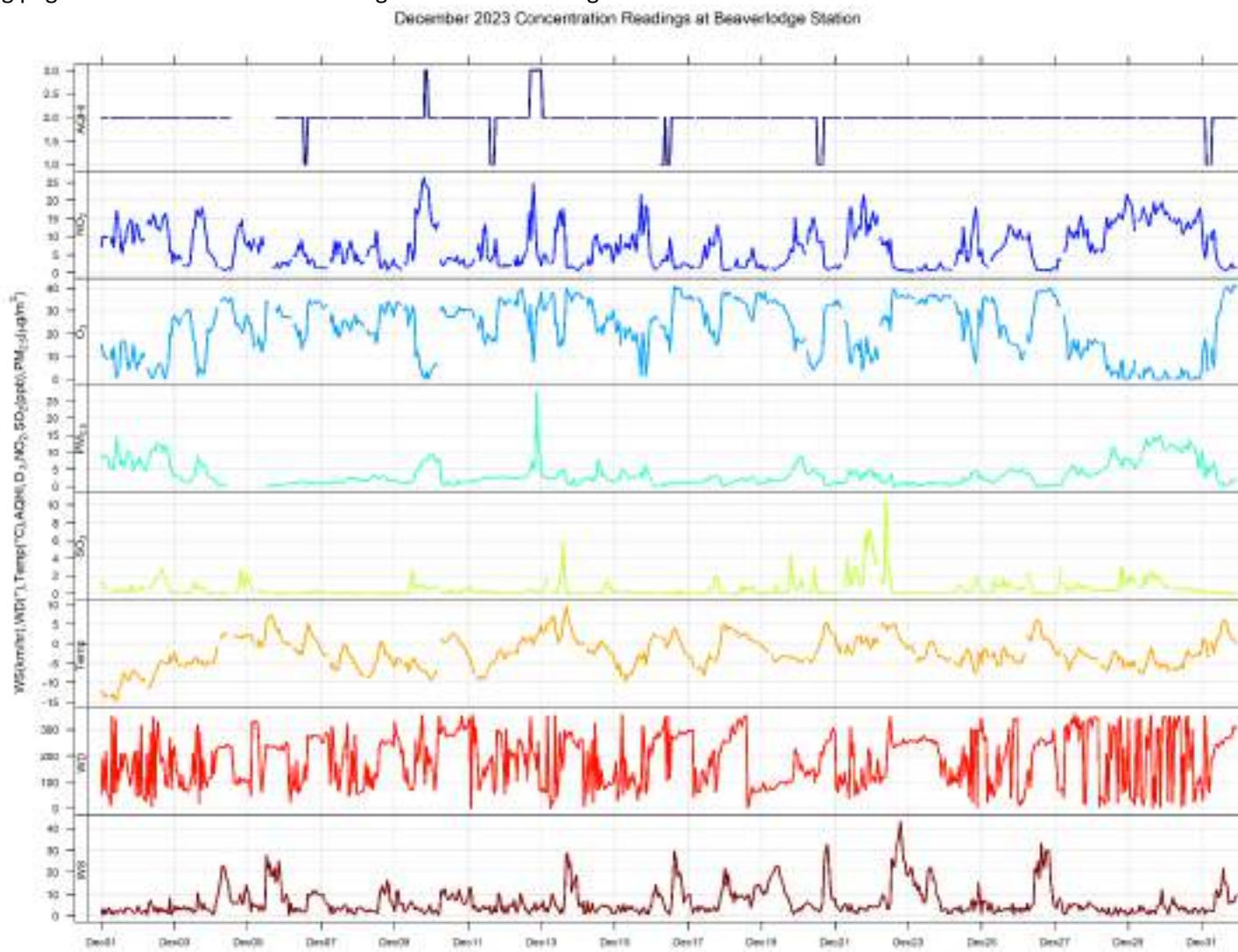
Average Wind Direction: 284 W

Update Summary:

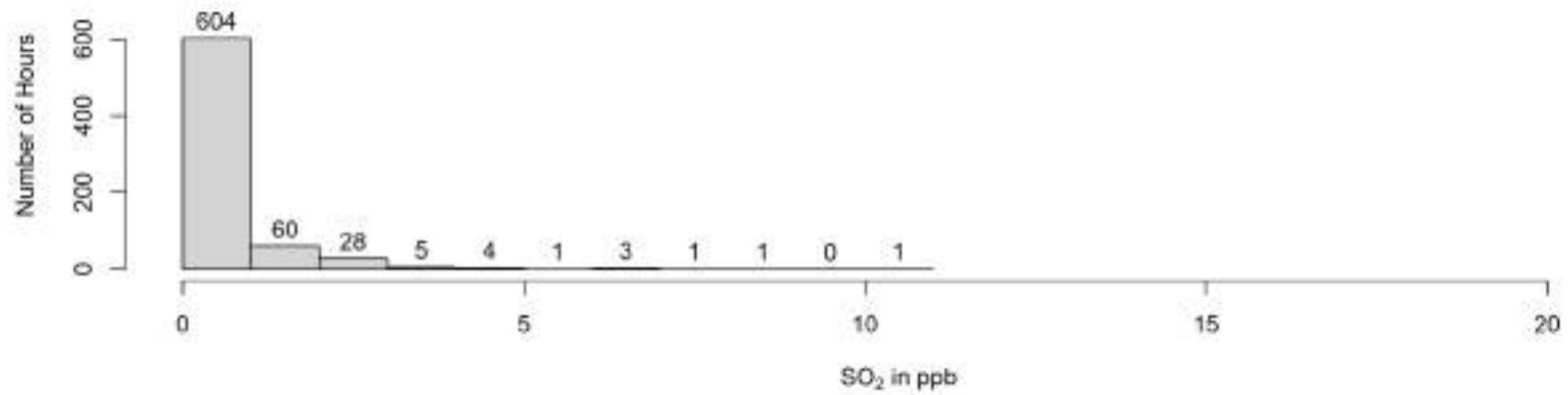
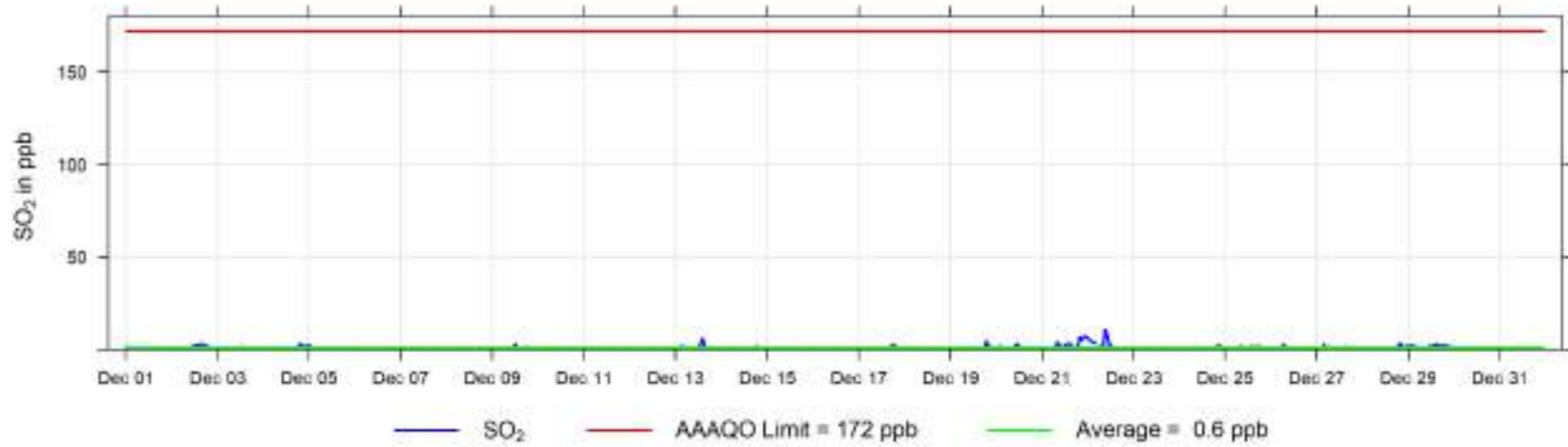
Parameter	Make	Model	Equipment summary
NO/NO <sub>2</sub> /NO <sub>x</sub>	Thermo	421	Analyzer issue with automatic zero, calibration good, data analyzed using calibrator zero
PM <sub>2.5</sub>	API	T640	Dec 8 firmware update (2hrs maintenance), data adjustment made from Dec 1 to 8
Met Equip	MetOne	50.5	No Operational issues noted

## 2 Beaverlodge Charts

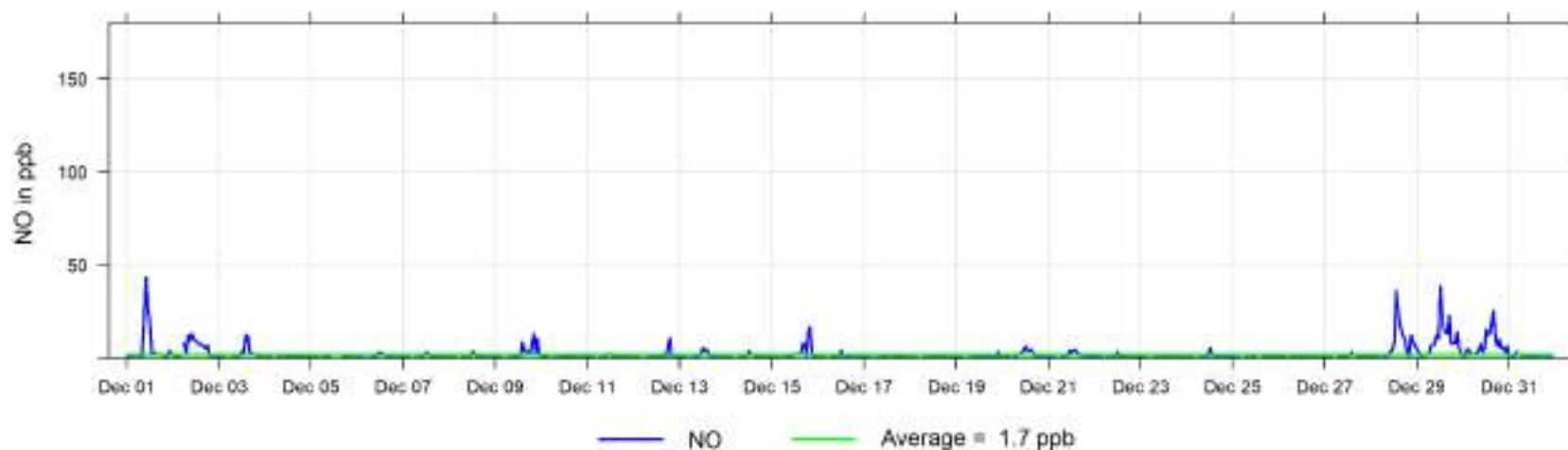
The following pages include the charts and histograms for Beaverlodge Station



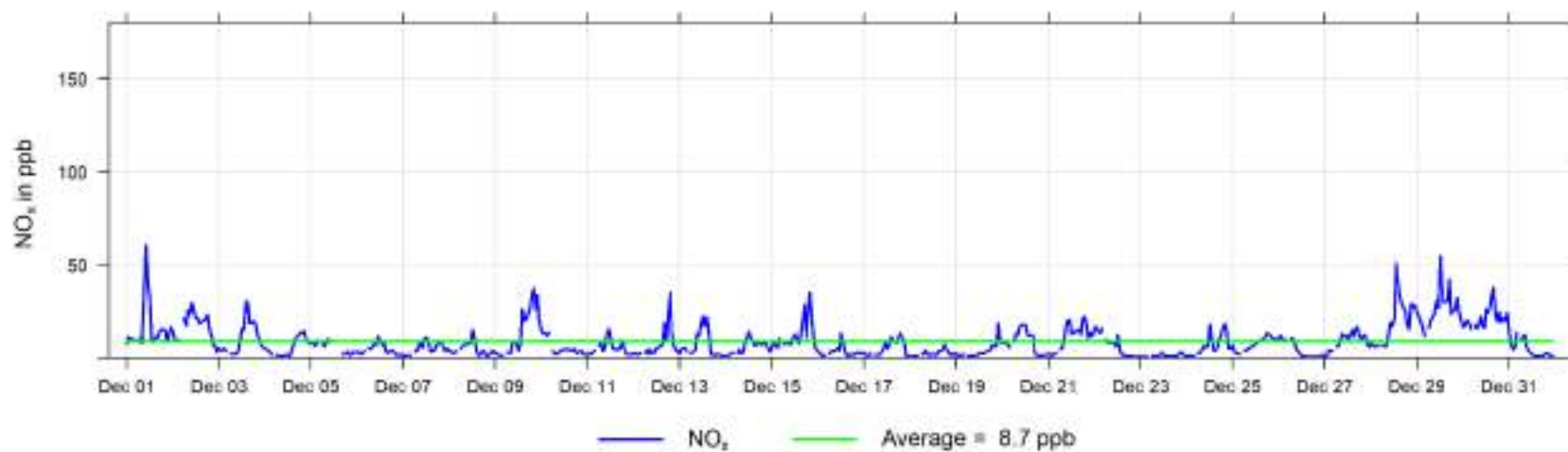
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Beaverlodge



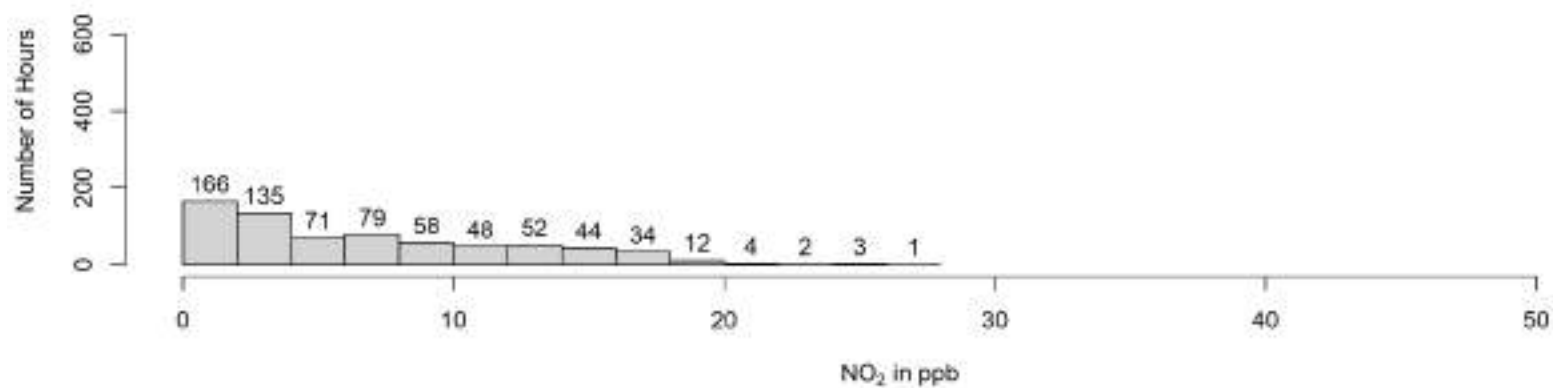
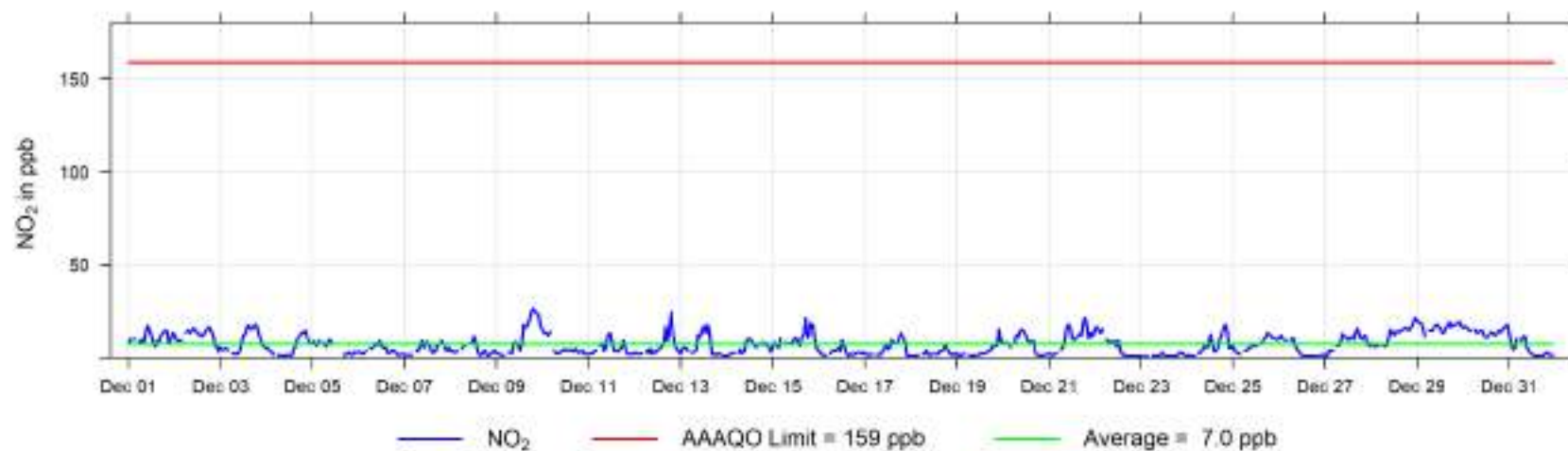
December 2023 Hourly Concentration Readings of NO (in ppb) at Beaverlodge



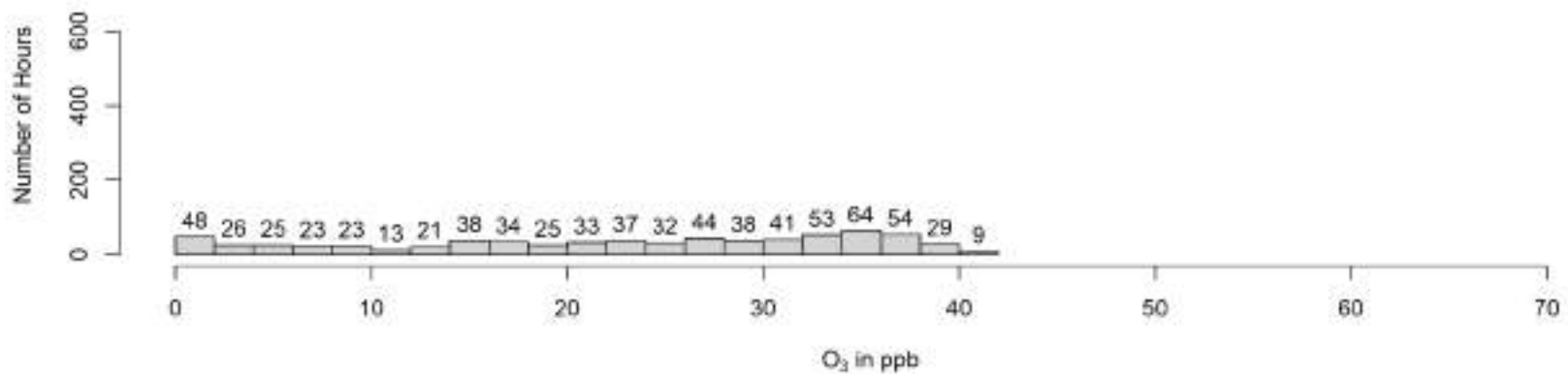
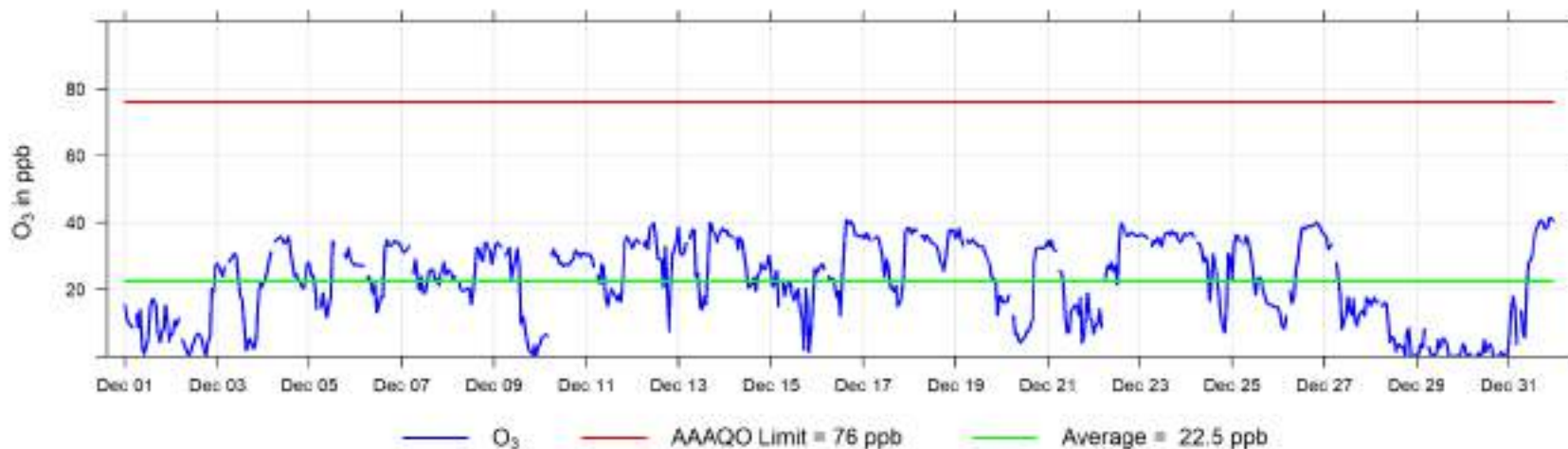
December 2023 Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Beaverlodge



December 2023 Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Beaverlodge

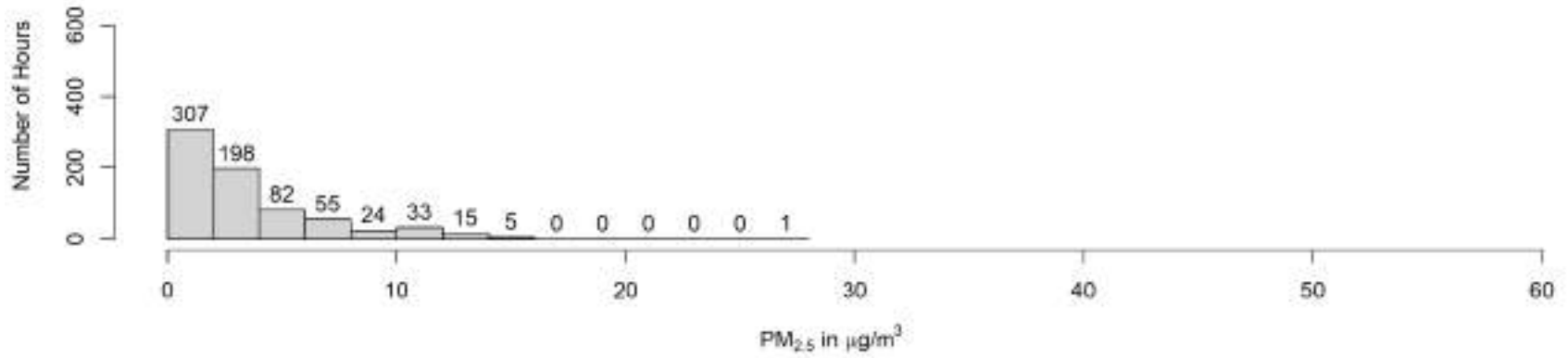
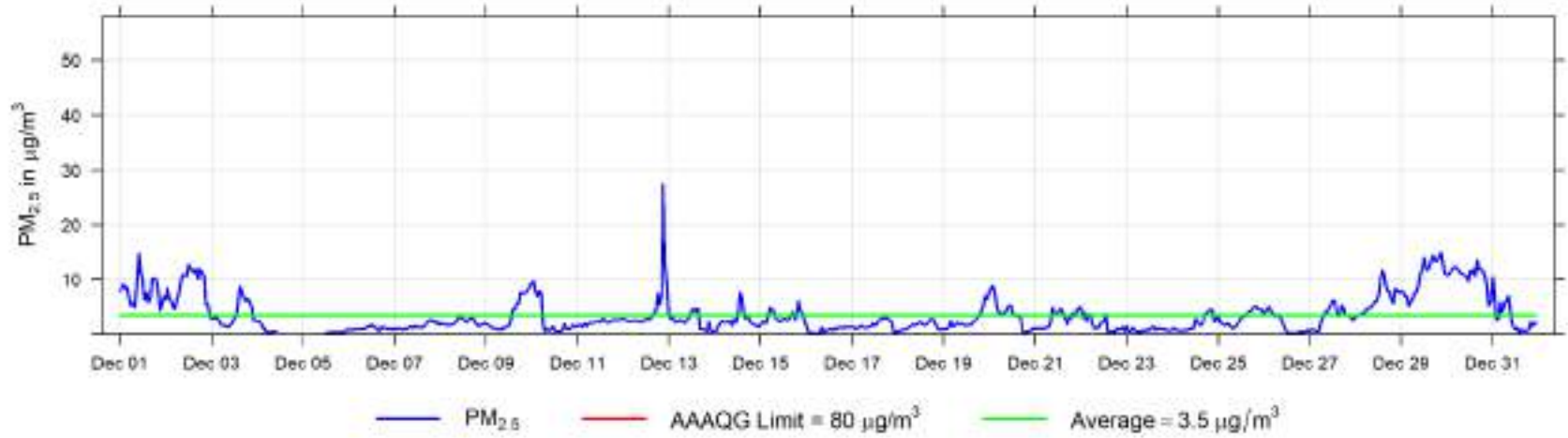


December 2023 Hourly Concentration Readings of O<sub>3</sub> (in ppb) at Beaverlodge

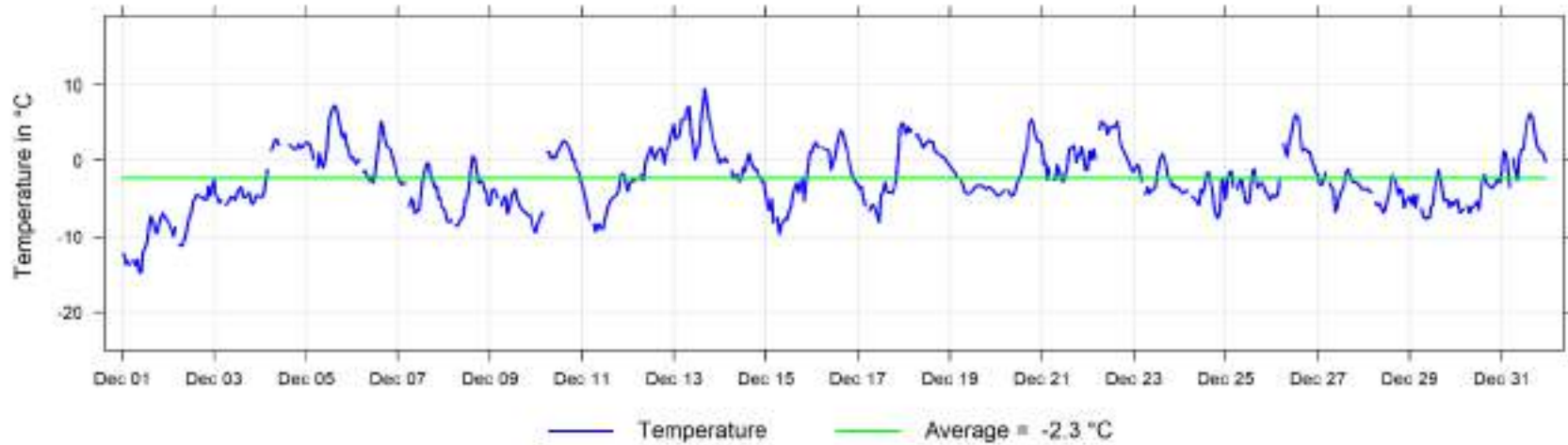




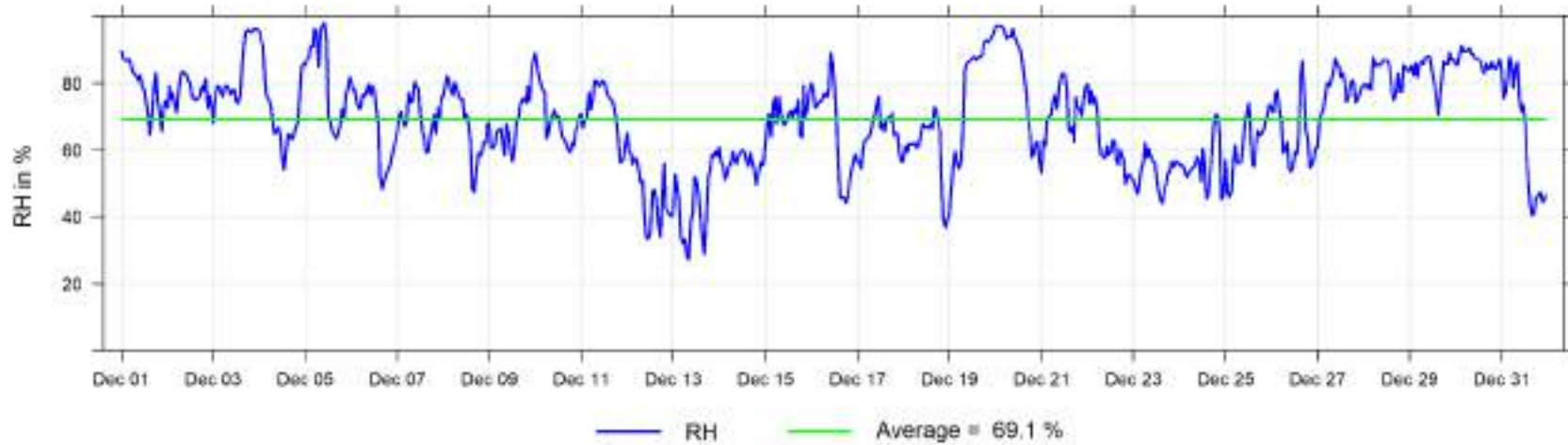
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Beaverlodge



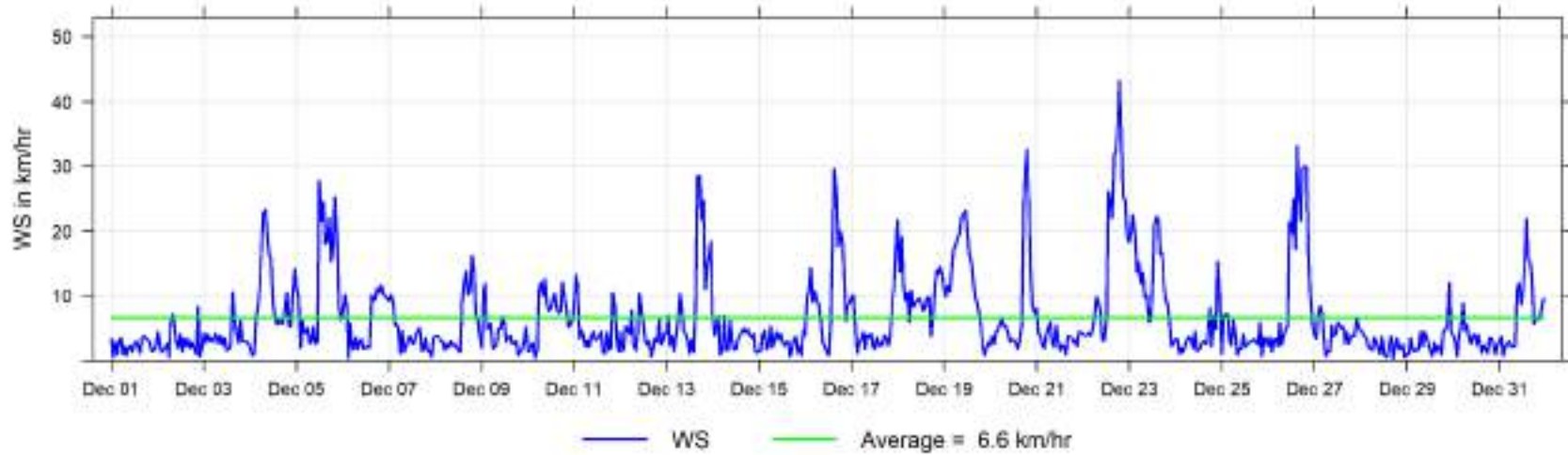
December 2023 Hourly Temperature Readings (in °C) at Beaverlodge



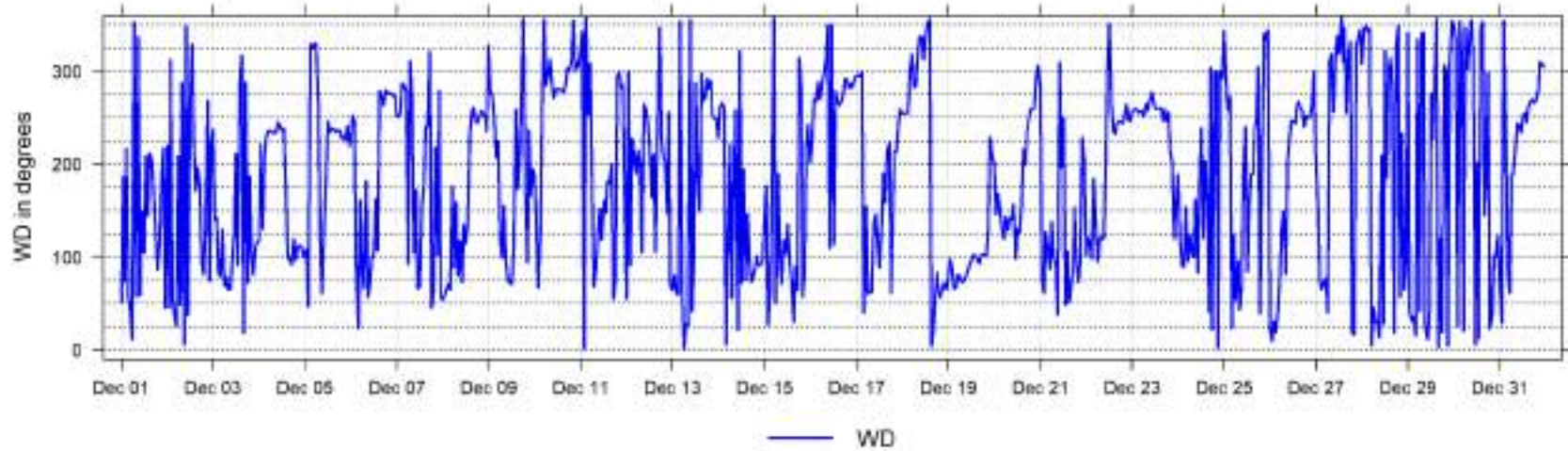
December 2023 Hourly Readings of Relative Humidity (in %) at Beaverlodge



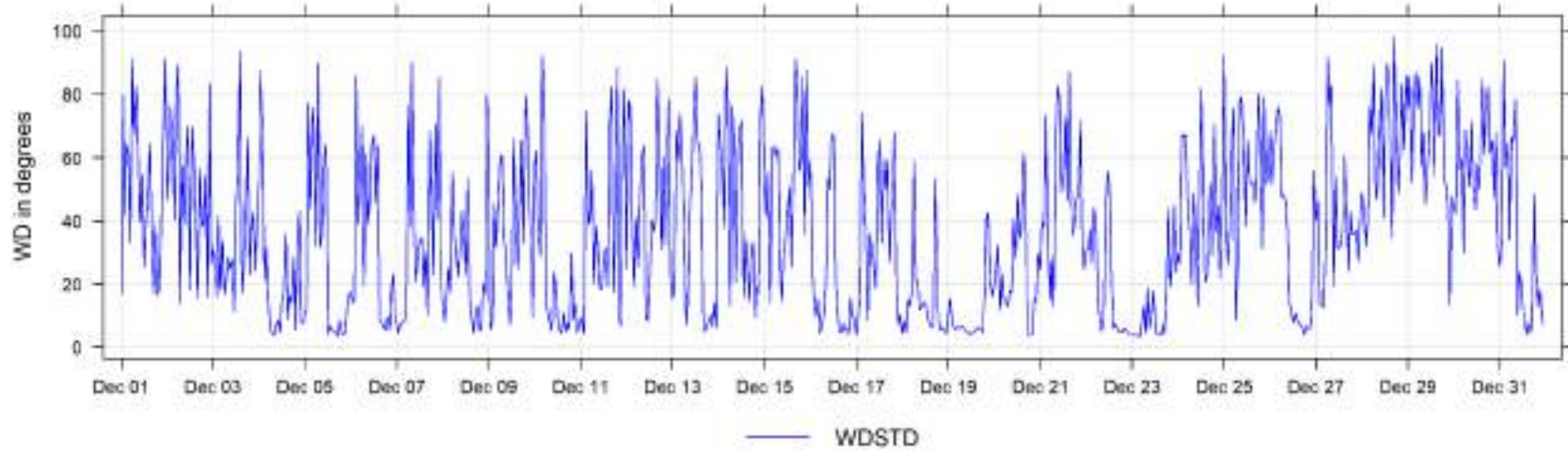
December 2023 Hourly Readings of Wind Speed (in km/hr) at Beaverlodge

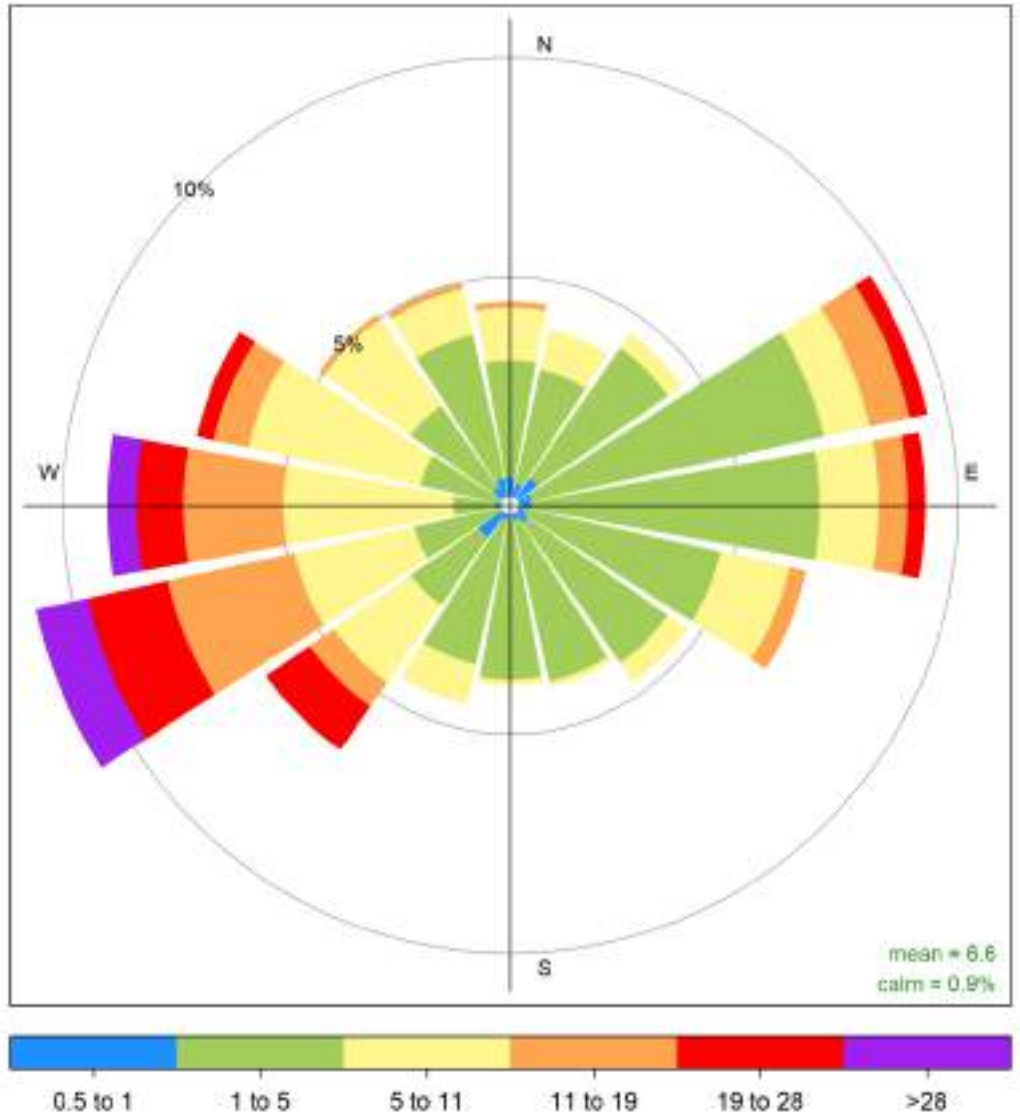


December 2023 Hourly Readings of Wind Direction (in degrees) at Beaverlodge



December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Beaverlodge

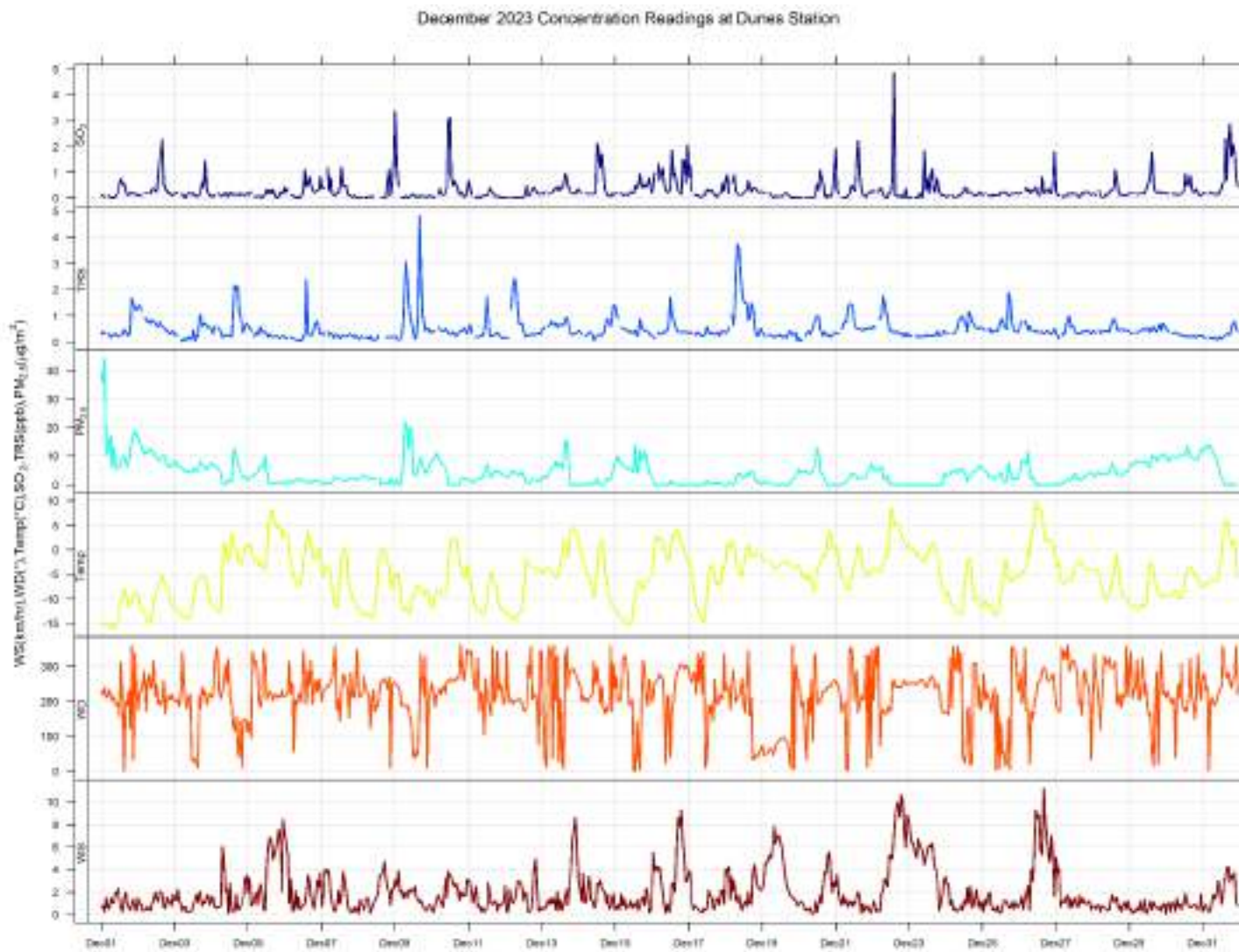




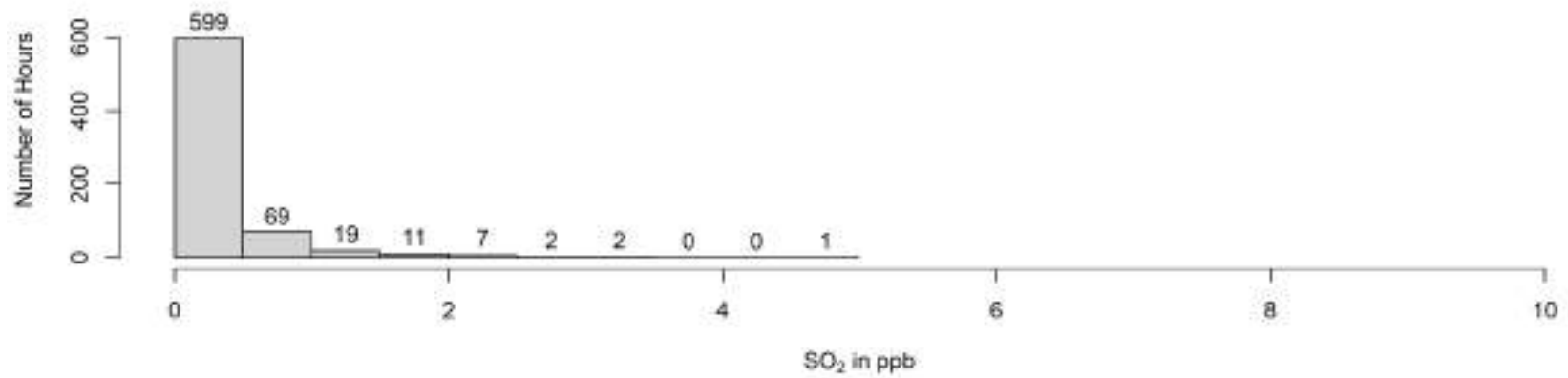
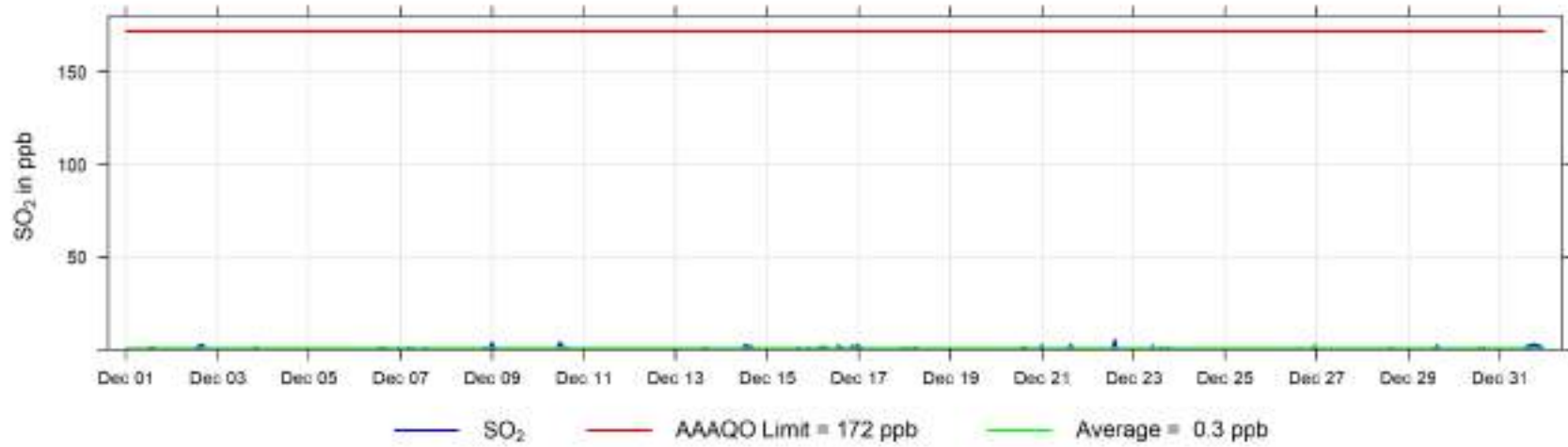
Beaverlodge December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

### 3 Dunes Charts

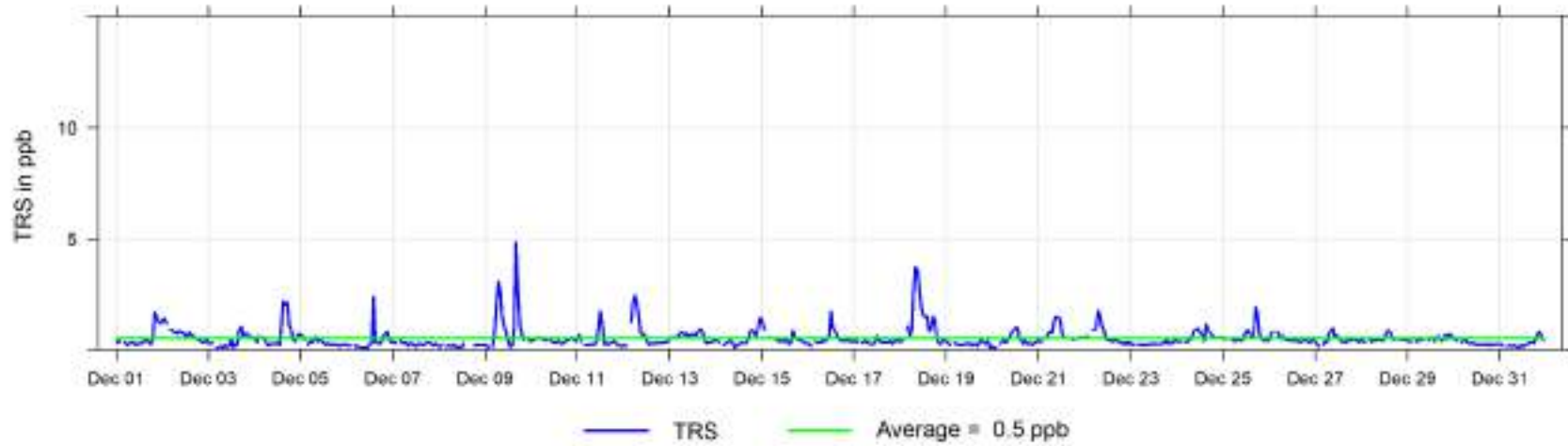
The following pages include the charts and histograms for Dunes Station



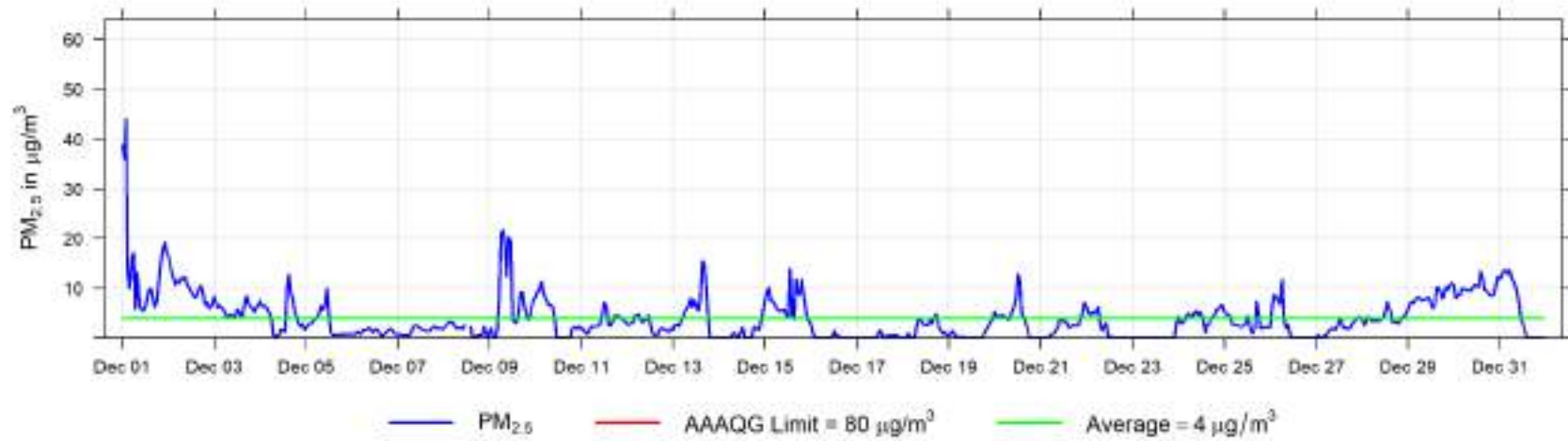
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Dunes



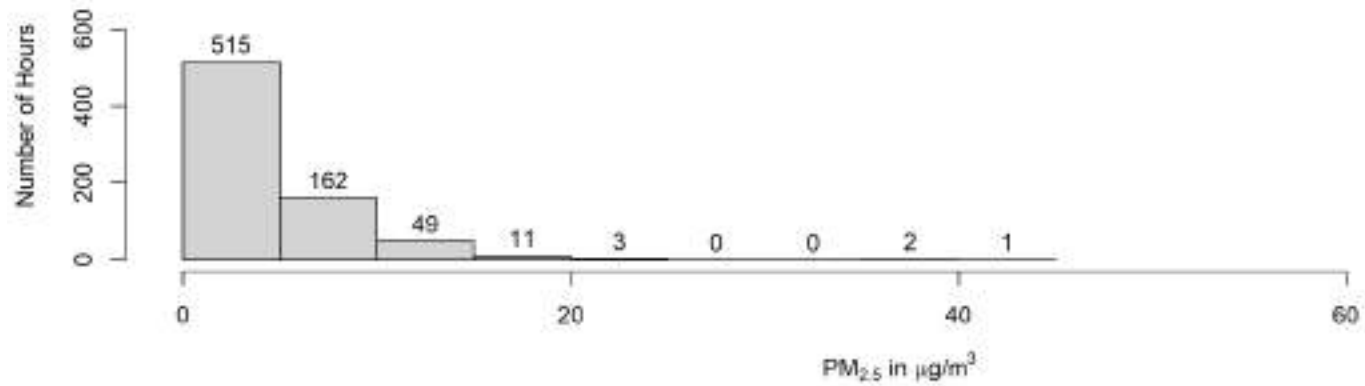
December 2023 Hourly Concentration Readings of TRS (in ppb) at Dunes



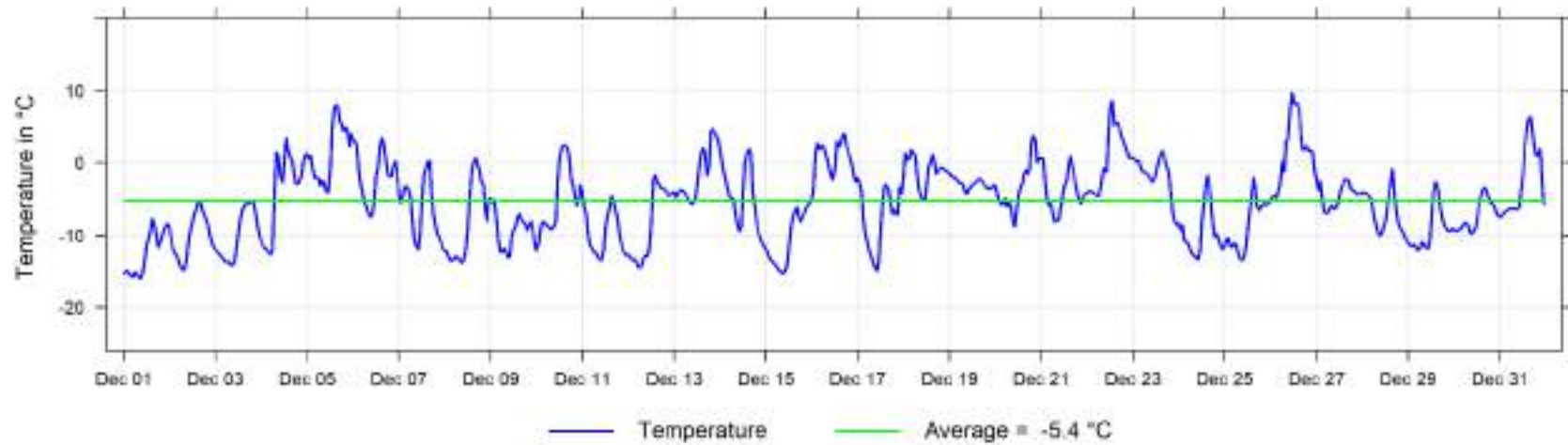
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Dunes



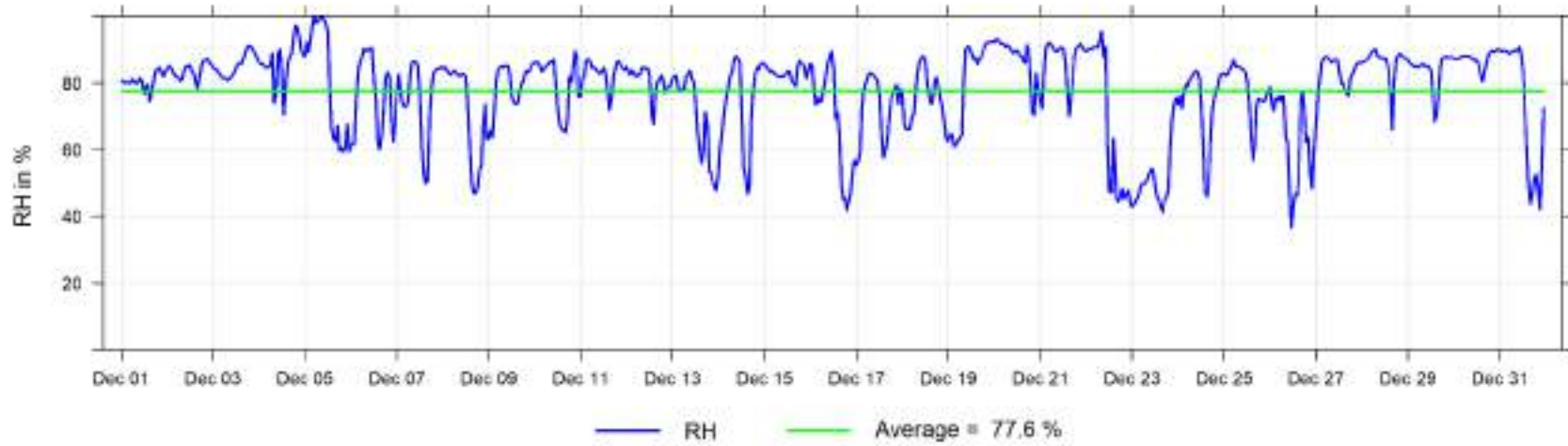




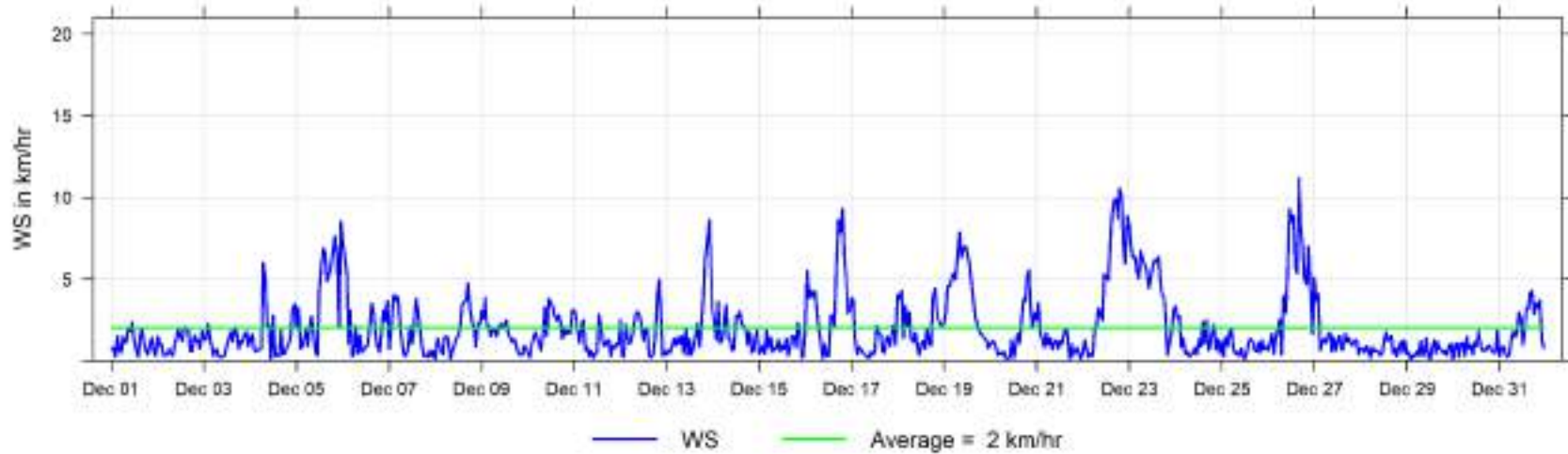
December 2023 Hourly Temperature Readings (in °C) at Dunes



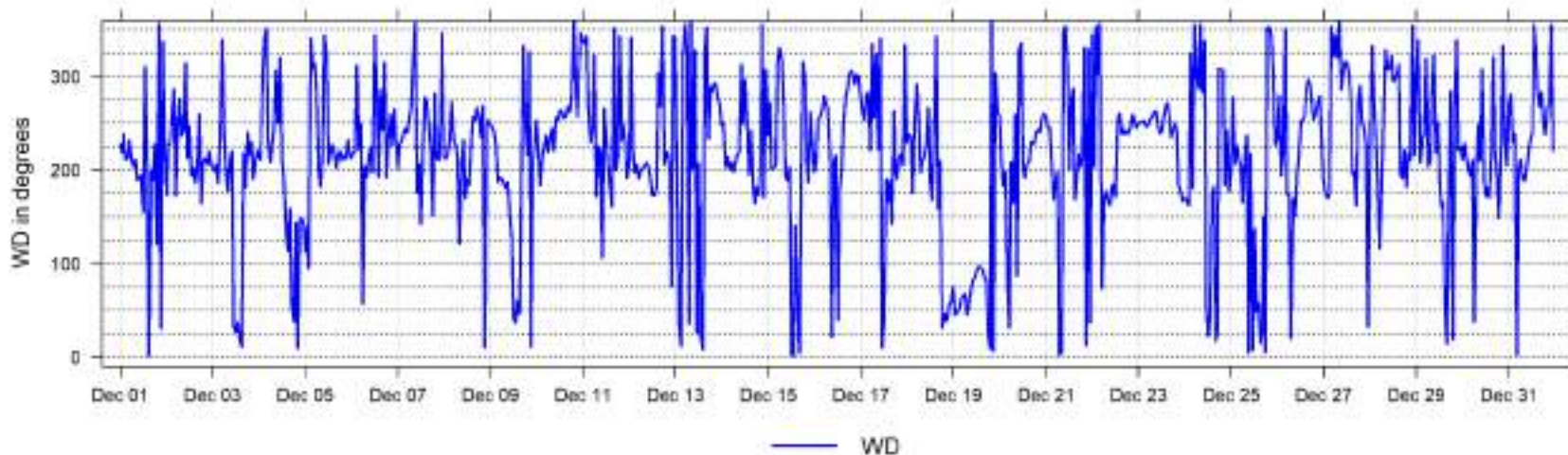
December 2023 Hourly Readings of Relative Humidity (in %) at Dunes



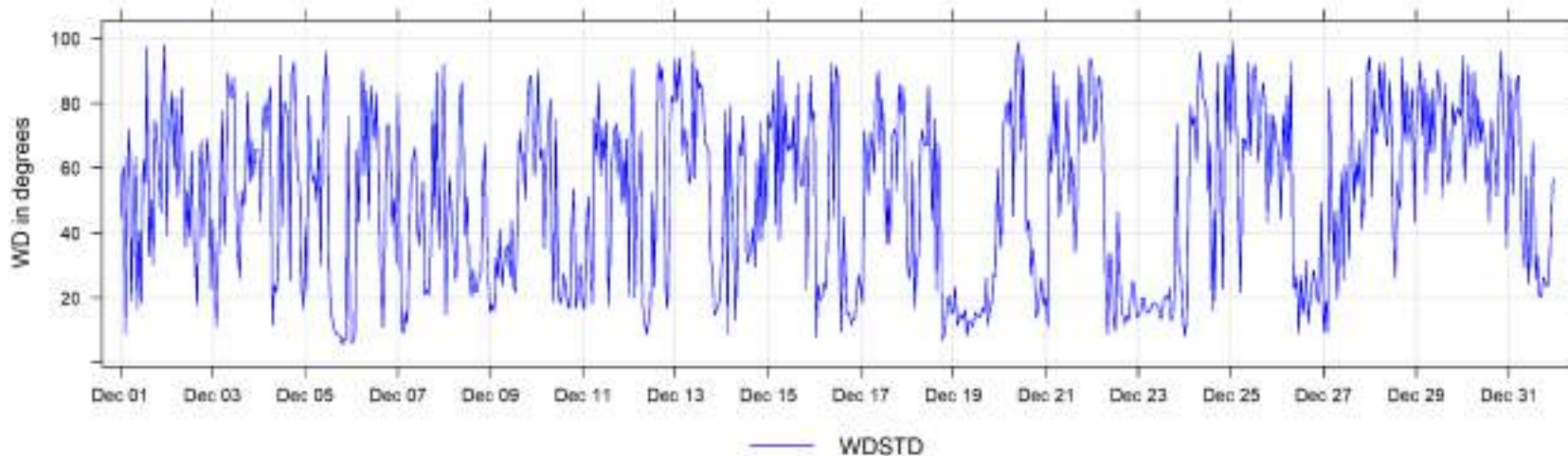
December 2023 Hourly Readings of Wind Speed (in km/hr) at Dunes

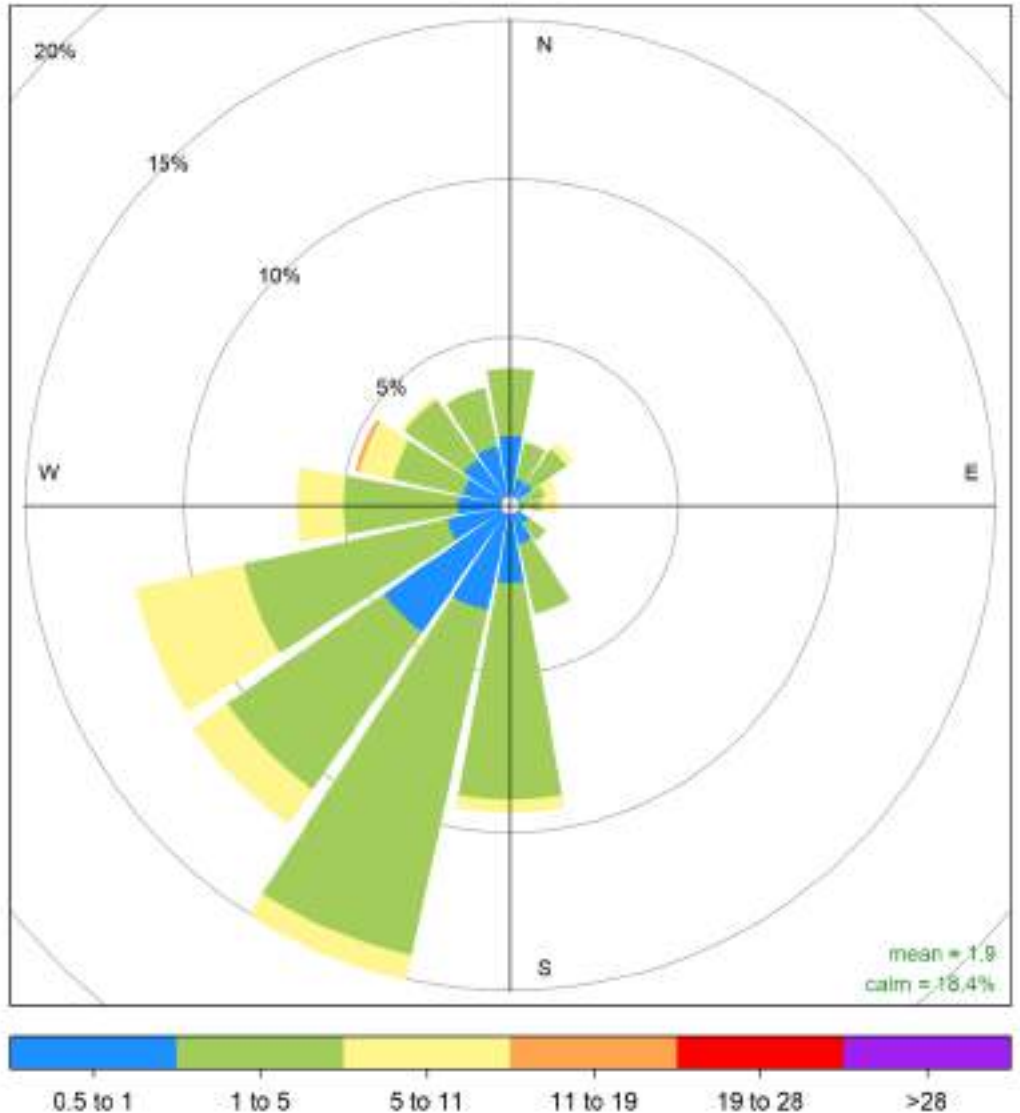


**December 2023 Hourly Readings of Wind Direction (in degrees) at Dunes**



**December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Dunes**



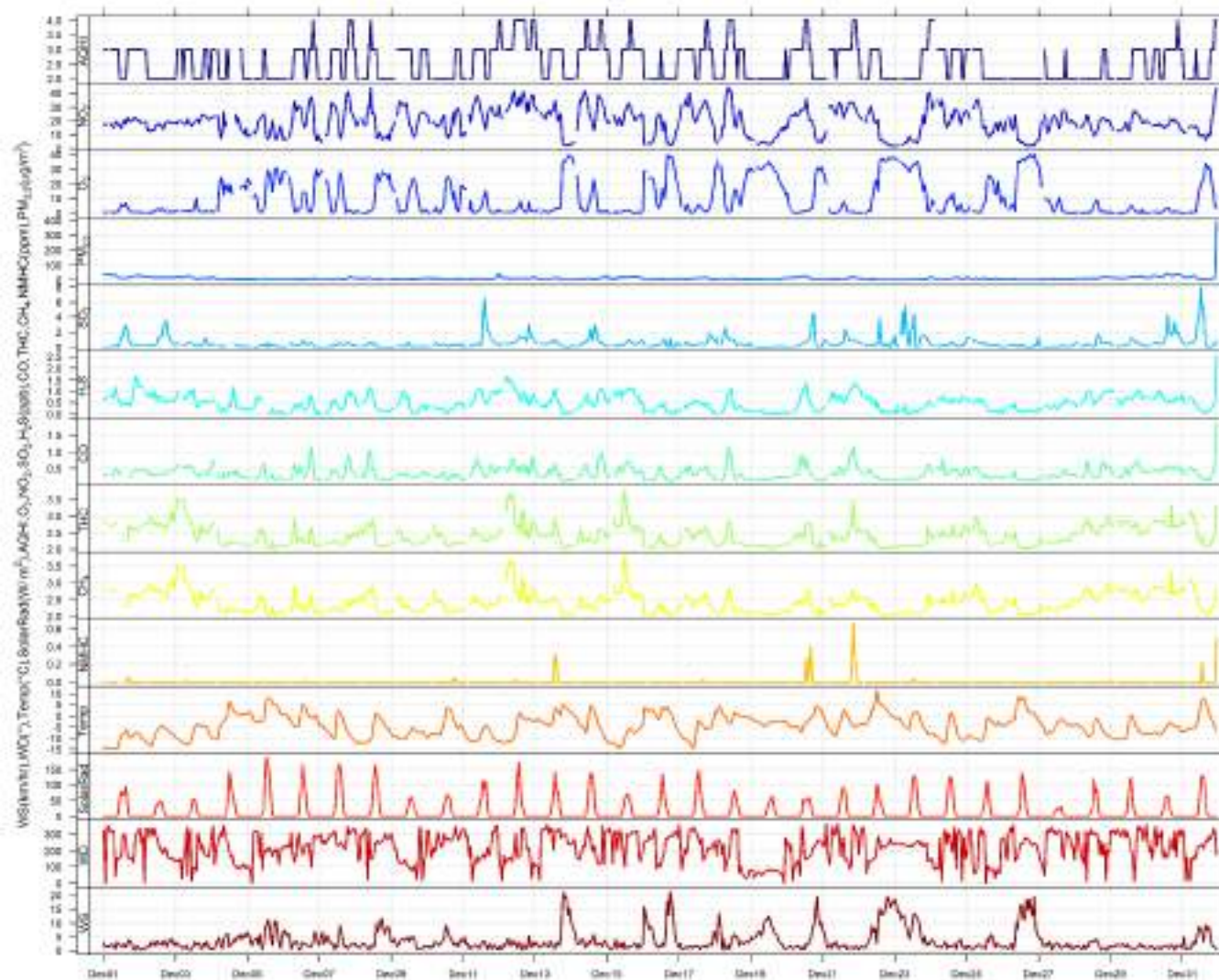


Dunes December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

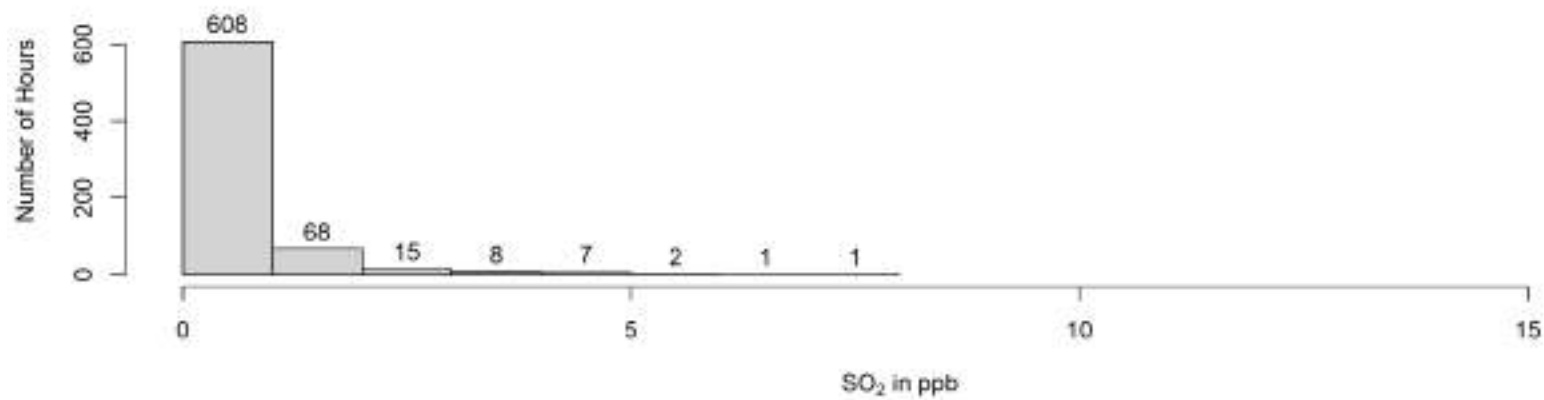
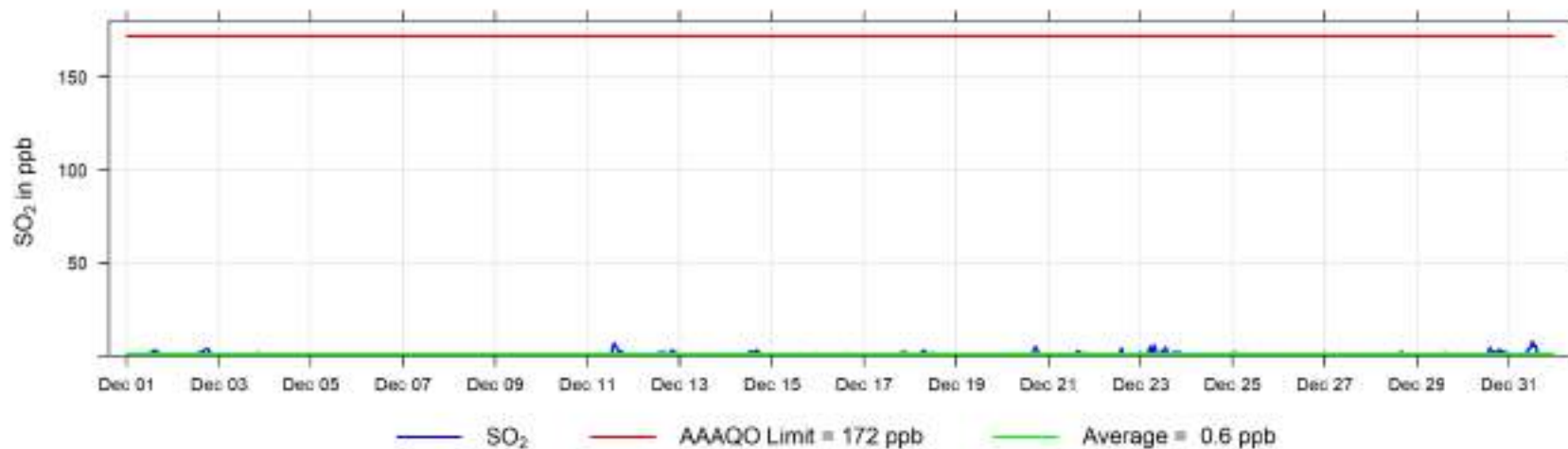
## 4 Grande Prairie - Henry Pirker Charts

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

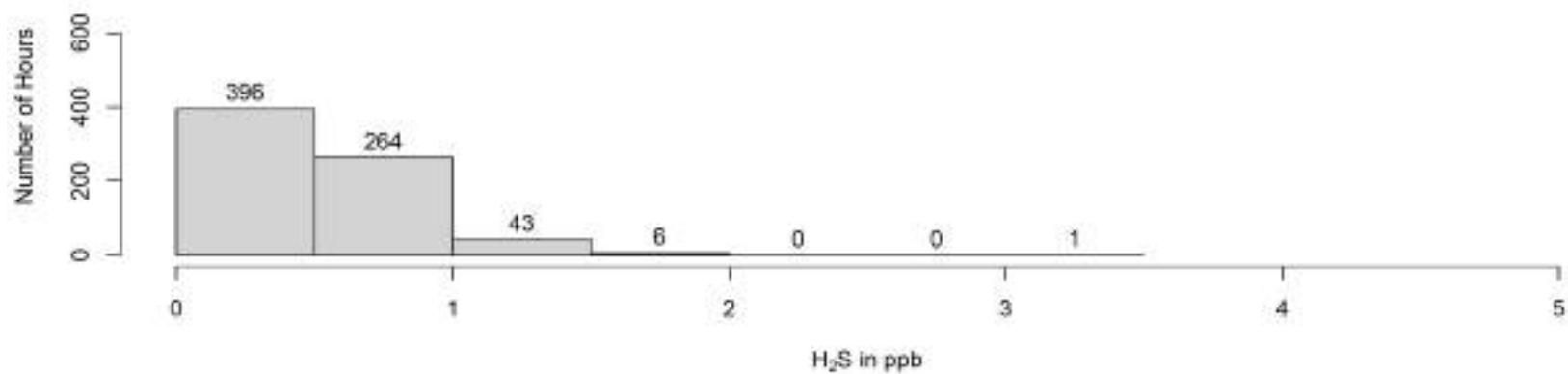
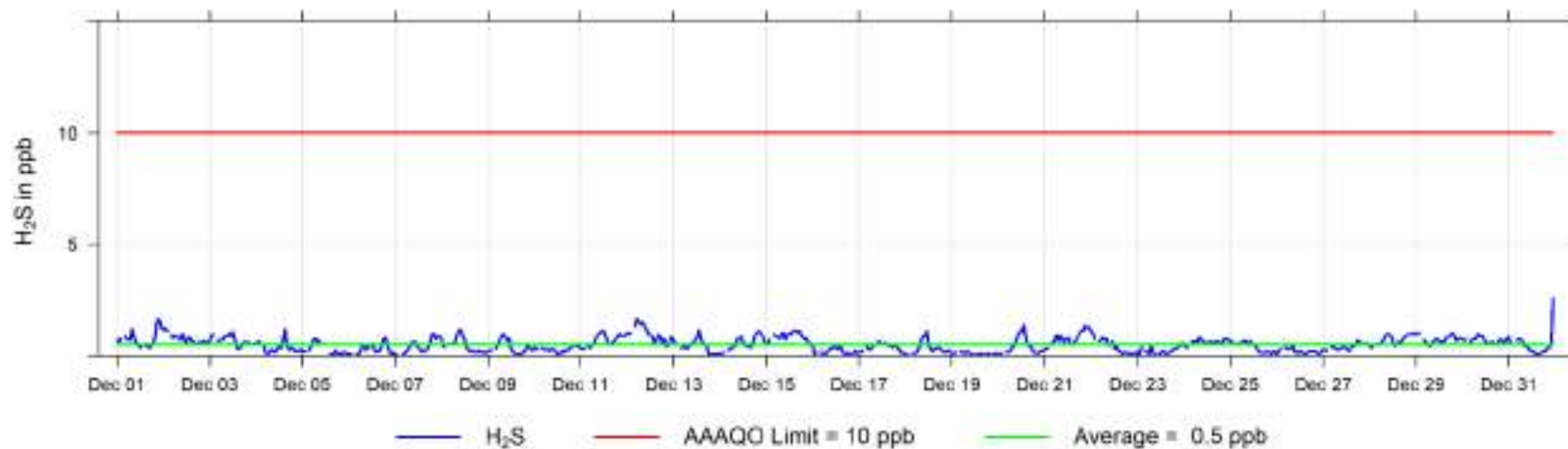
December 2023 Concentration Readings at Henry Pirker Station



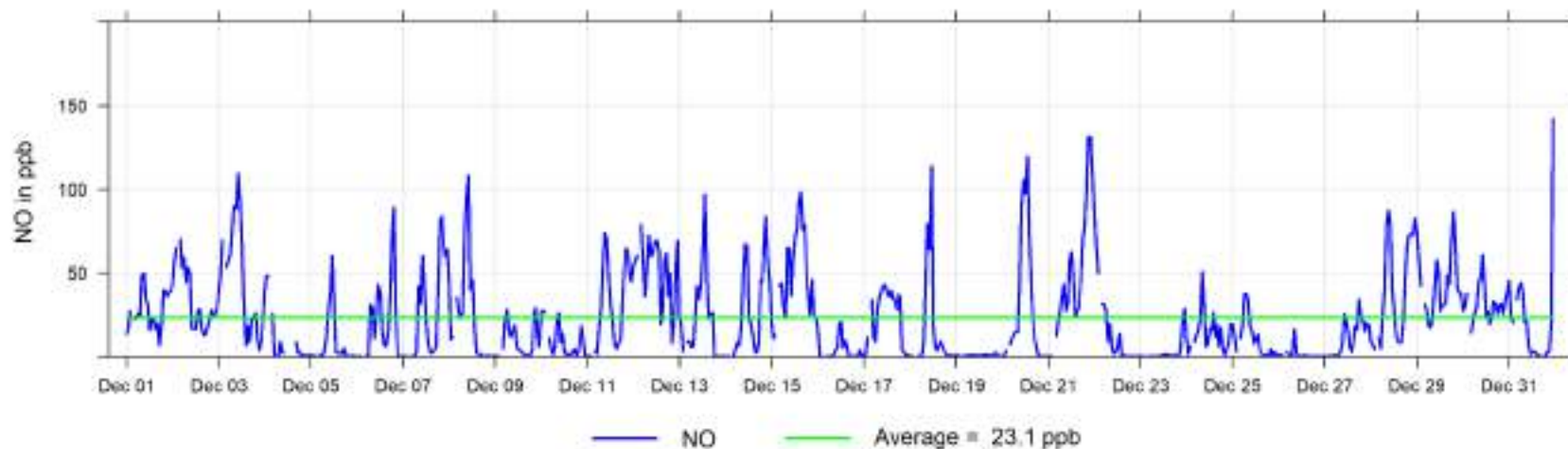
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Henry Pirker



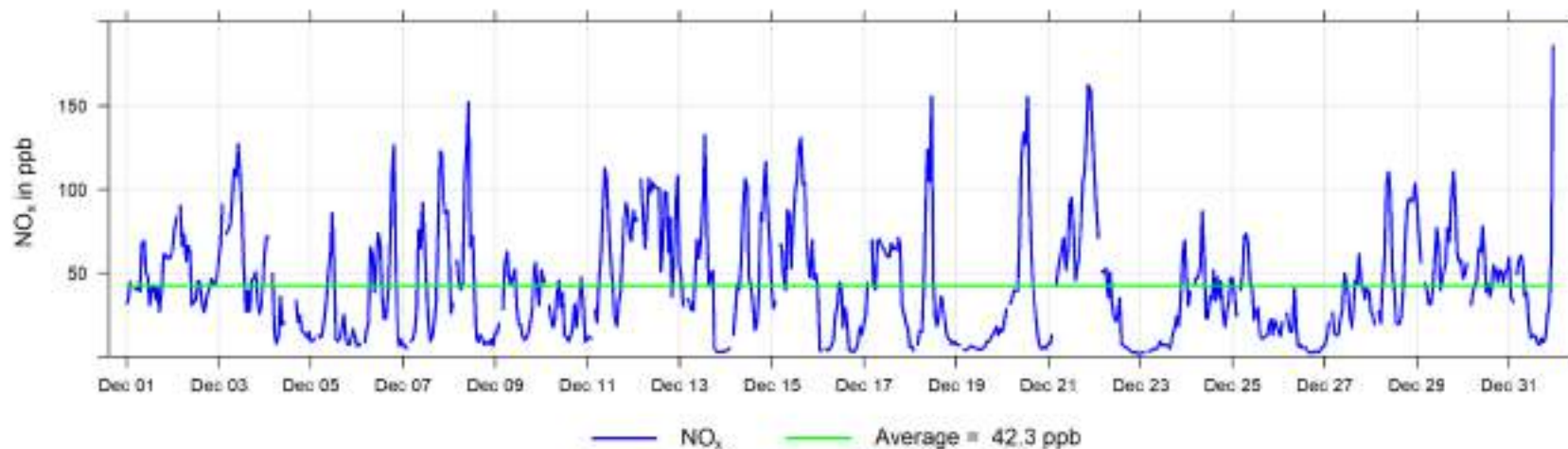
December 2023 Hourly Concentration Readings of H<sub>2</sub>S (in ppb) at Henry Pirker



December 2023 Hourly Concentration Readings of NO (in ppb) at Henry Pirker

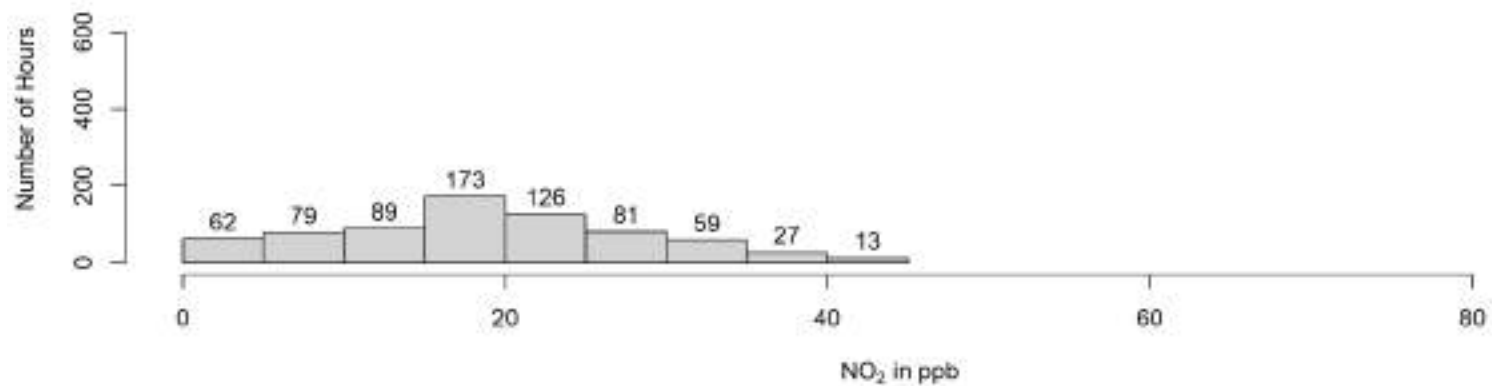
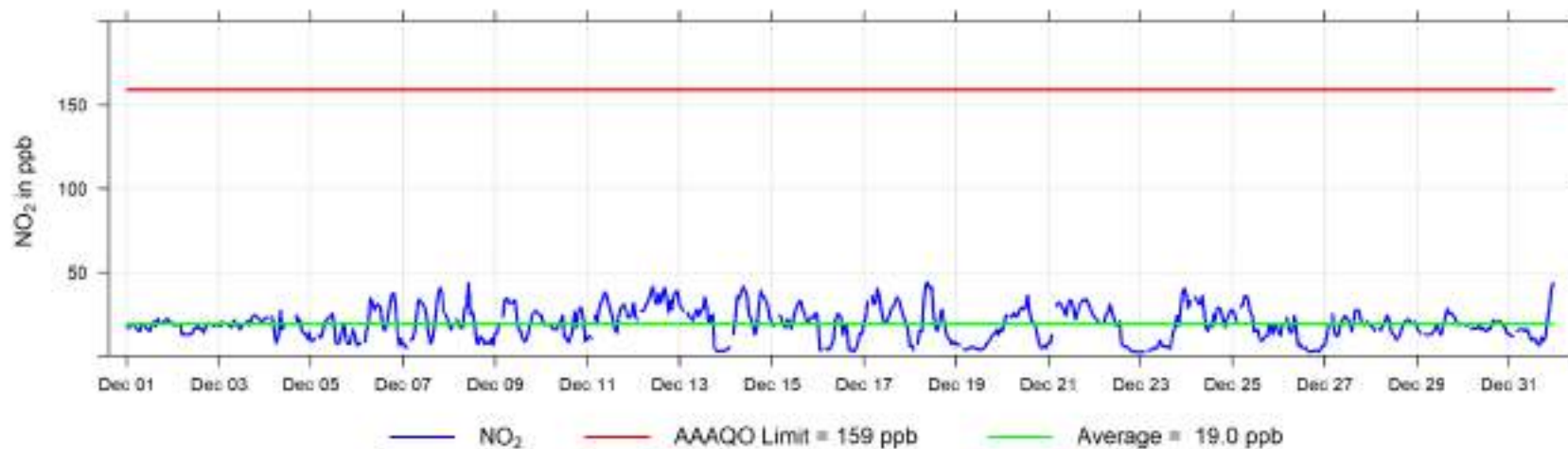


December 2023 Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Henry Pirker

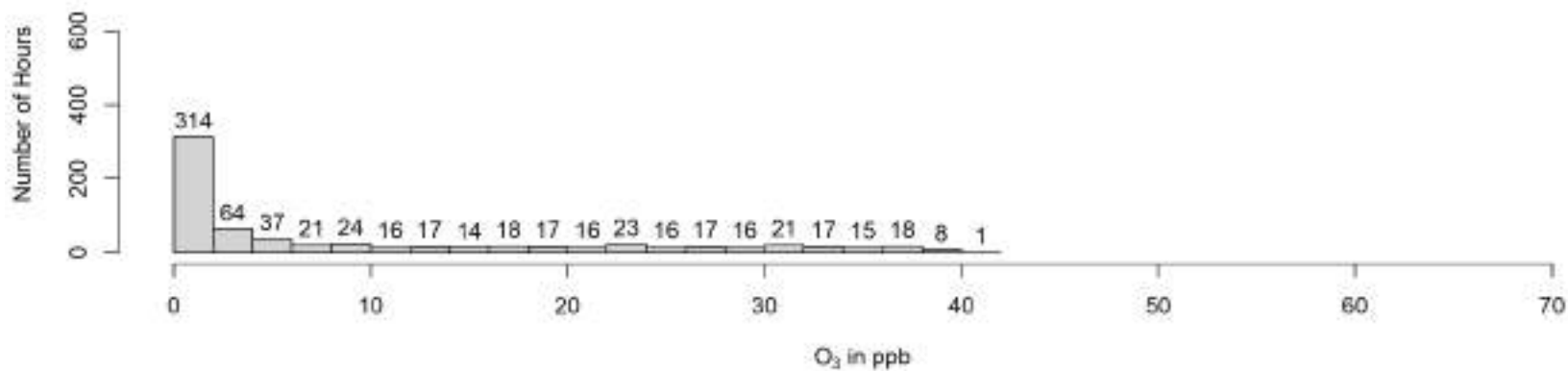
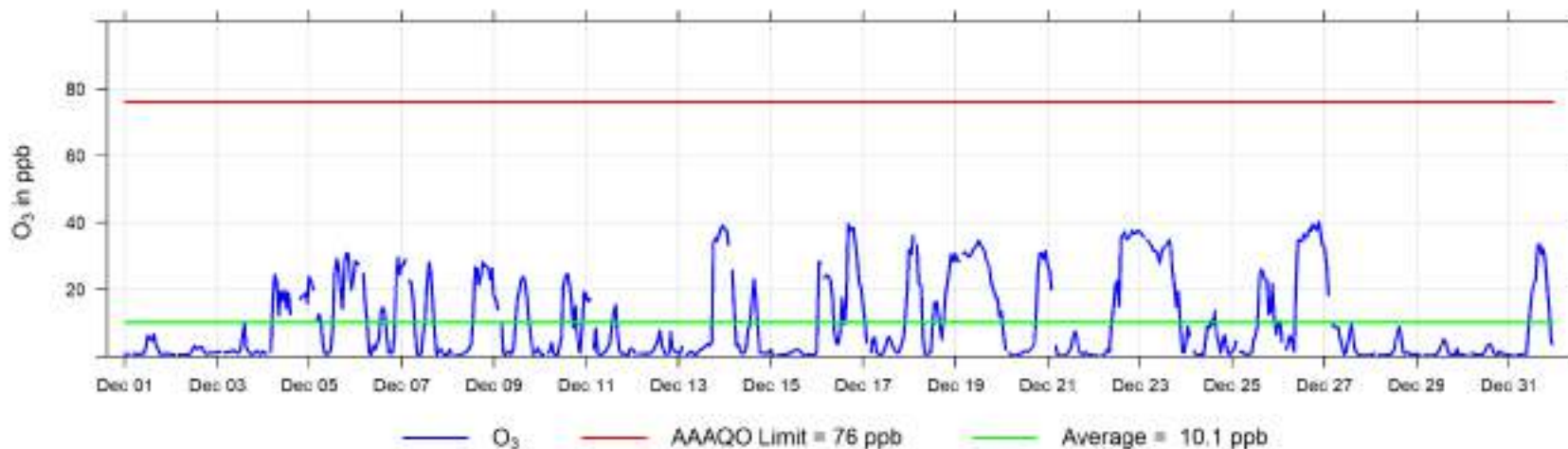




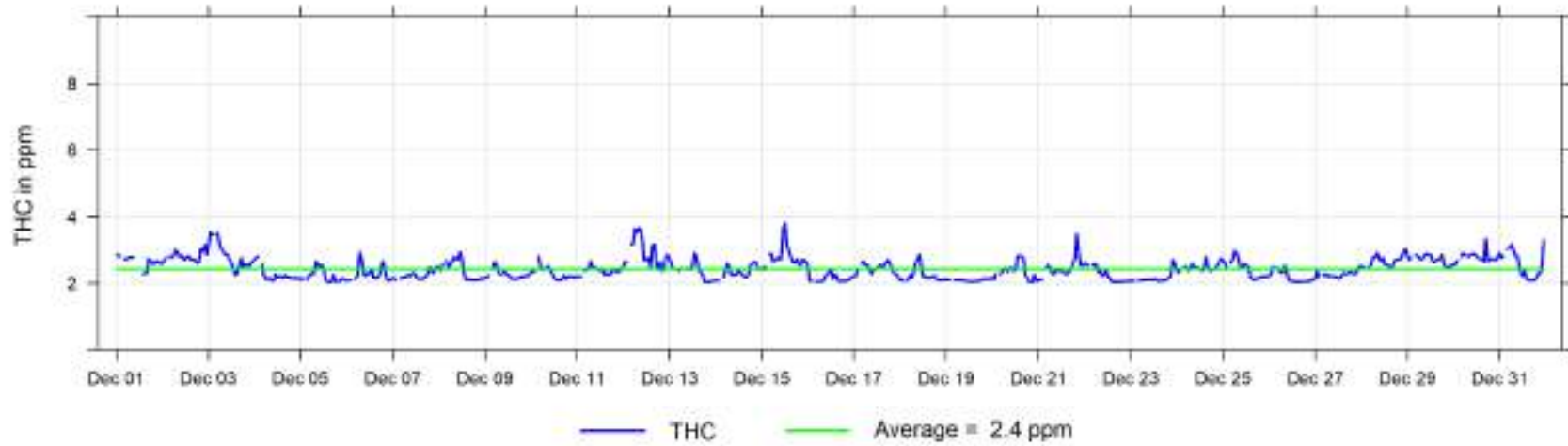
December 2023 Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Henry Pirker



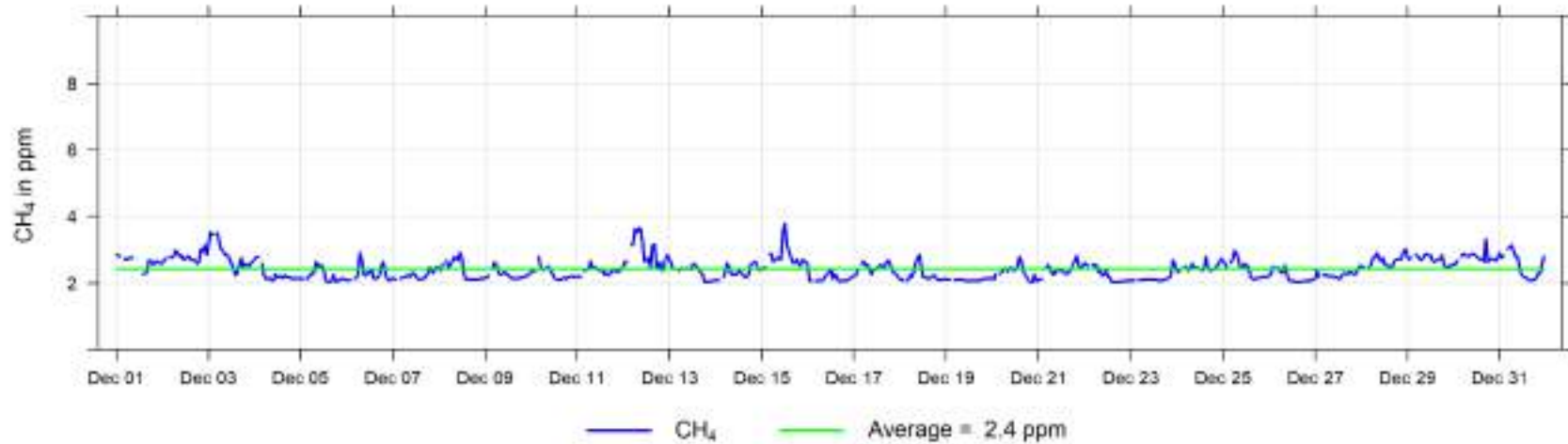
December 2023 Hourly Concentration Readings of O<sub>3</sub> (in ppb) at Henry Pirker



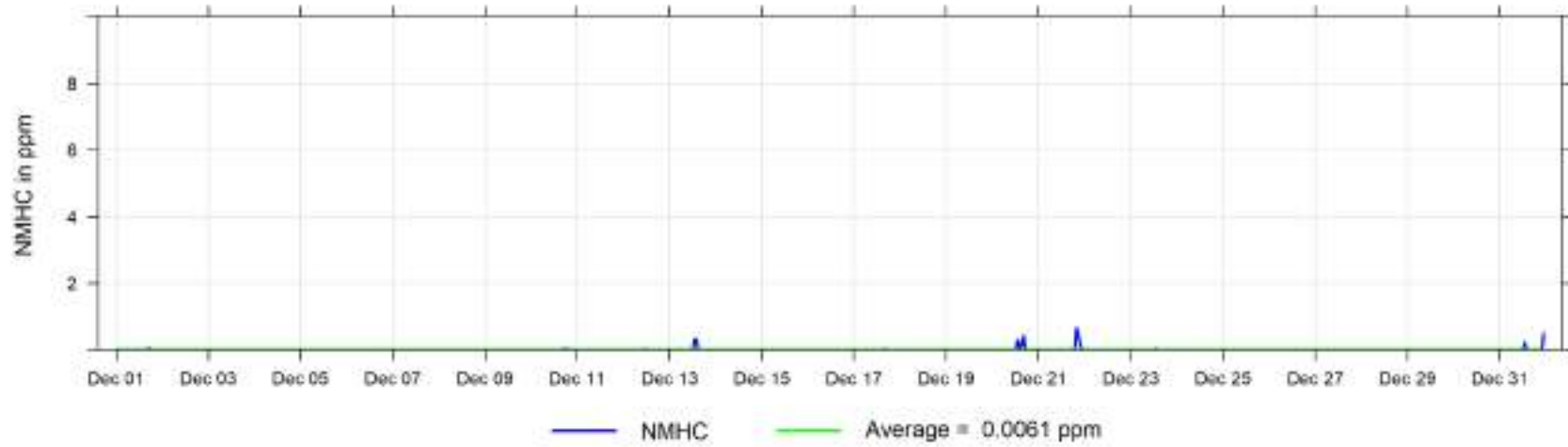
December 2023 Hourly Concentration Readings of THC (in ppm) at Henry Pirker



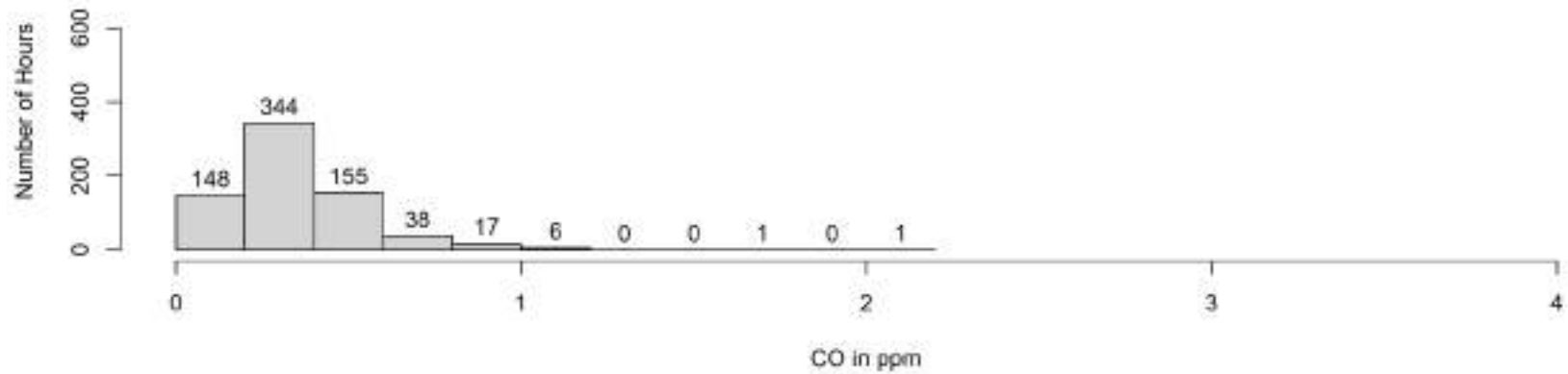
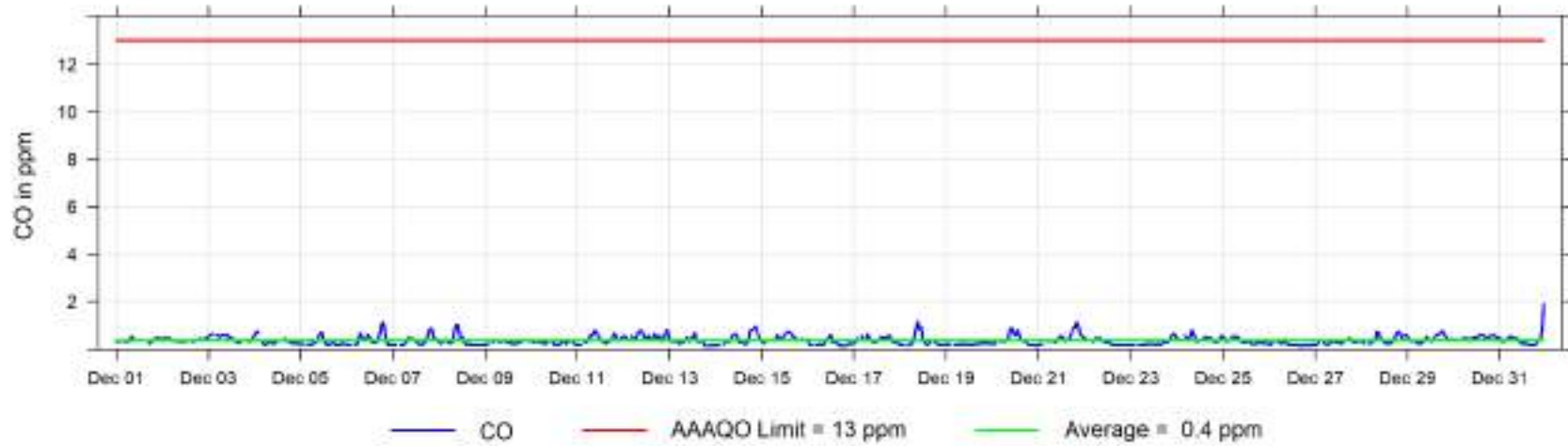
December 2023 Hourly Concentration Readings of CH<sub>4</sub> (in ppm) at Henry Pirker



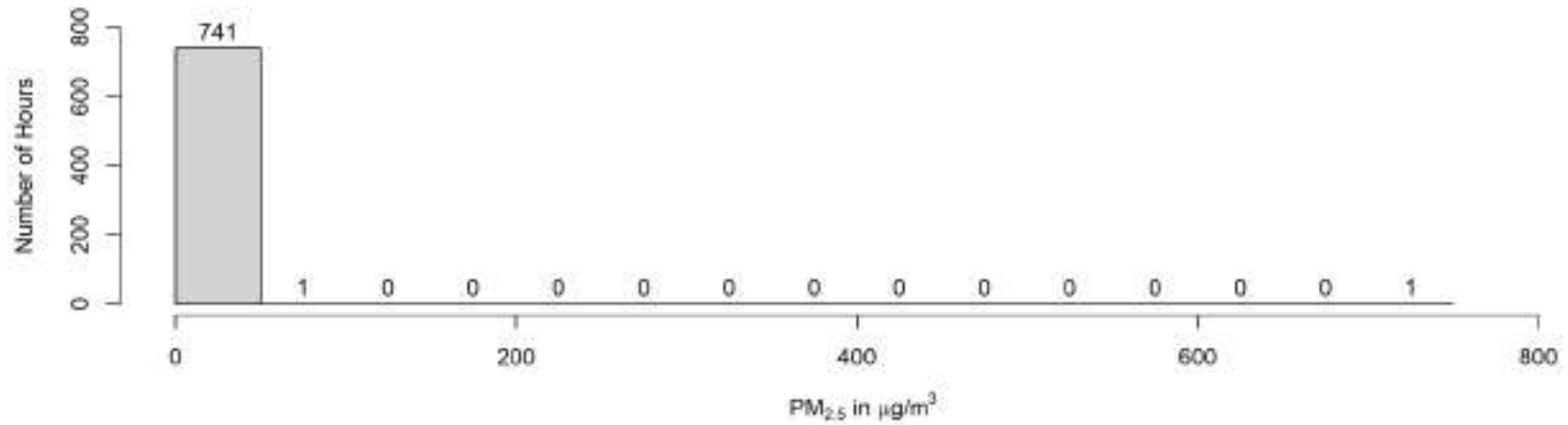
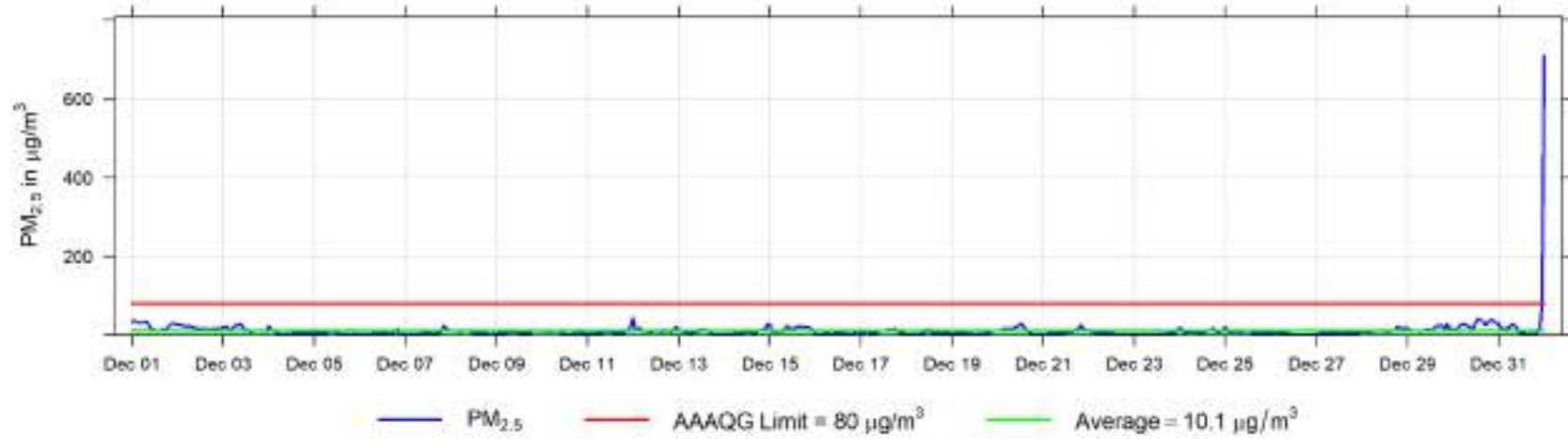
December 2023 Hourly Concentration Readings of NMHC (in ppm) at Henry Pirker



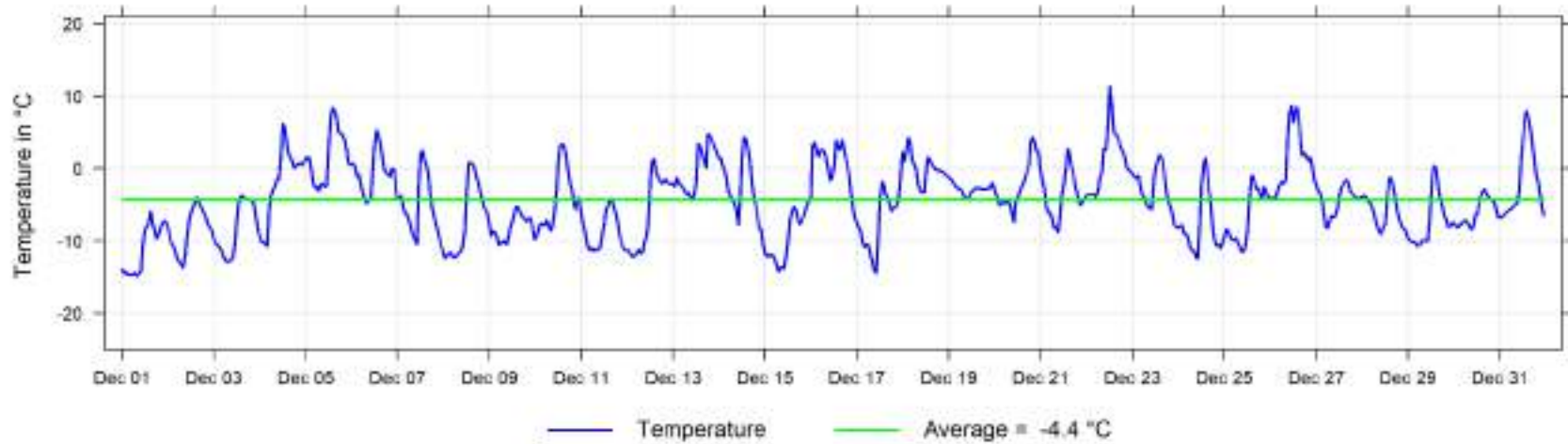
December 2023 Hourly Concentration Readings of CO (in ppm) at Henry Pirker



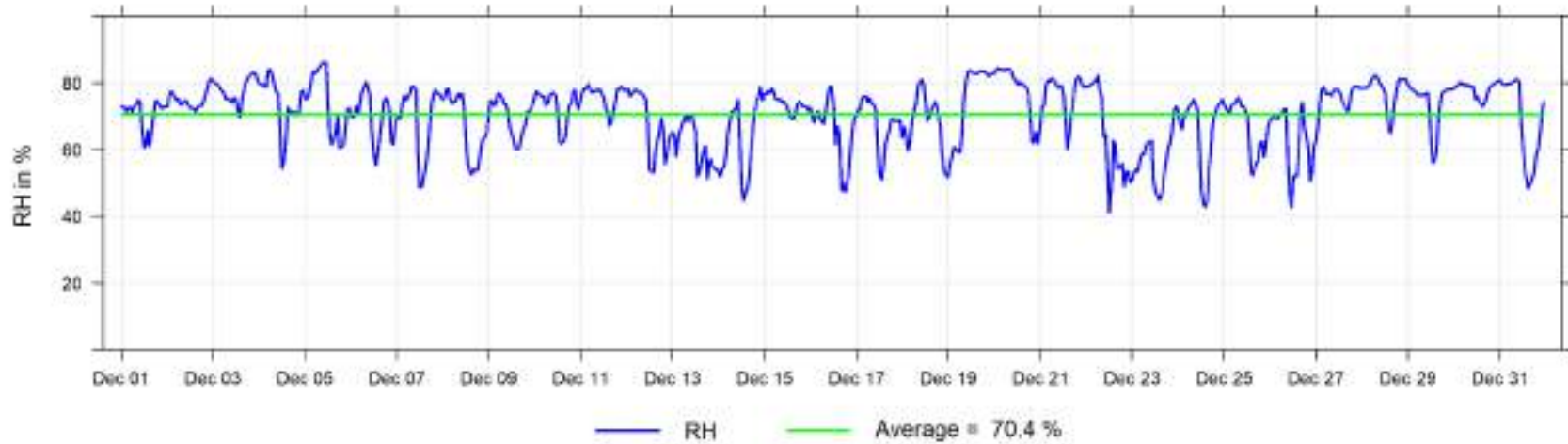
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Henry Pirker



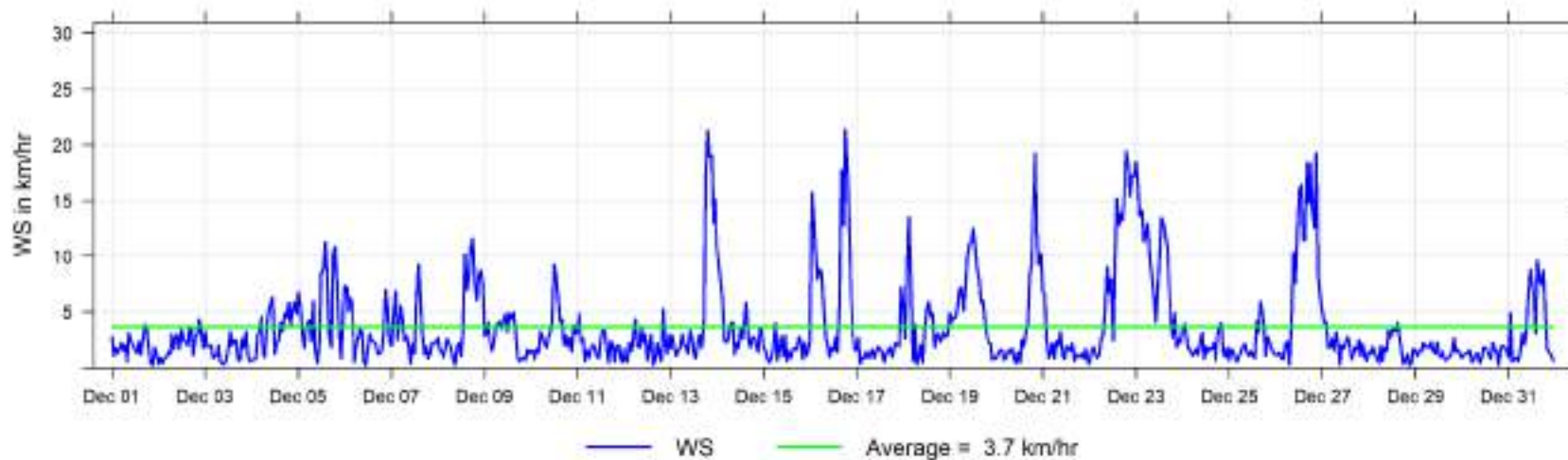
December 2023 Hourly Temperature Readings (in °C) at Henry Pirker



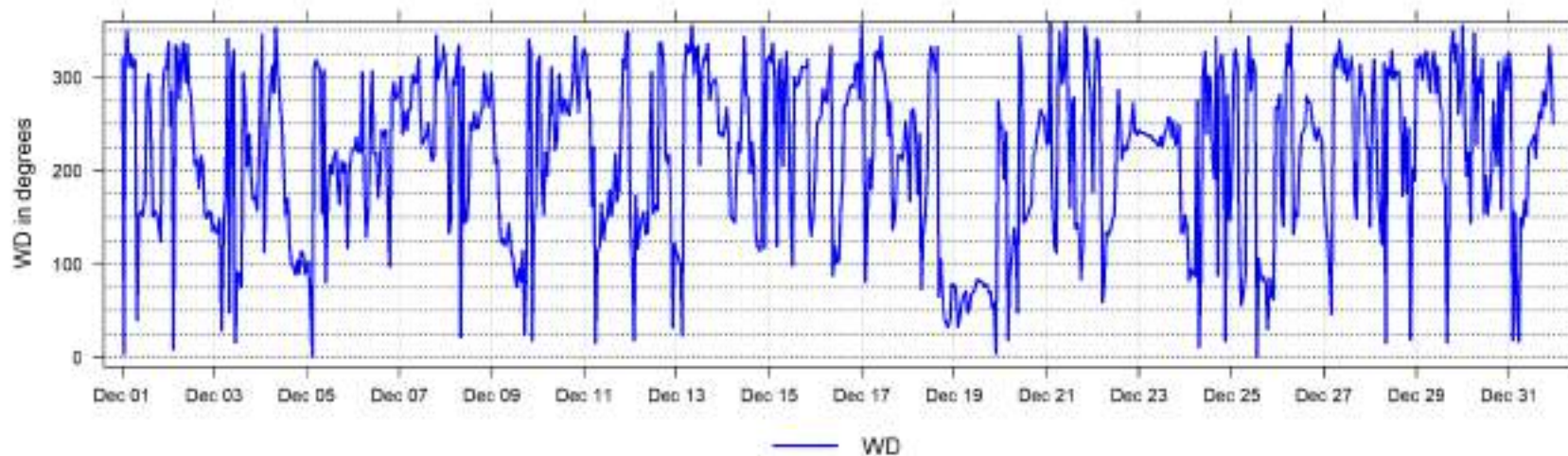
December 2023 Hourly Readings of Relative Humidity (in %) at Henry Pirker



December 2023 Hourly Readings of Wind Speed (in km/hr) at Henry Pirker

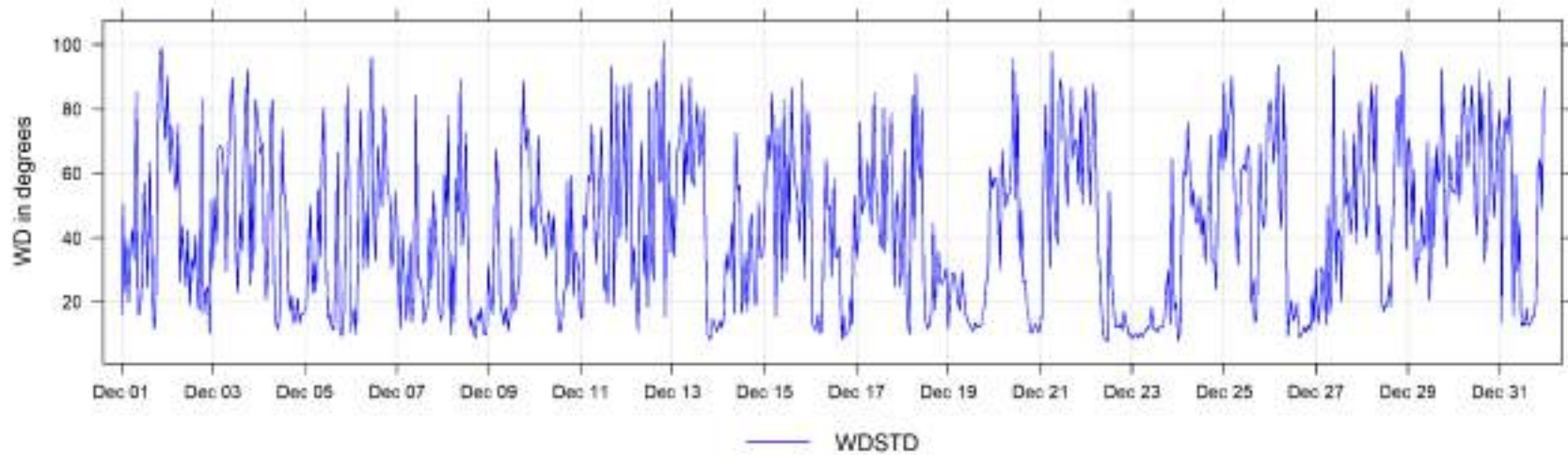


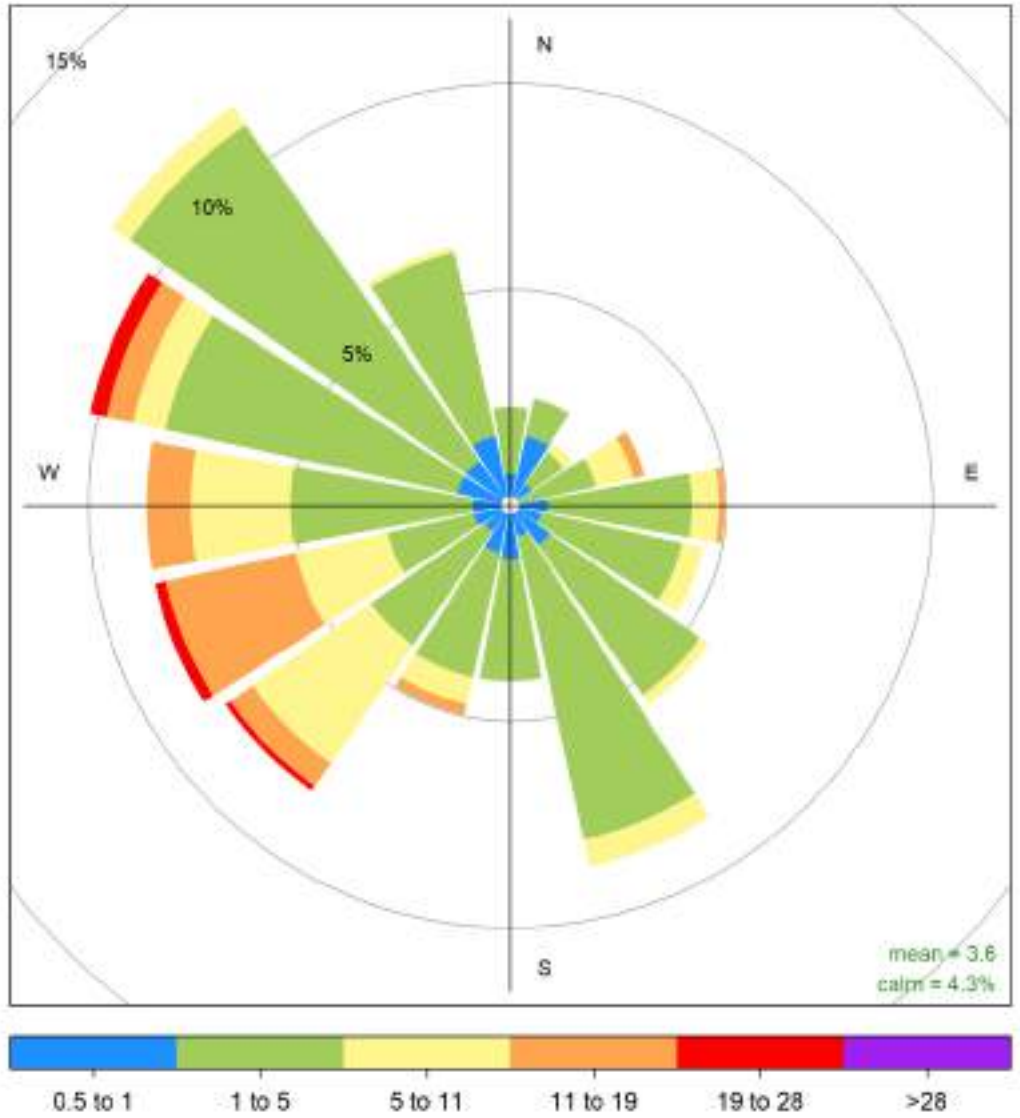
December 2023 Hourly Readings of Wind Direction (in degrees) at Henry Pirker





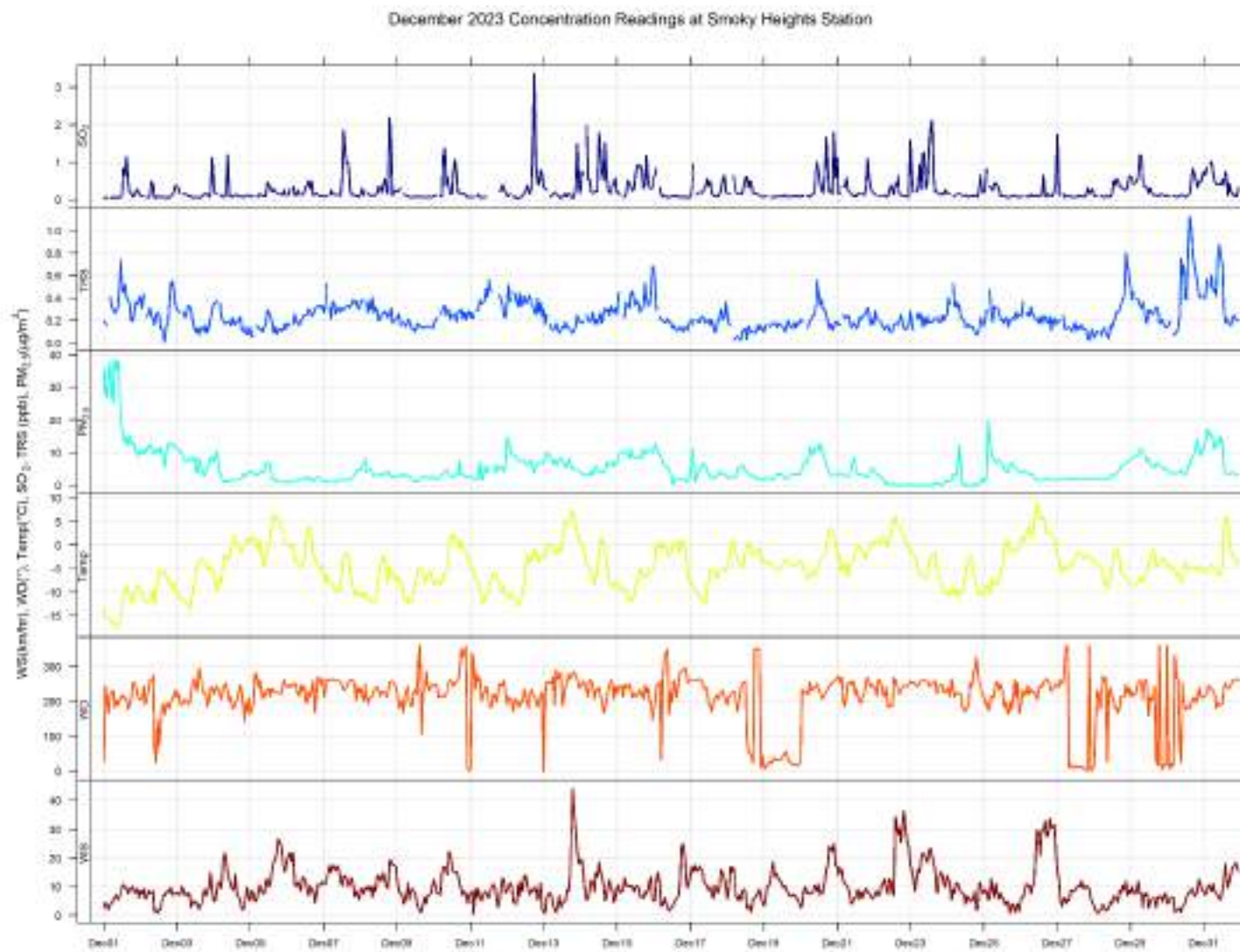
December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Henry Pirker



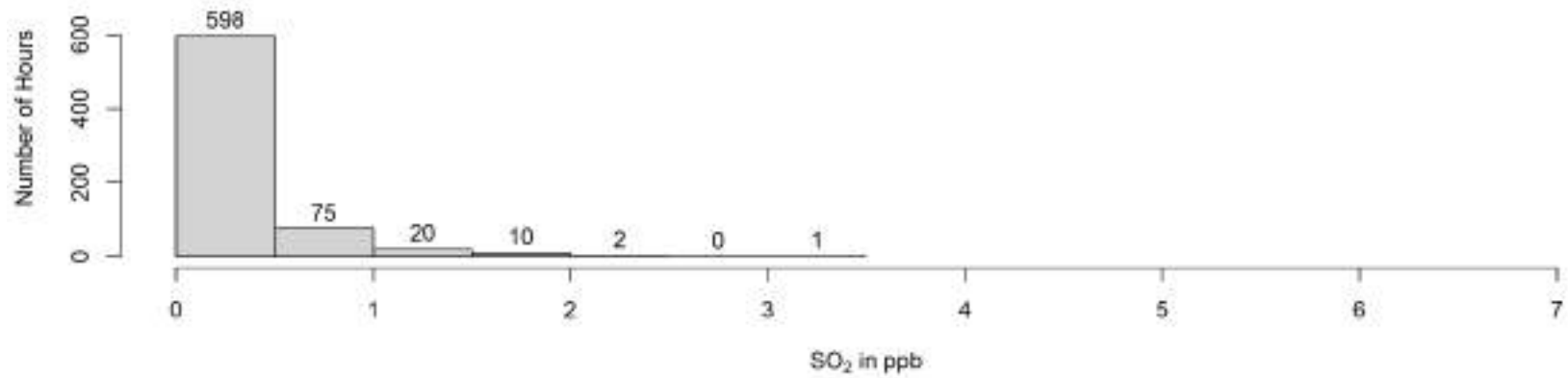
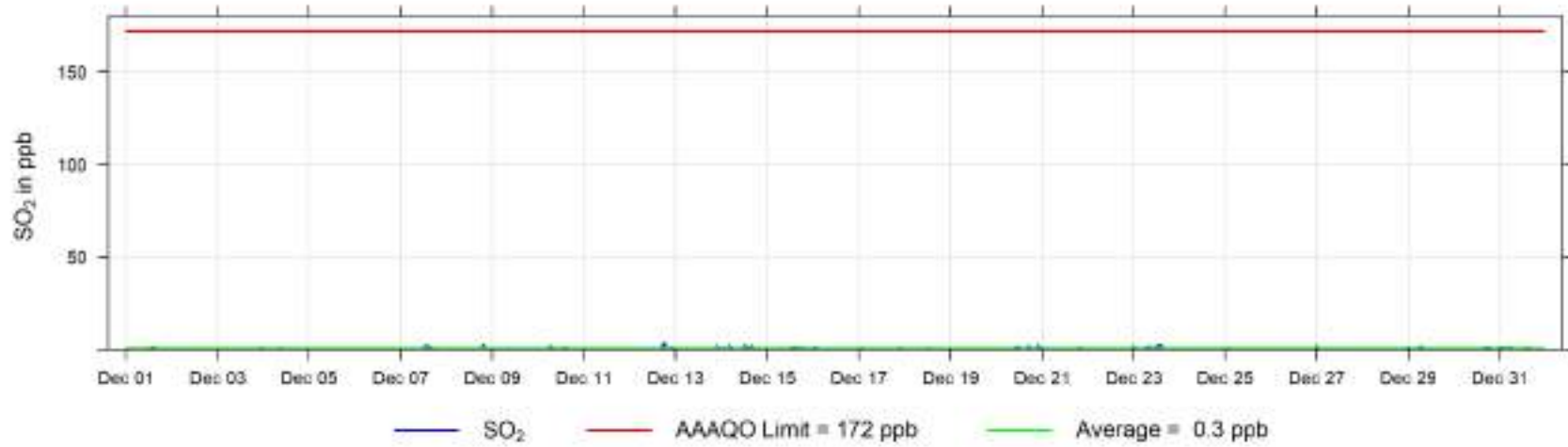


## 5 Smoky Heights Charts

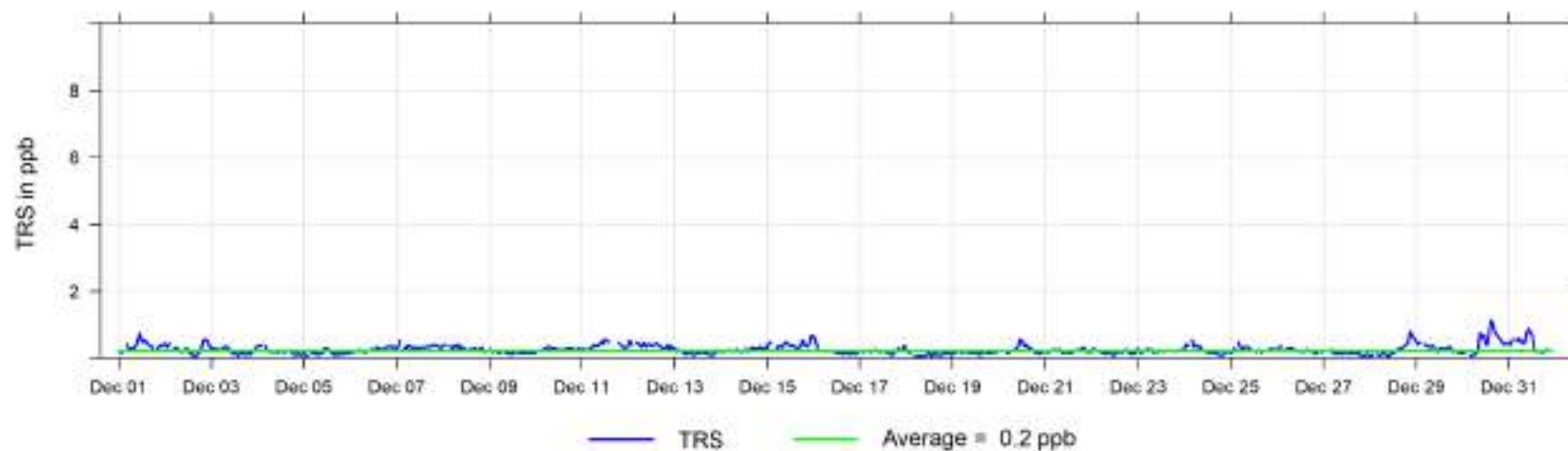
The following pages include the charts and histograms for Smoky Heights Station



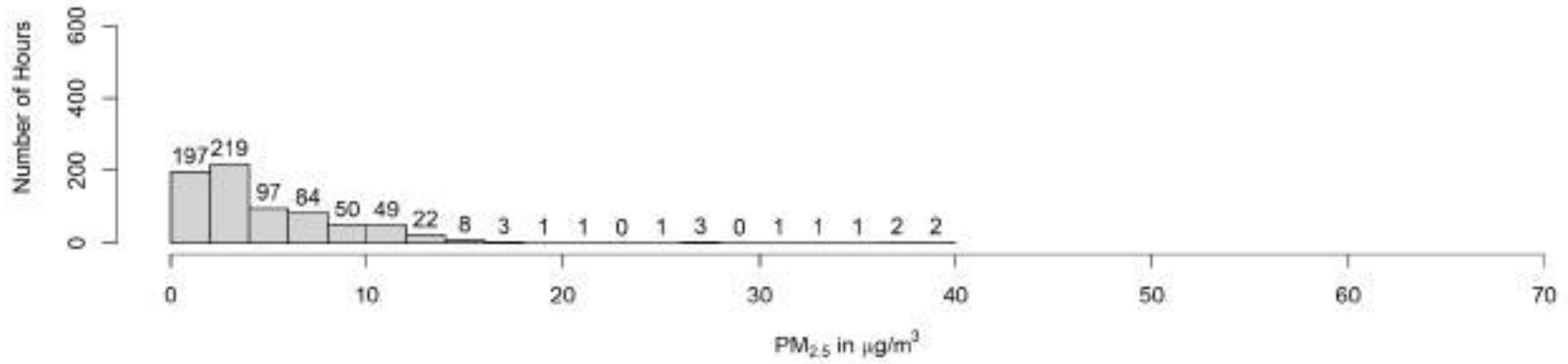
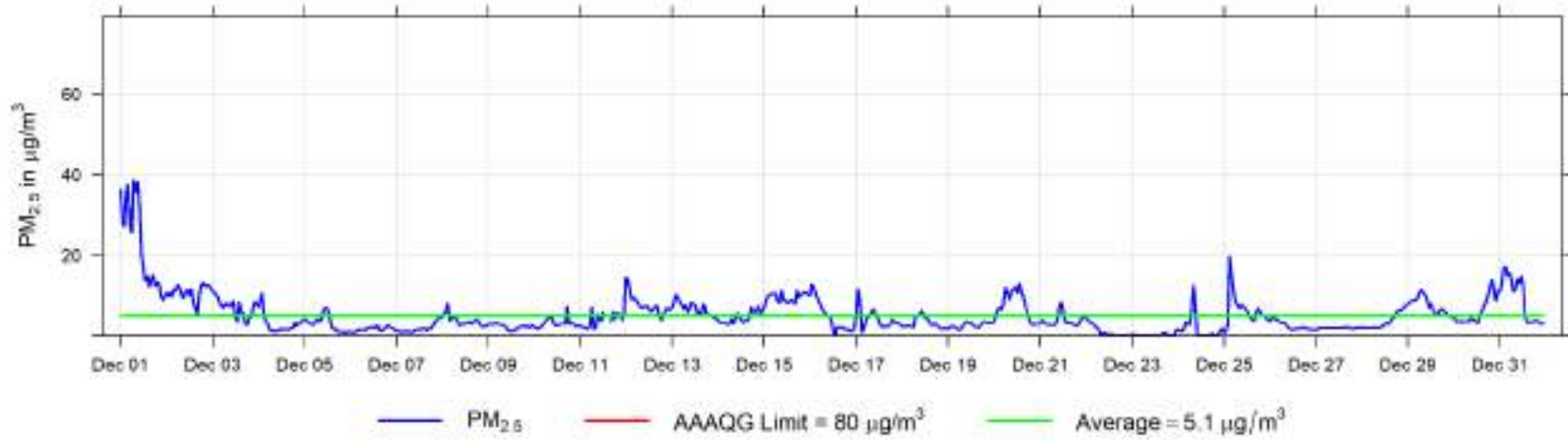
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Smoky Heights



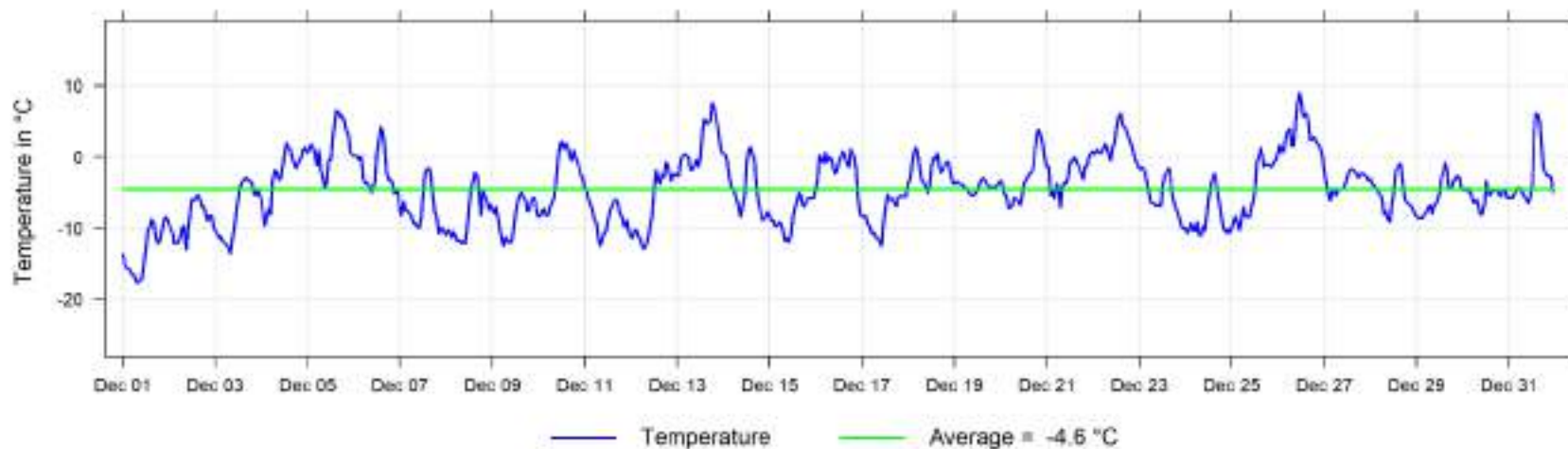
December 2023 Hourly Concentration Readings of TRS (in ppb) at Smoky Heights



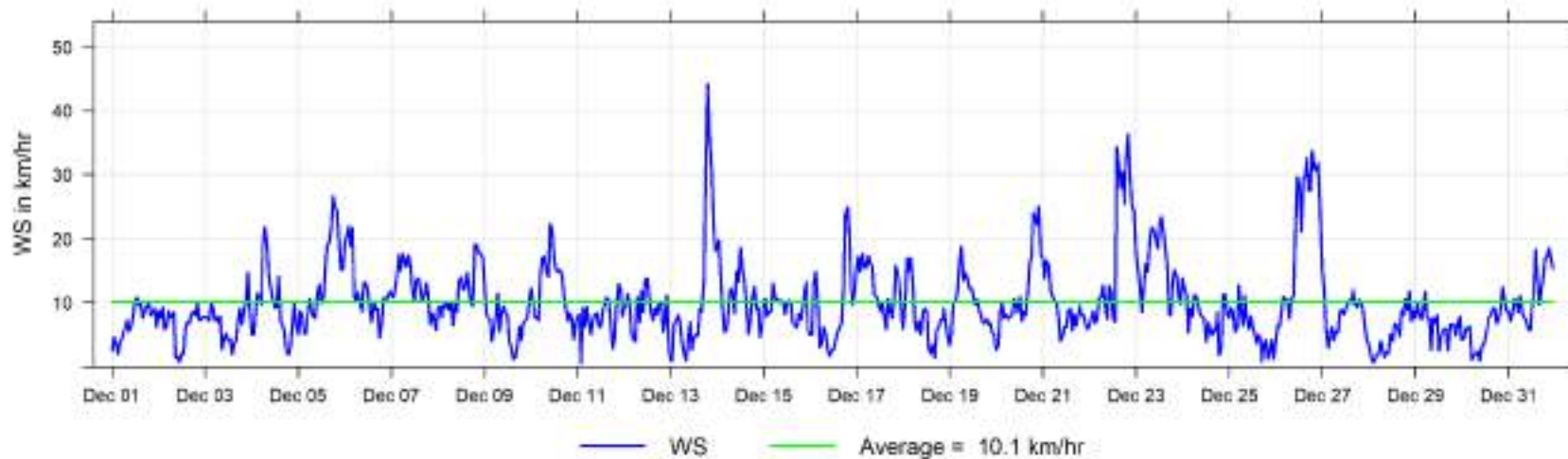
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Smoky Heights



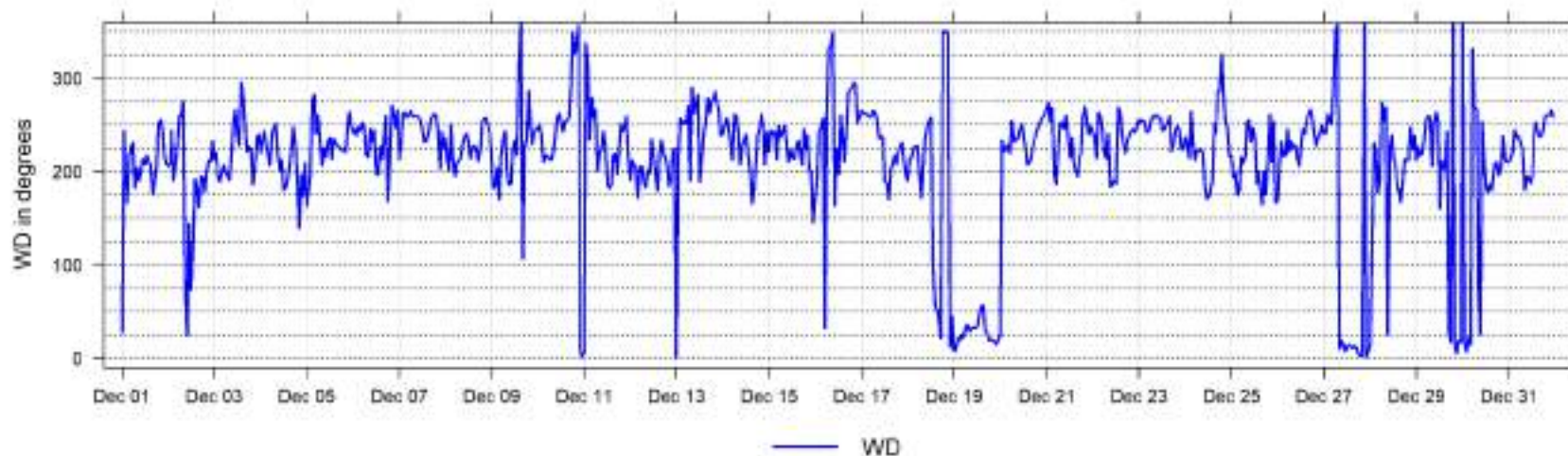
December 2023 Hourly Temperature Readings (in °C) at Smoky Heights



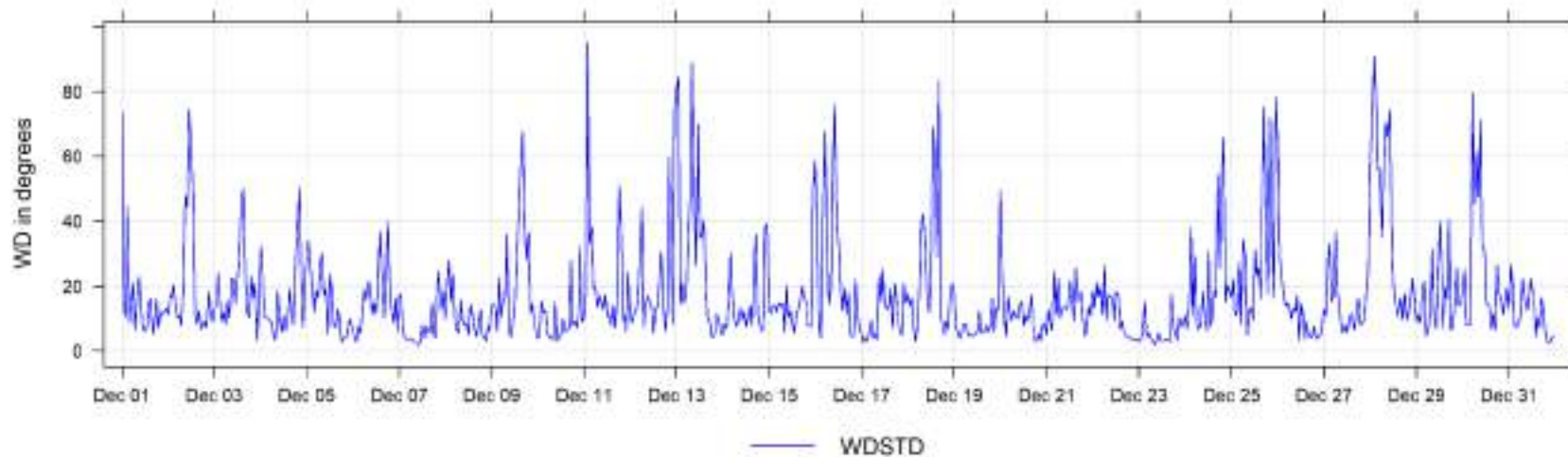
December 2023 Hourly Readings of Wind Speed (in km/hr) at Smoky Heights



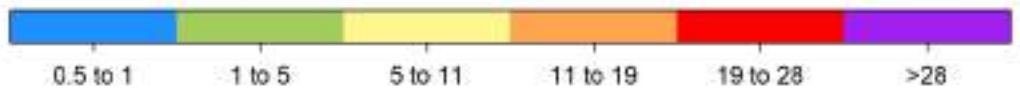
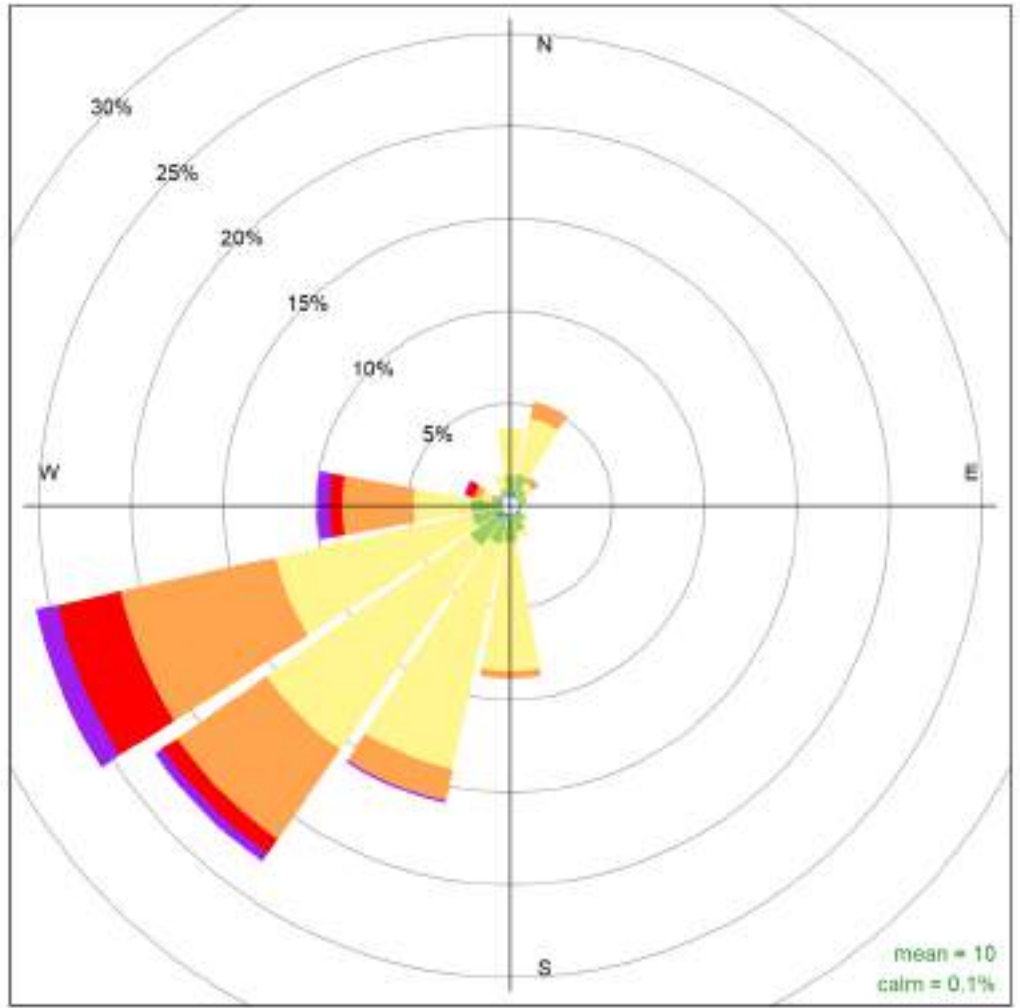
**December 2023 Hourly Readings of Wind Direction (in degrees) at Smoky Heights**



**December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Smoky Heights**



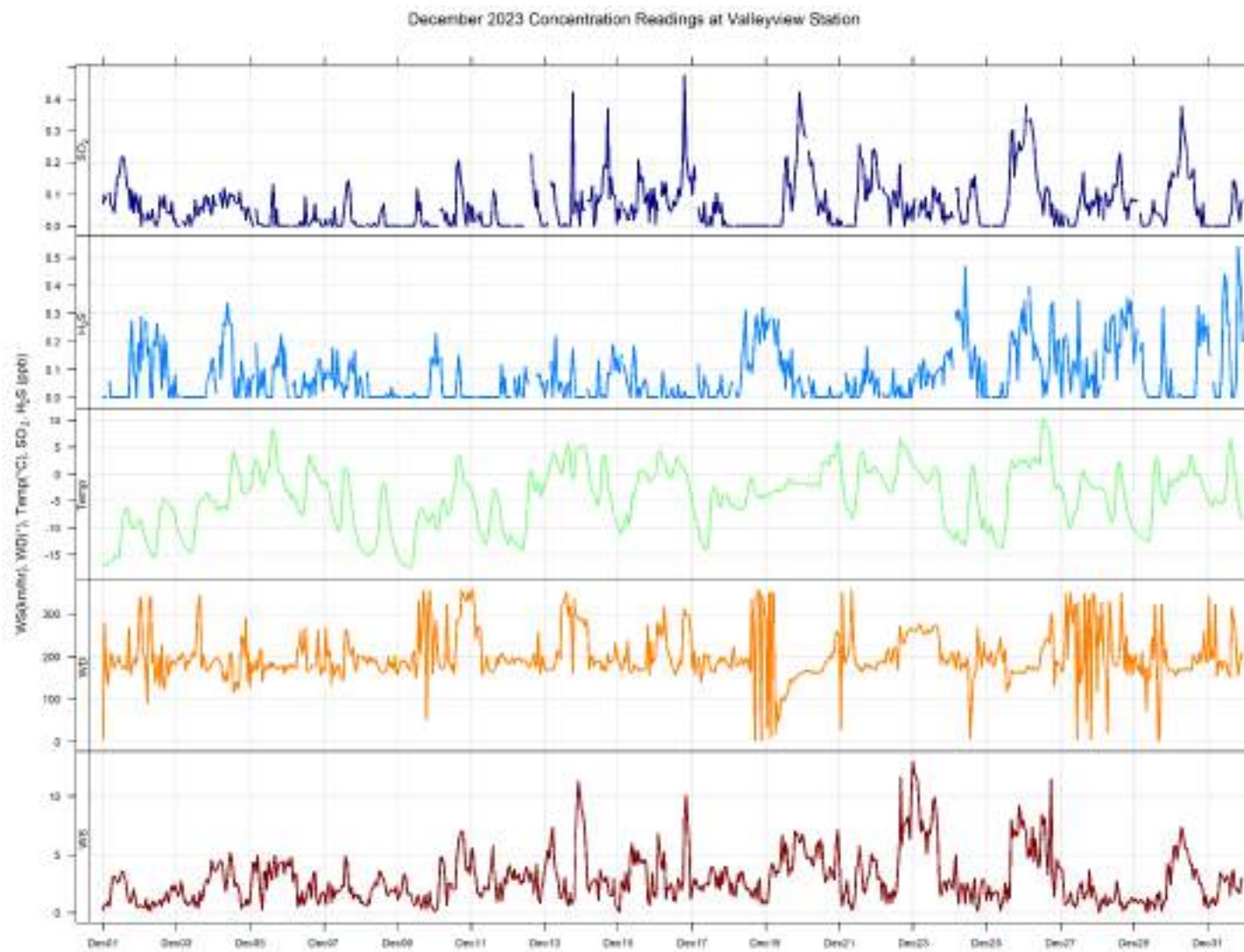




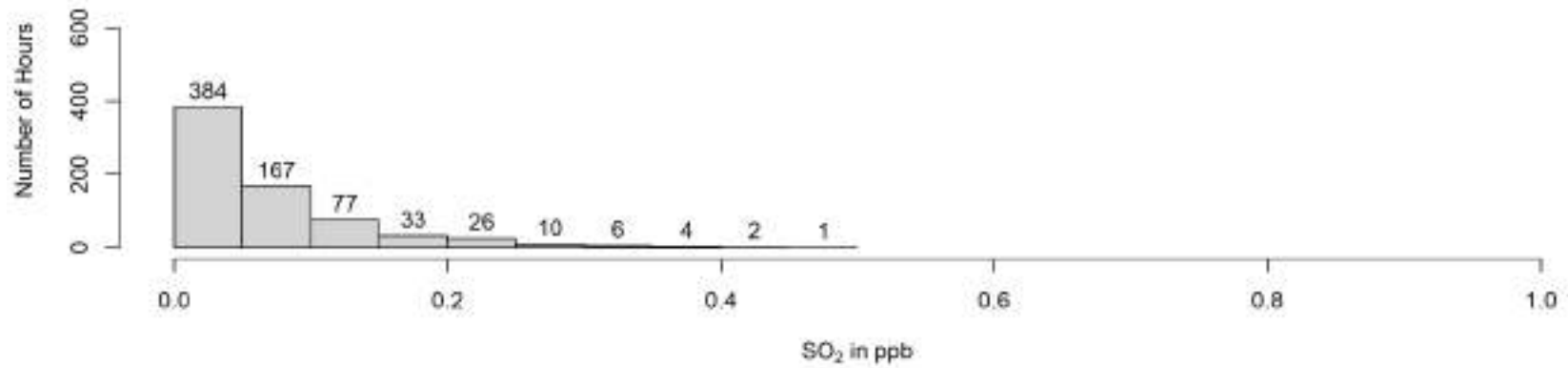
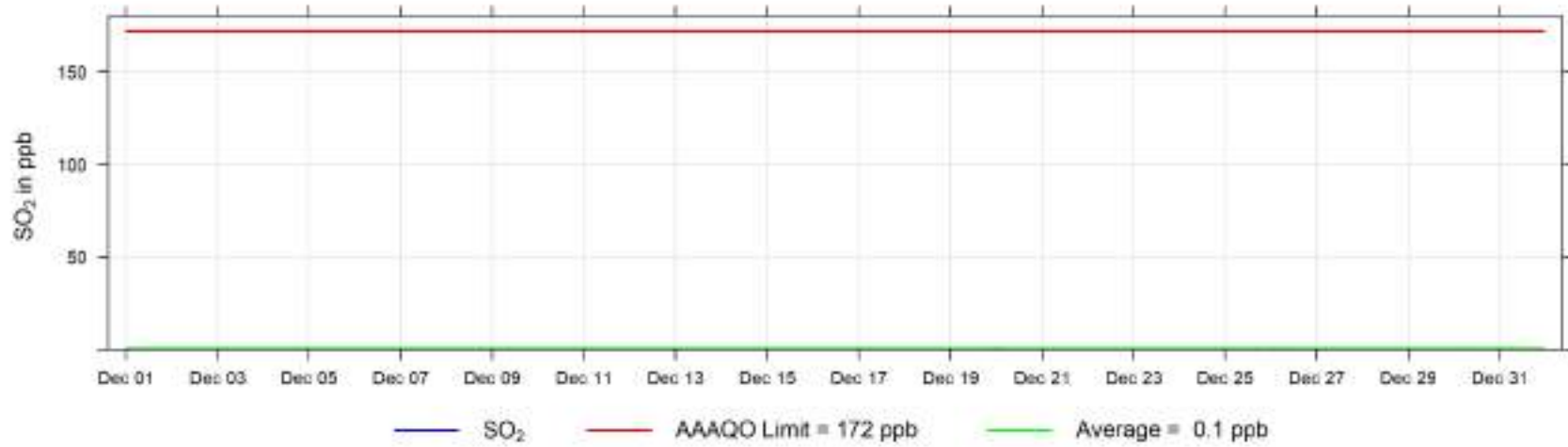
Smoky Heights December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

## 6 Valleyview Charts

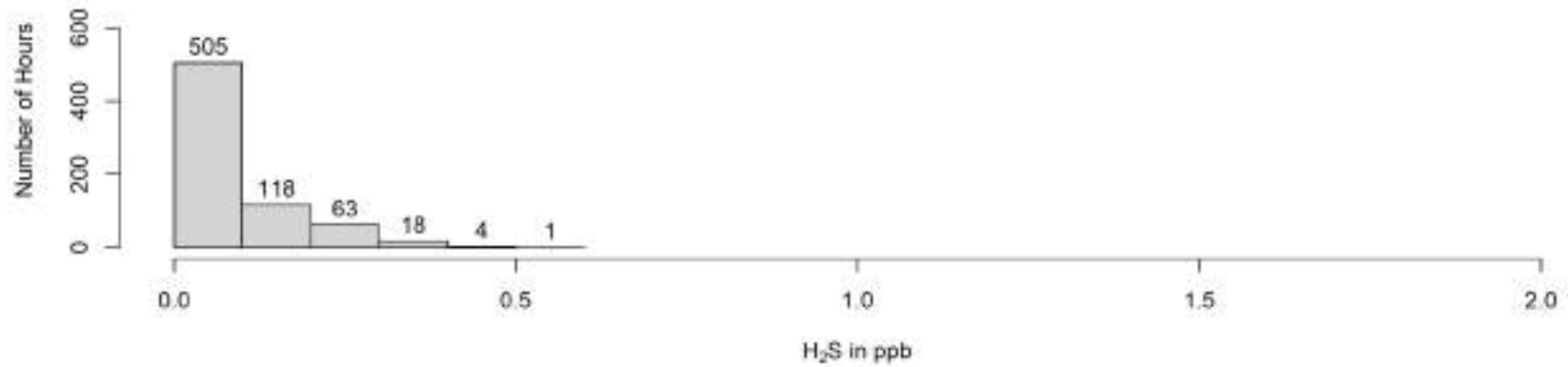
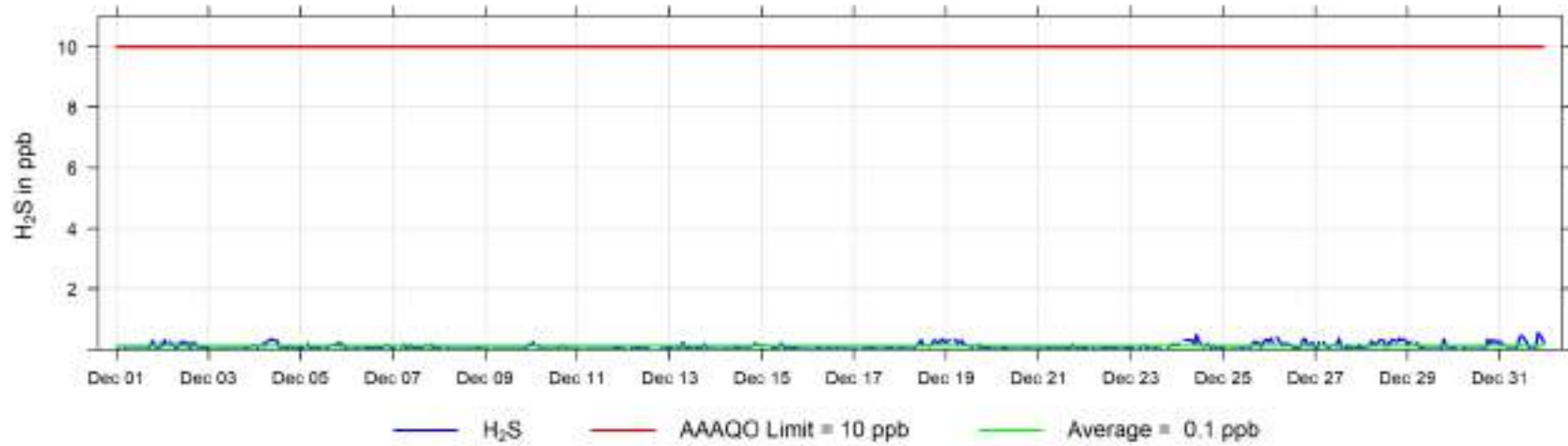
The following pages include the charts and histograms for Valleyview Station



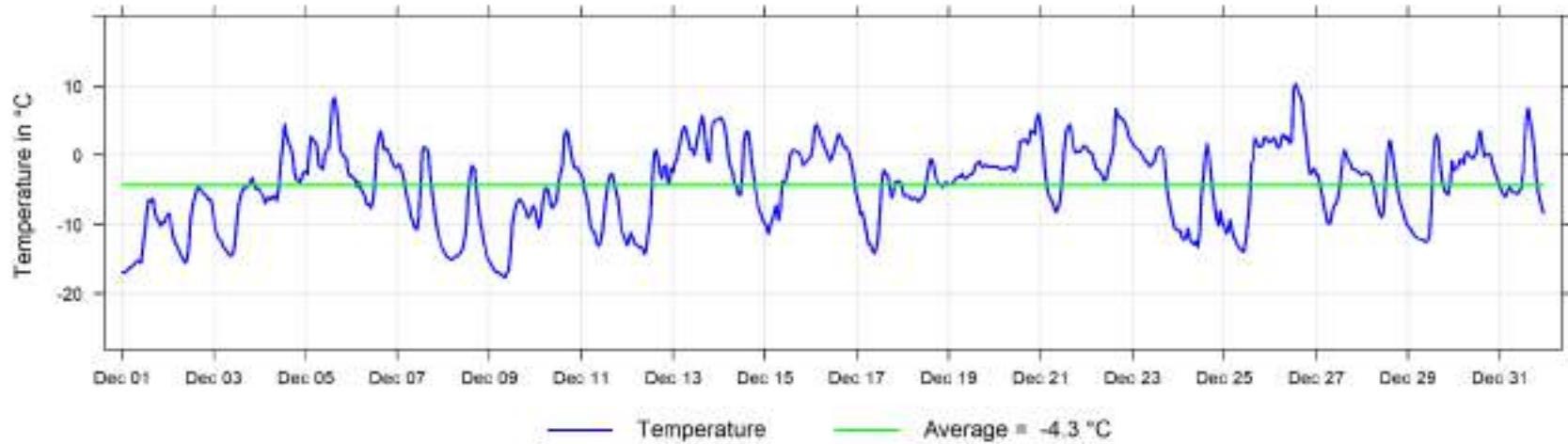
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Valleyview



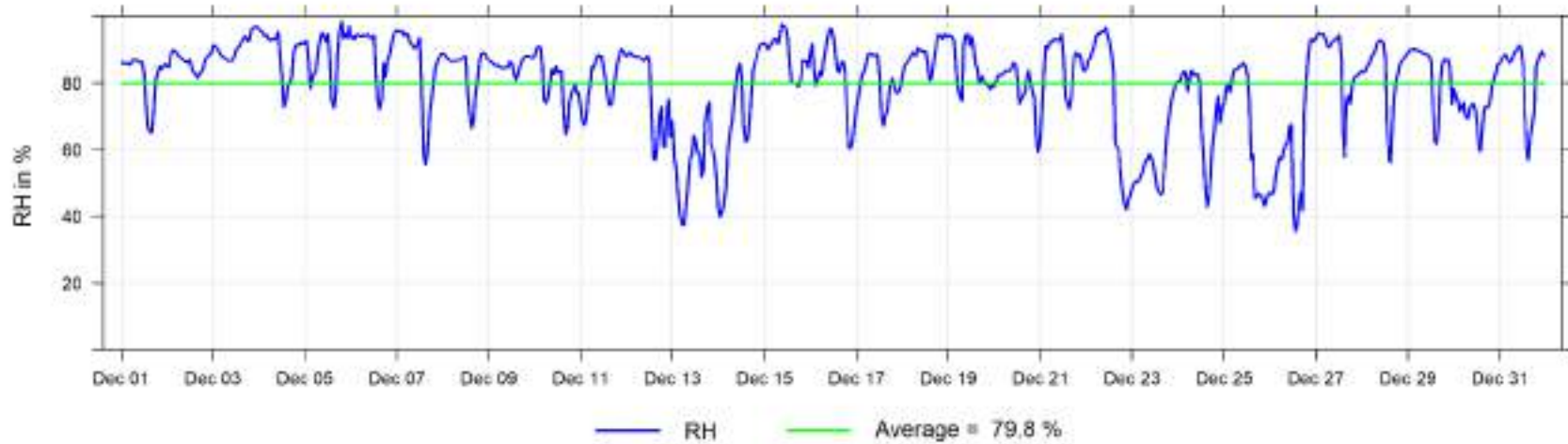
December 2023 Hourly Concentration Readings of H<sub>2</sub>S (in ppb) at Valleyview



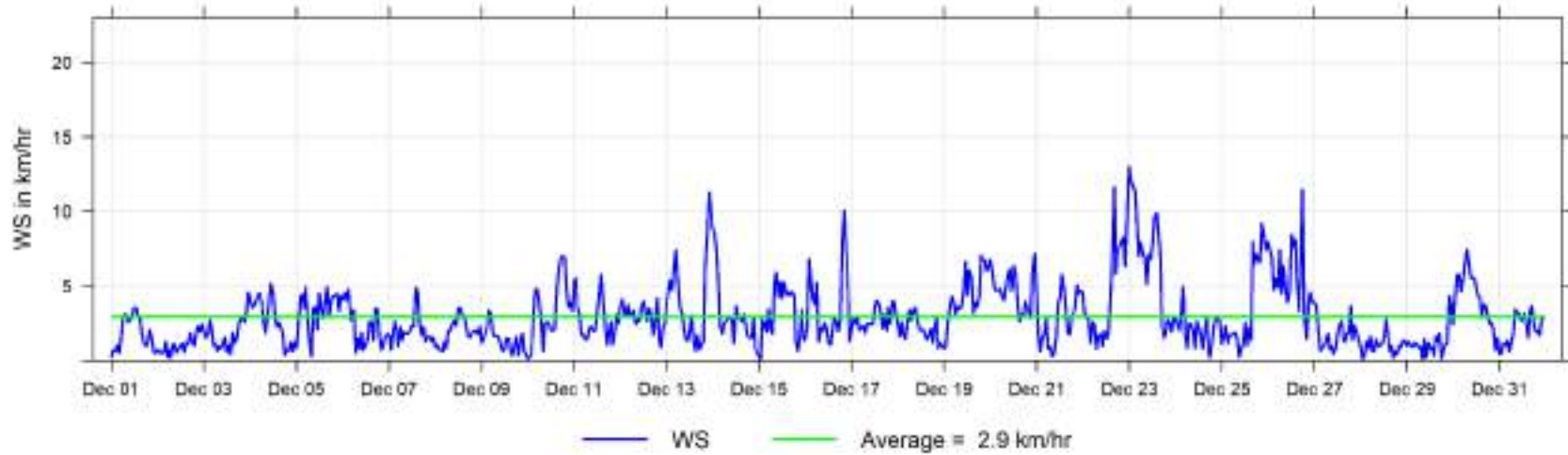
December 2023 Hourly Temperature Readings (in °C) at Valleyview



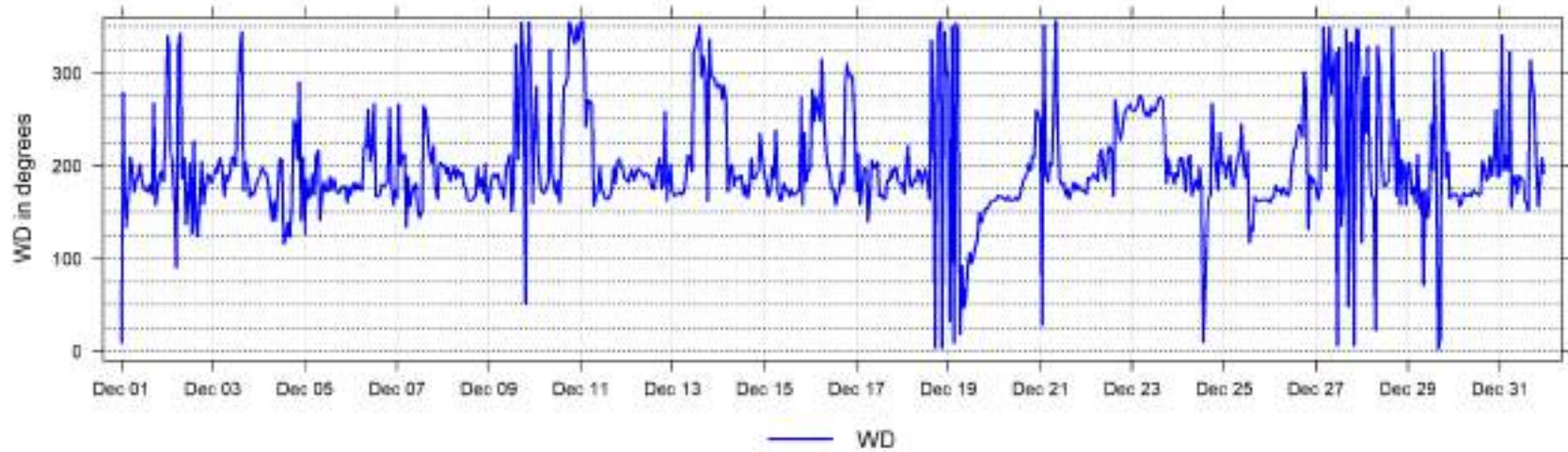
December 2023 Hourly Readings of Relative Humidity (in %) at Valleyview



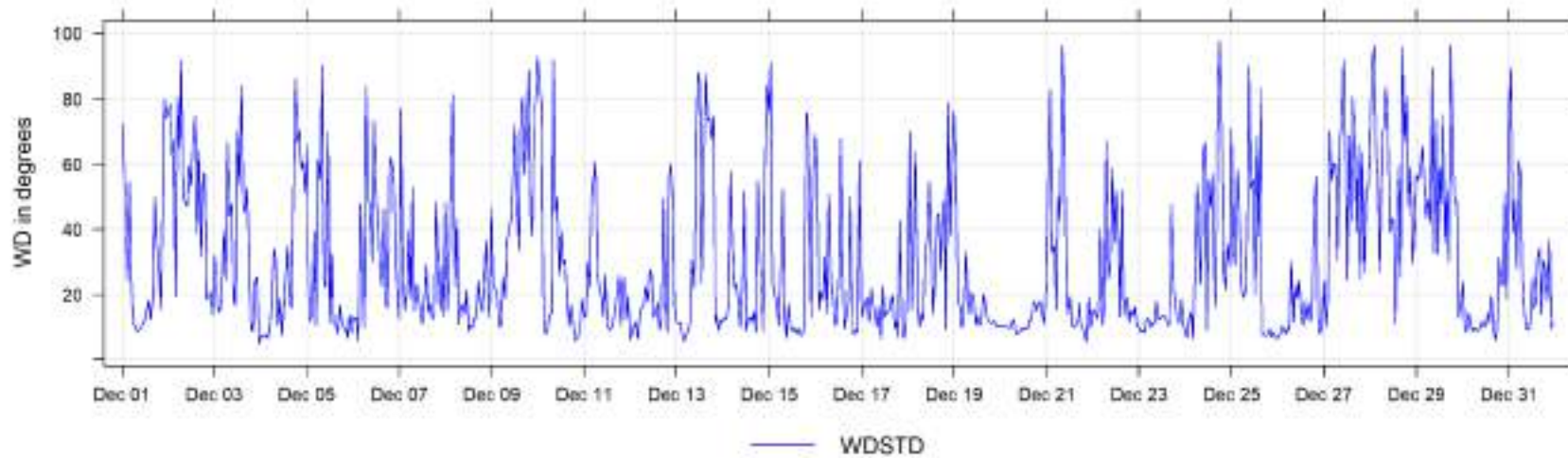
December 2023 Hourly Readings of Wind Speed (in km/hr) at Valleyview

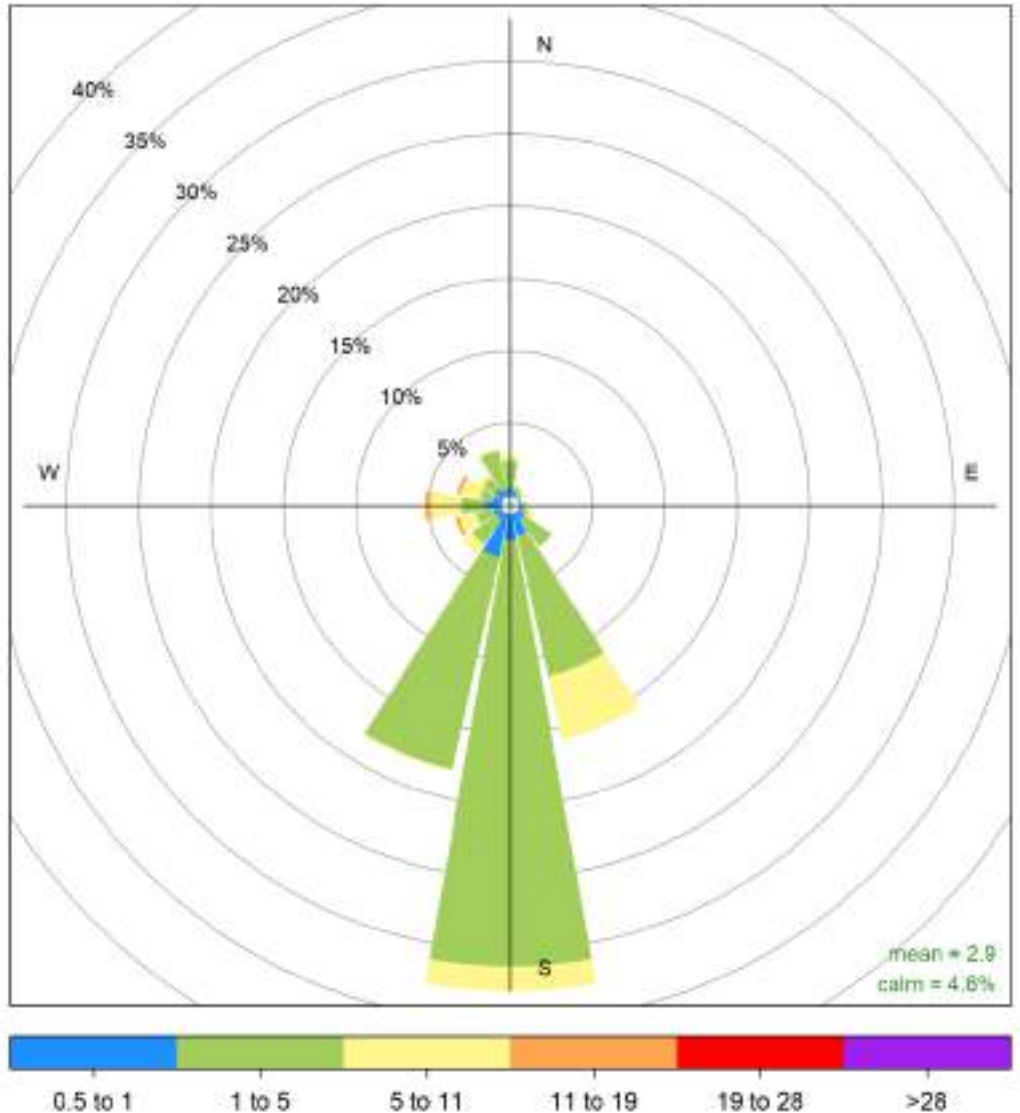


December 2023 Hourly Readings of Wind Direction (in degrees) at Valleyview



December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Valleyview



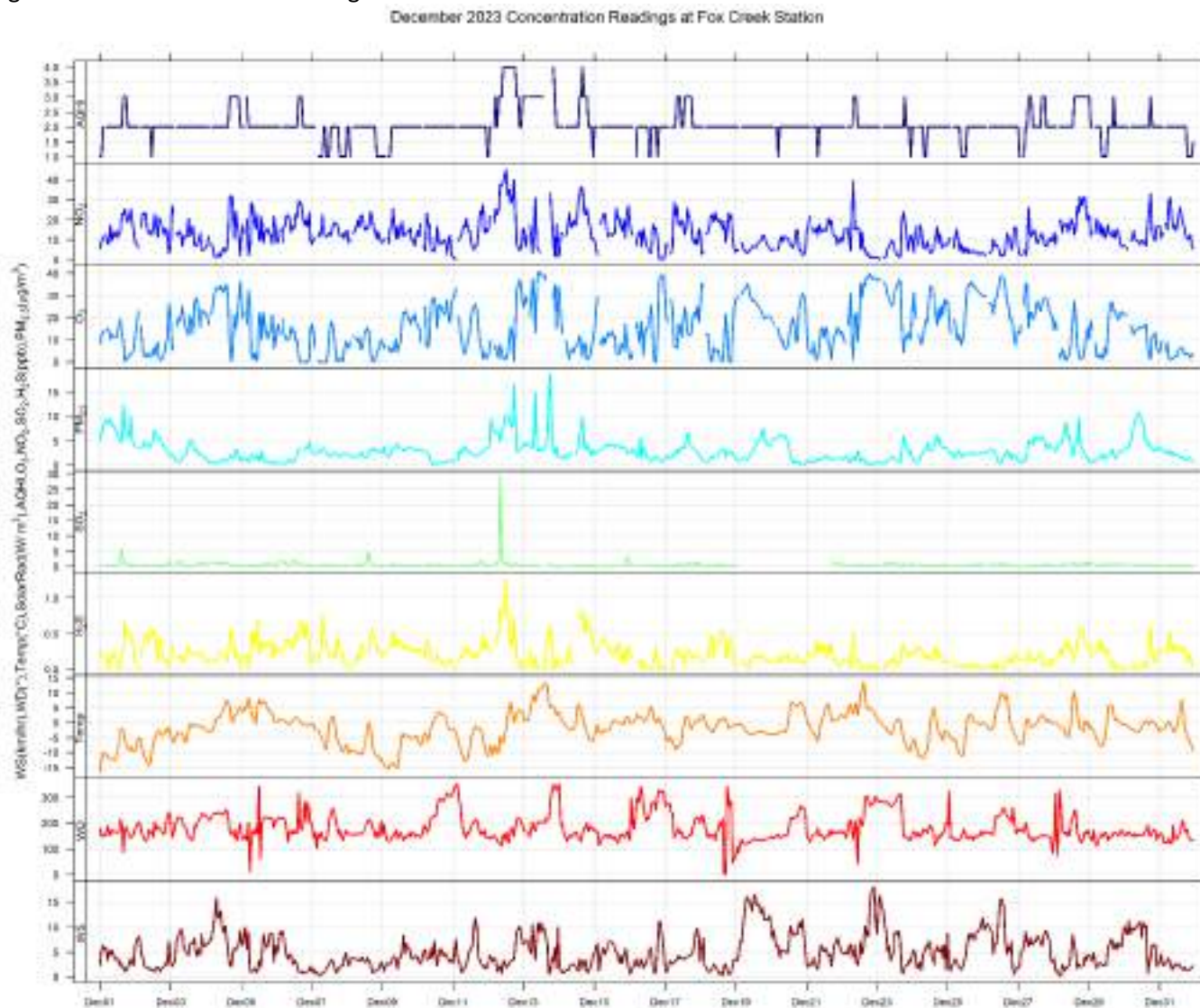


Valleyview December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

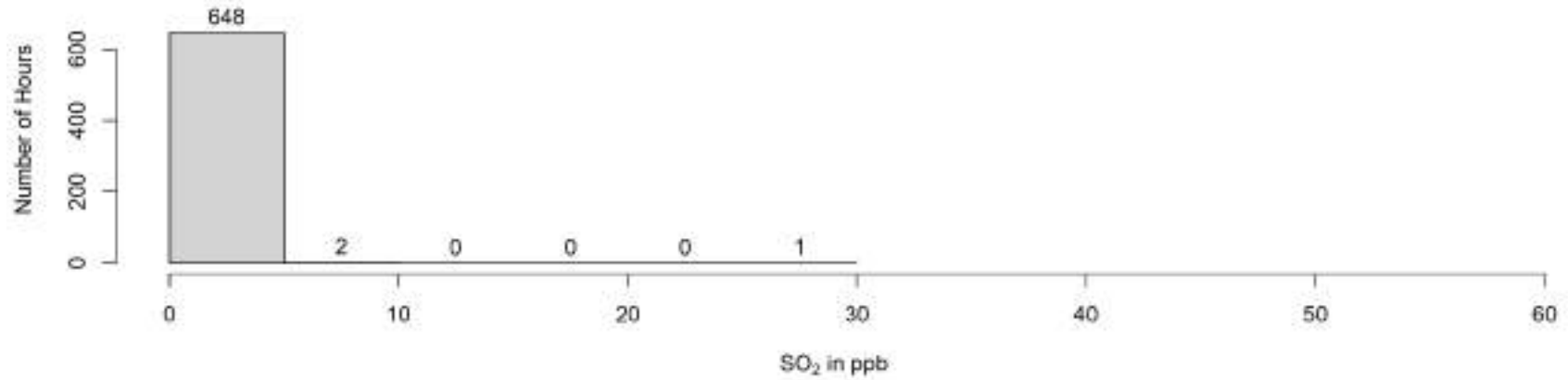
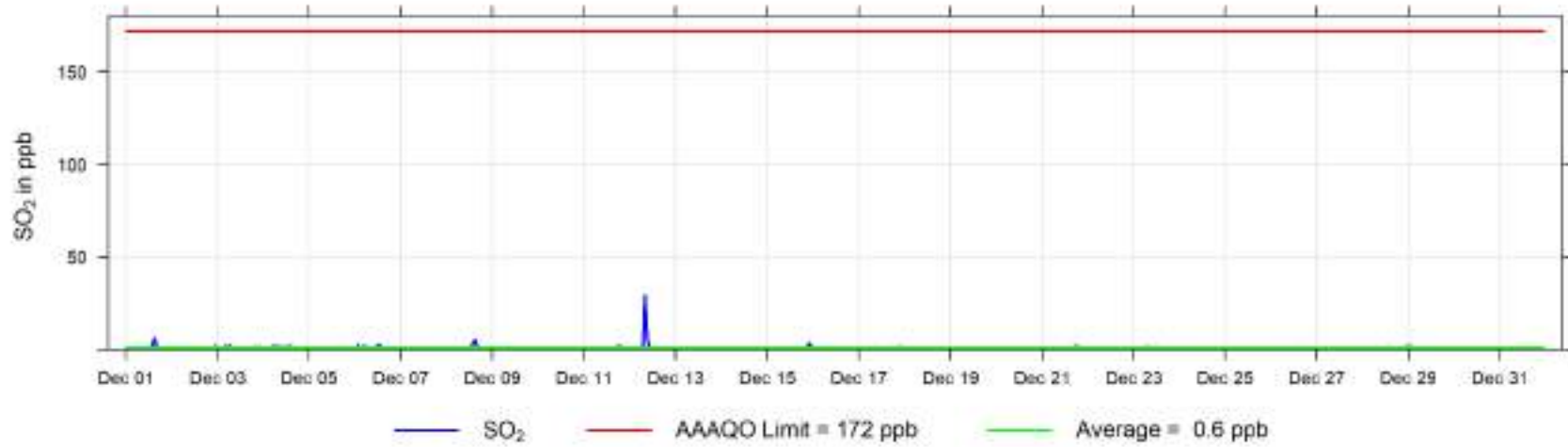


## 7 Fox Creek Charts

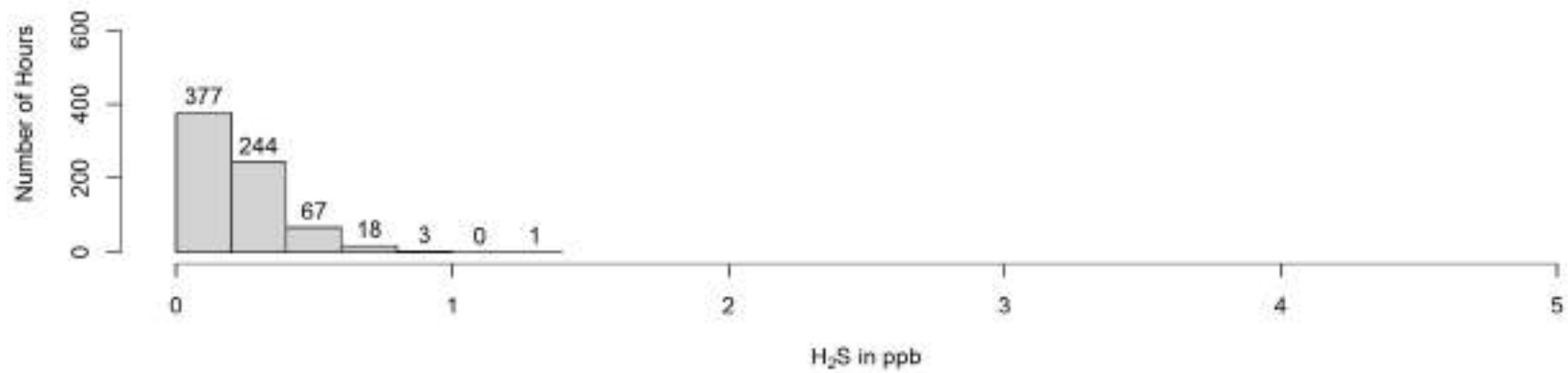
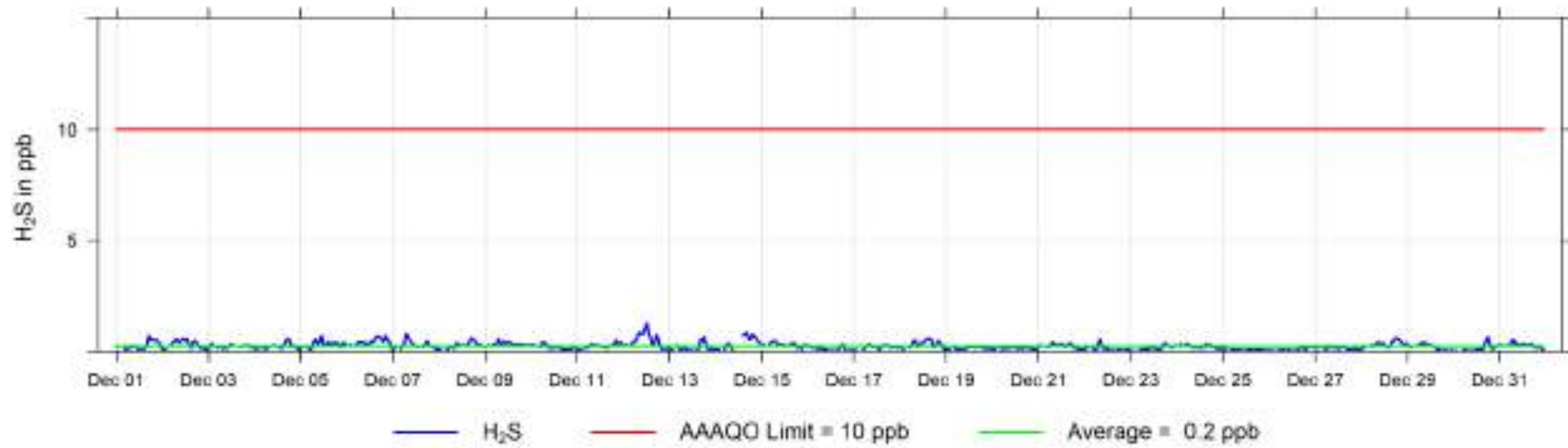
The following pages include the charts and histograms for Fox Creek Station



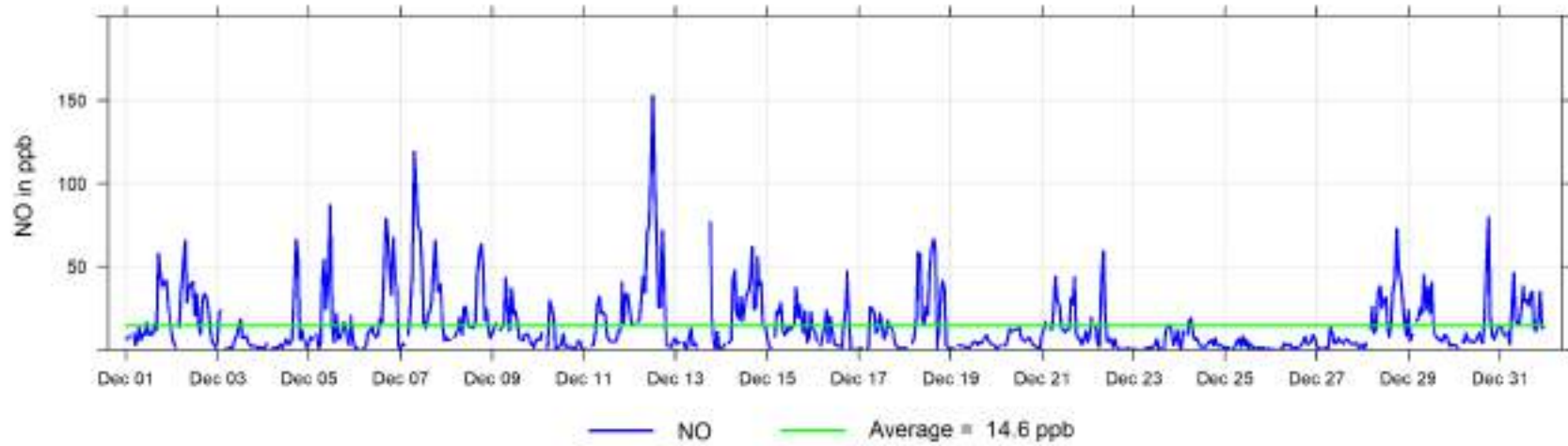
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Fox Creek



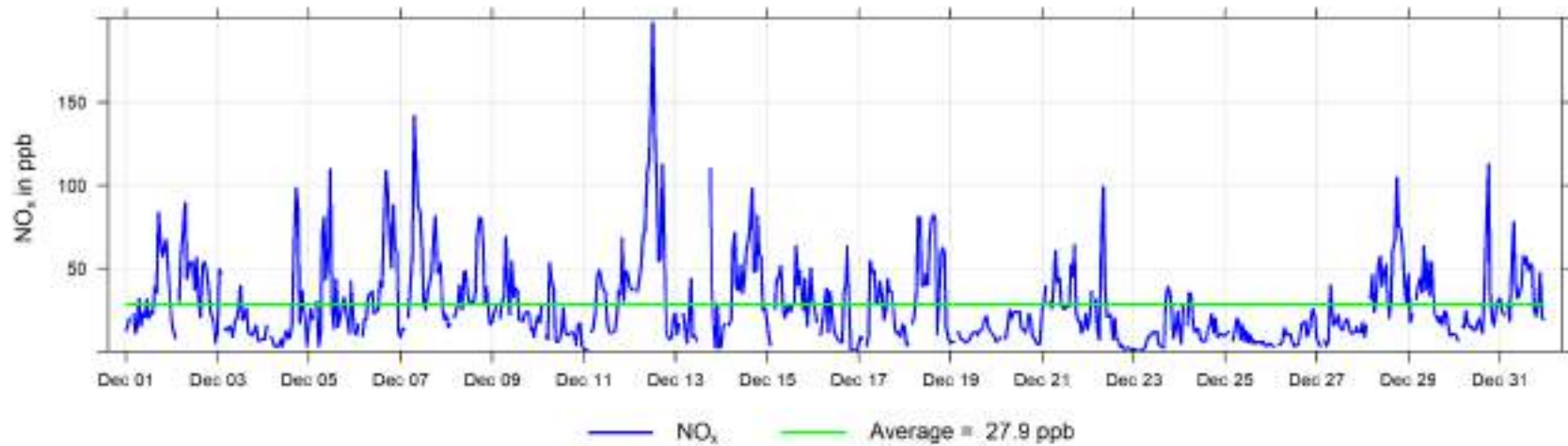
December 2023 Hourly Concentration Readings of H<sub>2</sub>S (in ppb) at Fox Creek



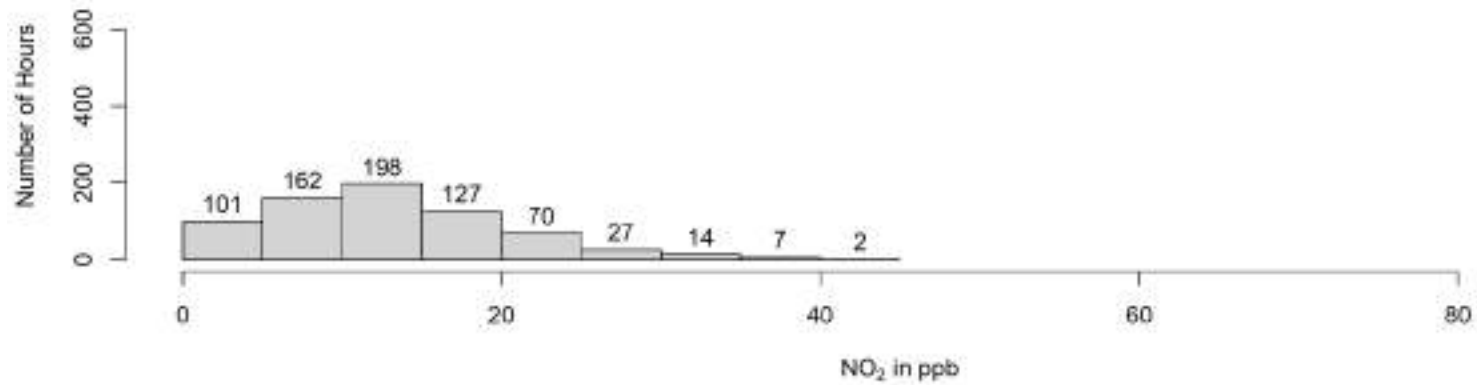
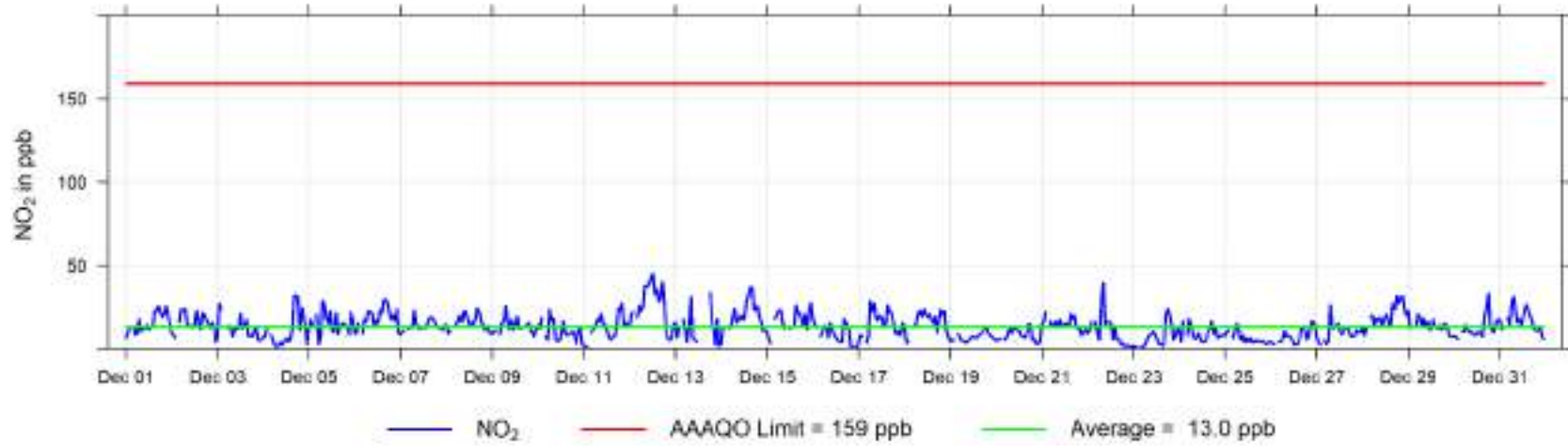
December 2023 Hourly Concentration Readings of NO (in ppb) at Fox Creek



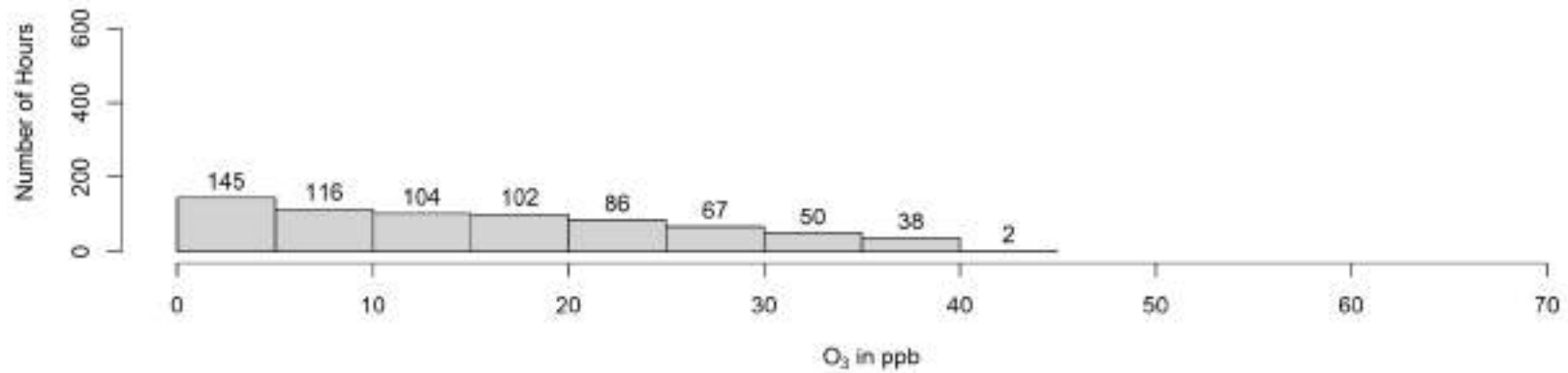
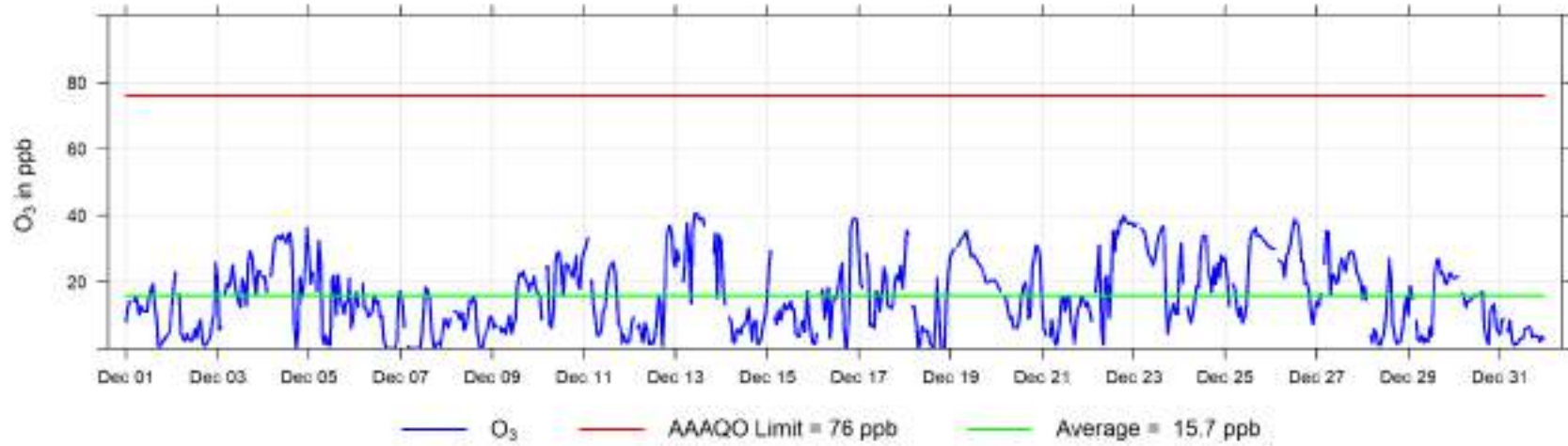
December 2023 Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Fox Creek



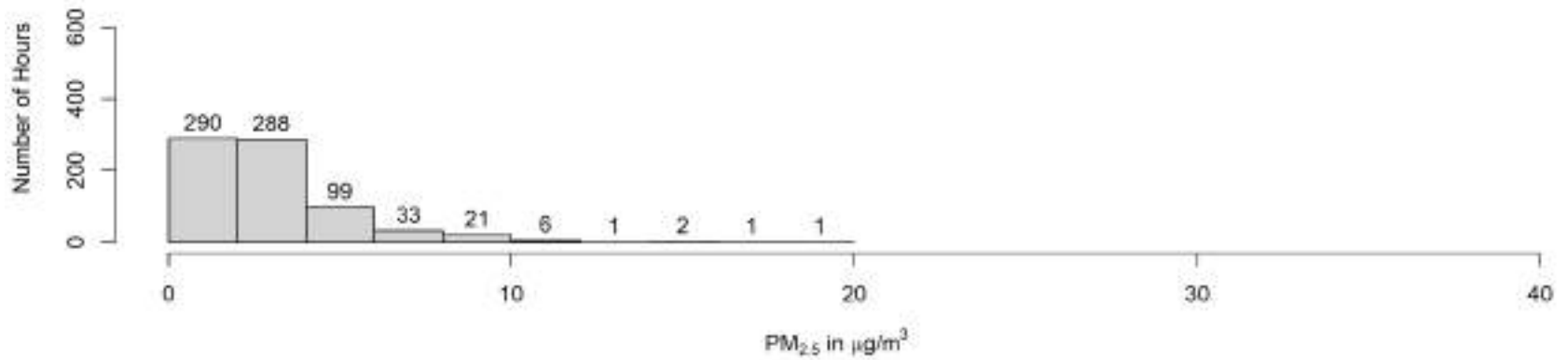
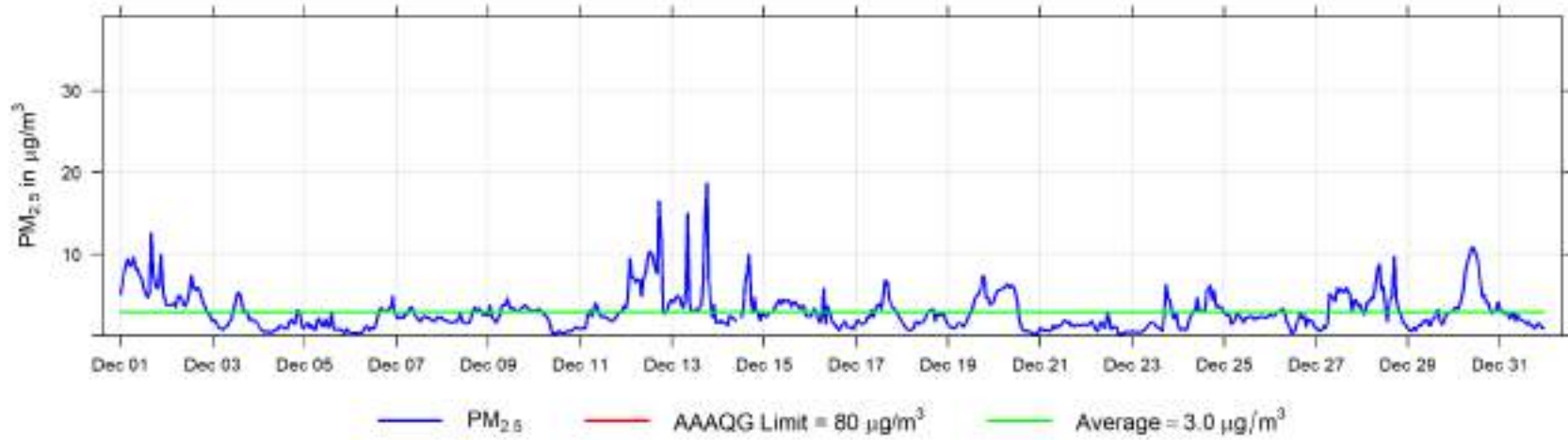
December 2023 Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Fox Creek



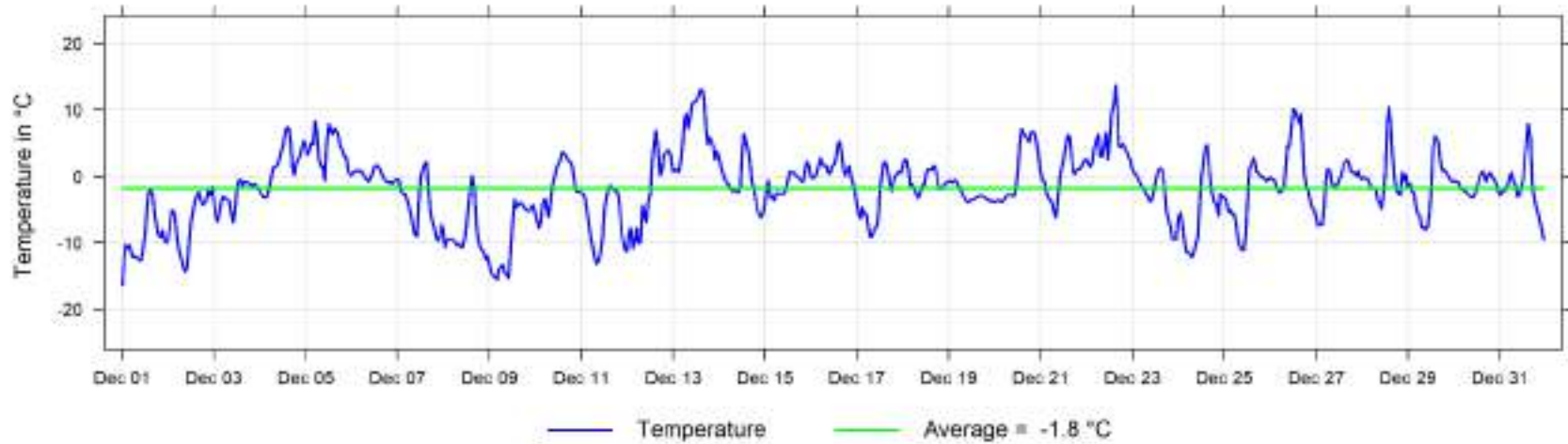
December 2023 Hourly Concentration Readings of O<sub>3</sub> (in ppb) at Fox Creek



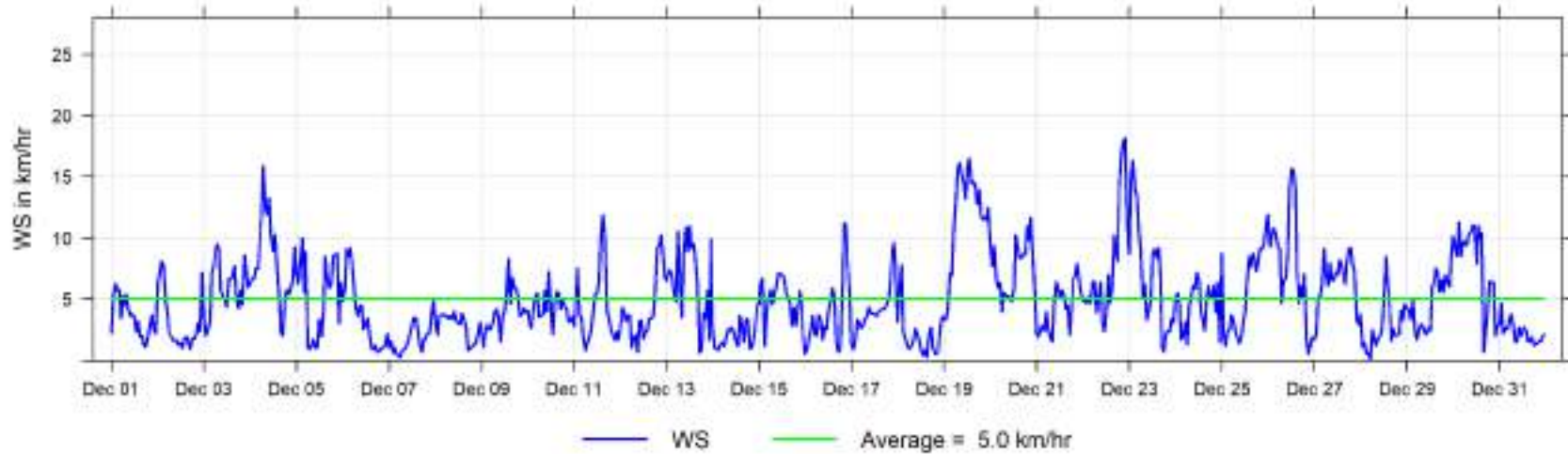
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Fox Creek



December 2023 Hourly Temperature Readings (in °C) at Fox Creek



December 2023 Hourly Readings of Wind Speed (in km/hr) at Fox Creek

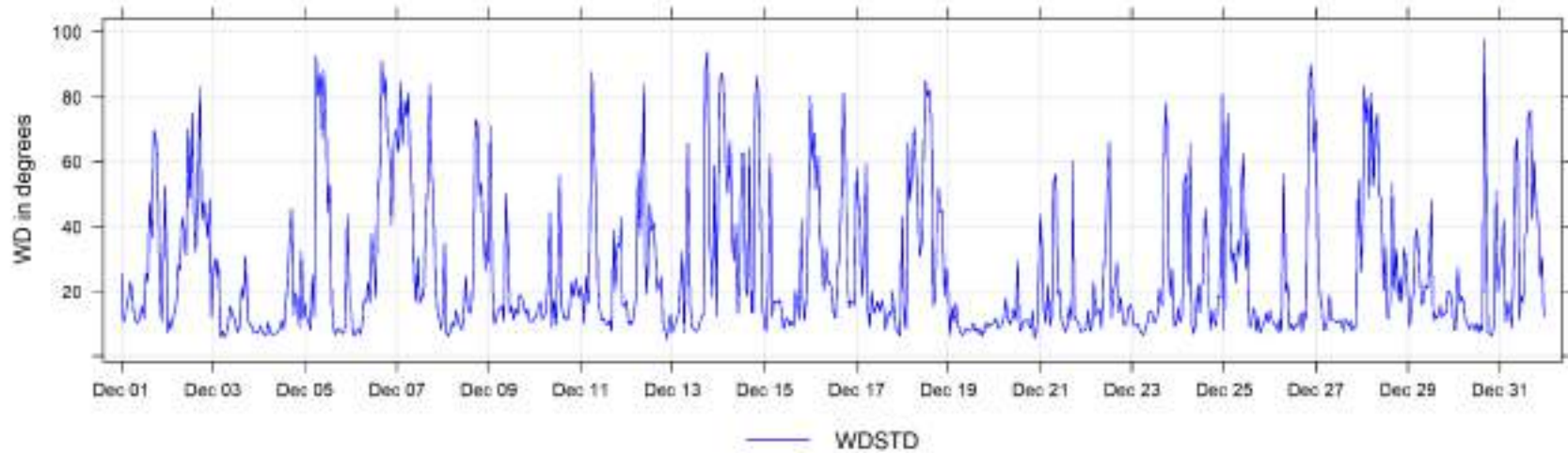


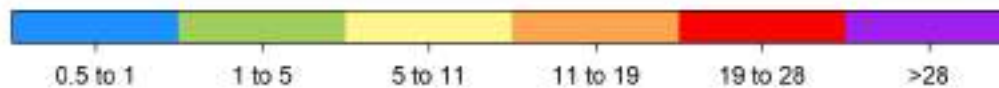
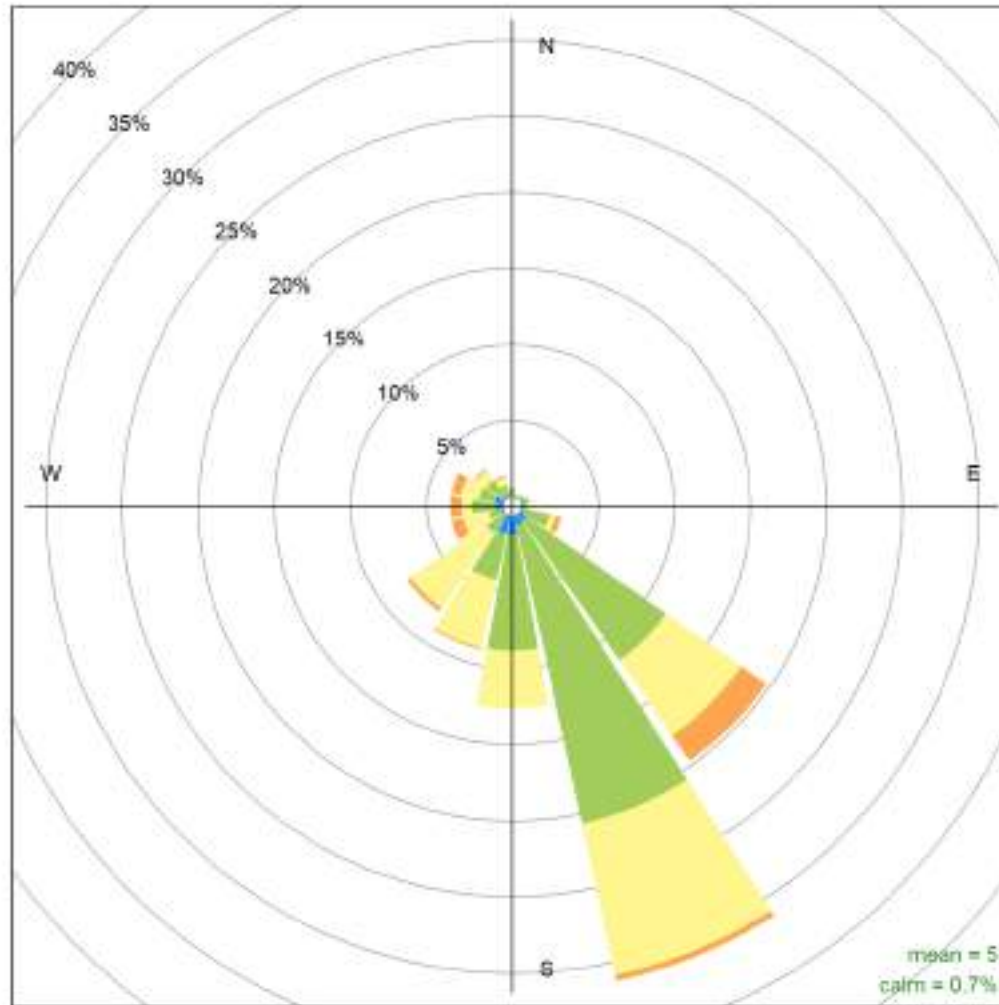


December 2023 Hourly Readings of Wind Direction (in degrees) at Fox Creek



December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Fox Creek



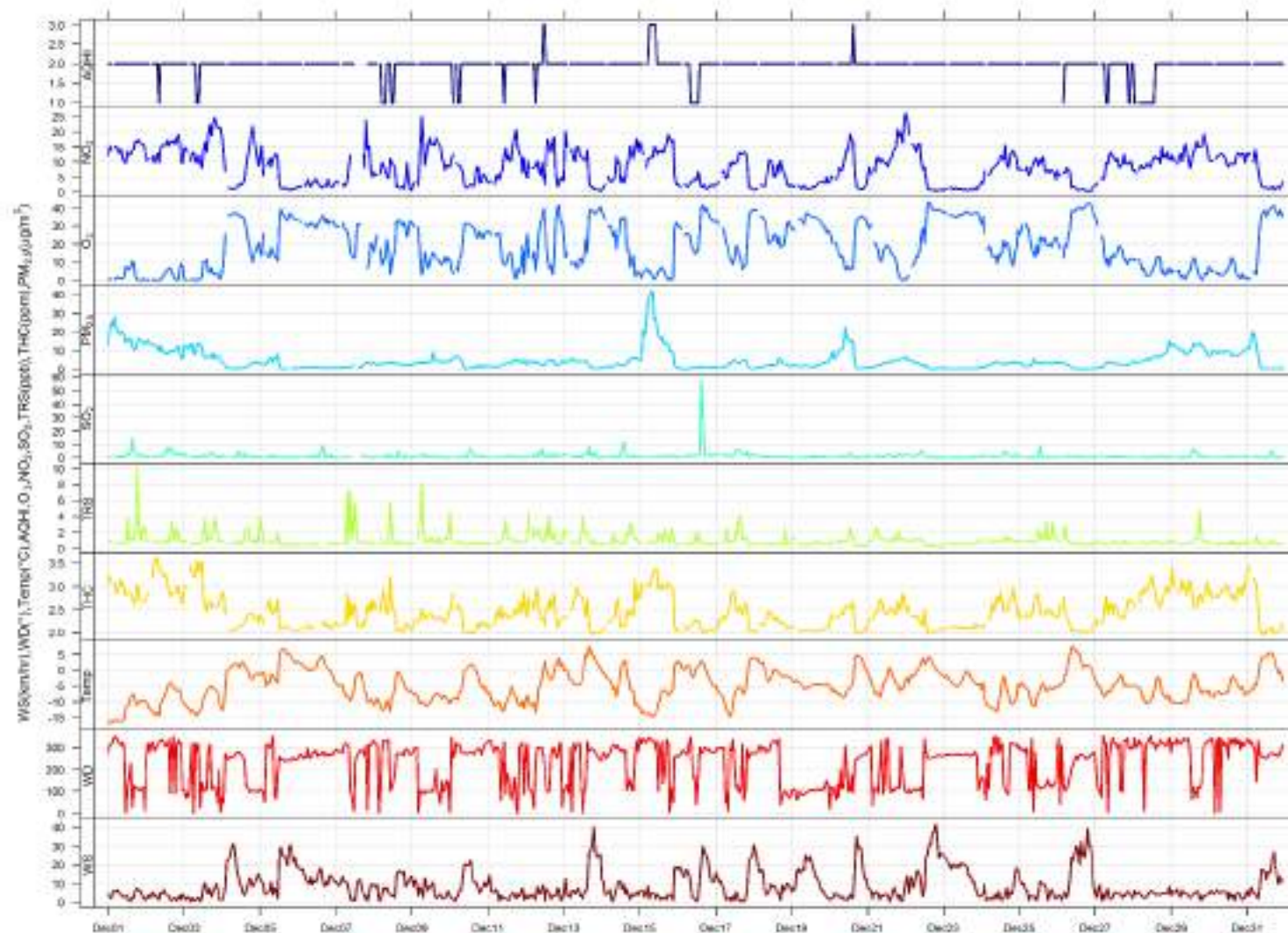


Fox Creek December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

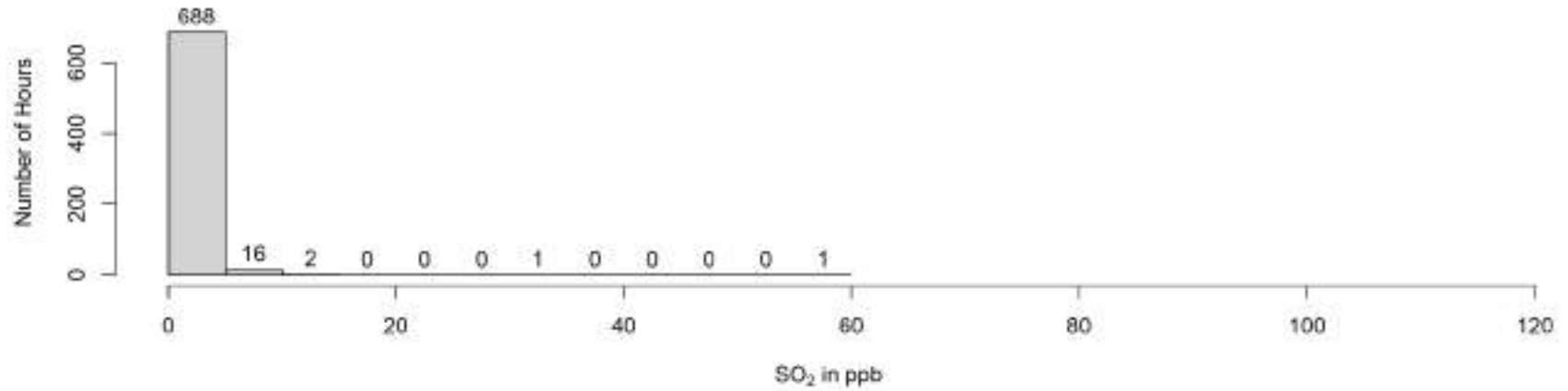
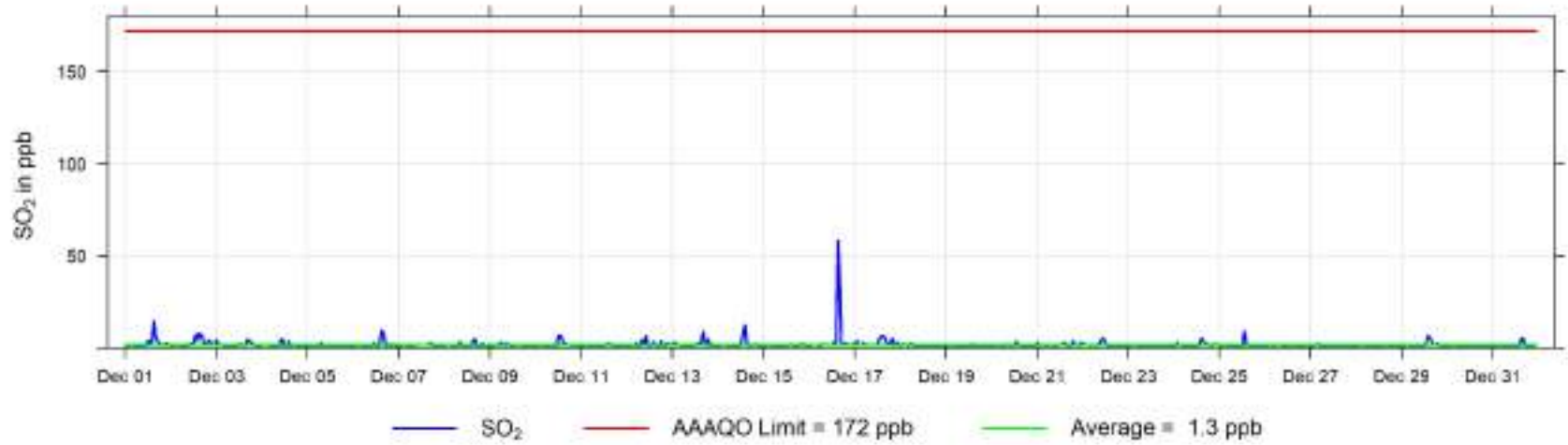
## 8 Poplar (Portable) Charts

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

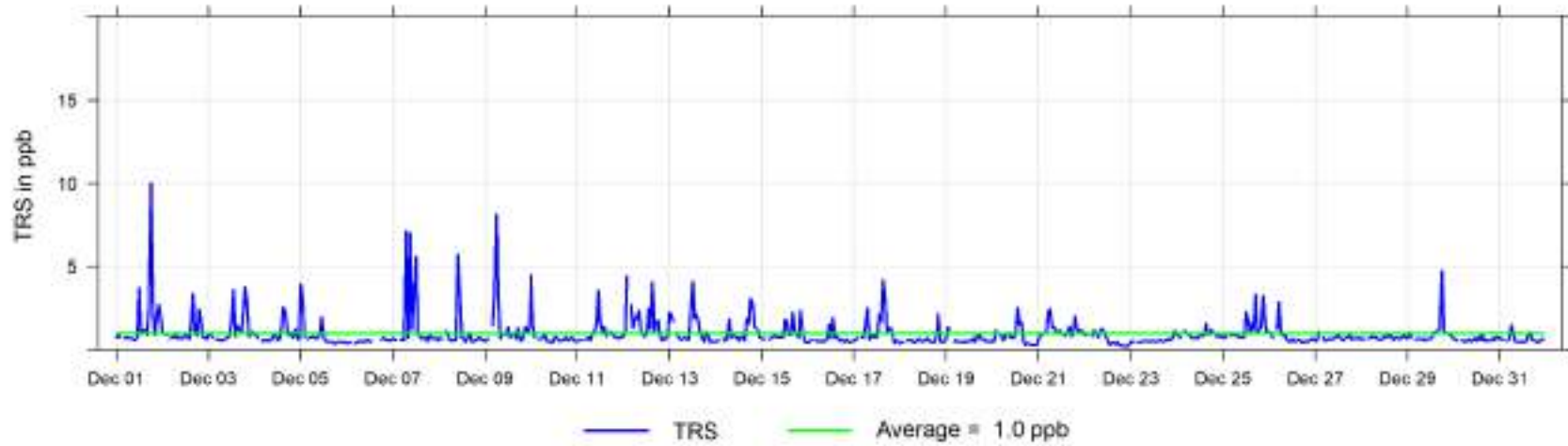
December 2023 Concentration Readings at Poplar Station



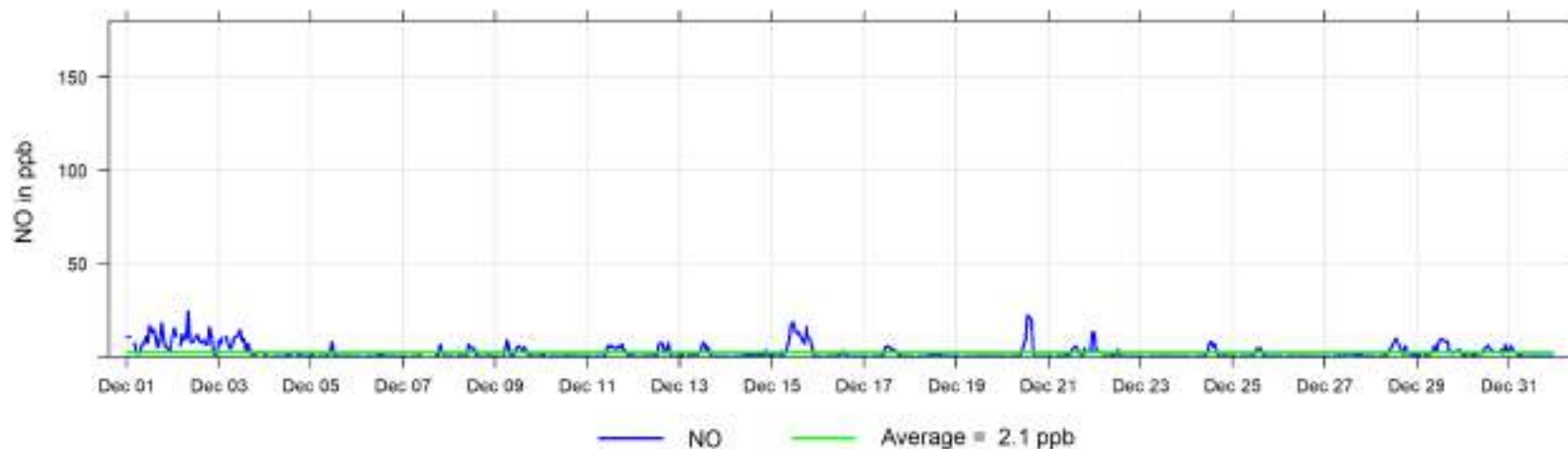
December 2023 Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Poplar



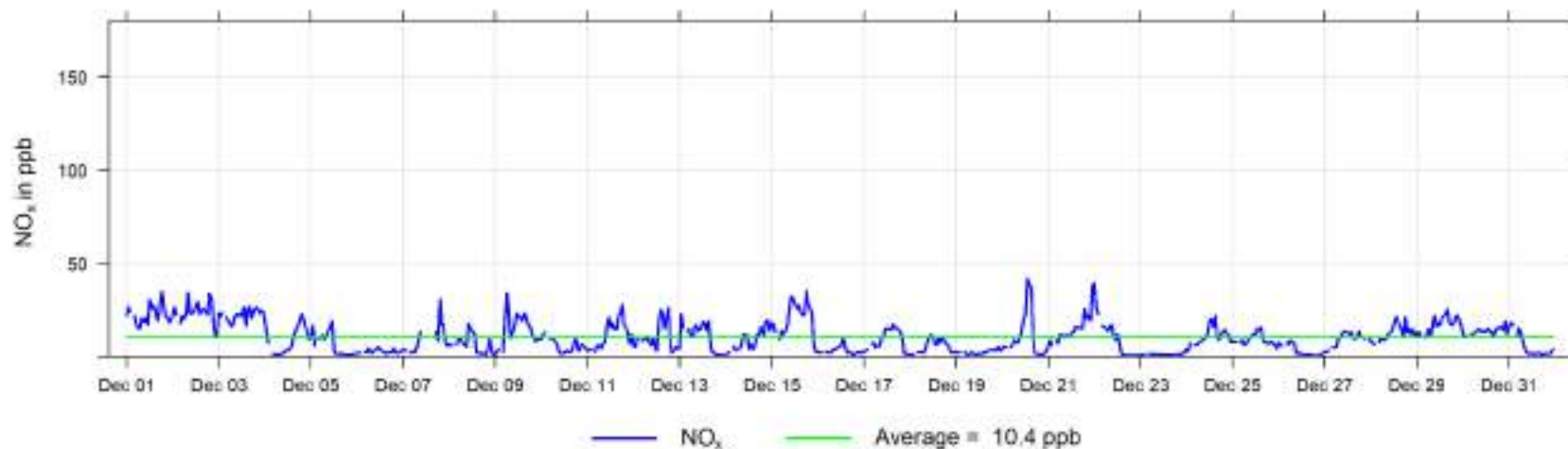
December 2023 Hourly Concentration Readings of TRS (in ppb) at Poplar



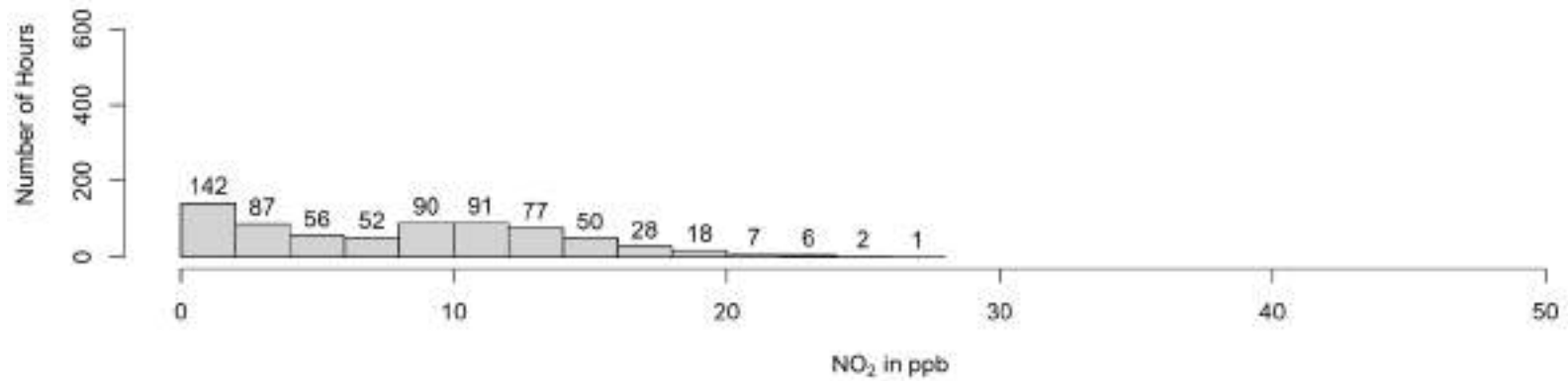
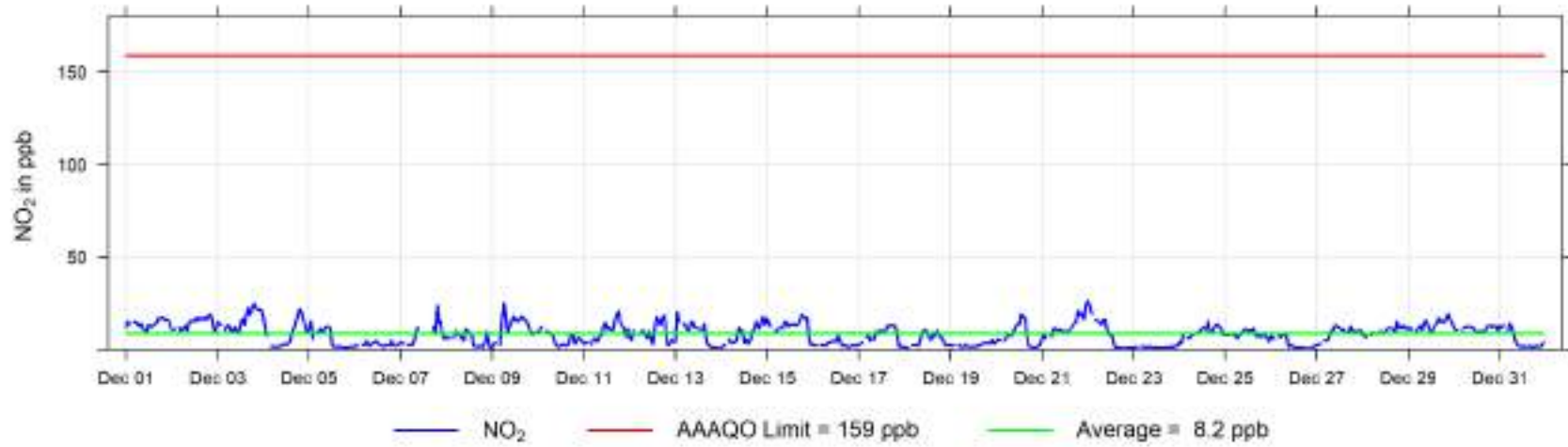
December 2023 Hourly Concentration Readings of NO (in ppb) at Poplar



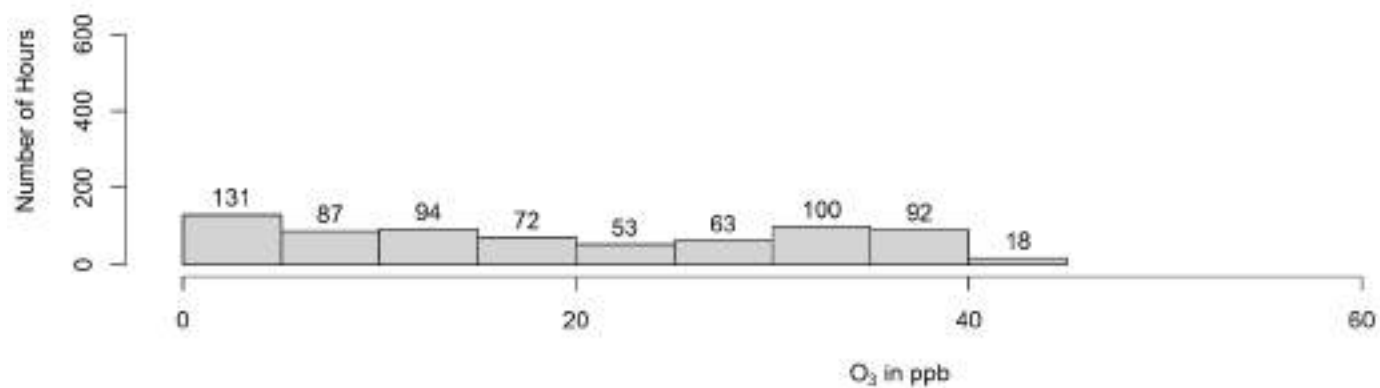
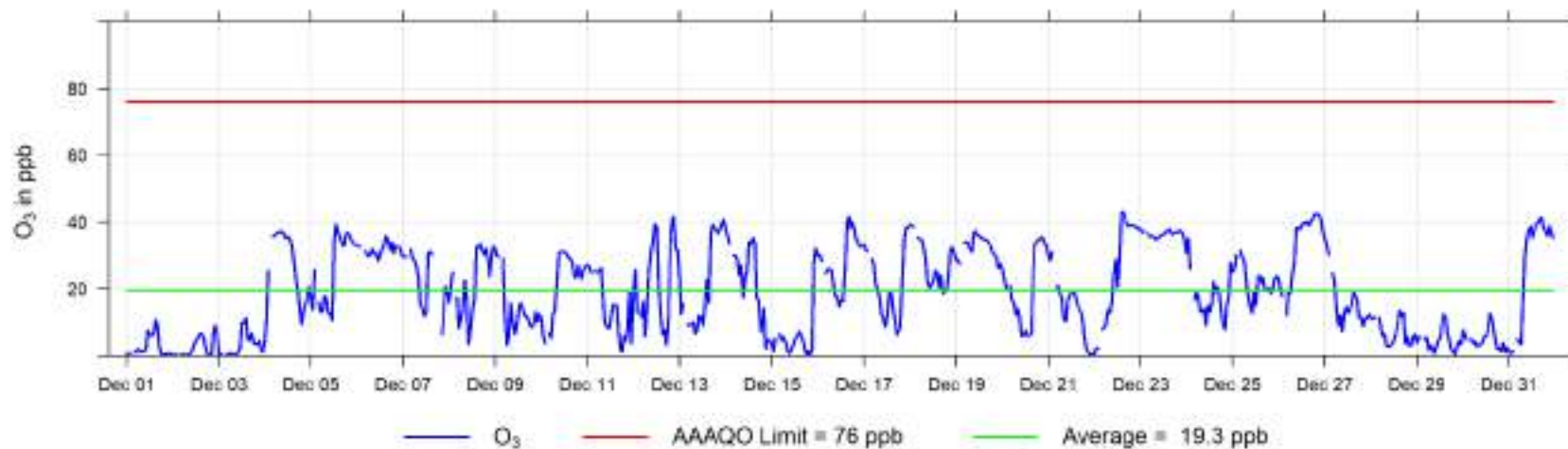
December 2023 Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Poplar



December 2023 Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Poplar

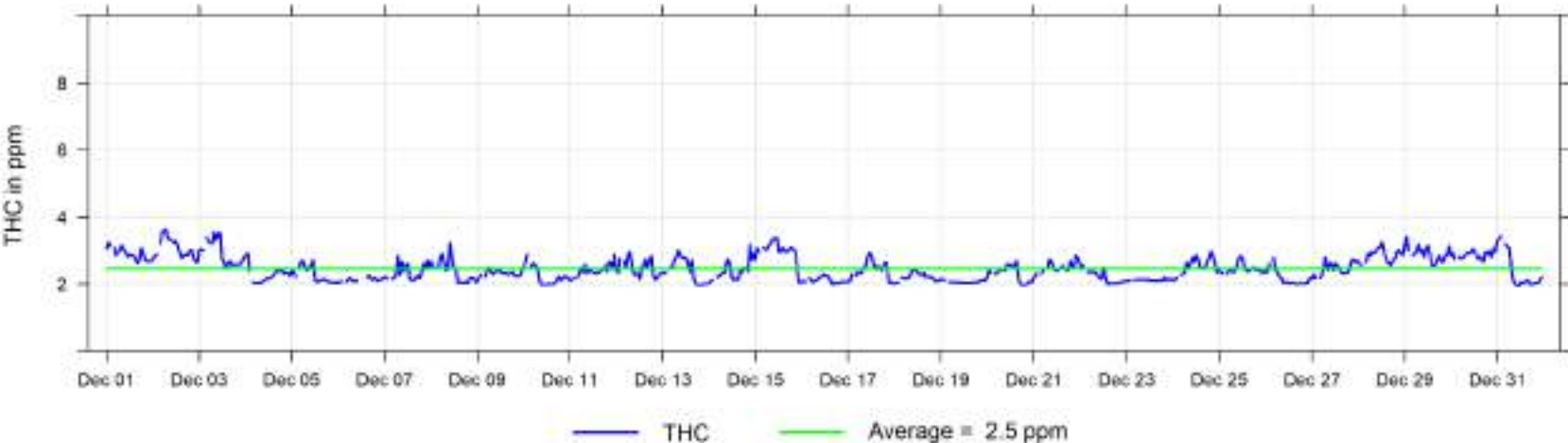


December 2023 Hourly Concentration Readings of O<sub>3</sub> (in ppb) at Poplar

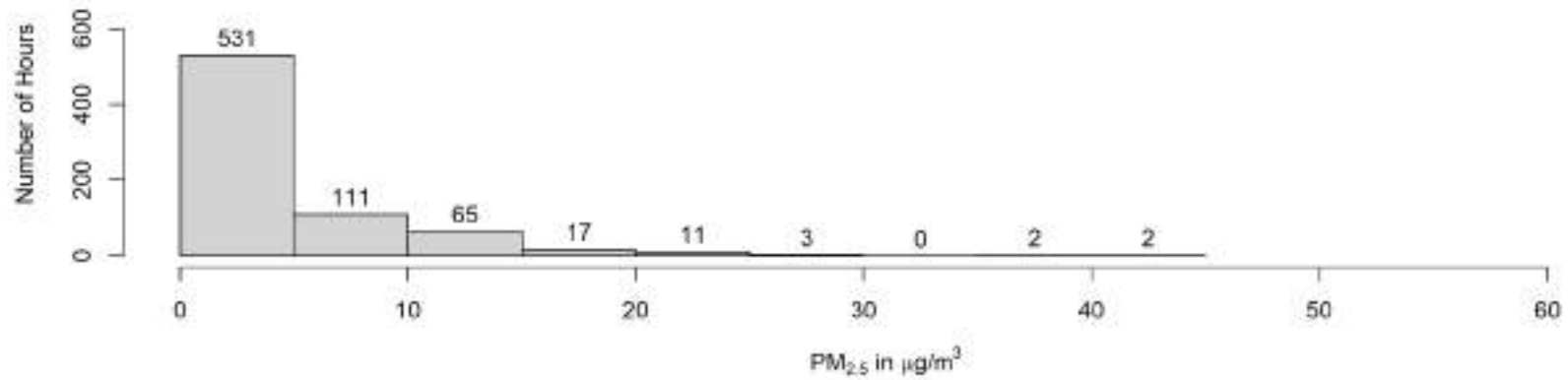
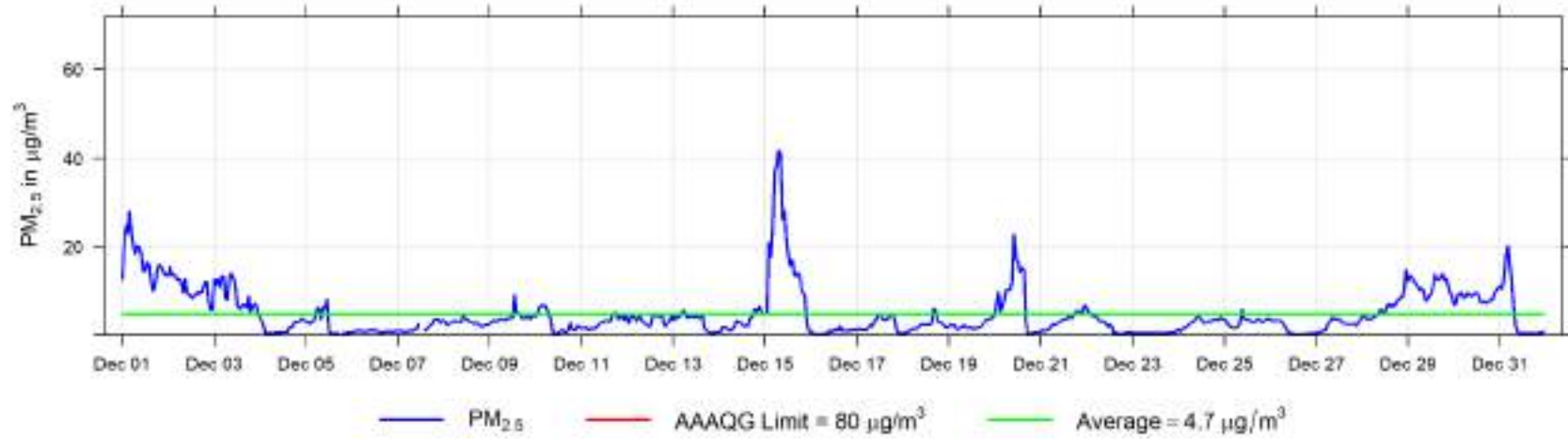




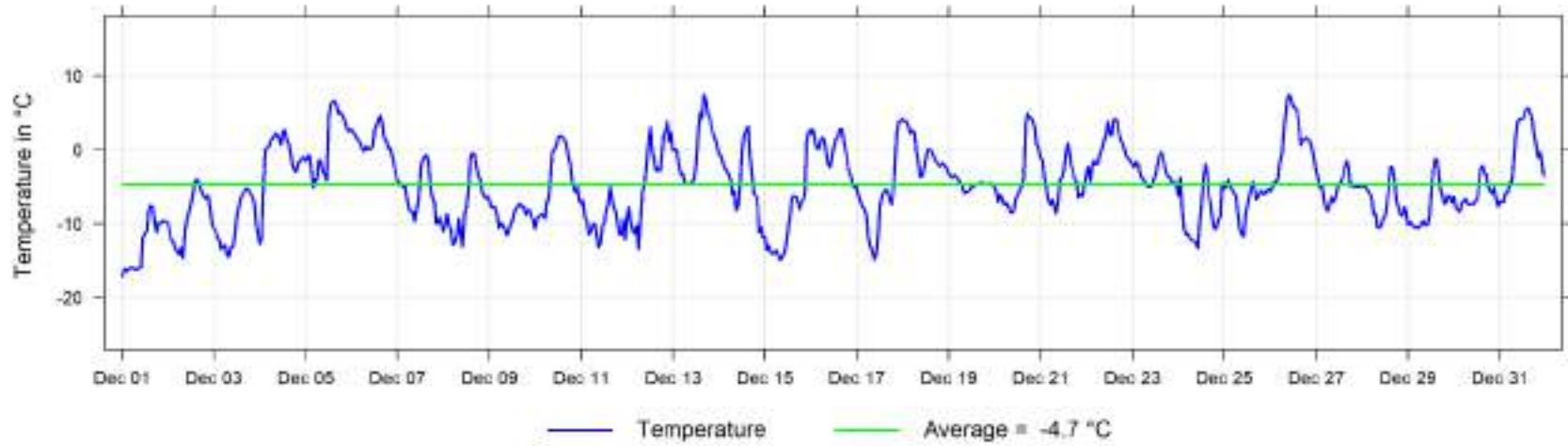
December 2023 Hourly Concentration Readings of THC (in ppm) at Poplar



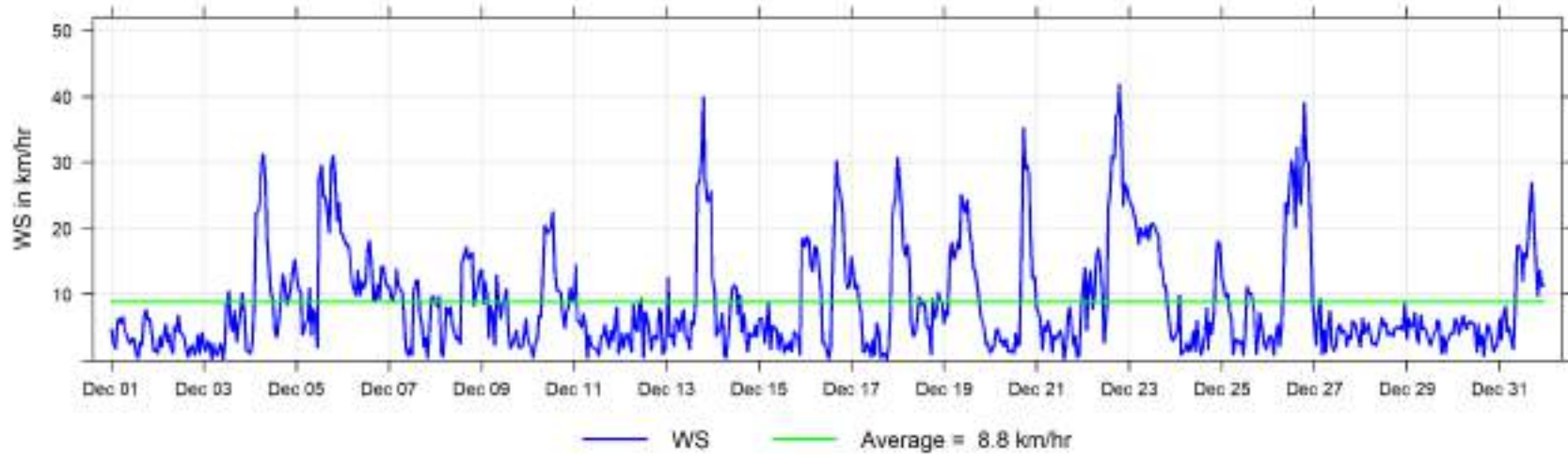
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Poplar



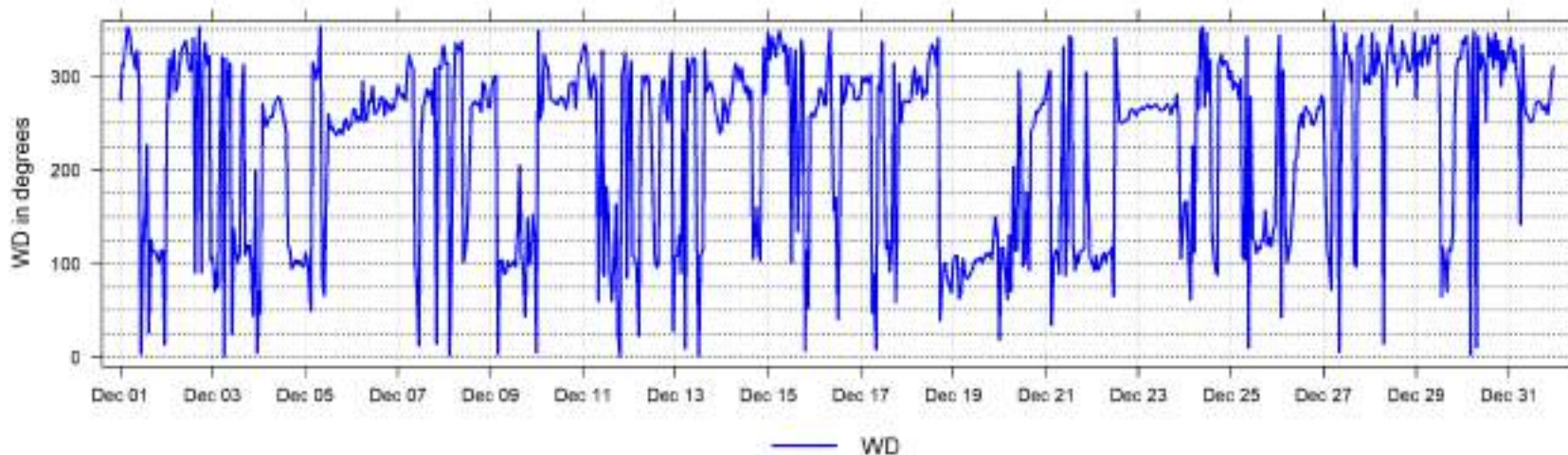
December 2023 Hourly Temperature Readings (in °C) at Poplar



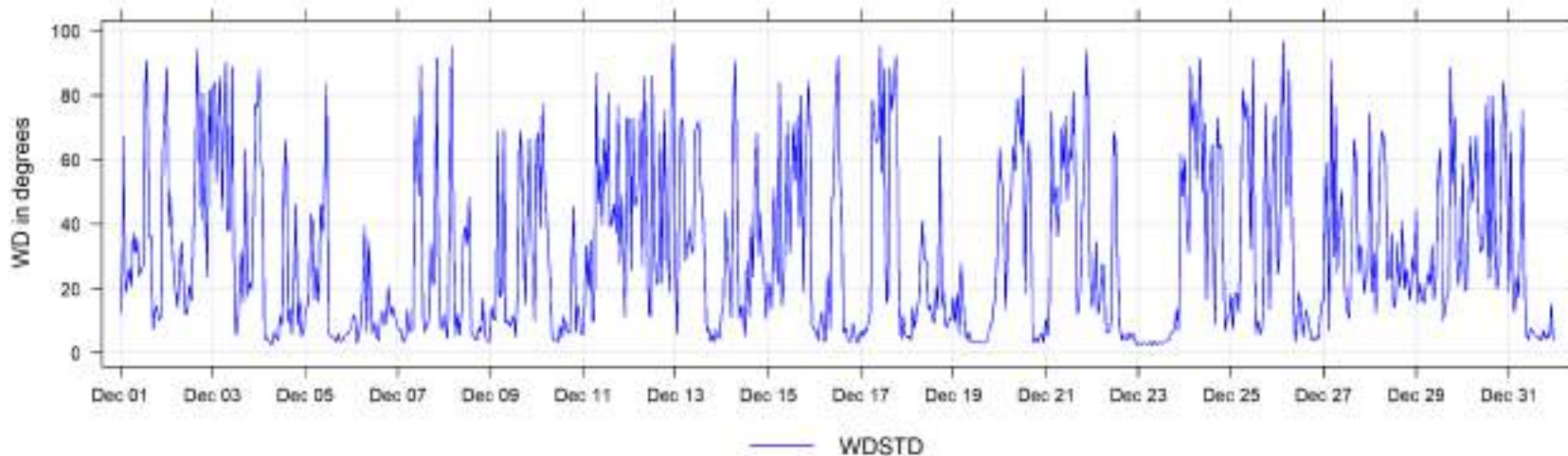
December 2023 Hourly Readings of Wind Speed (in km/hr) at Poplar

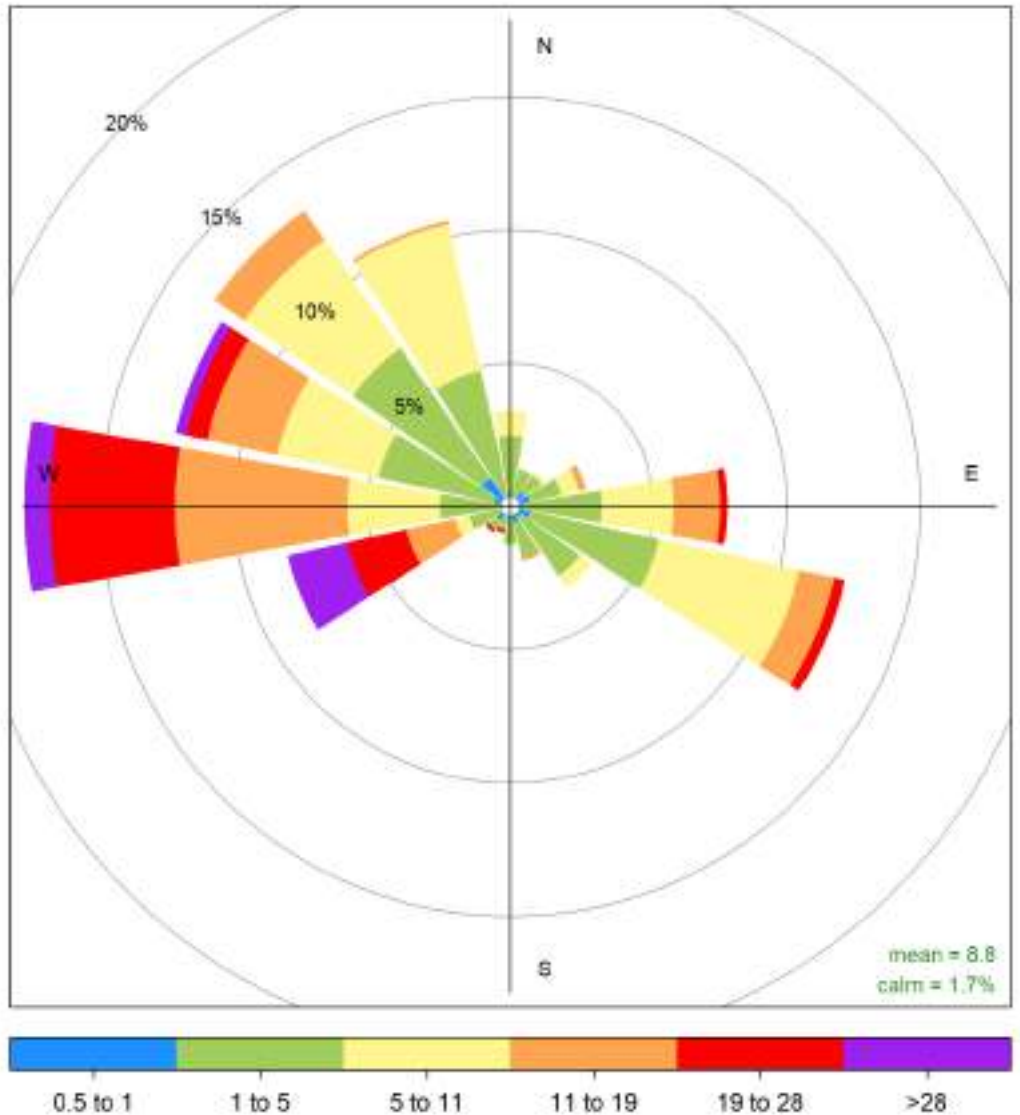


December 2023 Hourly Readings of Wind Direction (in degrees) at Poplar



December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Poplar

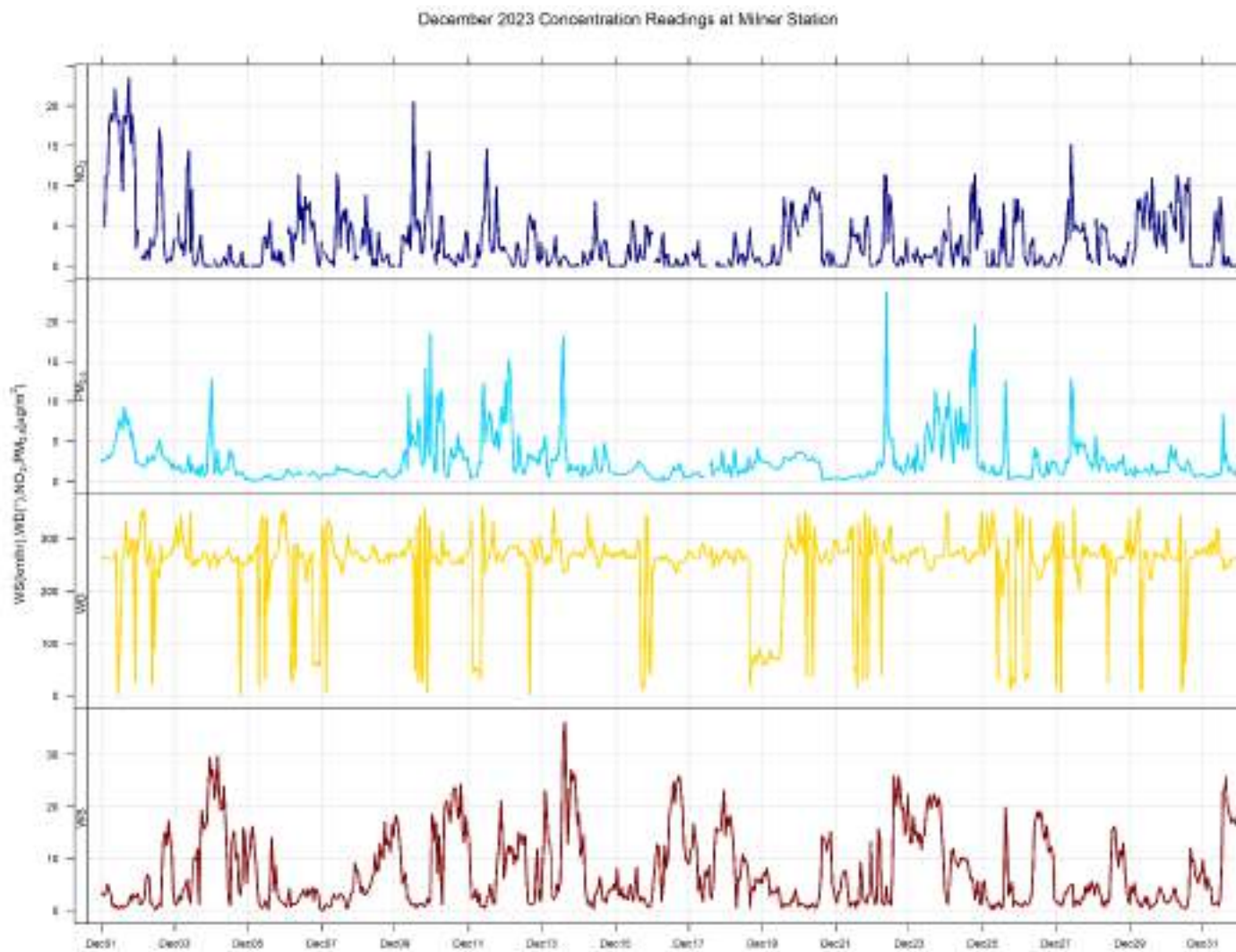




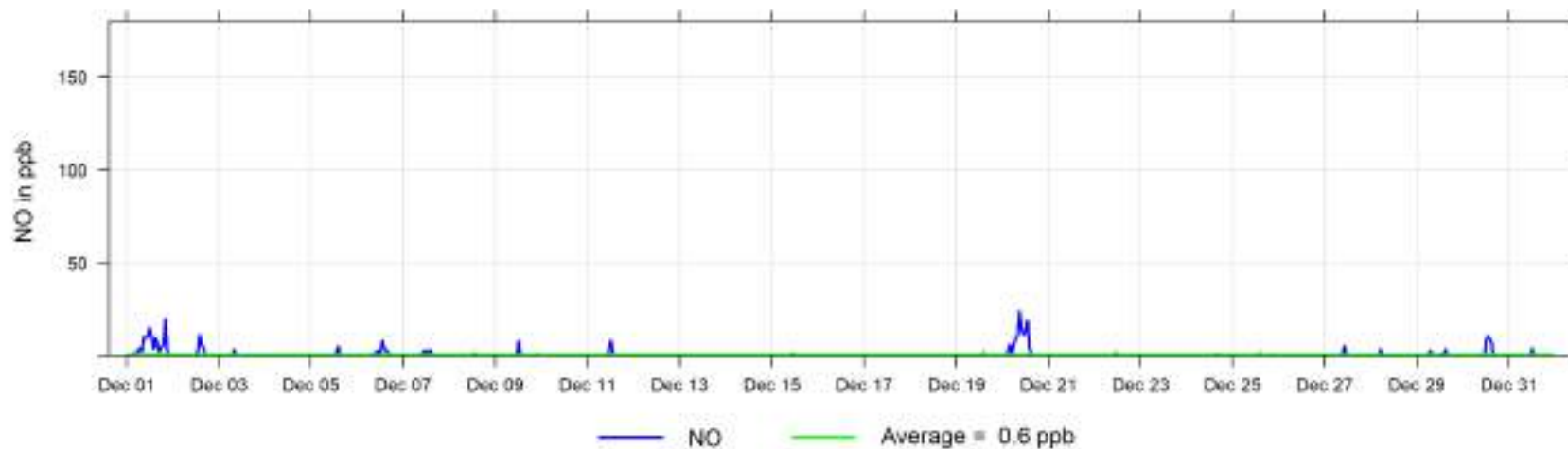
Poplar December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

## 9 Milner Charts

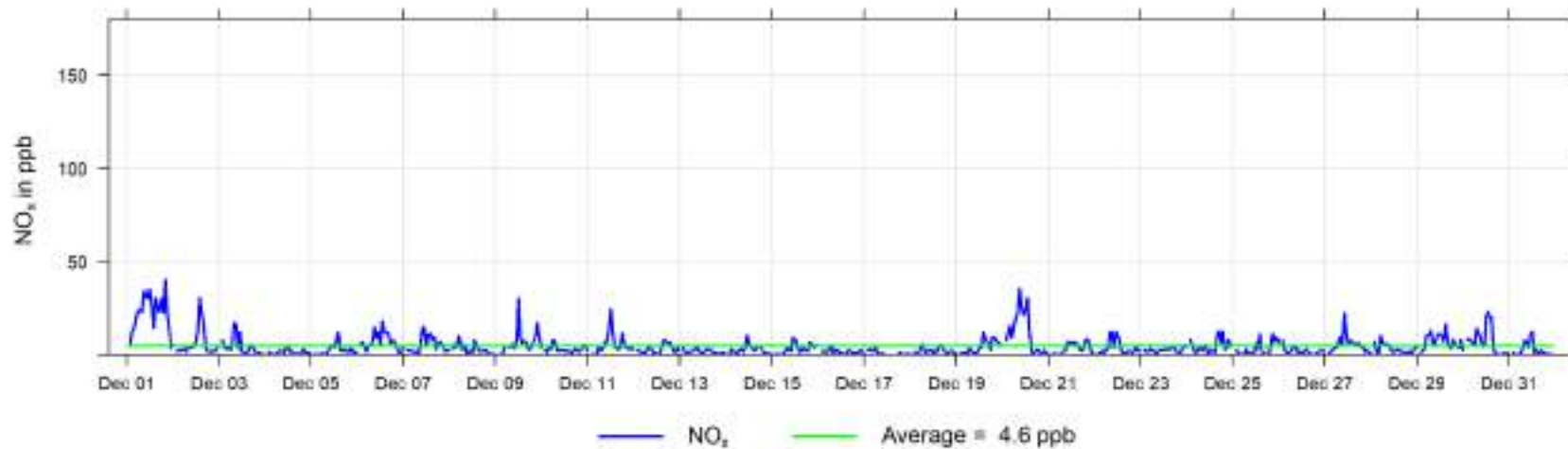
The following pages include the charts and histograms for Milner Station



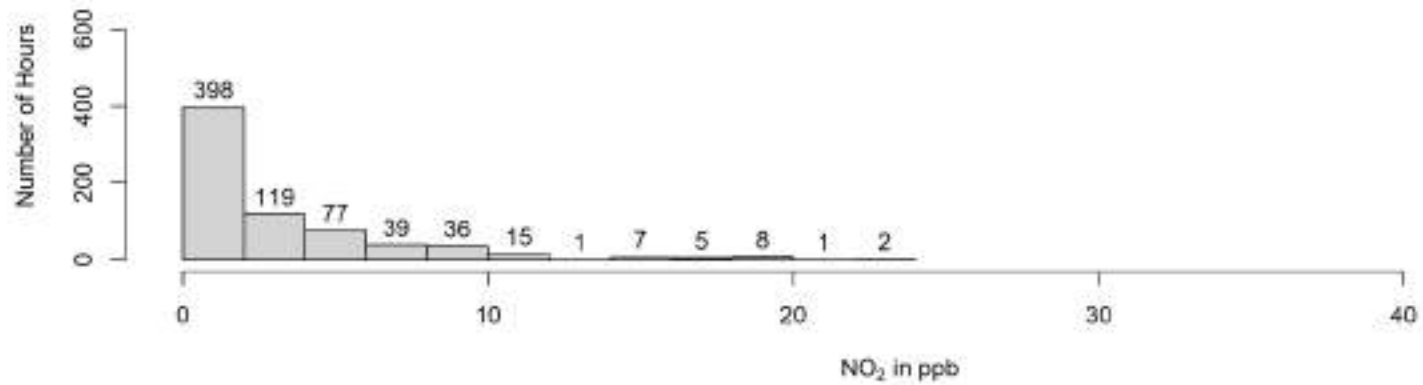
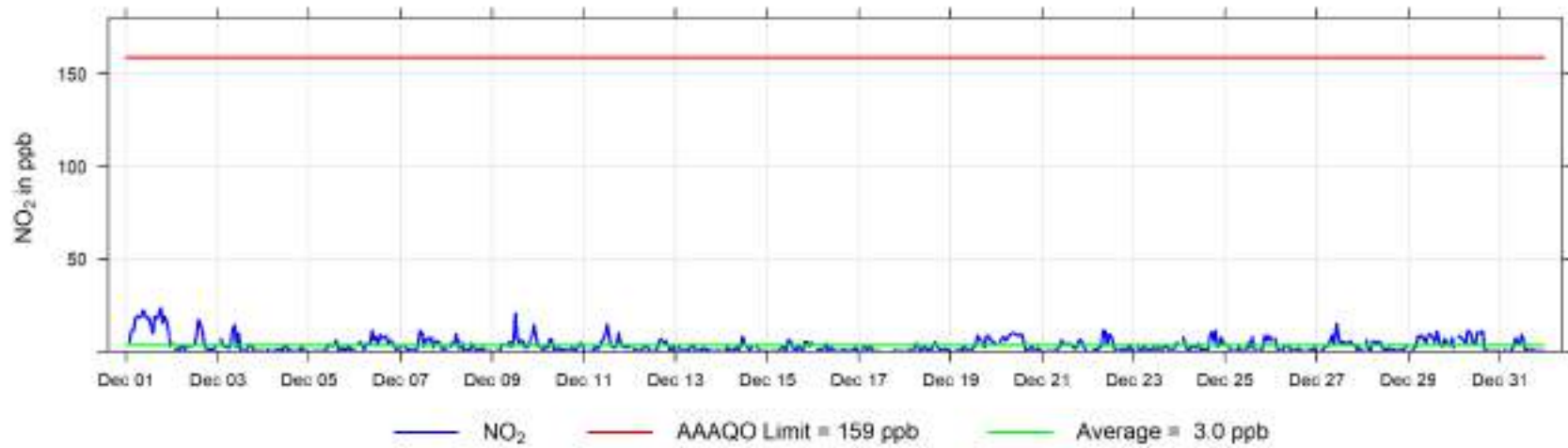
December 2023 Hourly Concentration Readings of NO (in ppb) at Milner



December 2023 Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Milner

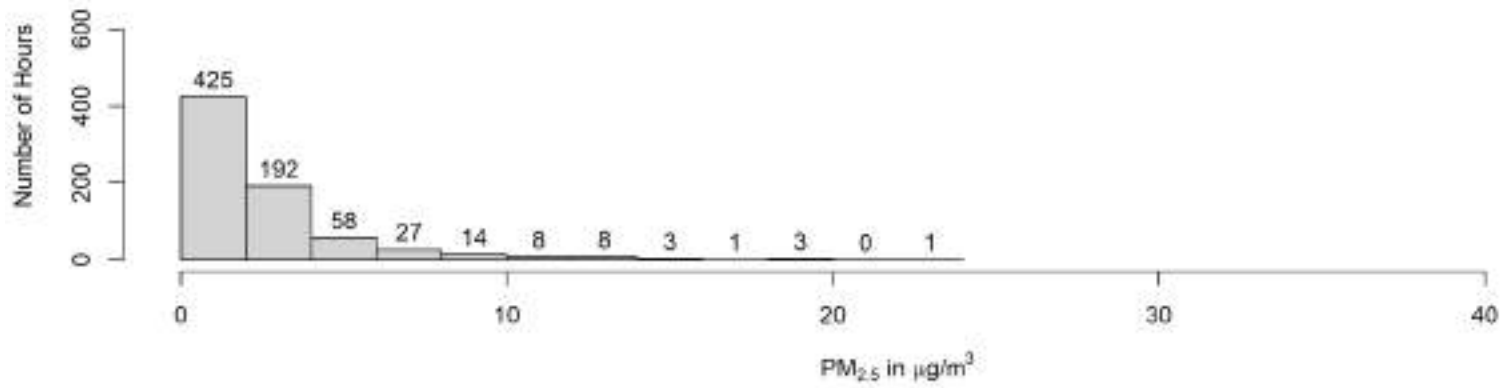
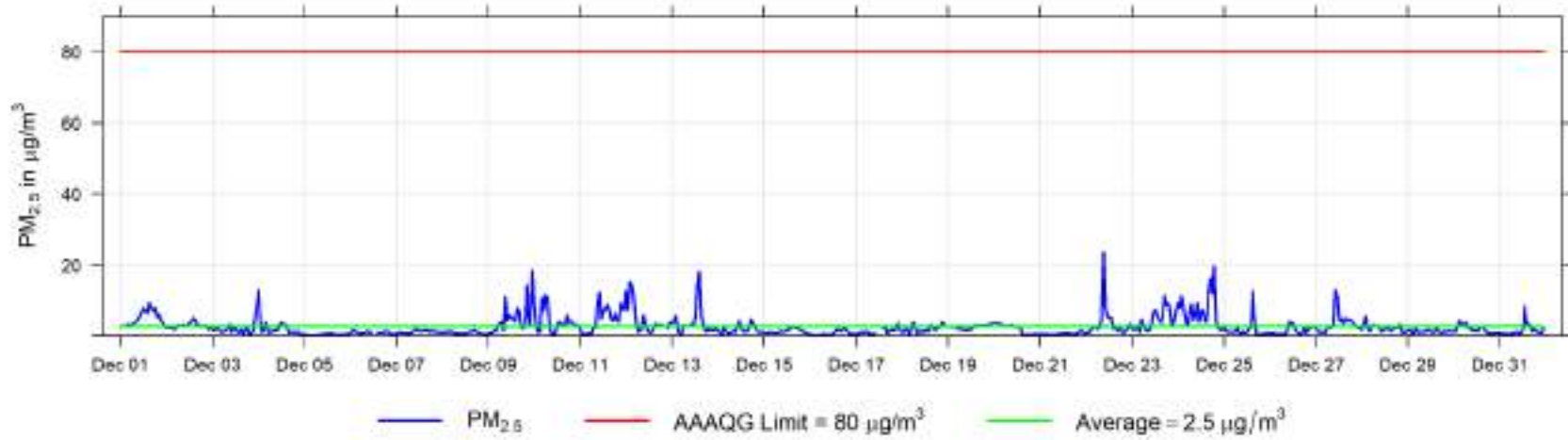


December 2023 Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Milner

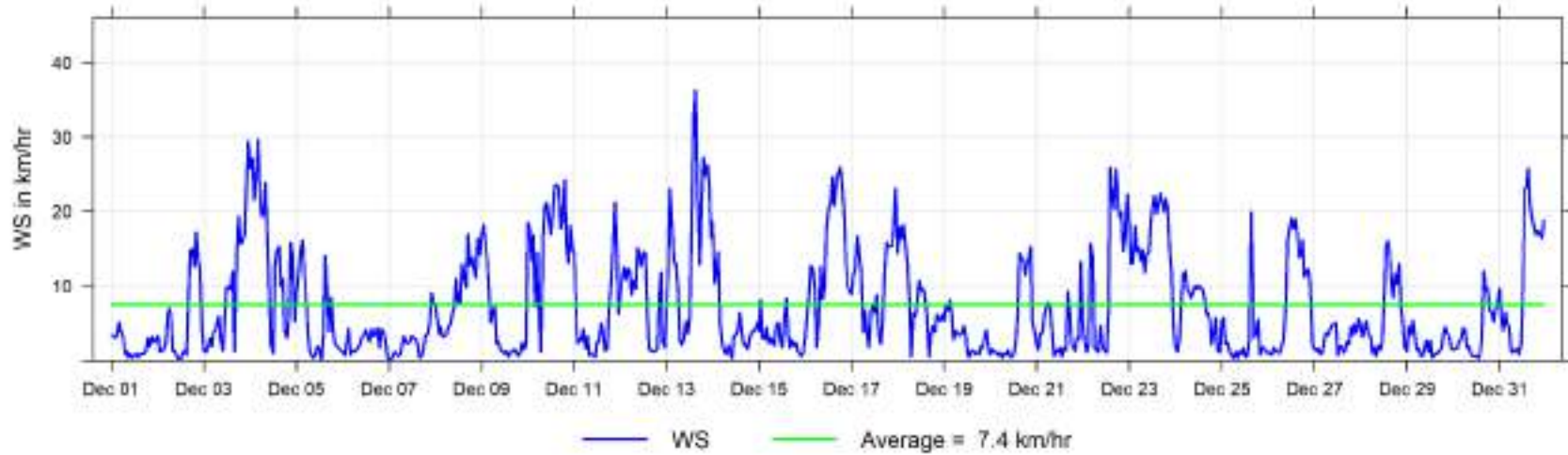




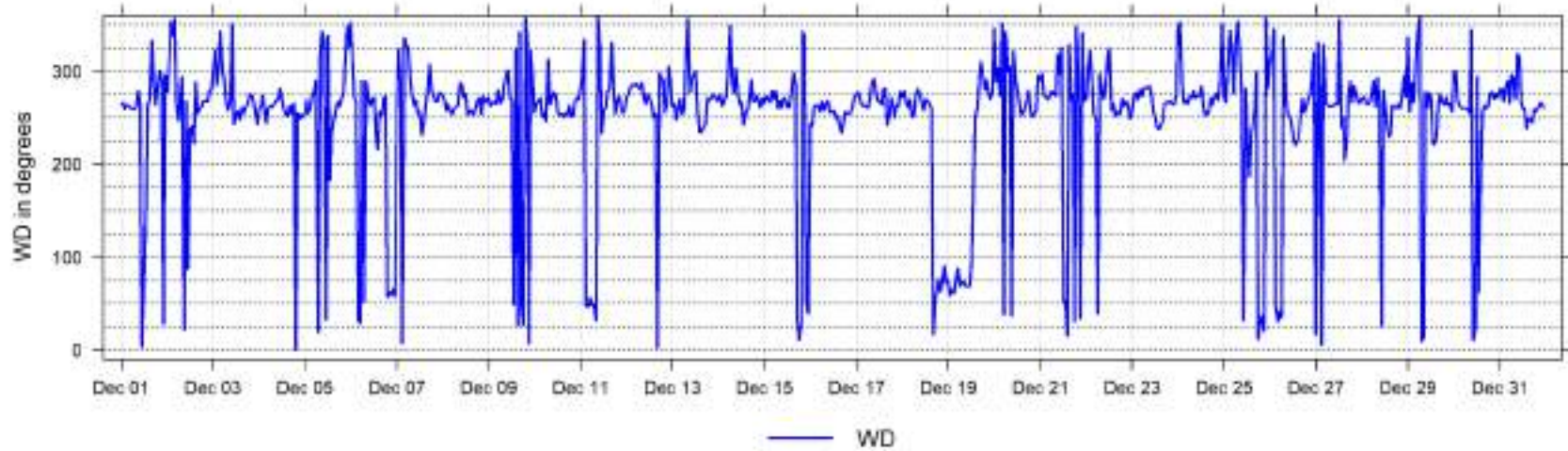
December 2023 Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Milner



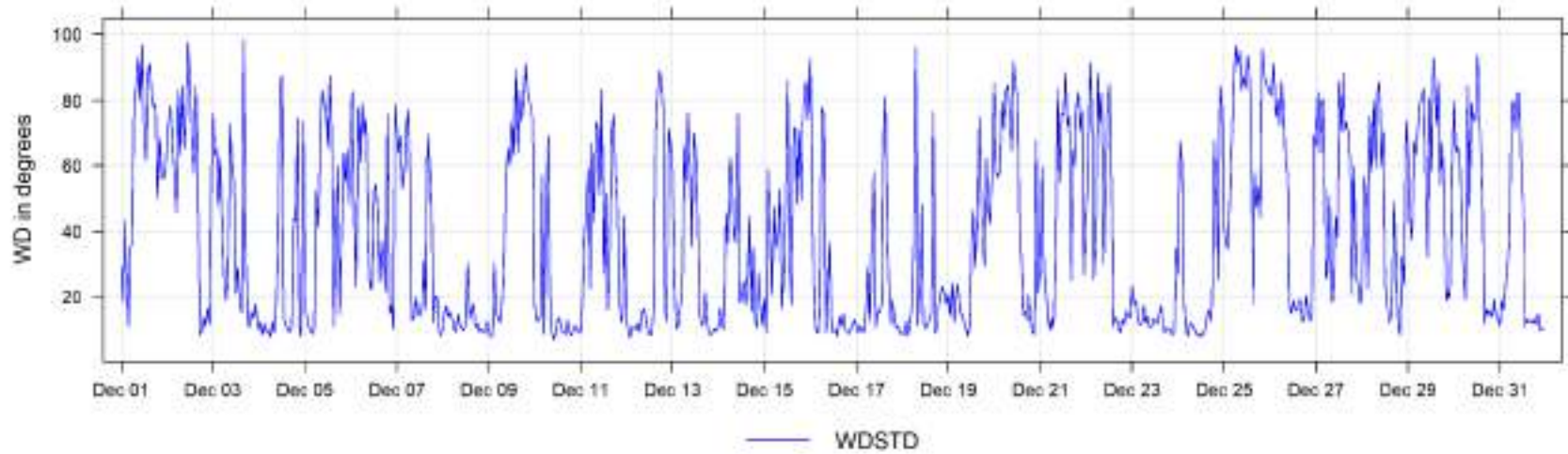
December 2023 Hourly Readings of Wind Speed (in km/hr) at Milner

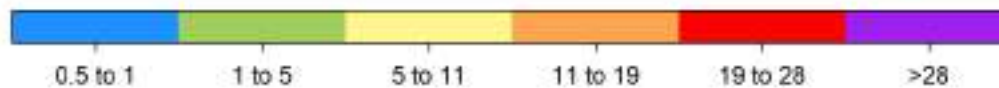
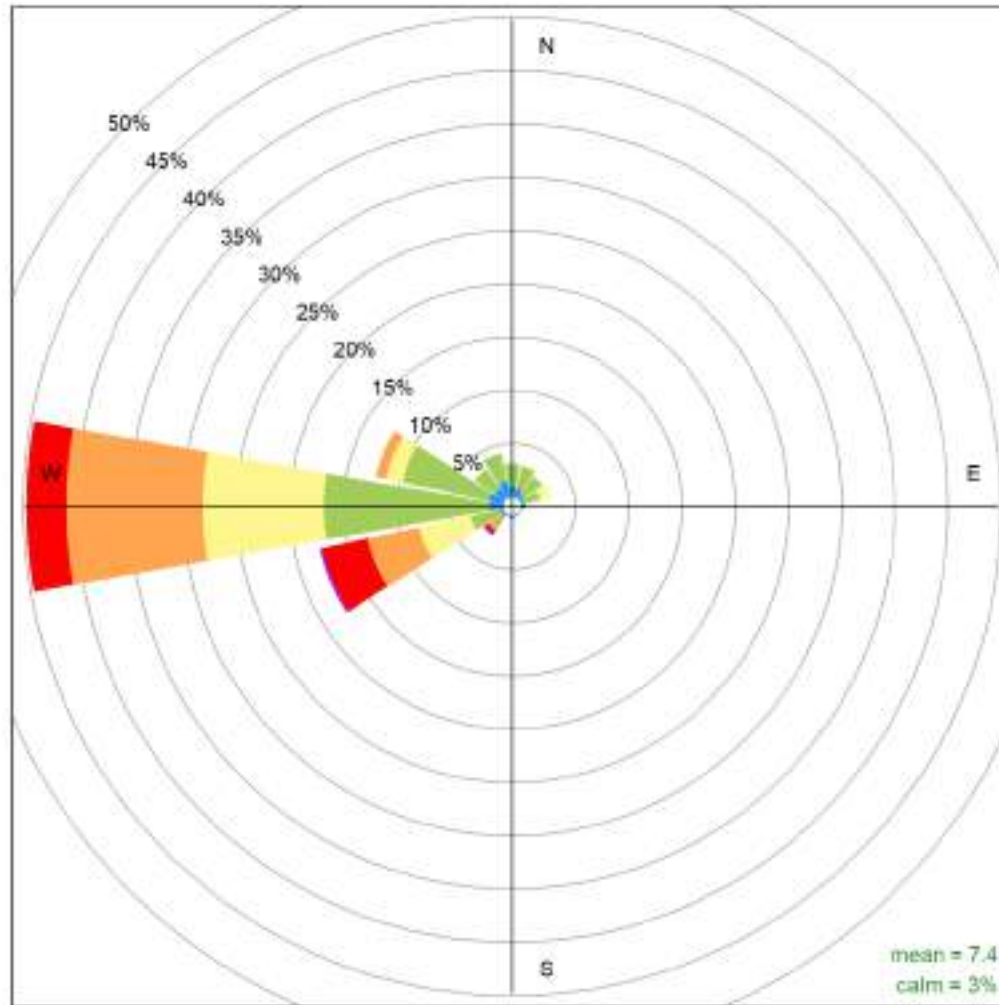


December 2023 Hourly Readings of Wind Direction (in degrees) at Milner



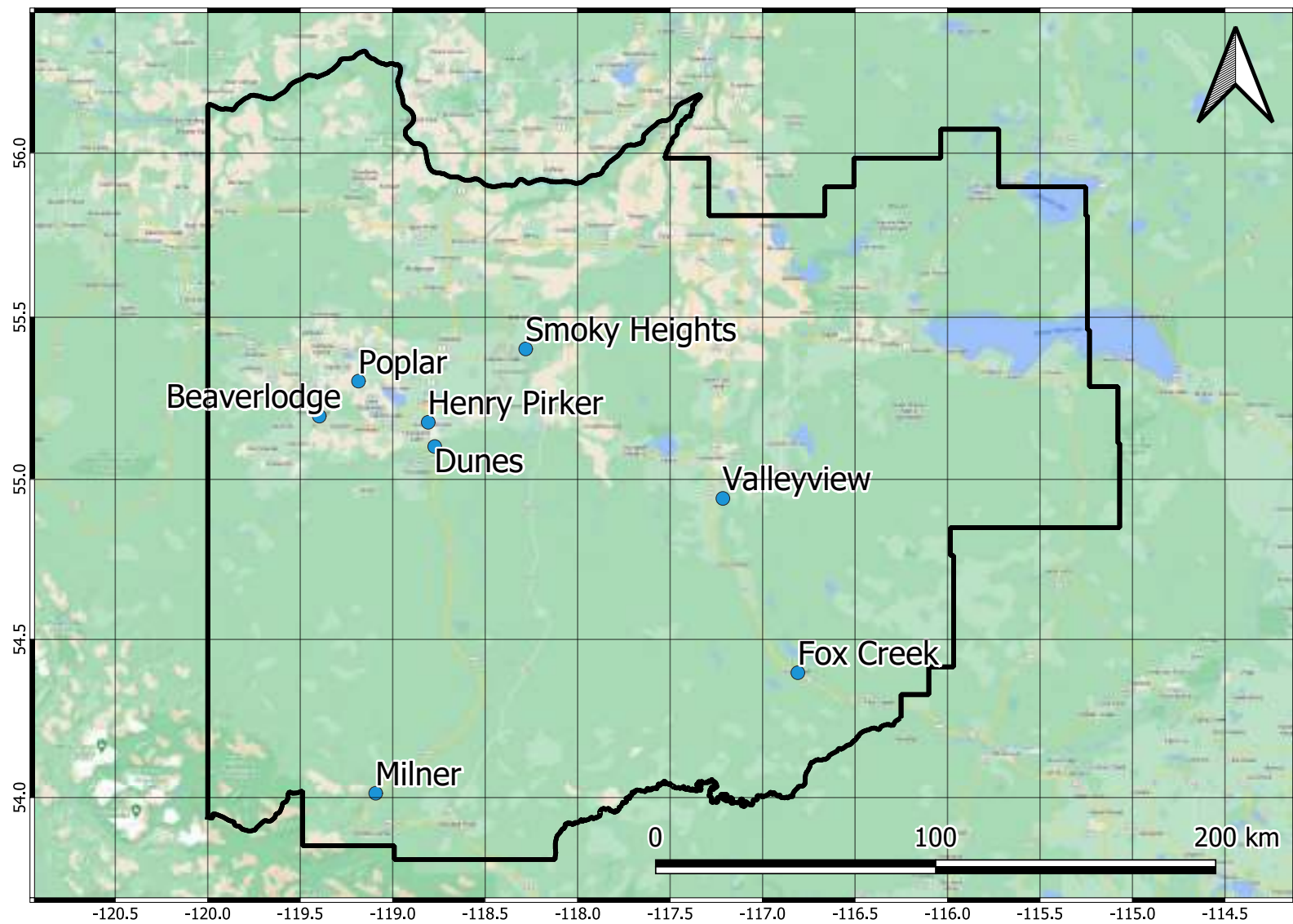
December 2023 Hourly Readings of Wind Direction Standard Deviation (in degrees) at Milner



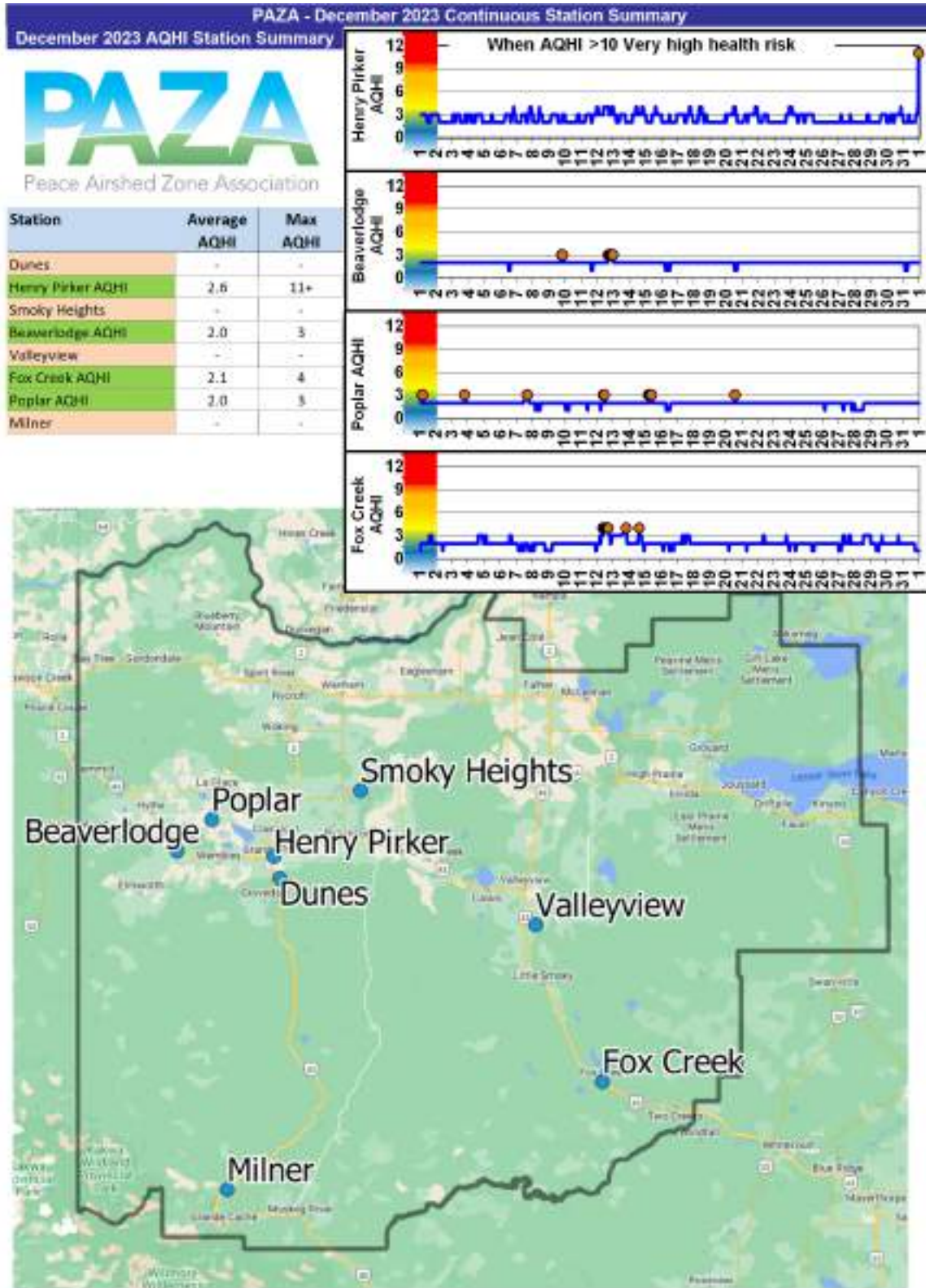


Milner December 2023 Wind Rose, wind speed in km/hr  
**Frequency of counts by wind direction (%)**

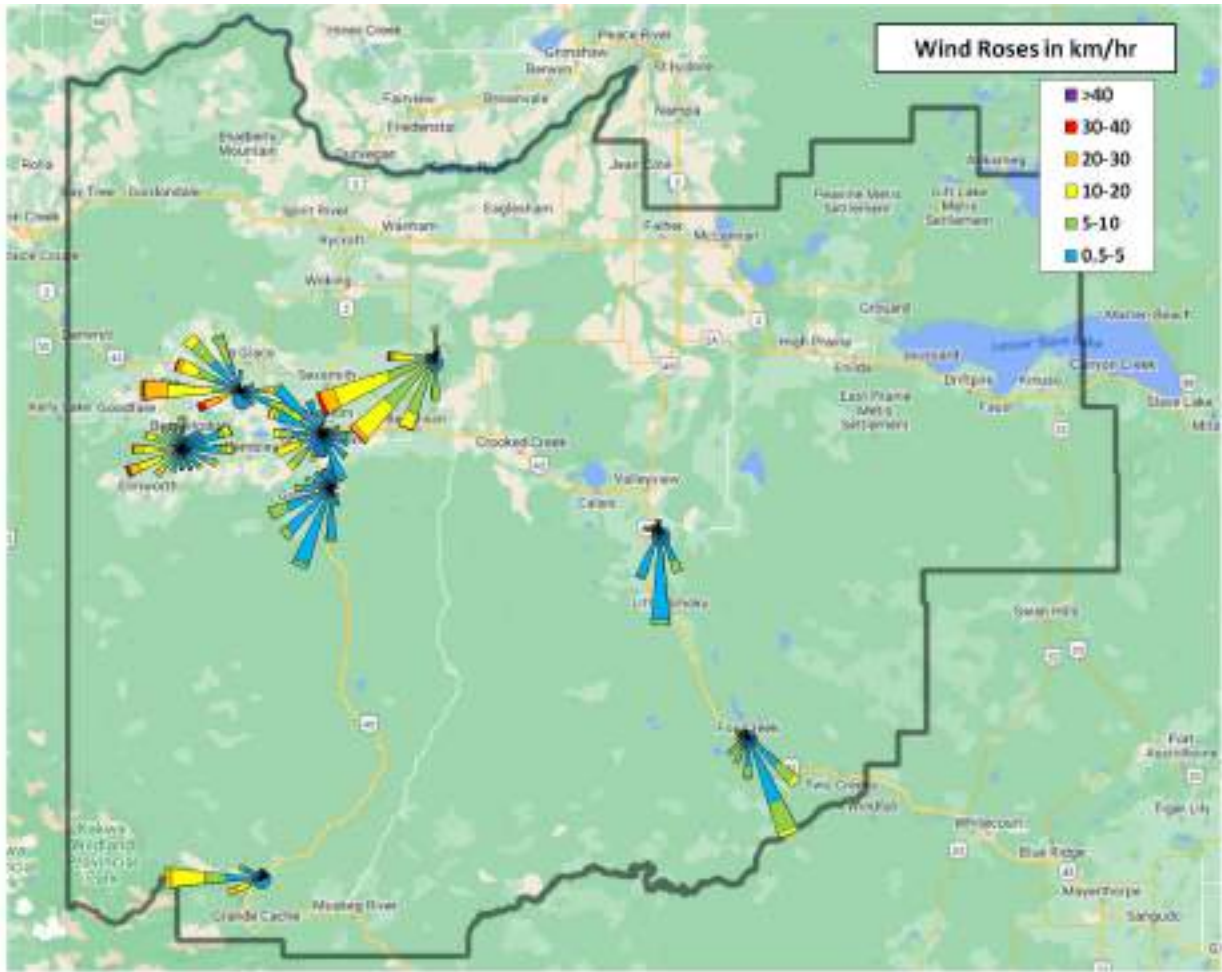
## 10 Concentration Summaries and Roses for PAZA



## 10.1 Air Quality Health Index (AQHI) Plots



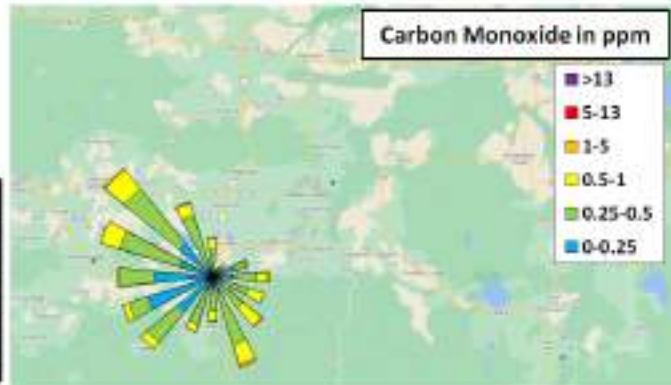
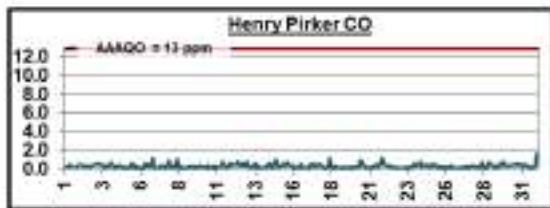
## 10.2 Wind Roses



## 10.3 Carbon Monoxide (CO) Plots

December 2023 CO Station Summary

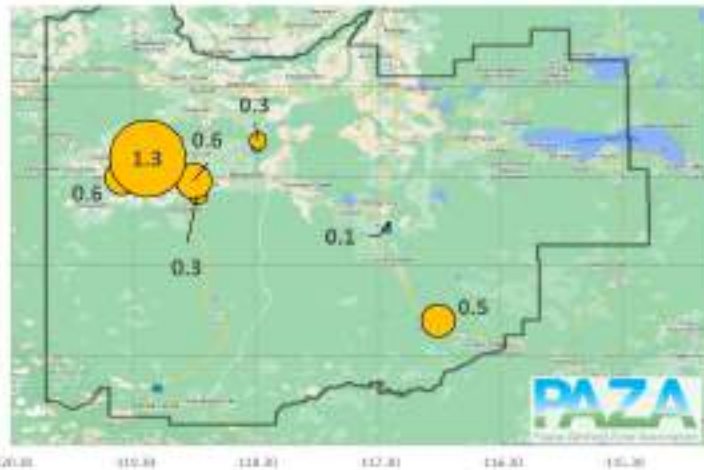
Station	Avg (ppm)	Max (ppm)
Henry Pirker CO	0.36	2.17



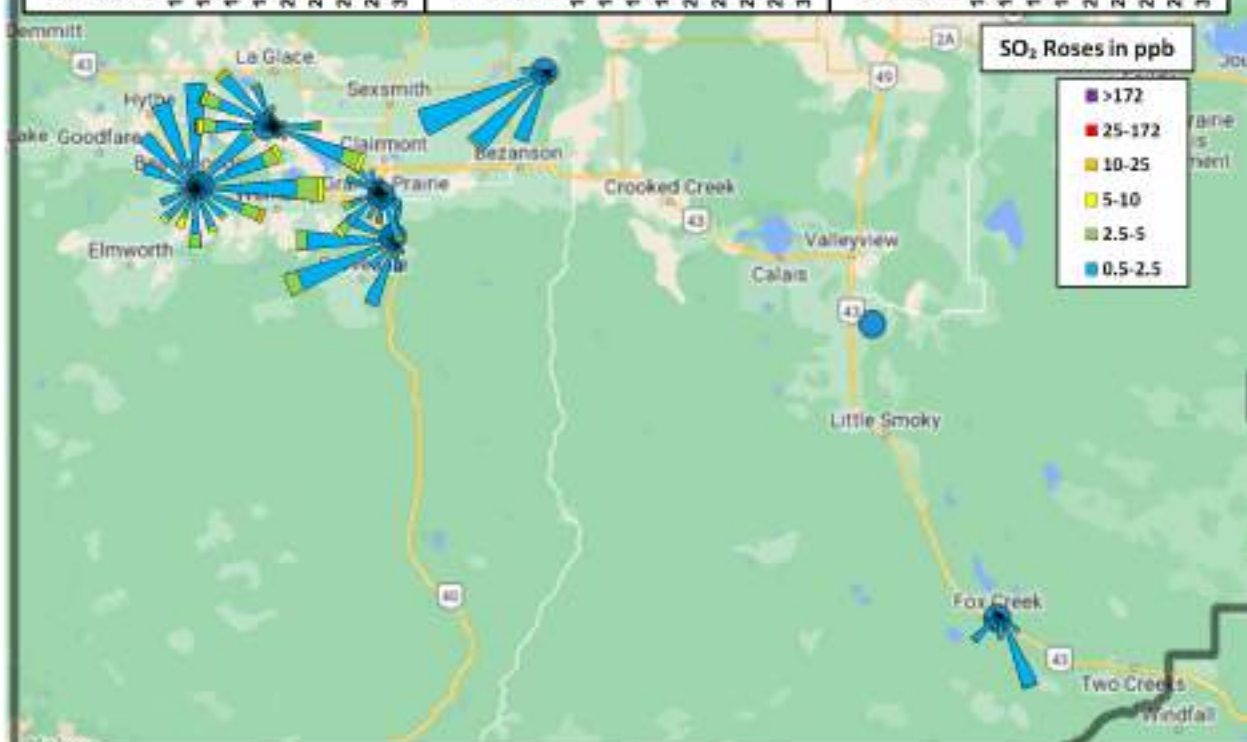
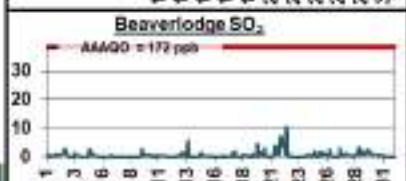
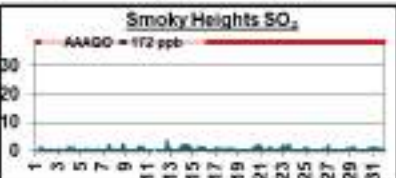
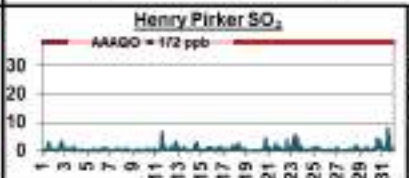
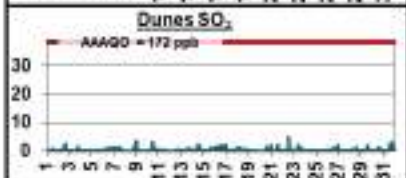
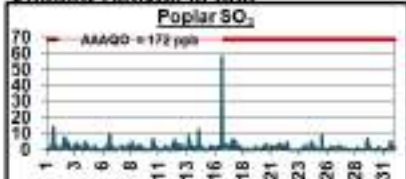
## 10.4 Sulphur Dioxide (SO<sub>2</sub>) Plots

December 2023 SO<sub>2</sub> Station Summary

Station	Avg (ppb)	Max (ppb)
Dunes SO <sub>2</sub>	0.3	4.9
Henry Pirkler SO <sub>2</sub>	0.6	7.8
Smoky Heights SO <sub>2</sub>	0.3	3.4
Beaverlodge SO <sub>2</sub>	0.6	30.6
Valleyview SO <sub>2</sub>	0.1	0.5
Fox Creek SO <sub>2</sub>	0.5	29.0
Poplar SO <sub>2</sub>	1.3	58.0
Milner SO <sub>2</sub>	-	-



Sulphur Dioxide in ppb

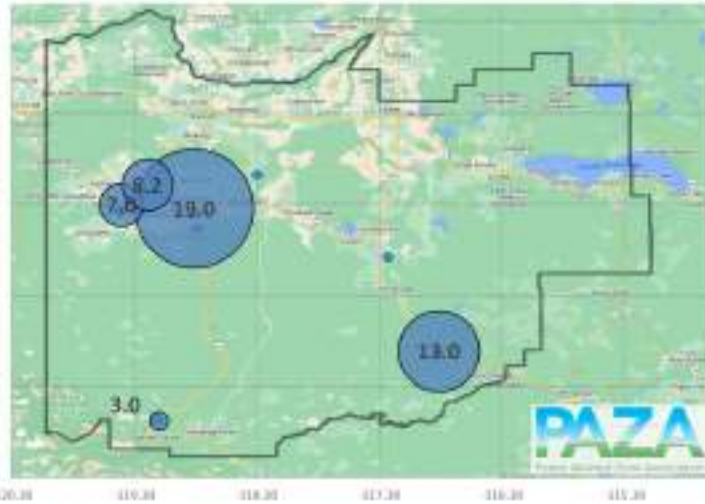




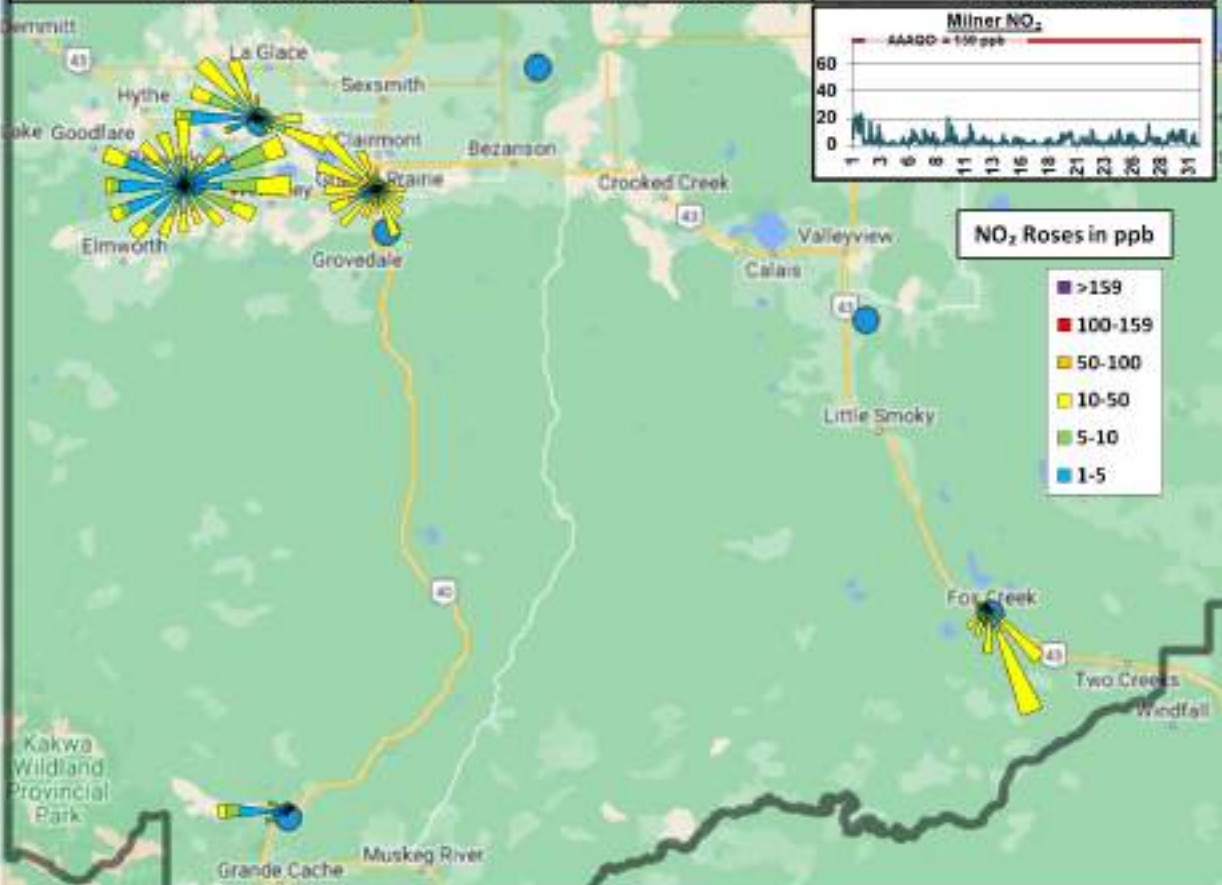
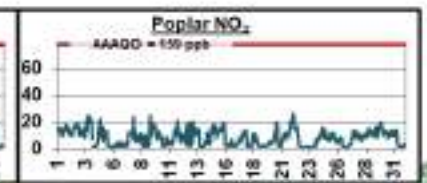
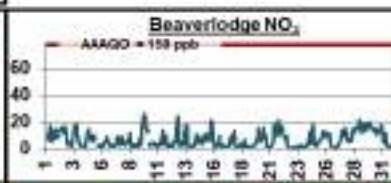
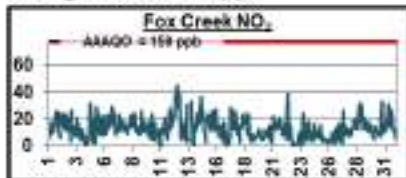
## 10.5 Nitrogen Dioxide (NO<sub>2</sub>) Plots

December 2023 NO<sub>2</sub> Station Summary

Station	Avg (ppb)	Max (ppb)
Dunes NO <sub>2</sub>	-	-
Henry Parker NO <sub>2</sub>	19.0	44.4
Smoky Heights NO <sub>2</sub>	-	-
Beaverfodge NO <sub>2</sub>	7.0	26.3
Valleyview NO <sub>2</sub>	-	-
Fox Creek NO <sub>2</sub>	13.0	45.0
Poplar NO <sub>2</sub>	8.2	26.0
Milner NO <sub>2</sub>	3.0	23.5



Nitrogen Dioxide in ppb

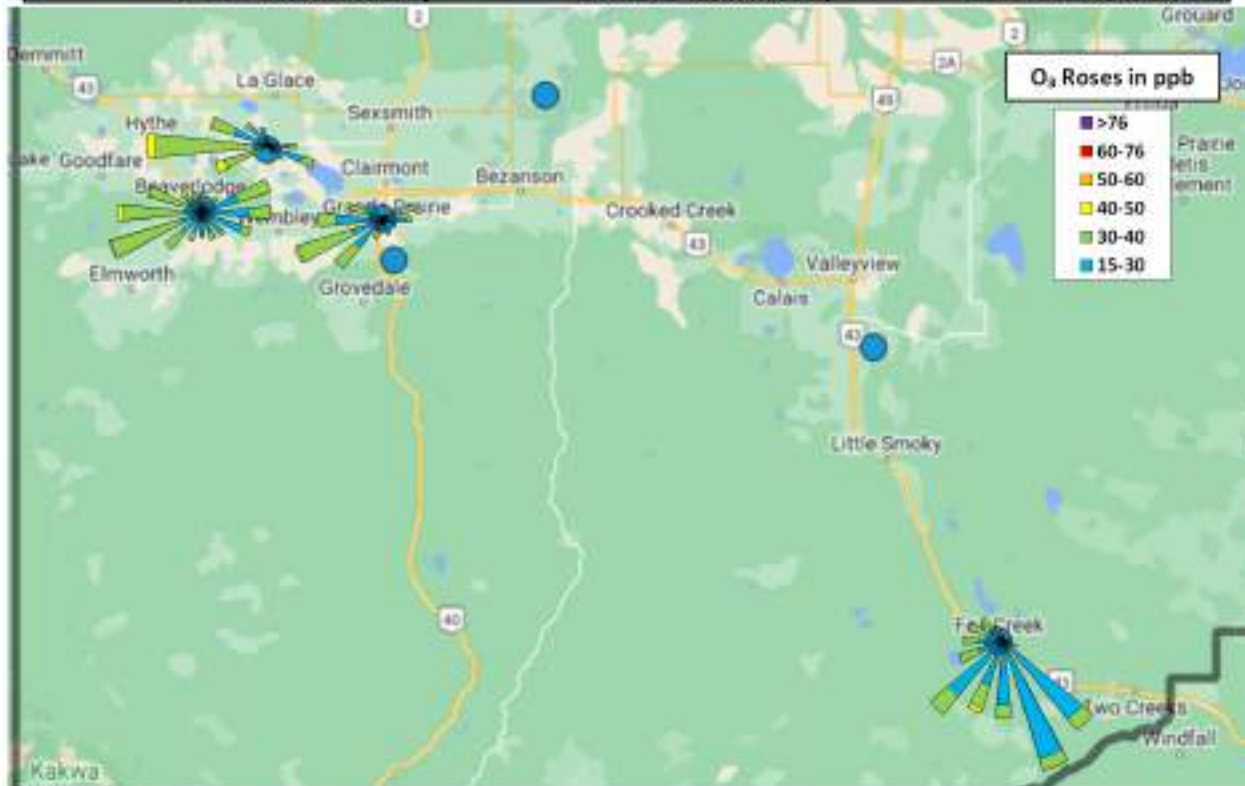
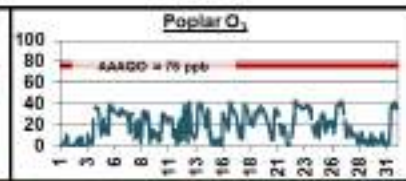
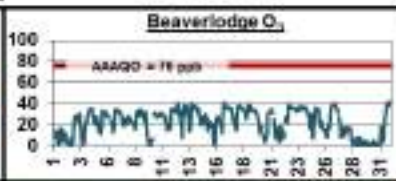
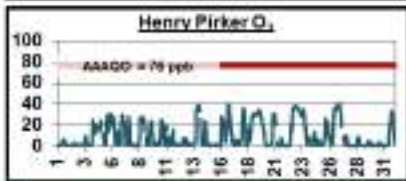
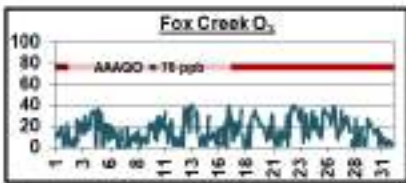


## 10.6 Ozone (O<sub>3</sub>) Plots

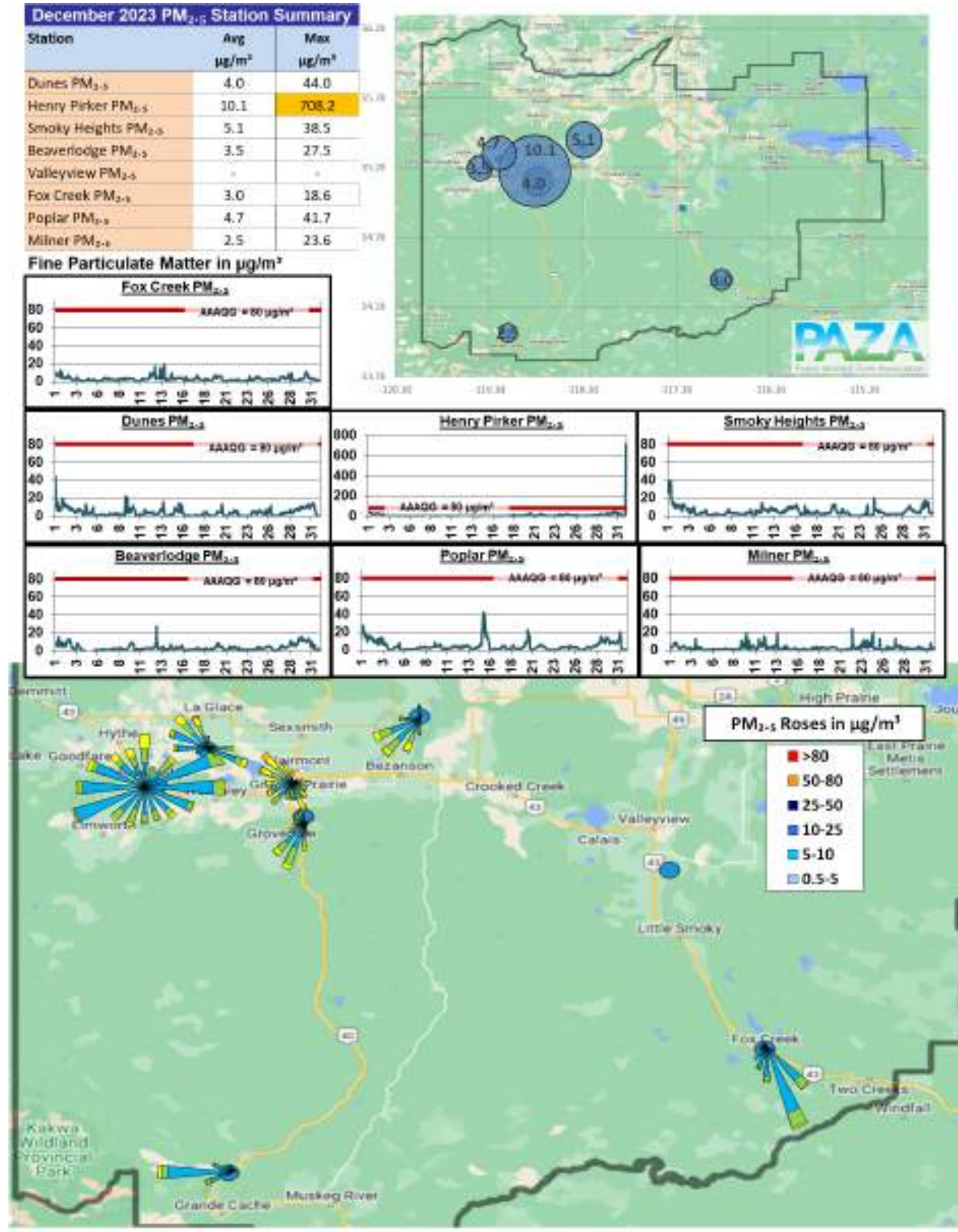
December 2023 O <sub>3</sub> Station Summary		
Station	Avg (ppb)	Max (ppb)
Dunes O <sub>3</sub>	-	-
Henry Pirkler O <sub>3</sub>	10.1	40.1
Smoky Heights O <sub>3</sub>	-	-
Beaverlodge O <sub>3</sub>	22.5	41.4
Valleyview O <sub>3</sub>	-	-
Fox Creek O <sub>3</sub>	15.7	40.6
Poplar O <sub>3</sub>	19.3	43.0
Milner O <sub>3</sub>	-	-



Ozone in ppb



## 10.7 Fine Particulate Matter (PM<sub>2.5</sub>) Plots



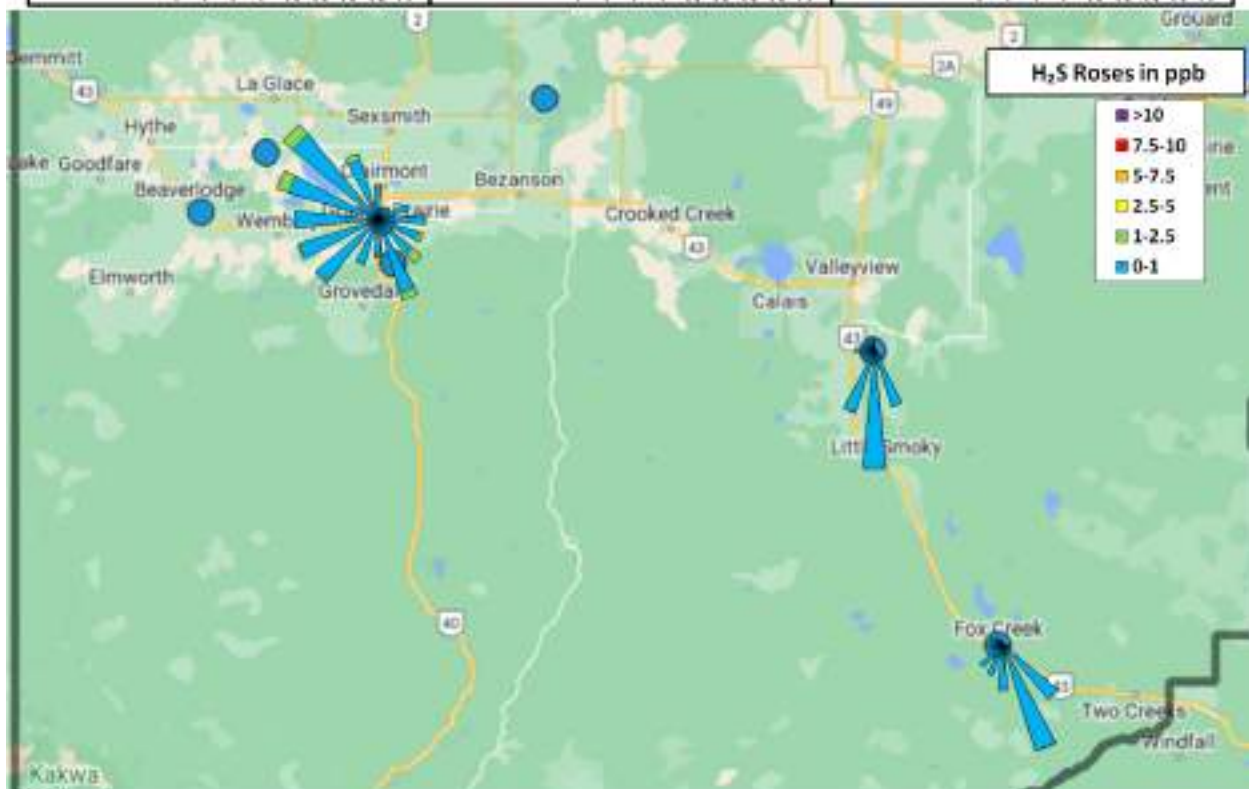
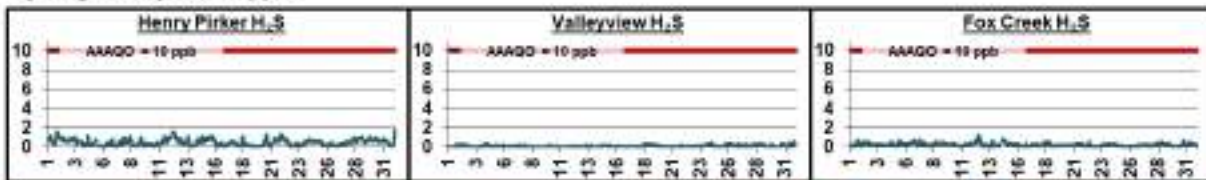
## 10.8 Hydrogen Sulphide (H<sub>2</sub>S) Plots

December 2023 H<sub>2</sub>S Station Summary

Station	Avg (ppb)	Max (ppb)
Dunes H <sub>2</sub> S	-	-
Henry Pirkler H <sub>2</sub> S	0.5	3.3
Smoky Heights H <sub>2</sub> S	-	-
Beaverlodge H <sub>2</sub> S	-	-
Valleyview H <sub>2</sub> S	0.1	0.5
Fox Creek H <sub>2</sub> S	0.2	1.3
Poplar H <sub>2</sub> S	-	-
Milner H <sub>2</sub> S	-	-



Hydrogen Sulphide in ppb

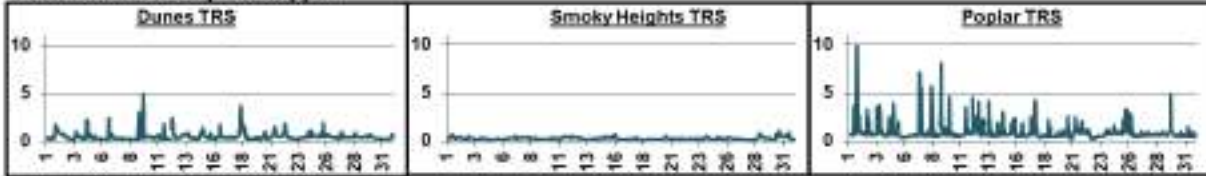


## 10.9 Total Reduced Sulphur (TRS) Plots

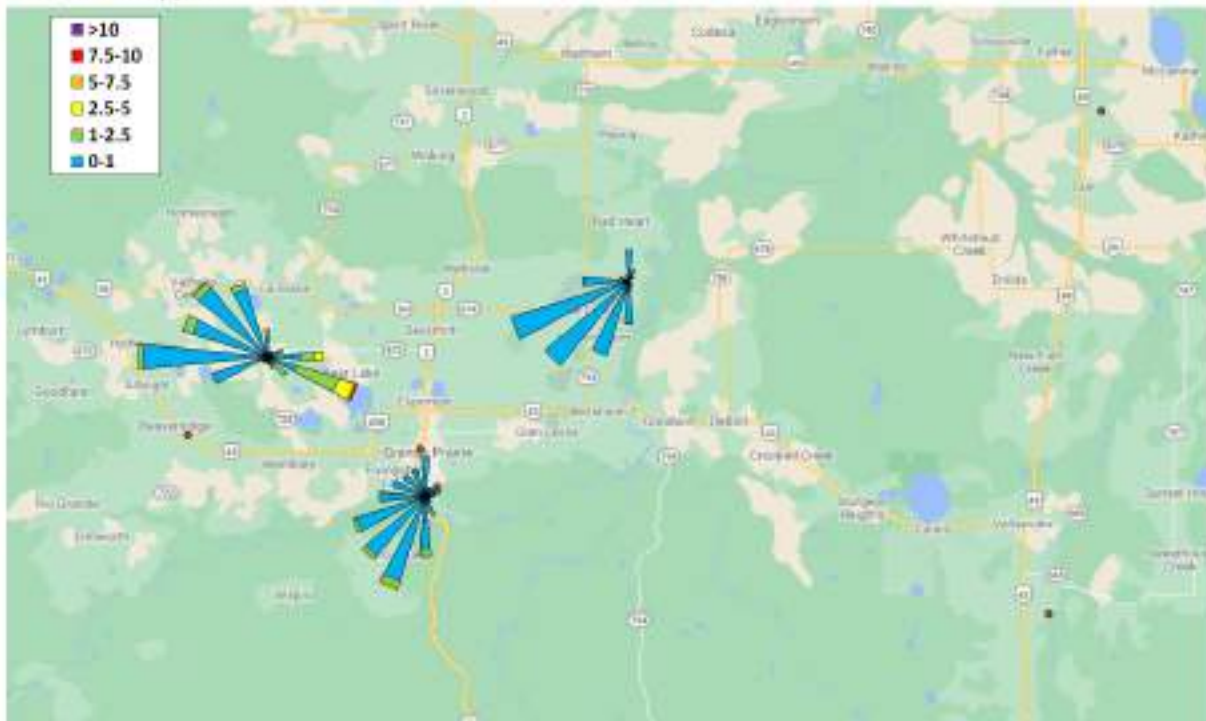
December 2023 TRS Station Summary		
Station	Avg (ppb)	Max (ppb)
Dunes TRS	0.5	4.8
Henry Piker TRS	-	-
Smoky Heights TRS	0.2	1.1
Beaverlodge TRS	-	-
Valleyview TRS	-	-
Fox Creek TRS	-	-
Poplar TRS	1.0	10.0
Milner TRS	-	-



Total Reduced Sulphur in ppb



TRS Roses in ppb

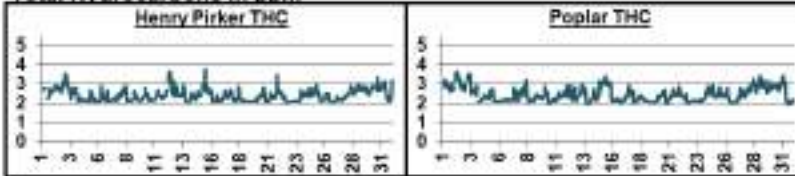


## 10.10 Total Hydrocarbon (THC) Plots

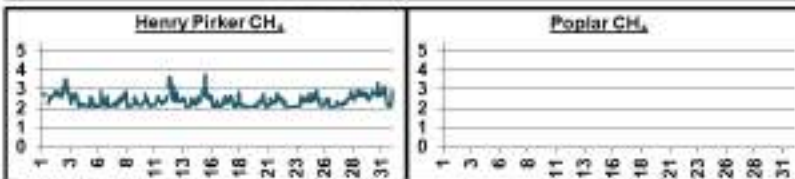
**December 2023 THC Station Summary**

Station	Total Hydrocarbons		Methane		Non-Methane HCs	
	Avg (ppm)	Max (ppm)	Avg (ppm)	Max (ppm)	Avg (ppm)	Max (ppm)
Dunes THC	-	-	-	-	-	-
Henry Pirkler THC	2.4	3.8	2.4	3.8	0.0	0.7
Smoky Heights THC	-	-	-	-	-	-
Beaverlodge THC	-	-	-	-	-	-
Valleyview THC	-	-	-	-	-	-
Fox Creek THC	-	-	-	-	-	-
Poplar THC	2.5	3.6	-	-	-	-

**Total Hydrocarbons in ppm**



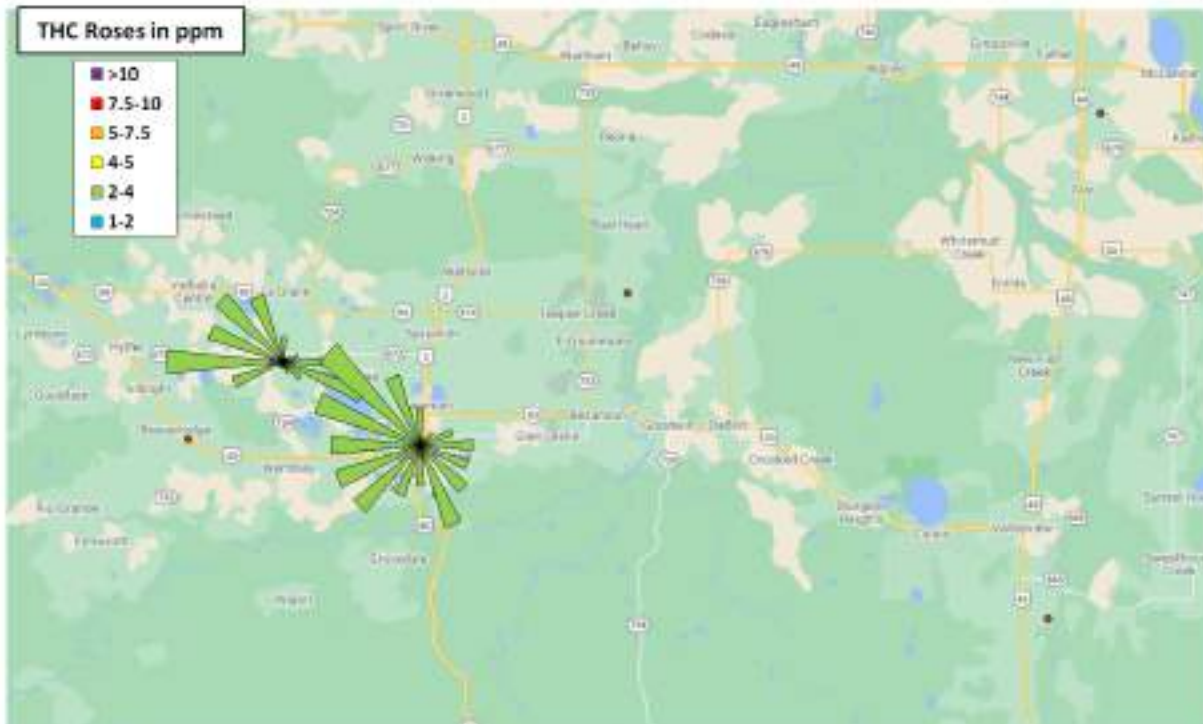
Total Hydrocarbons (THC)



Methane (CH<sub>4</sub>)



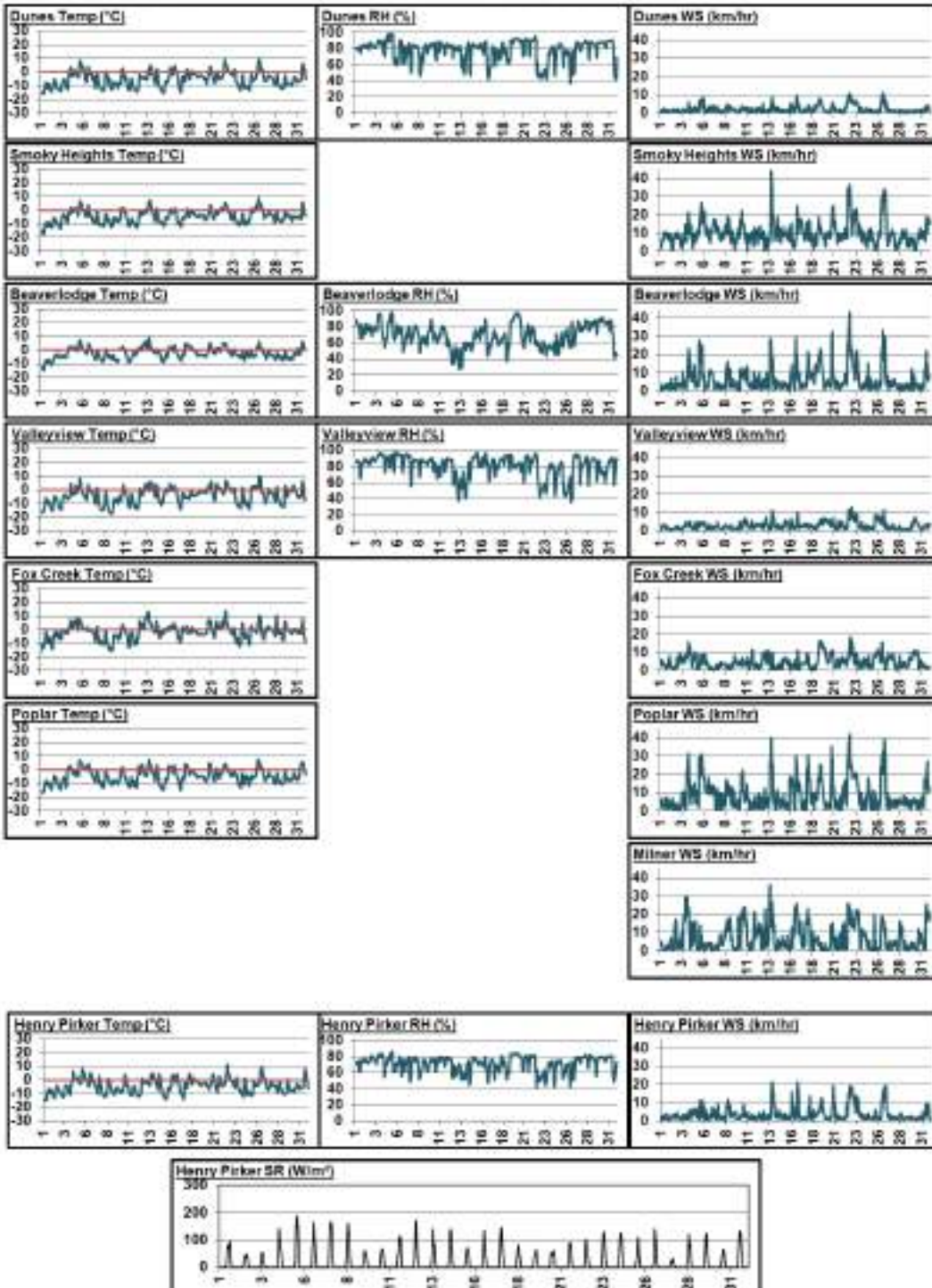
Non-Methane Hydrocarbons (NMHC)



## 10.11 Meteorology Summary

December 2023 Meteorological Summary						
Station	Temp (°C)	RH (%)	SR (W/m <sup>2</sup> )	WS (km/hr)	WD (deg)	WD
Dunes	-5.4	77.6	-	2.0	259	WSW
Henry Piker	-4.4	70.4	17.0	3.7	248	WSW
Smoky Heights	-4.6	-	-	10.1	258	WSW
Beaverlodge	-2.3	69.1	-	6.6	261	W
Valleyview	-4.1	79.8	-	2.9	197	SSW
Fox Creek	-1.8	-	-	5.0	179	WSW
Poplar	-4.7	-	-	8.8	277	W
Milner	-	-	-	7.4	265	W

Temp (°C) Outside Temperature  
 RH (%) Relative Humidity  
 SR (W/m<sup>2</sup>) Solar Radiation  
 WS (km/hr) Wind Speed  
 WD (deg) Wind Direction  
 WD Wind Direction



## 11 Passive Monitoring Data

### Peace Airshed Zone Association - PAZA Passive Stations for December 2023

Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
<b>Duplicates</b>						
7a	Steeprock Creek	0.2				09-35-072-13 W6M
7b	Steeprock Creek	0.3				
9a	Spirit River	0.3				08-12-079-07 W6M
9b	Spirit River	0.3				
12a	Hythe			3.7		14-36-072-11 W6M
12b	Hythe			3.0		
14a	Sylvester			0.9		08-06-069-12 W6M
14b	Sylvester			0.8		
35a	Jean Cote	0.2				12-35-079-21 W5M
35b	Jean Cote	0.2				
36a	Guy			1.7		03-04-076-22 W5M
36b	Guy			damaged		
37a	Crooked Creek		23.6			16-01-071-26 W5M
37b	Crooked Creek		24.0			
40a	McLennan			1.3		03-29-077-19 W5M
40b	McLennan			1.3		
42a	Sunset House	0.2				05-32-070-19 W5M
42b	Sunset House	0.2				
G4a	Girouxville 4				0.22	04-08-077-22 W5M
G4b	Girouxville 4				0.25	
D3a	Duvernay 3	0.6			0.09	04-33-062-20 W5M
D3b	Duvernay 3	0.5			0.10	
K4a	Kakwa 4			8.1		06-18-063-04 W6M
K4b	Kakwa 4			6.3		
K2a	Kakwa 2	1.2				08-13-063-05 W6M
K2b	Kakwa 2	1.3				
K1a	Kakwa 1				0.07	01-13-063-05 W6M
K1b	Kakwa 1				0.05	
M10a	Milner Powerline			6.6		06-14-058-08 W6M
M10b	Milner Powerline			6.6		
M9Aa	Milner Wanyandie	<0.1				11-13-058-08 W6M
M9Ab	Milner Wanyandie	<0.1				
J1a	Jayar1 Plant			1.8		06-08-062-03 W6M
J1b	Jayar1 Plant			1.6		
J5a	Jayar5 Camp	0.3				11-08-062-03 W6M
J5b	Jayar5 Camp	0.3				
J4a	Jayar4 7-8 or 8-8 Pad				0.09	10-08-062-03 W6M
J4b	Jayar4 7-8 or 8-8 Pad				0.07	



Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
2	Bay Tree	0.3	36.2	1.9	-	13-16-078-13 W6M
3	Forth Creek	0.2	-	0.9	-	04-13-082-07 W6M
5	Boone Creek	0.3	-	1.7	-	01-23-076-11 W6M
7	Steeptrock Creek	0.2	-	1.0	-	09-35-072-13 W6M
9	Spirit River	0.3	-	1.6	-	08-12-079-07 W6M
11	Webber Creek	0.5	-	7.7	-	09-36-074-09 W6M
12	Hythe	0.3	-	3.4	-	14-36-072-11 W6M
14	Sylvester	0.1	-	0.9	-	08-06-069-12 W6M
16	Beaverlodge	0.8	-	4.1	-	15-36-071-10 W6M
17	Poplar	0.5	-	4.8	-	13-06-073-08 W6M
18	Saddle Hills	0.5	-	1.3	-	04-25-074-07 W6M
19	Wanham	0.5	-	1.8	-	16-22-077-03 W6M
21	Eaglesham	0.1	-	1.2	-	16-21-079-25 W5M
24	Wembley	0.4	-	2.9	-	12-31-070-08 W6M
25	Pinto Creek	0.1	-	1.2	-	04-24-069-11 W6M
27	Grande Prairie I	0.7	-	13.5	-	08-15-071-06 W6M
29	Smoky Heights	0.4	-	3.6	-	04-06-075-02 W6M
30	Fitzsimmons	0.1	-	2.9	-	15-36-072-03 W6M
32	Gold Creek	0.1	-	6.5	-	06-33-067-05 W6M
35	Jean Cote	0.2	-	1.7	-	12-35-079-21 W5M
36	Guy	0.1	-	1.7 + (dup damaged)	0.09	03-04-076-22 W5M
37	Crooked Creek	0.1	23.8	2.7	-	16-01-071-26 W5M
39	Clouston Creek	0.2	-	2.2	-	12-01-073-22 W5M
40	McLennan	0.2	-	1.3	-	03-29-077-19 W5M
42	Sunset House	0.2	-	1.0	-	05-32-070-19 W5M
44	Peavine	0.1	-	1.6	-	03-05-079-15 W5M
46	Little Smoky	0.1	-	6.6	-	12-01-065-21 W5M
47	Kinuso	0.1	18.6	2.0	-	12-10-073-10 W5M
48	Deer Mountain	0.1	-	0.9	-	15-22-068-09 W5M
49	Henry Pirker	0.5	-	13.1	-	17-26-071-06 W6M
50	East Prairie	0.1	-	4.2	-	11-13-079-08 W6M
D1	Duvernay 1	0.5	-	-	0.08	04-33-062-20 W5M
D2	Duvernay 2	0.5	-	-	0.09	04-33-062-20 W5M
D3	Duvernay 3	0.5	-	-	0.10	04-33-062-20 W5M
D4	Duvernay 4	0.5	-	-	0.12	04-33-062-20 W5M
G3	Girouxville 3	-	-	-	0.36	14-02-077-23 W5M
G4	Girouxville 4	-	-	-	0.23	04-08-077-22 W5M
K1	Kakwa 1	0.2	-	4.0	0.06	01-13-063-05 W6M
K2	Kakwa 2	1.3	-	5.9	0.07	08-13-063-05 W6M
K3	Kakwa 3	1.4	-	6.1	0.20	12-18-063-04 W6M
K4	Kakwa 4	1.2	-	7.2	0.10	06-18-063-04 W6M
M1	Milner Pipeline	<0.1	-	2.7	-	12-14-058-08 W6M
M2	Milner Bridge	<0.1	-	1.8	-	08-06-057-08 W6M
M3	Milner Wanyandie	<0.1	-	1.1	-	11-13-058-08 W6M
M4	Milner Ambient Trailer	<0.1	-	3.1	-	09-15-058-08 W6M
M5	Milner Powerline	0.1	-	6.6	-	06-14-058-08 W6M
J1	Jayar1 Plant	0.2	-	1.7	0.12	06-08-062-03 W6M
J2	Jayar2 14-8	0.6	-	4.1	0.13	07-08-062-03 W6M
J3	Jayar3 Bone Yard	0.5	-	0.8	0.07	14-08-062-03 W6M
J4	Jayar4 7-8 or 8-8 Pad	0.2	-	1.1	0.08	10-08-062-03 W6M
J5	Jayar5 Camp	0.3	-	2.6	0.08	11-08-062-03 W6M

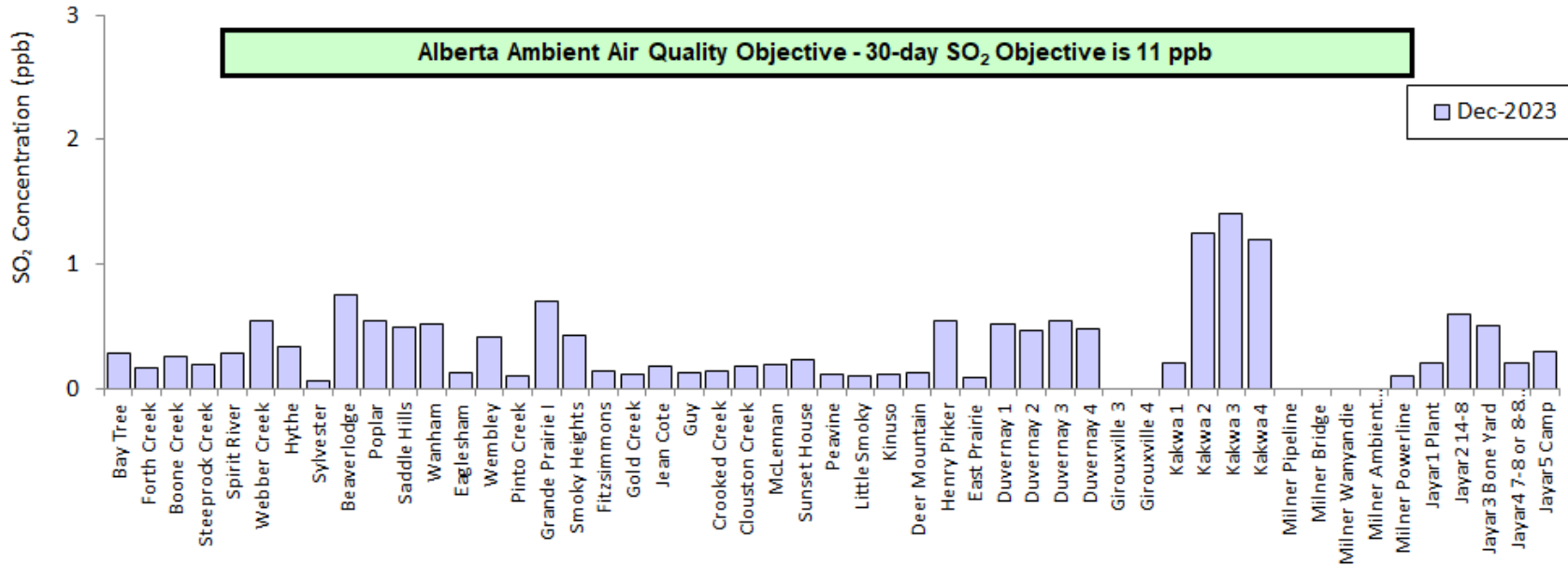
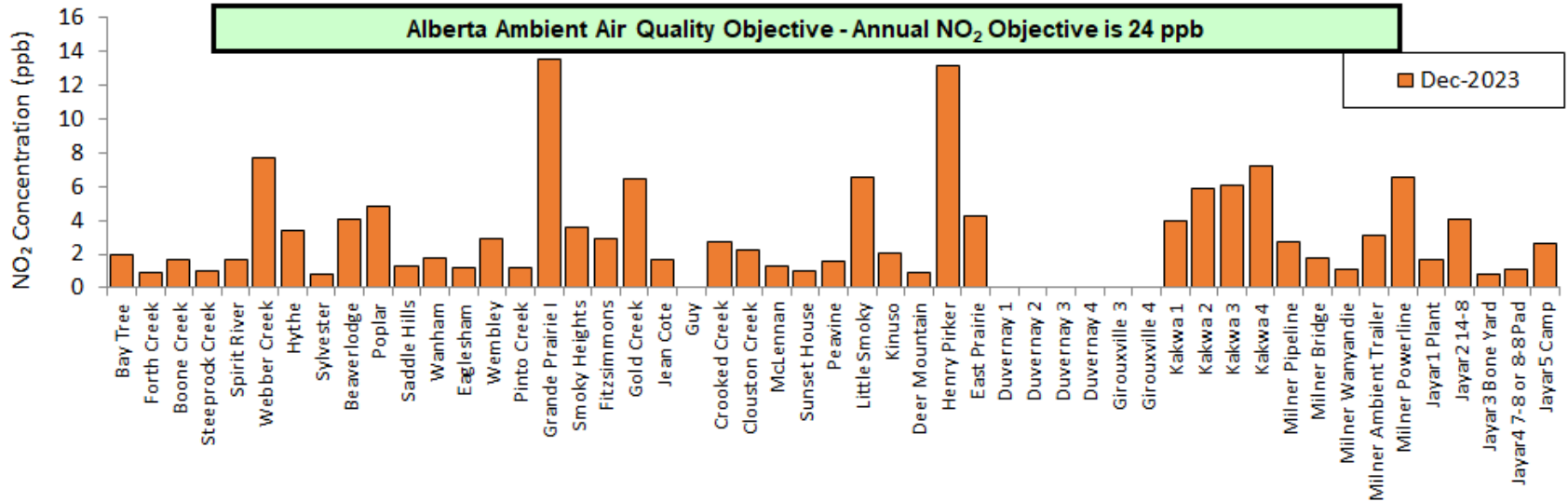
Note: Duplicate Guy consisted of one sample of 1.7 ppb and the other listed as “damage”

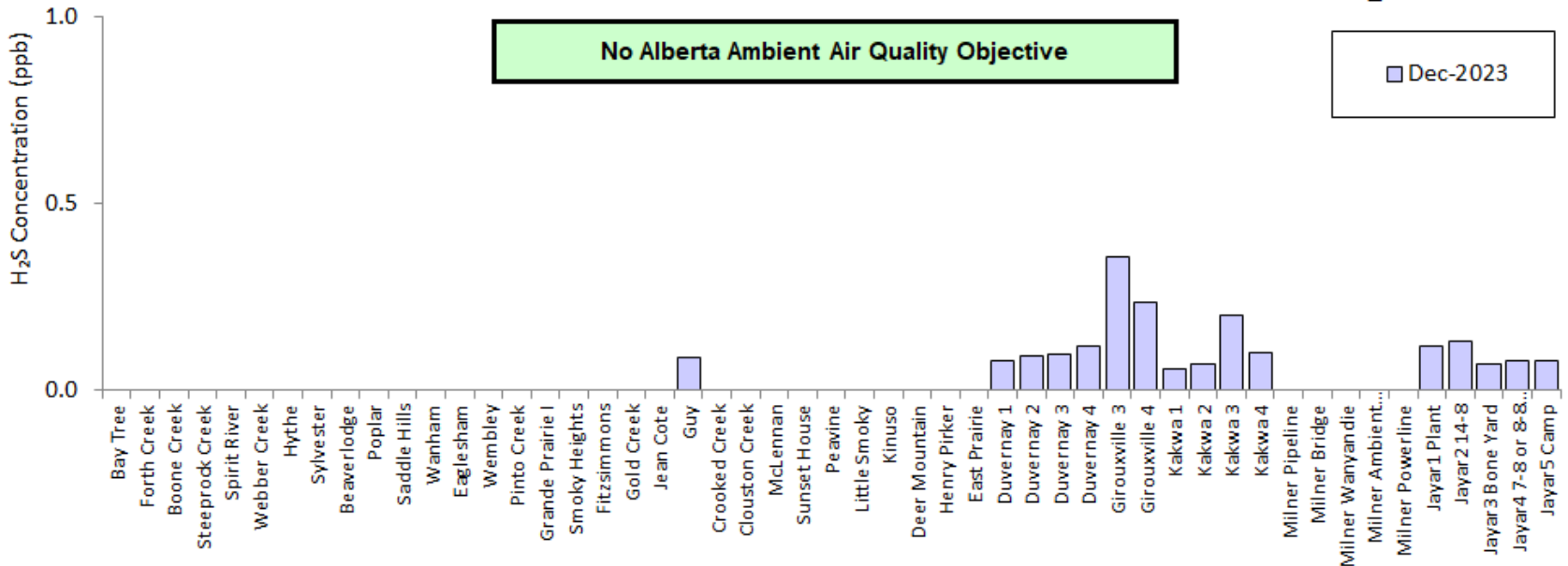
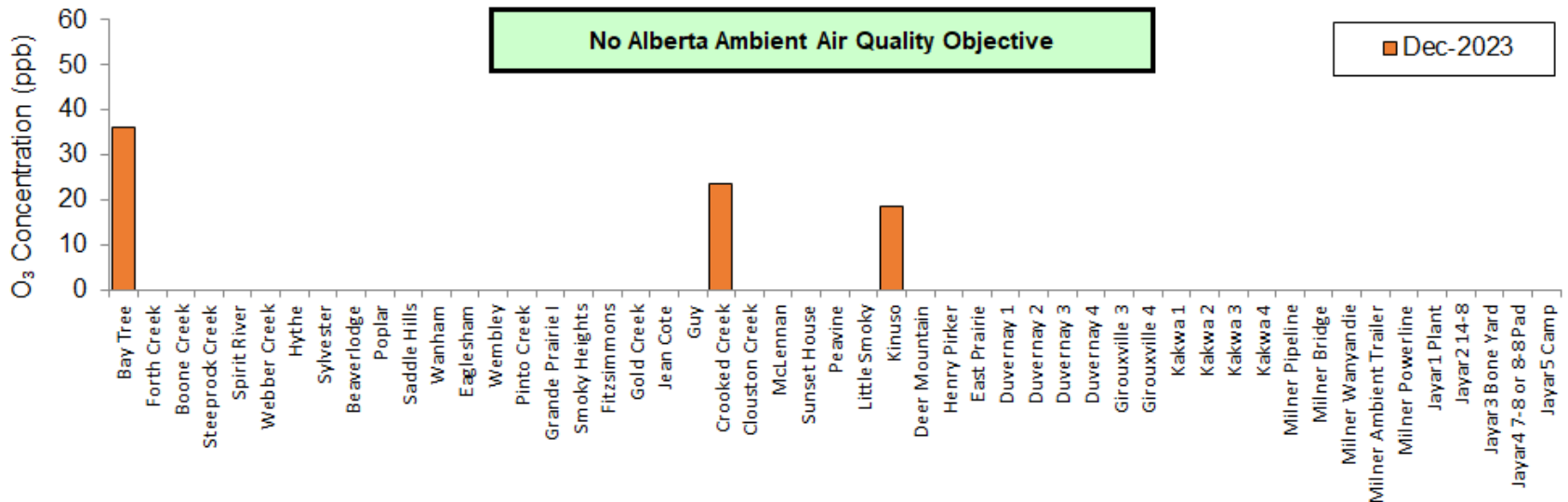
### Passive Summary for December 2023

Stats	Sulphur Dioxide SO <sub>2</sub> ppb	Ozone O <sub>3</sub> ppb	Nitrogen Dioxide NO <sub>2</sub> ppb	Hydrogen Sulphide H <sub>2</sub> S ppb
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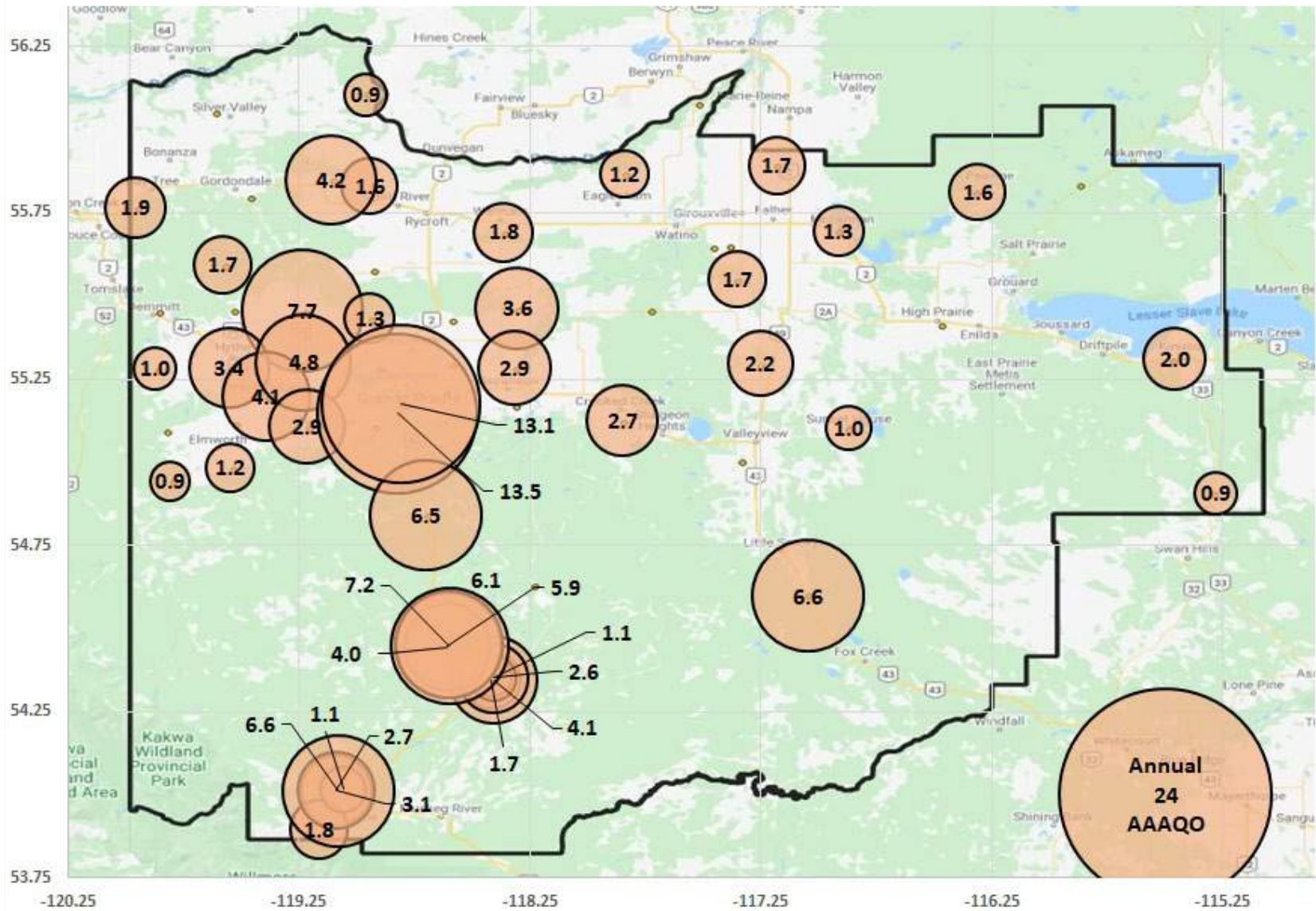
Passive Summary for December 2023 (PAZA)				
<b>Mean</b>	0.4	26.2	3.4	0.1
<b>Standard Deviation</b>	0.3	9.1	2.9	0.1
<b>Minimum</b>	0.1	18.6	0.8	0.1
	Sylvester (#14)	Kinuso (#47)	Jayar3 Bone Yard (#J3)	Kakwa 1 (#K1)
<b>Maximum</b>	1.4	36.2	13.5	0.4
	Kakwa 3 (#K3)	Bay Tree (#2)	Grande Prairie I (#27)	Girouxville 3 (#G3)

Continuous and Passive Monitoring Comparison				
<b>PAZA Beaverlodge Station</b>	<b>0.6</b>	<b>22.5</b>	<b>7.0</b>	<b>-</b>
<b>Beaverlodge Passive (#16)</b>	<b>0.8</b>	<b>-</b>	<b>4.1</b>	<b>-</b>
<b>PAZA Henry Pirker Station</b>	<b>0.6</b>	<b>10.1</b>	<b>19.0</b>	<b>0.5</b>
<b>Henry Pirker passive (#49)</b>	<b>0.5</b>	<b>-</b>	<b>13.1</b>	<b>-</b>
<b>Milner Station</b>	<b>-</b>	<b>-</b>	<b>3.0</b>	<b>-</b>
<b>Milner passive</b>	<b>&lt;0.1</b>	<b>-</b>	<b>3.1</b>	<b>-</b>



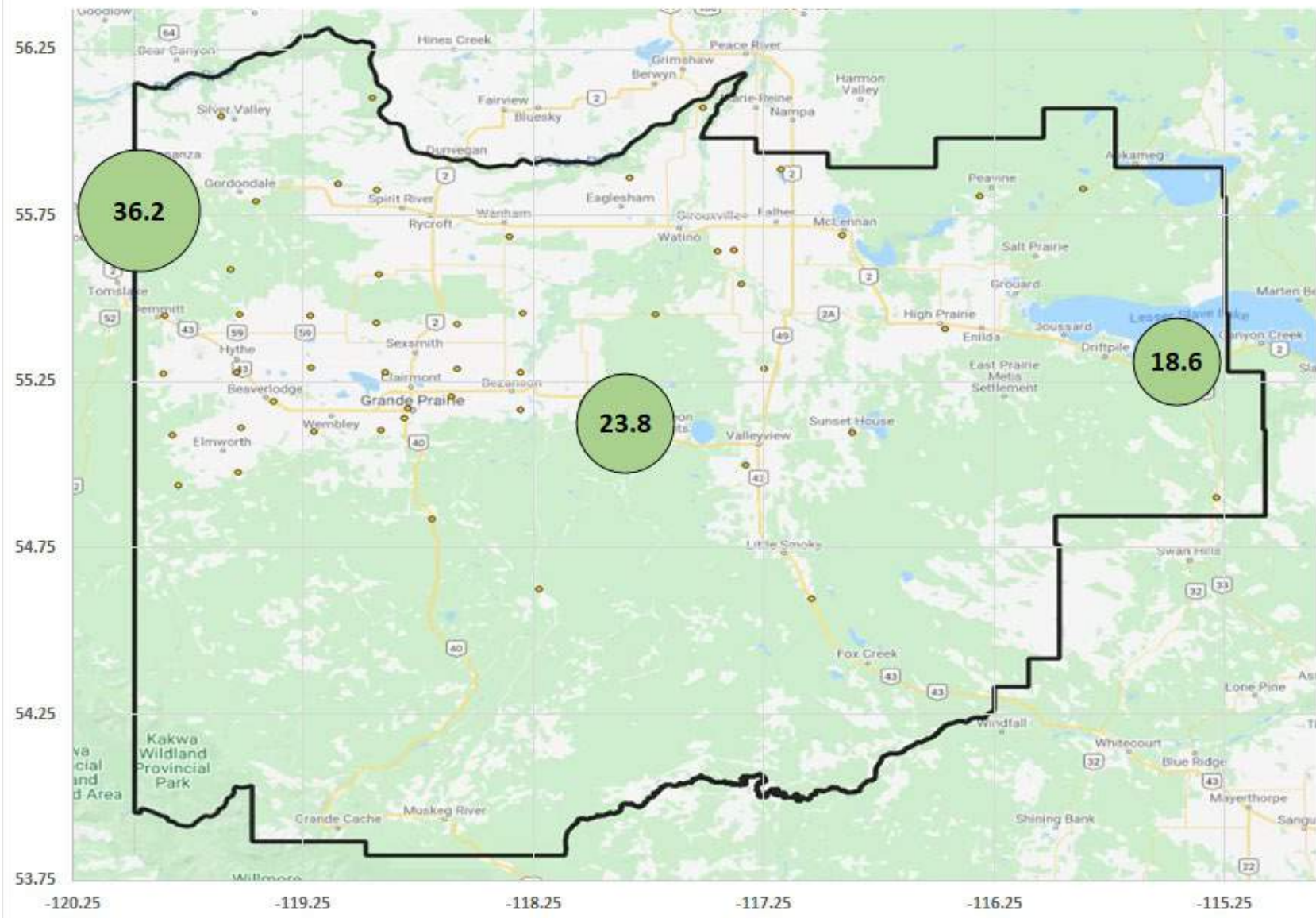


### NO<sub>2</sub> Monthly Average (units in ppb)





### O<sub>3</sub> Monthly Average (units in ppb)



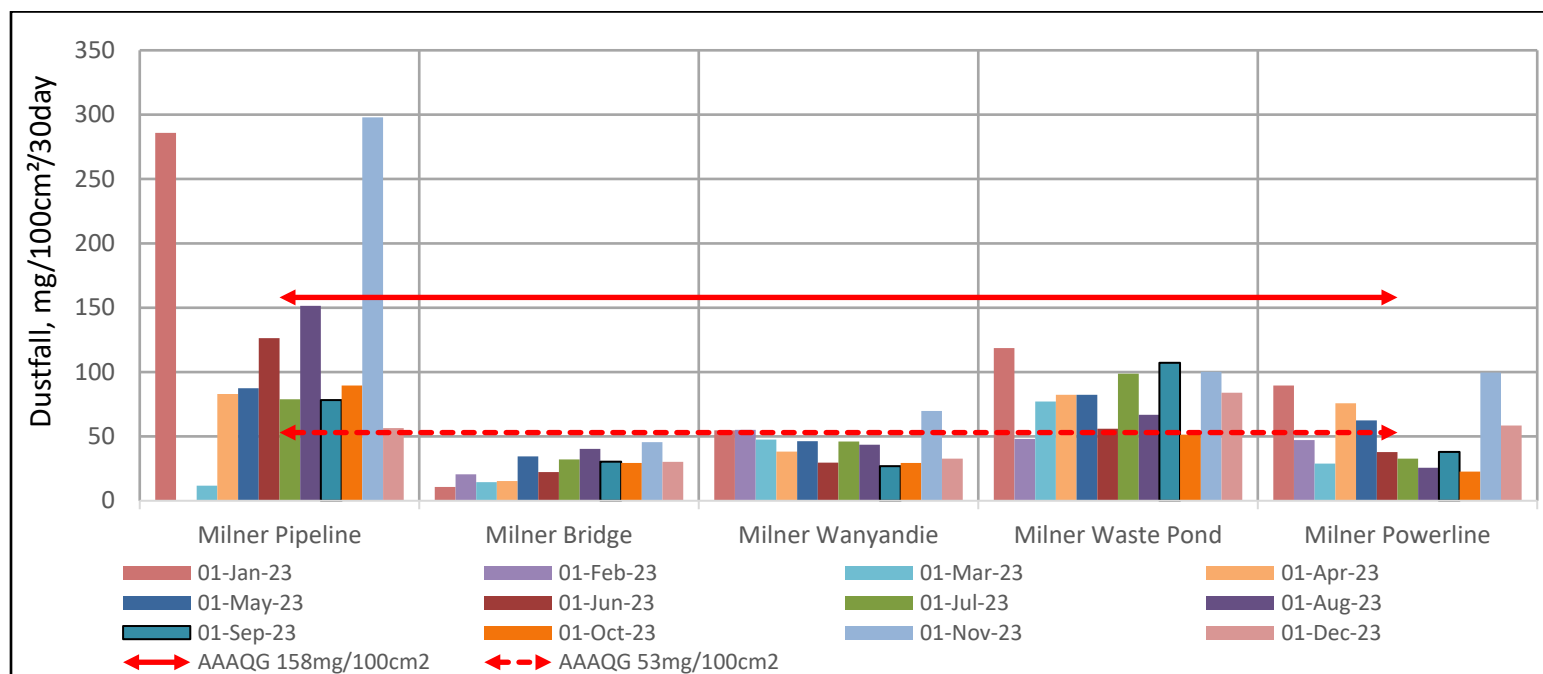




## 12 Dustfall Monitoring Data

**Milner Dustfall Samples December 2023**

Exposure Month	Year	Sample	Total Dustfall (30 day) mg/100cm <sup>2</sup> /30day	Fixed Dustfall (30 day) mg/100cm <sup>2</sup> /30day	Exposure days	Field Notes
December	2023	Milner Pipeline	56.5	42.0	32	
December	2023	Milner Bridge	30.3	19.3	32	
December	2023	Milner Wanyandie	32.8	20.1	32	
December	2023	Milner Waste Pond	84.0	13.8	32	
December	2023	Milner Powerline	58.5	27.5	32	
December	2023	Milner Powerline Dup	69.6	22.0	32	RPD= 17% / 22%



# End of Report



## Peace Airshed Zone Association

### Ambient Air Monitoring Report

December 2023