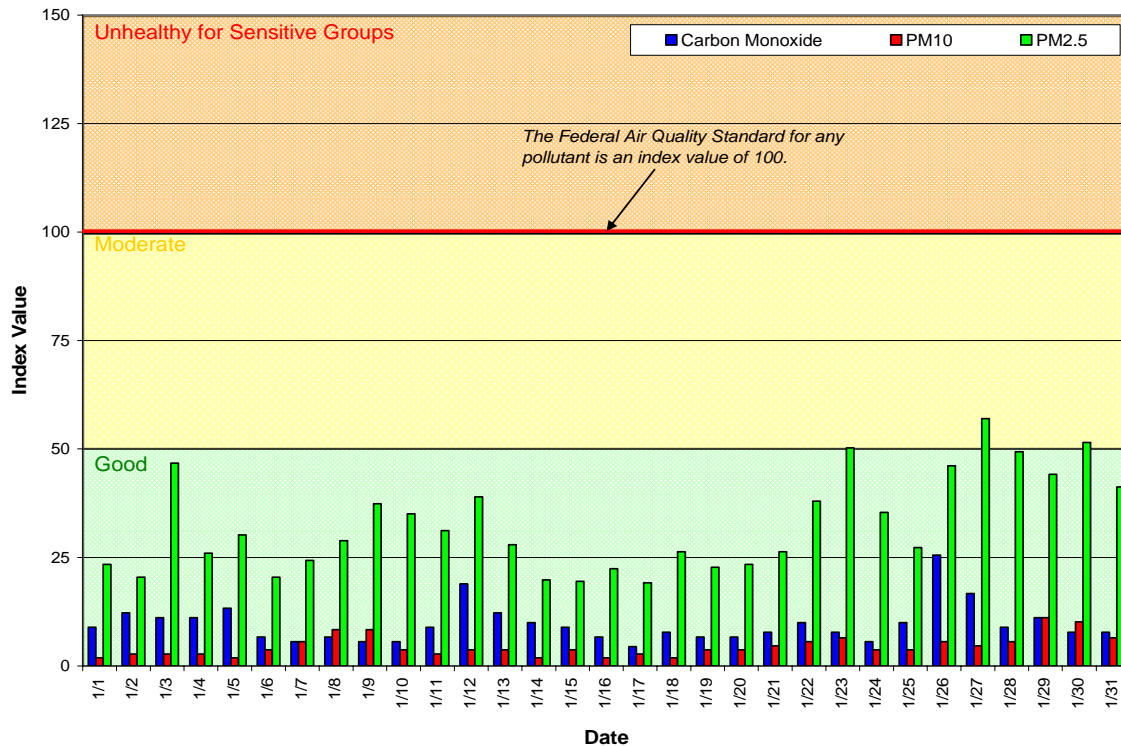


Spokane Regional Clean Air Agency Air Quality Report - January 2010

Spokane County had mostly good air quality in January, as determined by the Air Quality Index (AQI; Figure 1). The AQI crept into the moderate range near the end of the month because high atmospheric pressure built over the region and inhibited ventilation, resulting in an increase in fine particulate matter air pollution.

The AQI is EPA’s color-coded tool for communicating daily air quality to the general public and can be calculated for any of the “criteria” air pollutants regulated under the National Ambient Air Quality Standards (NAAQS), except lead. The criteria air pollutants include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), ozone (O₃) and sulfur dioxide (SO₂). The SRCAA provides AQI values for CO, PM₁₀, PM_{2.5} and O₃ in Spokane County. Ozone is monitored May through September only. The AQI categorizes air quality as “good,” “moderate,” “unhealthy for sensitive groups,” “unhealthy,” “very unhealthy” or “hazardous,” depending on air pollution levels. See appendices 1 and 2 for descriptions of the NAAQS and AQI, respectively. An assessment of the Spokane region’s compliance with the NAAQS and the quality of our monitoring data will no longer be included in the monthly report, but instead will be reported quarterly.

Figure 1: Air Quality Index (AQI) values for January 2010



The data used for calculating the AQIs are obtained using automated air pollution monitoring methods that provide “real time” data, which the SRCAA uses in its day-to-day programs, e.g., air quality forecasting and burning curtailment. For measurement of particulate matter concentrations, the SRCAA operates a network of automated particulate matter monitors consisting of Tapered Element Oscillating Microbalances (TEOM) and nephelometers. The Washington State Department of Ecology (Ecology) operates a carbon monoxide monitor near the intersection of 3rd & Washington in downtown Spokane. The January daily air quality data for all monitoring stations in the Spokane region are provided in Appendix 3 (Table A-3). Current and historical air quality data can be obtained electronically from Ecology via their air monitoring data website, <https://fortress.wa.gov/ecy/enviwa/Default.htm>. This website can also be accessed through SRCAA’s webpage, http://spokanecleanair.org/air_quality.asp. Select the link, “State Wide Air Monitoring Data.” Please note that the Washington Air Quality Advisory (WAQA) on Ecology’s webpage is similar to the AQI, which the SRCAA uses, but shows higher index values (increased health effects) at lower measured air pollution concentrations than the AQI.

Table 1 contains the maximum AQI values for each pollutant for the month and for the year to date. Table 2 summarizes the year to date daily AQIs by category and compares them to last year's AQIs. The higher air pollution concentrations occurred near the end of the month when the region's weather was dominated by an upper atmospheric high pressure ridge.

Table 1: Maximum AQI values and pollutant concentrations for this reporting period

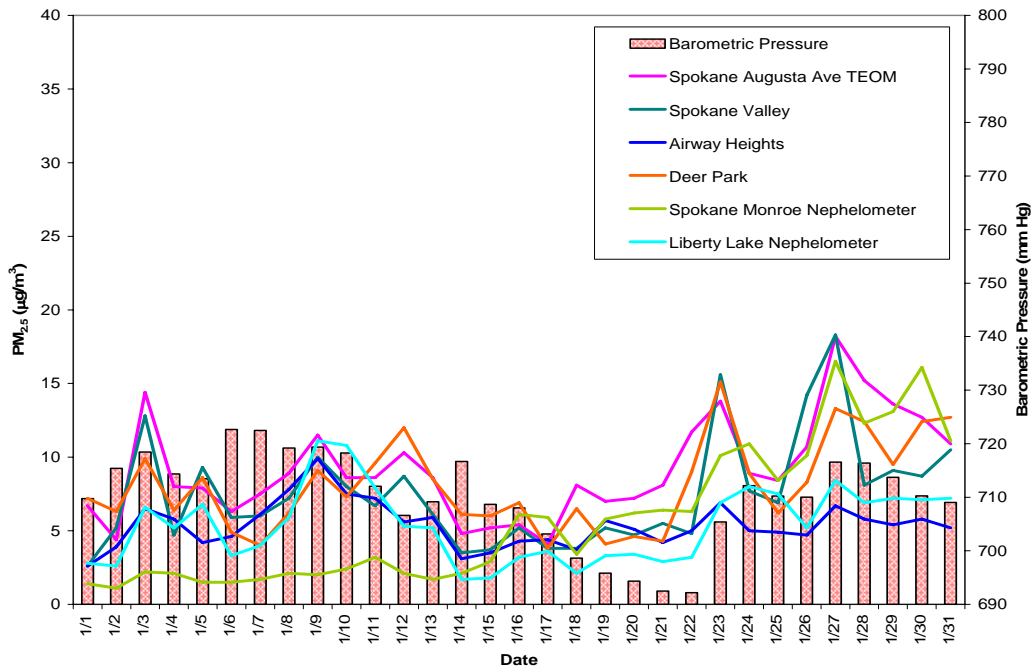
Pollutant	AQI/Concentration	Location	Date
CO	26/2.3 ppm	3 rd & Washington	1/26/10
PM ₁₀	11/12 µg/m ³	Turnbull Wildlife Refuge	1/29/10
PM _{2.5}	57/18.3 µg/m ³	Broadway Ave	1/27/10

Table 2: AQI summary as of January 31, 2010

Category	Number of Days This Year	Last Year to Date
Good (0-50)	28	29
Moderate (51-100)	3	2
Unhealthy for Sensitive Groups (101-150)	0	0
Unhealthy (151-200)	0	0
Very Unhealthy (201-300)	0	0
Hazardous (>300)	0	0

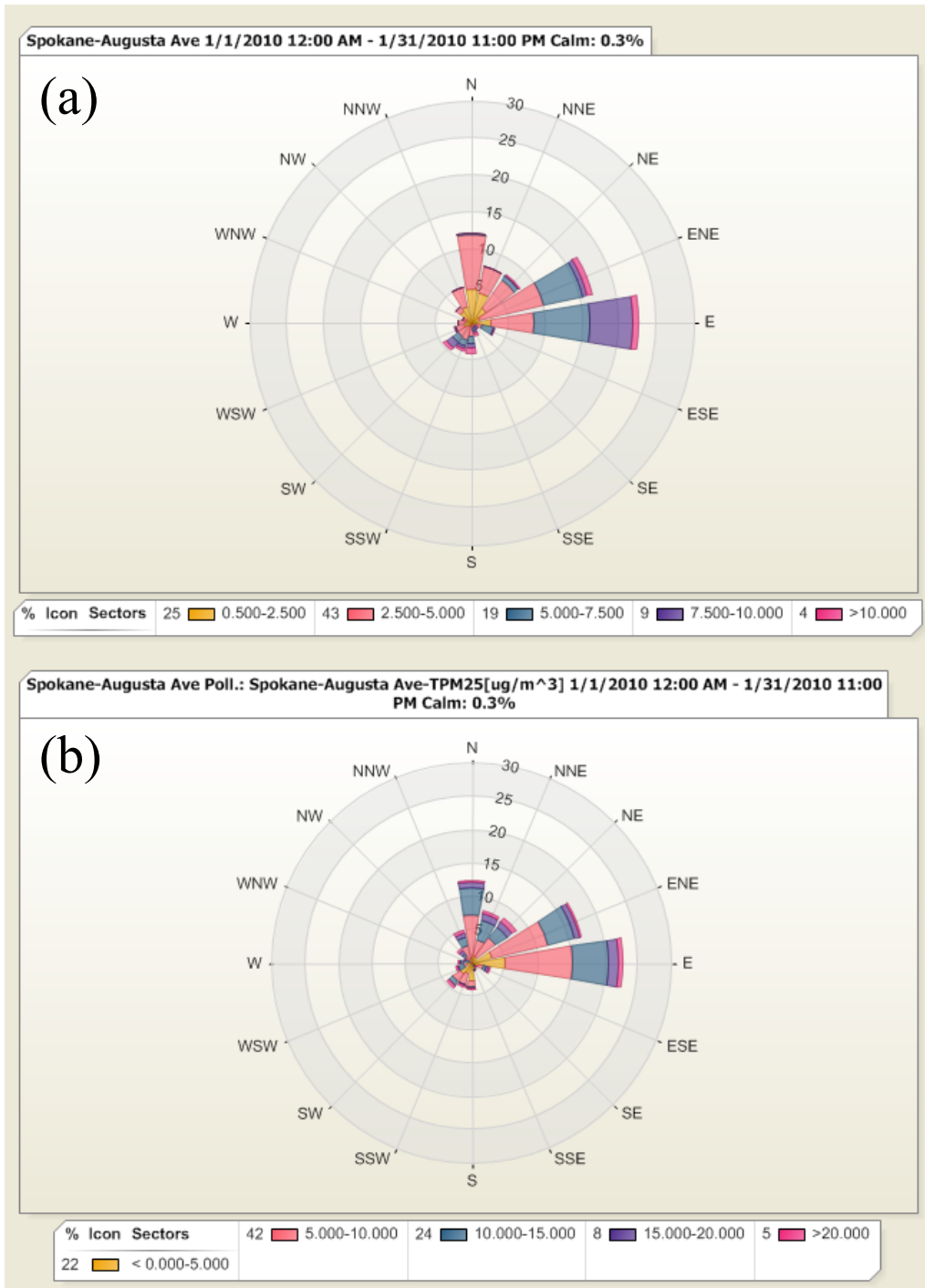
Figure 2 shows the 24 hour average PM_{2.5} mass concentrations across the monitoring network as they changed through the month of January.

Figure 2: PM_{2.5} multi-station time series for January 2010



Easterly and east-northeasterly winds predominated in January (Figure 3a). Fine particulate matter (PM_{2.5}) concentrations were spread about evenly across wind directions ranging from north-northwesterly to easterly (Figure 3b).

Figure 3: The wind rose (a) and PM_{2.5} pollution rose (b) summarize the percentage of time during the month of January that wind speed and PM_{2.5}, respectively, varied with wind direction. The charts are derived from hourly-averaged data.



Appendix 1 – National Ambient Air Quality Standards

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), ground-level ozone (O₃) and sulfur dioxide (SO₂; Table A-1). These are known as “criteria” pollutants because the US EPA established regulatory limits to concentrations in ambient air using human health or environmentally based criteria. Carbon monoxide, particulate matter and ozone are monitored in Spokane County by the Spokane Regional Clean Air Agency (SRCAA) and the Washington State Department of Ecology (Ecology).

Table A-1: National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾		
Lead	0.15 µg/m ³ ⁽²⁾	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m ³	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁽³⁾	Same as Primary	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁽⁴⁾ (Arithmetic Mean)	Same as Primary	
	35 µg/m ³	24-hour ⁽⁵⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁶⁾	Same as Primary	
	0.08 ppm (1997 std)	8-hour ⁽⁷⁾	Same as Primary	
	0.12 ppm	1-hour ⁽⁸⁾ (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m ³)	3-hour ⁽¹⁾
	0.14 ppm	24-hour ⁽¹⁾		

⁽¹⁾ Not to be exceeded more than once per year.

⁽²⁾ Final rule signed October 15, 2008.

⁽³⁾ Not to be exceeded more than once per year on average over 3 years.

⁽⁴⁾ To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁽⁵⁾ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

⁽⁶⁾ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008)

⁽⁷⁾ (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

⁽⁸⁾ (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

Appendix 2 – Air Quality Index

The Air Quality Index (AQI) is EPA’s color-coded tool for communicating daily air quality to the public and can be calculated for any of the criteria pollutants except lead, provided monitoring data are available. An index value above 100 indicates that the concentration of a criteria pollutant exceeded the limit established in the NAAQS. Categories of the AQI are “good” (green, 0-50), “moderate” (yellow, 51-100), “unhealthy for sensitive groups” (orange, 101-150), “unhealthy” (red, 151-200), “very unhealthy” (purple, 201-300) and “hazardous” (maroon, 301-500; Table A-2).

Table A-2: Air pollutant breakpoints for the Air Quality Index.

Air Quality Index Levels of Health Concern	Color Code	Index Numerical Value	Breakpoints					Health Effects
			O ₃ (ppm) 8-hour	O ₃ (ppm) 1-hour ⁽¹⁾	PM _{2.5} (µg/m ³) 24-hour	PM ₁₀ (µg/m ³) 24-hour	CO (ppm) 8-hour	
Good	Green	0-50	0.000-0.059	⁽³⁾	0.0-15.4	0-54	0.0-4.4	Air quality is considered satisfactory and air pollution poses little or no risk.
Moderate	Yellow	51-100	0.060-0.075	⁽³⁾	15.5-35.4	55-154	4.5-9.4	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	Orange	101-150	0.076-0.095	0.125-0.164	35.5-65.4	155-254	9.5-12.4	People especially sensitive to air pollution may experience health effects. The general public is not likely to be affected. An AQI in this category or above indicates that air pollution exceeds levels acceptable under federal air quality standards.
Unhealthy	Red	151-200	0.096-0.115	0.165-0.204	65.5-150.4	255-354	12.5-15.4	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	Purple	201-300	0.116-0.374	0.205-0.404	150.5-250.4	355-424	15.5-30.4	Health alert: everyone may experience more serious health effects.
Hazardous	Maroon	>300	⁽²⁾	0.405+	250.5+	425+	30.5+	Health warnings of emergency conditions. The entire population is more likely to be affected.

¹Areas are generally required to report the AQI based on 8-hour ozone values. However, there are a small number of areas where an AQI based on 1-hour ozone values would be more precautionary. In these cases, in addition to calculating the 8-hour ozone index value, the 1-hour ozone index value may be calculated, and the maximum of the two values reported.

²8-hour O₃ values do not define higher AQI values (≥ 301). AQI values of 301 or greater are calculated with 1-hour O₃ concentrations.

³There is no AQI for 1-hour O₃ concentrations below the Unhealthy for Sensitive Groups level.

Appendix 3

Table A-3: Summary air quality data for December from all of the analyzers operated in Spokane County. The CO data are 8-hour maximums in parts per million (ppm) and the PM data are 24-hour averages in micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). The Augusta PM_{2.5} FRM data were not available when this table was prepared.

Date	CO 3rd & Washington (ppm)	PM10 Augusta & Fiske FRM ($\mu\text{g}/\text{m}^3$)	PM2.5 Augusta & Fiske FRM ($\mu\text{g}/\text{m}^3$)	PM2.5 Augusta & Fiske TEOM ($\mu\text{g}/\text{m}^3$)	PM2.5 Monroe & Wellesley nephelometer ($\mu\text{g}/\text{m}^3$)	PM2.5 Deer Park TEOM ($\mu\text{g}/\text{m}^3$)	PM2.5 Spokane Valley TEOM ($\mu\text{g}/\text{m}^3$)	PM2.5 Airway Heights TEOM ($\mu\text{g}/\text{m}^3$)	PM10 Turnbull Wildlife Refuge TEOM ($\mu\text{g}/\text{m}^3$)	PM10 Turnbull Wildlife Refuge FRM ($\mu\text{g}/\text{m}^3$)	PM2.5 Turnbull Wildlife Refuge FRM ($\mu\text{g}/\text{m}^3$)	PM10 Liberty Lake ($\mu\text{g}/\text{m}^3$)	PM10-2.5 Liberty Lake ($\mu\text{g}/\text{m}^3$)	PM2.5 Liberty Lake ($\mu\text{g}/\text{m}^3$)	PM2.5 Liberty Lake nephelometer ($\mu\text{g}/\text{m}^3$)
1/1	0.8			6.7	1.4	7.2	2.6	2.6	2						2.8
1/2	1.1	6	NA	4.4	1.1	6.3	5.2	3.9	3	2	0.8	5.1	2.7	2.4	2.6
1/3	1			14.4	2.2	9.9	12.8	6.5	3						6.6
1/4	1			8	2.1	6.4	4.7	5.8	3						5.2
1/5	1.2		NA	7.9	1.5	8.6	9.3	4.2	2						6.8
1/6	0.6			6.3	1.5	4.9	5.9	4.6	4						3.3
1/7	0.5			7.5	1.7	4	6	6.1	6						4
1/8	0.6	27	NA	8.9	2.1	6.2	7.2	7.8	9	10	4.5	12.1	7.1	5.0	5.9
1/9	0.5			11.5	2	9.1	10	9.9	9						11.1
1/10	0.5			8.6	2.4	7.3	8	7.5	4						10.8
1/11	0.8		NA	8.6	3.2	9.6	6.7	7.2	3						7.9
1/12	1.7			10.3	2.1	12	8.7	5.6	4						5.3
1/13	1.1			8.6	1.7	8.5	6.1	5.9	4						5.2
1/14	0.9	20	NA	4.8	2.1	6.1	3.5	3.1	2	3	0.8	6.4	4.3	2.1	1.7
1/15	0.8			5.2	2.9	6	3.7	3.5	4						1.8
1/16	0.6			5.4	6.1	6.9	5.2	4.3	2						3.2
1/17	0.4		NA	4.1	5.9	3.8	3.8	4.4	3						3.6
1/18	0.7			8.1	3.4	6.5	3.8	3.7	2						2.1
1/19	0.6			7	5.8	4.1	5.2	5.7	4						3.3
1/20	0.6	32	NA	7.2	6.2	4.6	4.7	5.1	4	4	1.6	6.5	3.8	2.7	3.4
1/21	0.7			8.1	6.4	4.3	5.5	4.2	5						2.9
1/22	0.9			11.7	6.3	9	4.8	5	6						3.2
1/23	0.7		NA	13.8	10.1	15.1	15.6	6.9	7						6.9
1/24	0.5			8.9	10.9	8.9	7.7	5	4						8
1/25	0.9			8.4	8.4	6.2	6.9	4.9	4						7.5
1/26	2.3	27	NA	10.7	10.1	8.3	14.2	4.7	6	6	3.5	5.5	1.9	3.7	5.2
1/27	1.5			18.2	16.5	13.3	18.3	6.7	5						8.4
1/28	0.8			15.2	12.3	12.4	8.1	5.8	6						6.9
1/29	1		NA	13.6	13.1	9.5	9.1	5.4	12						7.2
1/30	0.7			12.7	16.1	12.4	8.7	5.8	11						7.1
1/31	0.7			10.9	11.1	12.7	10.5	5.2	7						7.2
AVG	0.9	22	NA	9.2	5.8	8.1	7.5	5	5	5	2	7	4	3	5.4
MAX	2.3	32	NA	18.2	17	15.1	18	10	12	10	5	12	7	5	11

