

## Minnesota Air Quality Index (AQI) 2003 Summary

While 2003 summary data is interesting and suggestive, it is not complete enough to suggest trends. New monitors were placed in several locations mid-year; other locations' monitors are seasonal (summer) only; and other regions were not yet covered by an AQI monitor. In other words, it is not yet possible to usefully compare data from one year to the next, or to discern trends.

### Figure 1: AQI Operational Network

Figure 1 shows the network of air monitors the MPCA uses to calculate the AQI. Note that not all locations monitor all pollutants, nor is the network uniform across the state.

Minnesota Pollution Control Agency Air Quality Index (AQI) 2003 Operational Network						
REGION	SITES	MONITORS				Total
Duluth	3	O3 1	PM2.5 1	CO 1		3
Ely	1	O3 1				1
Mille Lacs	1	O3 1				1
St. Cloud	2	O3 1	PM2.5 1	CO 1		3
Rochester	1	O3 1	PM2.5 1			2
Twin Cities	13	O3 7	PM2.5 5	CO 3	SO2 2	17
<b>TOTALS</b>						
6	21	12	8	5	2	27

**Legend**

O3	Ozone
PM2.5	Particulate Matter
CO	Carbon Monoxide
SO2	Sulfur Dioxide

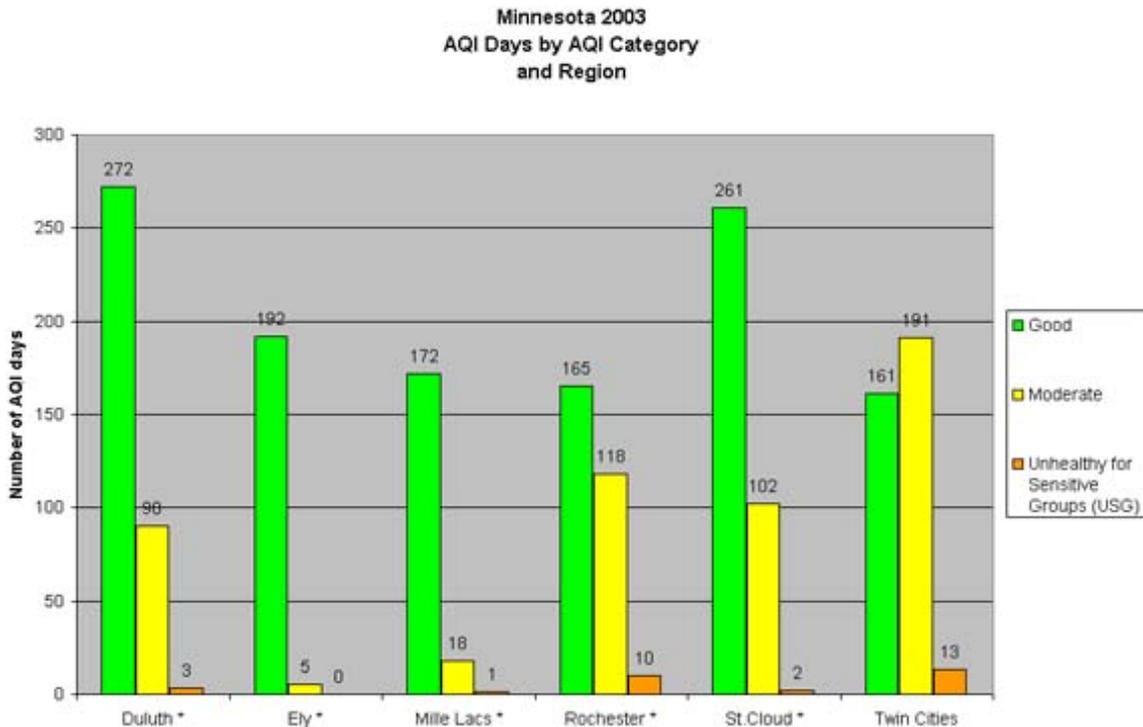
Because of upgrades to Minnesota's air monitoring network, the year 2003 is not comparable to preceding years in AQI reporting. In 2003, new fine particle monitors were placed in both the Twin Cities and in cities outside the metro area. In 2004, the MPCA is adding fine particle monitors in the northwest and southwest parts of the state.

As the MPCA strengthens its network, data collected over the next few years will give a much clearer picture of AQI trends in Minnesota.

**Figure 2: 2003 AQI Days by AQI Category and Region**

Figure 2 shows 2003 summarized by number of days in each of three health categories (Good, Moderate, and Unhealthy for Sensitive Groups) in each of the six current reporting regions (Duluth, Ely, Mille Lacs, Rochester, St. Cloud, and the Twin Cities). Each day’s AQI is calculated by using the highest hourly AQI value that day for all measured pollutants and sites in that particular region. Some regions do not show a total of 365 days. For instance, since ozone is the sole pollutant monitored at Ely and Mille Lacs, and ozone season runs from April through September, these two monitors operate only for those six months. Some monitors in other locations were placed mid-year, so would have results only for the days they were operating rather than the entire year.

This graphic illustrates the fact that the Twin Cities had more days in the Moderate category (191 days) than in the Good category (161 days). Recent research indicates that, when the major pollutant is fine particles, an AQI in the “high Moderate,” (e.g., 90), is sufficient to cause health concerns for one group of people: those with heart conditions. Although there is not enough data from previous years to establish a trend, it will be important to see if Moderate days continue to outnumber Good days in the Twin Cities.



**Figure 3: 2003 Days with AQI Greater Than 100**

Figure 3 shows days when the AQI reached 101 or above, or the Unhealthy for Sensitive Groups category. The range for this category is AQI values of 101 to 150. Some AQI days in the table are consecutive and grouped together; these days are often part of one multi-day event, a result of the same set of environmental conditions.

In 2003, the majority of days with an AQI of more than 100 were due to fine particles (PM2.5), rather than ozone or smog. Four such days occurred for ozone. The Twin Cities area had the highest number of days with an AQI of more than 100 (13 days), followed by Rochester (10 days).

Note that days with higher fine particle concentrations primarily occurred from March through September in 2003, although fine particle concentrations are just as likely in winter. (Ozone, however, appears only in summer in Minnesota, since it is formed by a chemical reaction involving heat and sunshine.)

**Minnesota - 2003  
Air Quality Index (AQI)  
Days with AQI > 100**

Date	Duluth	Ely	Mille Lacs	Rochester	St. Cloud	Twin Cities	
3/15/2003						105	
3/16/2003	124						
3/17/2003	129						
3/18/2003				116		108	
3/19/2003				107		106	
4/11/2003				101			
4/19/2003				124		119	
4/20/2003				119		120	
6/05/2003						101	<b>Legend</b>
6/17/2003						101	Ozone
7/3/2003						101	PM2.5
7/5/2003						135	
7/6/2003						119	
8/15/2003				139		110	
8/16/2003				113			
8/18/2003			108				
8/20/2003				110			
9/10/2003				117	101	112	
9/11/2003	109			119	107	117	
<b>Totals</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>2</b>	<b>13</b>	