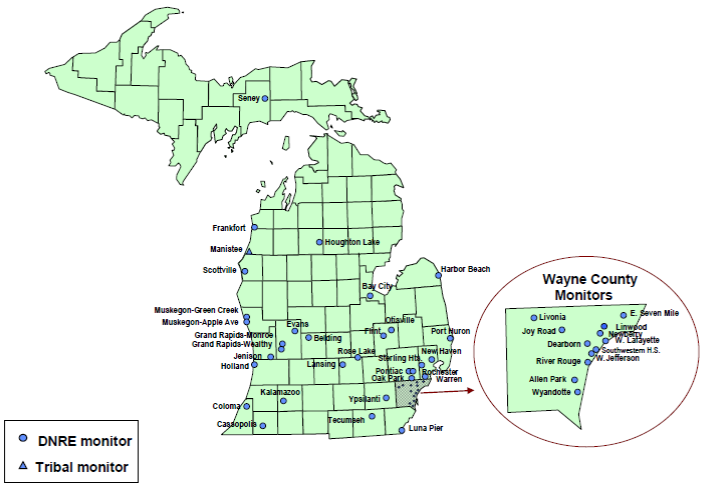
Air Quality Index (AQI)

Indicator Definition: The Air Quality Index (AQI) is an index for reporting daily air quality, which indicates how healthy or unhealthy the ambient air is. The index is calculated for four major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution, carbon monoxide, and sulfur dioxide. For each of these pollutants, the Environmental Protection Agency (EPA) has established national air quality standards to protect public health.

Indicator Overview:

- Under the Clean Air Act, EPA establishes air quality standards to protect public health, including the health of "sensitive" populations. EPA also sets limits to protect public welfare. This includes protecting ecosystems, including plants and animals, from harm, as well as protecting against decreased visibility and damage to crops, vegetation, and buildings. The EPA has set national air quality standards for six common air pollutants: Nitrogen dioxide (NO2), ozone (O3), sulfur dioxide (SO2), particulate matter (PM), carbon monoxide (CO), and lead (Pb).
- Sensitive populations include individuals with asthma, children, and older adults.
- The AQI takes a daily measure of four of the six common measures and determines on a scale of 0 to 500 how healthy the air quality is. The scale measures as: Good (0-50), Moderate, (51-100), Unhealthy for Sensitive Groups (101-150), Unhealthy (151-200), Very Unhealthy (201-300), and Hazardous (301-500).
- In many U.S. communities, AQI values are usually below 100, with higher values occurring just a few times a year. Larger cities typically have more air pollution than smaller cities, so their AQI values may exceed 100 more often. AQI values higher than 200 are infrequent, and AQI values above 300 are extremely rare—they generally occur only during events such as forest fires.

Figure 1.1: 2009 MASN Monitoring Sites



← Michigan DNRE Air Monitoring Division: Michigan has several sites that monitor air quality state wide. Not all sites monitor every toxin on every day.

Due to the variations from day-to-day, it is easier to look at air quality regionally. The following tables include annual summaries from different Metropolitan Statistical Areas (MSAs).

For this report, air quality index statistics include Detroit Metro, Grand Rapids-Muskegon-Holland, Flint, and Lansing-East Lansing MSAs.

→ Trends:

MSA: Detroit

Between 1998 and 2008, the highest recorded AQI value was 204 in 2003, but the index values have remained below 200 since 2004. In general, Detroit Metro Area has 40%-60% of the days monitored in the good air quality range. For the most recent year reported, 2008, the percent of good air quality days was 62.7% of the days monitored with less than 2% of days in the Unhealthy for Sensitive Group range and less than 1% of days in the Unhealthy index range.

Year	Number of Days AQI was measured	Percent of Days when Air Quality in Detroit Metro Area was…				Max AQI# Value for year
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	
1998	182	56.0%	28.0%	14.3%	1.6%	201
1999	365	52.1%	36.7%	9.0%	2.2%	177
2000	366	40.7%	54.4%	4.6%	0.3%	159
2001	365	40.3%	48.5%	9.9%	1.4%	174
2002	365	40.8%	49.3%	6.8%	3.0%	197
2003	365	39.2%	53.4%	5.8%	1.6%	204
2004	366	46.7%	48.9%	4.4%	0.0%	144
2005	365	44.4%	44.9%	8.8%	1.9%	179
2006	365	54.8%	41.4%	3.6%	0.3%	188
2007	365	52.1%	41.9%	4.9%	1.1%	161
2008	311	62.7%	35.0%	1.9%	0.3%	173

Year	Number of Days AQI was measured	Percent of Days when Air Quality in Flint was…				Max AQI# Value for year
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	
1998	184	65.8%	28.3%	6.0%	0.0%	150
1999	244	64.8%	25.8%	9.0%	0.4%	154
2000	245	71.4%	26.1%	2.4%	0.0%	129
2001	245	64.1%	27.3%	8.2%	0.4%	179
2002	245	61.6%	29.8%	8.2%	0.4%	154
2003	243	65.4%	29.6%	4.1%	0.8%	190
2004	246	75.2%	23.2%	1.6%	0.0%	124
2005	361	79.8%	17.2%	3.0%	0.0%	128
2006	242	77.3%	22.3%	0.4%	0.0%	101
2007	241	67.2%	29.9%	2.9%	0.0%	135
2008	214	80.8%	18.2%	0.9%	0.0%	111

← Trends:

MSA: Flint

Between 1998 and 2008, the highest recorded AQI value was 190 in 2003, but the index values have remained at or below 135 since. In general, Flint MSA has 60%-80% of the days monitored annually in the good air quality range. For the most recent year reported, 2008, the percent of good air quality days was 80.8% of the days monitored with less than 1% of the days in the Unhealthy for Sensitive Groups range and no days in the Unhealthy index range.

→ Trends:

MSA: Grand Rapids - Muskegon - Holland

Between 1998 and 2008, the highest recorded AQI value was 195 in 2005, but the index values have remained below 180 since then. In general, the Grand Rapids-Muskegon-Holland MSA has 60%-70% of the days monitored in the good air quality range. For the most recent year reported, 2008, the percent of good air quality days was 62.5% of the days monitored with less than 1% of days in the Unhealthy for Sensitive Groups range and Unhealthy index range.

Year	Number of Days AQI was measured	Percent of Days when Air Quality in Grand Rapids Metro Area was…				Max AQI# Value for year
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	
1998	365	64.4%	26.6%	7.1%	1.9%	190
1999	219	58.4%	27.9%	11.9%	1.8%	192
2000	242	75.6%	22.7%	1.7%	0.0%	127
2001	240	66.3%	26.7%	6.3%	0.8%	166
2002	242	66.5%	24.8%	5.8%	2.9%	182
2003	242	71.9%	24.8%	2.9%	0.4%	151
2004	241	79.3%	20.7%	0.0%	0.0%	94
2005	365	56.2%	34.5%	8.5%	0.8%	195
2006	243	80.7%	18.1%	1.2%	0.0%	107
2007	243	69.5%	25.1%	4.9%	0.4%	177
2008	285	62.5%	36.5%	0.7%	0.4%	161

Year	Number of Days AQI was measured	Percent of Days when Air Quality in Lansing was…				Max AQI# Value for year
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	
1998	365	78.1%	12.9%	7.1%	1.9%	197
1999	260	71.9%	22.7%	5.0%	0.4%	154
2000	243	74.5%	24.7%	0.8%	0.0%	119
2001	245	68.6%	27.3%	3.3%	0.8%	159
2002	242	64.5%	28.9%	6.6%	0.0%	150
2003	241	74.3%	18.3%	7.1%	0.4%	164
2004	240	79.6%	20.0%	0.4%	0.0%	109
2005	244	66.8%	29.9%	3.3%	0.0%	150
2006	365	75.1%	20.3%	3.8%	0.8%	174
2007	239	75.3%	22.6%	2.1%	0.0%	124
2008	214	81.3%	18.2%	0.5%	0.0%	106

← Trends:

MSA: Lansing - East Lansing

Between 1998 and 2008, the highest recorded AQI value was 197 in 1998, and the index values have remained below 190 since then. In general, the Lansing-East Lansing MSA has 60%-70% of the days monitored in the good air quality range. For the most recent year reported, 2008, the percent of good air quality days was 81.3% of the days monitored with less than 1% of the days in the Unhealthy for Sensitive Groups range and no days in the Unhealthy index range.

Links to Other Sources of Information:

U.S. Environmental Protection Agency Air Emissions Sources: http://www.epa.gov/air/emissions/where.htm

Michigan Department of Natural Resources & Environment – Air Monitoring: http://www.michigan.gov/deq/0,1607,7-135-3310_4195-79055--,00.html

CDC – National Environmental Public Health Tracking Network: http://ephtracking.cdc.gov/showHome.action

Links to Related Public Health Programs:

MDCH Asthma Prevention: http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_48758---,00.html

CDC – Air Pollution & Respiratory Health: http://www.cdc.gov/nceh/airpollution/default.htm

EPA – Patient Exposure & Air Quality Index: http://www.epa.gov/air/oaqps/eog/ozonehealth/aqi.html