2017 Air Quality Index

New Jersey Department of Environmental Protection

What is the Air Quality Index (AQI)?

The Air Quality Index (AQI) is a national air quality rating system based on the National Ambient Air Quality Standards (NAAQS). An index value of 100 is equal to the primary, or health-based, NAAQS for each pollutant. This allows for a comparison of each of the pollutants used in the AQI. These pollutants are ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Although air concentrations of pollutants have been dropping over the past few years, the U.S. Environmental Protection Agency (USEPA) periodically reviews the NAAQS to make sure that they are protective of public health, and adjusts them accordingly in response to new research. The latest NAAQS revision, for ozone, occurred in October 2015.

Every morning an air pollution forecast for the current and following day is prepared by the New Jersey Department of Environmental Protection (NJDEP) using the AQI format. The forecast is provided to USEPA and is disseminated through the Enviroflash system to subscribers who sign up to receive air quality forecast and alert emails or texts (www.enviroflash.info). Anyone can view the forecast and current air quality conditions at USEPA's AirNow website (www.airnow.gov) or at NJDEP's air monitoring webpage (www.njaqinow.net/).

In an effort to make the AQI easier to understand, a color code and descriptive interpretation are assigned to the numerical ratings (see Table 3-1). Table 3-2 contains suggested actions to take to protect public health for different AQI levels. For more information on the AQI, visit EPA's web site at www.airnow.gov.

Table 3-1
Air Quality Index Levels and Associated Health Impacts

AQI Level of Health Concern	Numerical Value	Meaning	Color Code
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.	**Green**
Moderate	51 to 100	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.	**Yellow**
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	**Orange**
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.	**Red**
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.	**Purple**
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects.	**Maroon**

Table 3-2
AQI Suggested Actions to Protect Health

Air Quality Index Level	AQI Value Actions to Protect Your Health
Good (1-50)	None
Moderate (51-100)	Unusually sensitive individuals should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups (101-150)	Children, active adults, and people with respiratory disease such as asthma should limit prolonged outdoor exertion.
Unhealthy (151-200)	Children, active adults, and people with respiratory disease such as asthma should avoid prolonged outdoor exertion: Everyone else should limit prolonged outdoor exertion.
Very Unhealthy (201-300)	Children, active adults, and people with respiratory disease such as asthma should avoid outdoor exertion. Everyone else should limit outdoor exertion.
Hazardous (301-500)	Everyone should avoid all physical activity outdoors.

Table 3-3 shows the pollutant-specific ranges for the AQI categories. These are set according to the corresponding NAAQS.

Table 3-3
AQI Pollutant-Specific Ranges

Category	AQI Level	O_3 (ppm) 8-hour	$PM_{2.5}$ ($\mu g/m^3$) 24-hour	CO (ppm) 8-hour	SO_2 (ppm) 1-hour	NO_2 (ppm) 1-hour
Good	0-50	0.000-0.054	0.0-12.0	0.0-4.4	0-0.035	0-0.053
Moderate	51-100	0.055-0.070	12.1-35.4	4.5-9.4	0.036-0.075	0.054-0.100
Unhealthy for Sensitive Groups	101-150	0.071-0.085	35.5-55.4	9.5-12.4	0.076-0.185	0.101- 0.360
Unhealthy	151- 200	0.086-0.105	55.5-150.4	12.5-15.4	0.186-0.304	0.361-0.649
Very Unhealthy	201-300	0.106-0.200	150.5-250.4	15.5-30.4	0.305-0.604	0.605-1.249
Hazardous	301-500	>0.200	250.5-500.4	30.5-1004	0.605-1.004	1.250-2.049

Pollutants:
O_3 – Ozone
$PM_{2.5}$ – Fine particulate matter
CO – Carbon monoxide
SO_2 – Sulfur dioxide
NO_2 – Nitrogen dioxide

On days when the air quality is expected to reach the “Unhealthy for Sensitive Groups” range or above, cautionary statements similar to those in Tables 3-1 and 3-2 are provided as part of the forecast. These air quality alerts are issued through Enviroflash emails, are displayed on the AirNow and NJDEP air monitoring websites, and can also be viewed on the National Weather Service page for the Philadelphia/Mount Holly area (http://airquality.weather.gov/). Maps, charts, site photos, and other air quality information are also available on the NJDEP air monitoring web site, as shown in Figure 3-1 below.

Figure 3-1
Examples of Information Available on NJDEP’s Air Monitoring Website
www.njaqinow.net

Current Air Quality

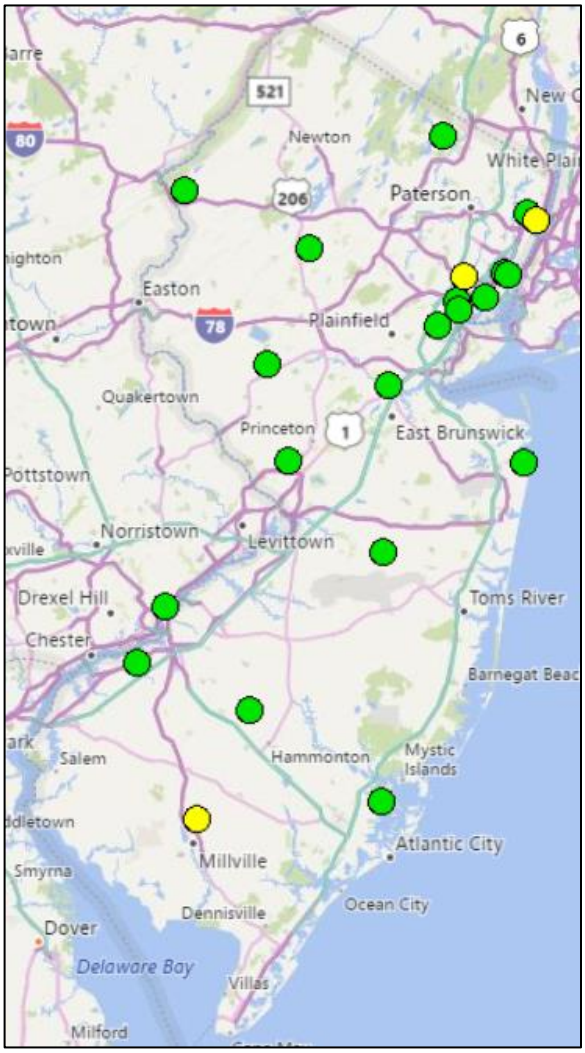
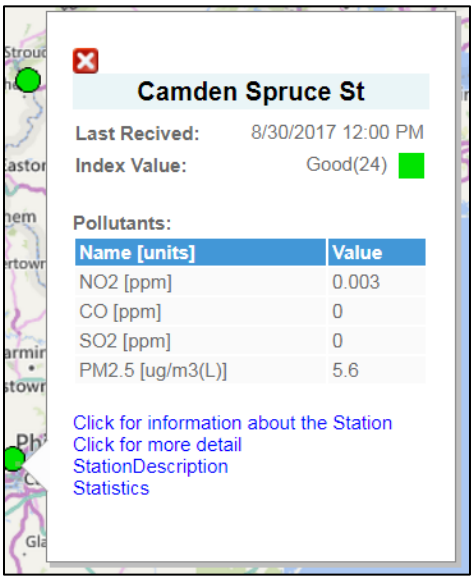
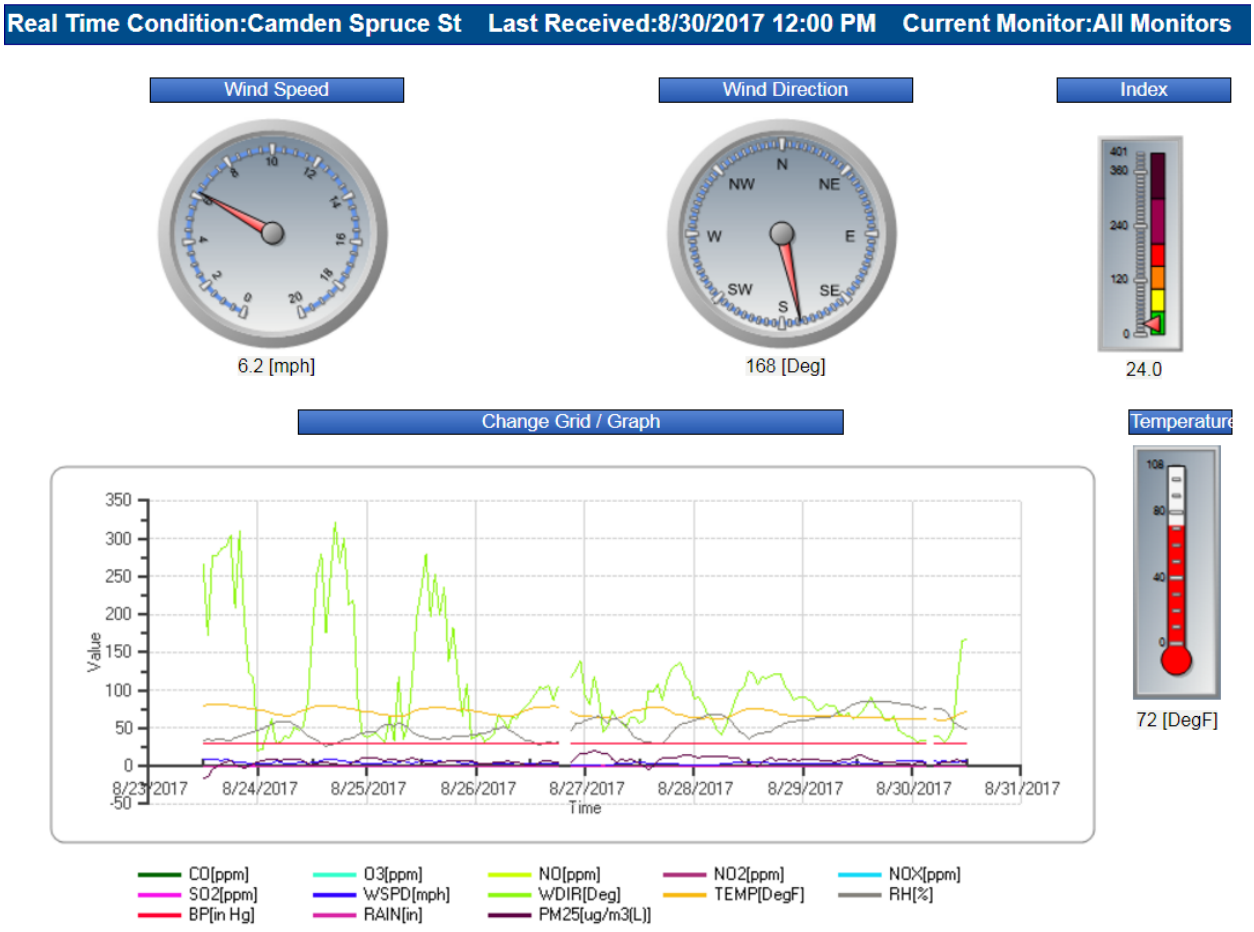


Figure 3-1 (continued)
Examples of Information Available on NJDEP's Air Monitoring Website

Monitors		
☑	Monitor	Value
☑	CO[ppm]	0.0
☑	O3[ppm]	--
☑	NO[ppm]	0.001
☑	NO2[ppm]	0.003
☑	NOX[ppm]	0.005
☑	SO2[ppm]	0.000
☑	WSPD[mph]	6.2
☑	WDIR[Deg]	168
☑	TEMP[DegF]	72
☑	RH[%]	48.3
☑	BP[in Hg]	29.97
☑	RAIN[in]	0.000
☑	PM25[ug/m3(L)]	5.6





2017 AQI Summary

Not all of New Jersey's monitoring sites have 365 days of reported air quality index values. Certain ozone monitors only operate during "ozone season," from March through October. Also, not all monitoring sites measure all pollutants. Table 3-4 shows which pollutants are used to determine the daily AQI at different monitoring stations.

Table 3-4
Pollutants Monitored at Each Air Quality Index Monitoring Site in New Jersey in 2017

	Monitoring Site	Ozone	Particulate Matter	Carbon Monoxide	Sulfur Dioxide	Nitrogen Dioxide
1	Ancora State Hospital	√ (s)				
2	Bayonne	√			√	√
3	Brigantine	√	√		√	
4	Camden Spruce St.	√	√	√	√	√
5	Chester	√			√	√
6	Clarksboro	√ (s)				
7	Colliers Mills	√ (s)				
8	Columbia WMA	√	√		√	√
9	Elizabeth			√	√	
10	Elizabeth Lab		√	√	√	√
11	Flemington	√	√			
12	Fort Lee Near Road		√	√		√
13	Jersey City			√	√	√
14	Jersey City Firehouse		√			
15	Leonia	√ (s)				
16	Millville	√	√			√
17	Monmouth University	√ (s)				
18	Newark Firehouse	√	√	√	√	√
19	Rahway		√			
20	Ramapo	√ (s)				
21	Rider University	√	√			
22	Rutgers University	√	√			√

(s) – Seasonal operation only (March 1 through October 31)

A summary of the AQI ratings for New Jersey in 2017 is presented in the pie chart in Figure 3-2 below. In 2017, there were 143 “Good” days, 203 were “Moderate,” and 19 were rated “Unhealthy for Sensitive Groups.” There were no days rated “Unhealthy” or “Very Unhealthy.” This indicates that air quality in New Jersey is mostly good or moderate, but that air pollution was still bad enough in 2017 to adversely affect sensitive people about 5% of the time. However, this is an improvement from the previous year, when 26 days were unhealthy for sensitive groups and there were two “Unhealthy” days.

Figure 3-2
2017 Air Quality Summary by Days

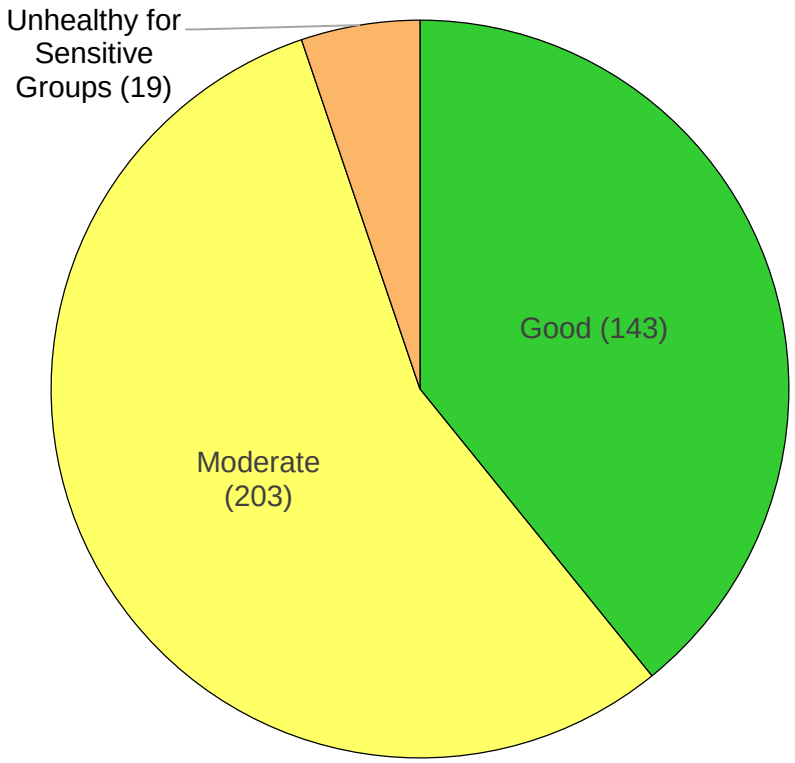


Table 5 lists the dates when the AQI reached the “Unhealthy for Sensitive Groups” threshold at any monitoring location, and shows the responsible pollutants and their concentrations. Fourteen out of the nineteen “USG” days are the result of high ozone levels during warm-weather periods.

Table 3-5
AQI "Unhealthy" or "USG" Days in New Jersey During 2017

Day	Date	Monitor Location	Pollutant	Concen-tration	Units	AQI Rating	AQI Value
1	1/28/17	Camden Spruce St.	$PM_{2.5}$	36.2	$\mu g/m^3$	USG	103
2	2/1/17	Camden Spruce St.	$PM_{2.5}$	37.7	$\mu g/m^3$	USG	106
3	3/9/17	Camden Spruce St.	$PM_{2.5}$	40.6	$\mu g/m^3$	USG	114
4	4/11/17	Chester	O_3	0.075	ppm	USG	115
		Flemington	O_3	0.077	ppm	USG	122
		Ramapo	O_3	0.074	ppm	USG	112
		Rutgers University	O_3	0.071	ppm	USG	101
		Washington Crossing*	O_3	0.071	ppm	USG	101
5	5/17/17	Camden Spruce St.	O_3	0.077	ppm	USG	122
		Chester	O_3	0.072	ppm	USG	105
		Clarksboro	O_3	0.071	ppm	USG	101
		Columbia	O_3	0.071	ppm	USG	101
		Flemington	O_3	0.072	ppm	USG	105
		Leonia	O_3	0.074	ppm	USG	112
		Rider University	O_3	0.077	ppm	USG	122
		Rutgers University	O_3	0.080	ppm	USG	133
		Washington Crossing*	O_3	0.073	ppm	USG	108
6	5/18/17	Camden Spruce St.	O_3	0.083	ppm	USG	143
		Clarksboro	O_3	0.076	ppm	USG	119
		Flemington	O_3	0.072	ppm	USG	105
		Leonia	O_3	0.074	ppm	USG	112
		Rider University	O_3	0.080	ppm	USG	133
		Rutgers University	O_3	0.075	ppm	USG	115
		Washington Crossing*	O_3	0.071	ppm	USG	101
7	6/10/17	Camden Spruce St.	O_3	0.076	ppm	USG	119
		Leonia	O_3	0.074	ppm	USG	112
8	6/11/17	Camden Spruce St.	O_3	0.071	ppm	USG	101
9	6/12/17	Bayonne	O_3	0.074	ppm	USG	112
		Camden Spruce St.	O_3	0.074	ppm	USG	112
		Chester	O_3	0.072	ppm	USG	105
		Clarksboro	O_3	0.073	ppm	USG	108
		Colliers Mills	O_3	0.080	ppm	USG	133
		Flemington	O_3	0.073	ppm	USG	108
		Leonia	O_3	0.082	ppm	USG	140
		Monmouth University	O_3	0.071	ppm	USG	101
		Newark Firehouse	O_3	0.071	ppm	USG	101
		Rutgers University	O_3	0.072	ppm	USG	105

Continued on next page.

Table 3-5 (continued)
AQI "Unhealthy" or "USG" Days in New Jersey During 2017

Day	Date	Monitor Location	Pollutant	Concen-tration	Units	AQI Rating	AQI Value
10	6/13/17	Ancora	O_3	0.071	ppm	USG	101
		Camden Spruce St.	O_3	0.079	ppm	USG	129
		Clarksboro	O_3	0.078	ppm	USG	126
		Colliers Mills	O_3	0.079	ppm	USG	129
		Leonia	O_3	0.074	ppm	USG	112
11	6/22/17	Camden Spruce St.	O_3	0.076	ppm	USG	119
		Leonia	O_3	0.071	ppm	USG	101
		Rider University	O_3	0.076	ppm	USG	119
		Rutgers University	O_3	0.076	ppm	USG	119
		Washington Crossing*	O_3	0.071	ppm	USG	101
12	6/30/17	Leonia	O_3	0.079	ppm	USG	129
13	7/19/17	Camden Spruce St.	O_3	0.072	ppm	USG	105
		Clarksboro	O_3	0.076	ppm	USG	119
		Colliers Mills	O_3	0.074	ppm	USG	112
14	7/20/17	Ancora	O_3	0.073	ppm	USG	108
		Clarksboro	O_3	0.071	ppm	USG	101
		Colliers Mills	O_3	0.077	ppm	USG	122
15	7/22/17	Bayonne	O_3	0.075	ppm	USG	115
		Camden Spruce St.	O_3	0.076	ppm	USG	119
16	8/1/17	Bayonne	O_3	0.072	ppm	USG	105
17	9/24/17	Rutgers University	O_3	0.078	ppm	USG	126
18	12/4/17	Elizabeth Lab	$PM_{2.5}$	35.6	$\mu g/m^3$	USG	101
19	12/10/17	Camden Spruce St.	$PM_{2.5}$	44.2	$\mu g/m^3$	USG	122

Rating
USG – Unhealthy for sensitive groups

Pollutants
$PM_{2.5}$ – Fine particulate matter
O_3 – Ozone

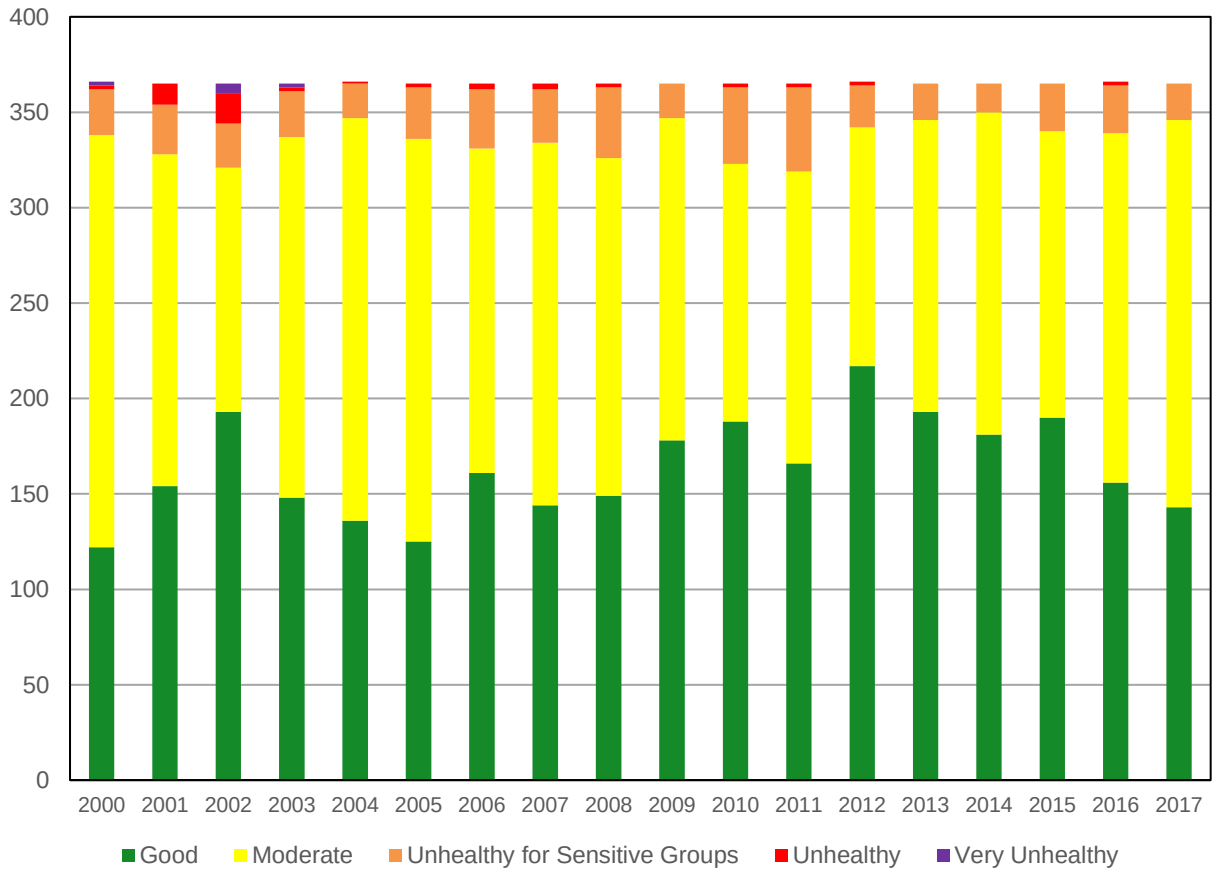
Units
$\mu g/m^3$ – micrograms per cubic meter
ppm – parts per million

* Washington Crossing air monitoring station is operated by USEPA. The site's data is included in determining exceedances in New Jersey.

Figure 3-3 shows the distribution of AQI days since 2000. It should be noted that AQI ranges change whenever a NAAQS is revised (so far, always to be more stringent) for a specific pollutant. So even though improvement in AQI days appears to be somewhat erratic, to see how things really have improved, refer to the concentration trend graphs in the individual criteria pollutant reports.

Of all the criteria pollutants, ozone is predominantly responsible for AQI days above the moderate range in New Jersey.

Figure 3-3
Number of Days in Each AQI Category Since 2000



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