



2017 Air Monitoring Network

New Jersey Department of Environmental Protection

NETWORK DESCRIPTION

In 2017, the New Jersey Department of Environmental Protection (NJDEP) Bureau of Air Monitoring (BAM) operated 33 ambient air monitoring stations. The monitoring stations vary in the number and type of monitors operating at each site. New Jersey's air monitoring program is primarily focused on the measurement of pollutants for which National Ambient Air Quality Standards (NAAQS) have been established, also known as criteria pollutants. Criteria pollutant monitoring is regulated by the United States Environmental Protection Agency (USEPA), which prescribes the design and siting of the monitoring networks, the acceptable monitoring methods, and the minimum quality assurance activities. Only data which meet USEPA requirements can be used to determine compliance with the NAAQS. There are six criteria air pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), and particulate matter (PM). Because particulate matter encompasses such a wide range of contaminants, there are separate NAAQS for two different size fractions of particles. There are NAAQS for fine particles, less than 2.5 microns in size, also referred to as PM_{2.5} (1 micron = one millionth of a meter), and another NAAQS for inhalable particles, less than 10 microns in size, referred to as PM₁₀.

In New Jersey, O₃, CO, NO₂, and SO₂ are measured using USEPA-approved real-time monitoring methods, and data for these pollutants are continuously transmitted to a central data acquisition system. Once an hour, the Bureau of Air Monitoring posts this air quality data to its website (www.njaqinow.net) and to the USEPA's Air Now website (www.airnow.gov). Data is subsequently reviewed and certified, and is available from USEPA's Air Quality Database at <https://www.epa.gov/outdoor-air-quality-data>.

PM_{2.5} is measured with both 24-hour filter-based samplers and real-time continuous monitors. Filters must be installed and removed manually, and brought to the BAM lab to be weighed and analyzed. A filter-based sampler is also used to determine lead, PM₁₀, and PM_{coarse} concentrations (PM larger than 2.5 microns and smaller than 10 microns).

Figure 2-1
Ramapo Air Monitoring Station



In addition to monitoring criteria pollutants, the NJDEP also measures “non-criteria pollutants,” or pollutants that do not have health-based National Ambient Air Quality Standards. Certain non-criteria pollutants are grouped together by their purpose or collection method. USEPA’s Photochemical Assessment Monitoring Station (PAMS) program, for example, measures non-criteria pollutants that are important in the formation of ozone. Since most ozone is not directly emitted from sources but forms in the atmosphere when volatile organic compounds and oxides of nitrogen react in the presence of sunlight, it is important to know the levels of these “precursor” pollutants.

Other non-criteria pollutants monitored by BAM include some that are commonly emitted by motor vehicles and other combustion sources: Benzene, toluene, ethylbenzene, ortho-xylene, meta-xylene, para-xylene (measured with a “BTEX” analyzer), and black carbon (measured with an aethalometer).

Five sites in the monitoring network collect samples of PM_{2.5} that are analyzed to determine the chemical makeup of the particles. These are part of USEPA’s Chemical Speciation Network (CSN). This data is used in helping to identify the primary sources of particles, and in assessing potential health effects.

**Figure 2-2
USEPA-Approved PM_{2.5} Sampler
in Jersey City**



Volatile organic compounds (VOCs) are collected and analyzed at four monitoring sites. These non-criteria pollutants are classified as “air toxics,” pollutants that have potential health effects but for which NAAQS have not been established. They can be carcinogenic or have other serious health effects, and are very diverse in their chemical composition.

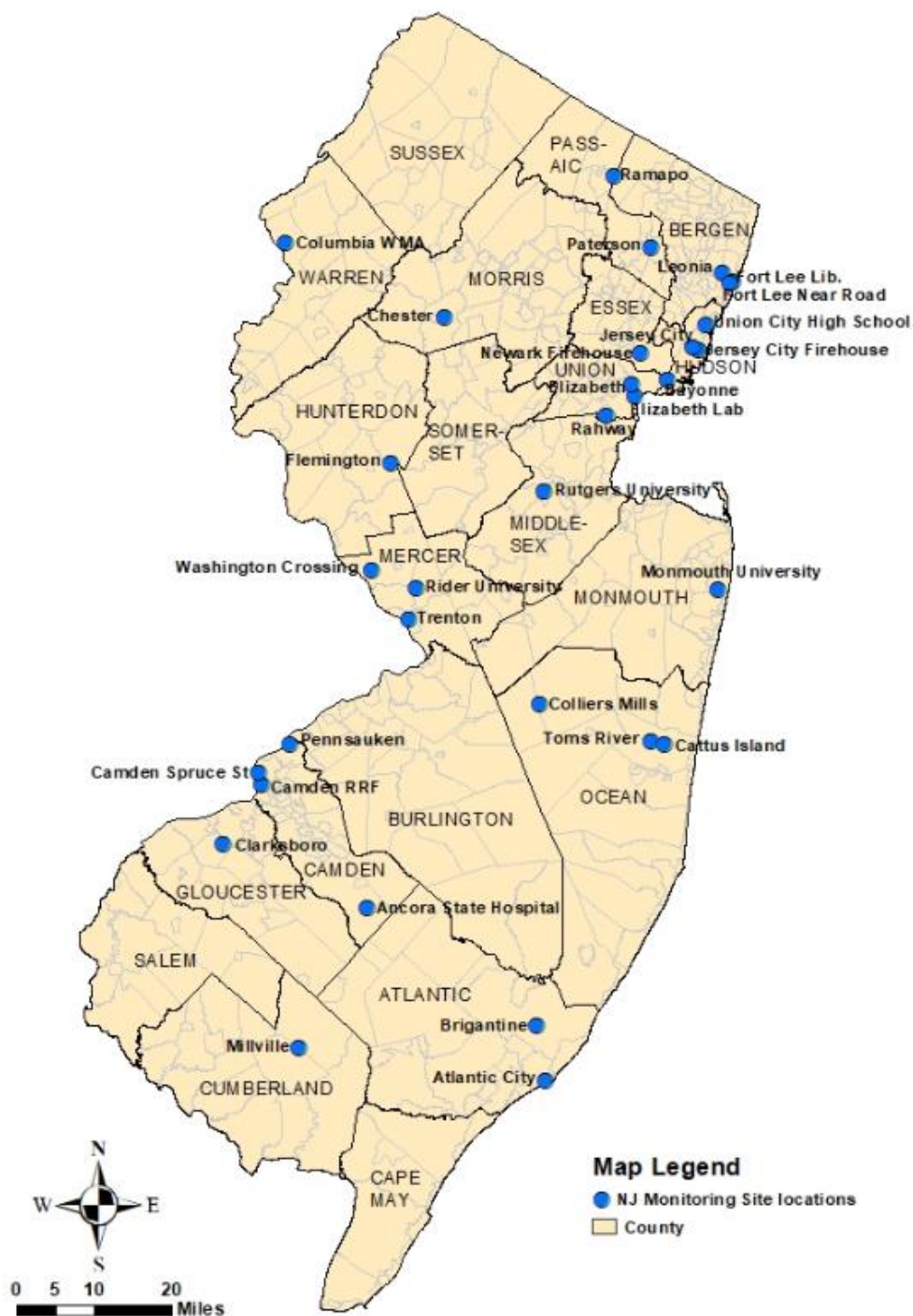
Two sites, Cattus Island and Washington Crossing, are part of the National Atmospheric Deposition Network. BAM staff collect the samples and ship them to a national laboratory for analysis of acids, nutrients, and base cations in precipitation.

A number of sites within the air monitoring network also take measurements of meteorological parameters, such as temperature, relative humidity, barometric pressure, wind speed, wind direction, precipitation, and solar radiation.

Figure 2-1 shows the seasonal ozone monitoring station at Ramapo Mountain State Forest in Passaic County. Figure 2-2 shows a USEPA-approved manual PM_{2.5} sampler located at the Jersey City Firehouse on Newark Avenue.

The locations of all the monitoring stations that operated in 2017 are shown on the map in Figure 2-3. Table 2-1 lists the parameters that were measured at each site. More details about the monitoring stations can be found in Appendix A.

Figure 2-3
New Jersey Air Monitoring Sites in 2017



**Table 2-1
2017 New Jersey Air Monitoring Network Summary**

Monitoring Station	Monitoring Parameter																					
	CO	NO _x	NO _y	O ₃	SO ₂	Smoke Shade	PM _{2.5}	Real-Time PM _{2.5} TEOM	Real-Time PM _{2.5} Beta	Visibility	PM ₁₀	Lead/PM _{coarse}	PM _{2.5} -Speciation	O ₃ Precursors (PAMS)	Toxics	BTEX/ Black Carbon	Acid Deposition	Mercury	Meteorological#	Rain	Solar Radiation	
1	Ancora State Hospital				1																	
2	Atlantic City						1															
3	Bayonne		1		1	1										1			1	1		
4	Brigantine				1	1	1	1	1								1					
5	Camden RRF									1												
6	Camden Spruce Street	1	1		1	1	2	1				1	1	1	1				1	1		
7	Cattus Island																1					
8	Chester		1		1	1	1						1	1								
9	Clarksboro				1		1a															
10	Colliers Mills				1																	
11	Columbia		1		1	1	1	1											1	1		
12	Elizabeth	1				1	1															
13	Elizabeth Lab	1	1			1	1	2	1				1	1	1			1	1	1		
14	Flemington				1				1											1	1	
15	Fort Lee Library						1															
16	Fort Lee Near Road	1	1						1							1				1	1	
17	Gibbstown *						1b															
18	Jersey City	1	1			1	1															
19	Jersey City Firehouse						2	1		2												
20	Leonia				1																	
21	Millville		1		1				1													
22	Monmouth University				1																	
23	Newark Firehouse	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1
24	Paterson						1															
25	Pennsauken						1															
26	Rahway						1	1														
27	Ramapo				1																	
28	Rider University				1				1											1		
29	Rutgers University		1		1		1	1					2	1	1			1				
30	Toms River						1															
31	Trenton						1															
32	Union City High School**						1															
33	Washington Crossing																1					
TOTAL		6	10	1	16	9	0	20	1	11	1	4	1	6	1	4	5	3	2	8	7	1

Meteorological parameters include temperature, relative humidity, barometric pressure, wind direction & wind speed.

* Monitoring site shut down in 2017

1 - Parameter measured in 2017

2 - Collocated parameter measured in 2017

a - Monitor started up in 2017

b - Monitor shut down in 2017

CHANGES TO THE NETWORK IN 2017

The only change to New Jersey's monitoring network in 2017 was the shutdown of the Gibbstown station in August because of construction activity at the site. The filter-based PM_{2.5} sampler was relocated to the Clarksboro monitoring station.

Table 2-2
2016 Network Changes (by Date)

Monitoring Site	Parameter(s)	Action	Date
Clarksboro	PM _{2.5} FRM	Moved from Gibbstown	8/8/2017
Gibbstown	PM _{2.5} FRM	Site shut down	8/8/2017

PM_{2.5} FRM is a federal reference method filter-based manual sampler for measuring 24-hour samples of inhalable particulate.

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