



2015 Network Summary

New Jersey Department of Environmental Protection

NETWORK DESCRIPTION

In 2015, the New Jersey Department of Environmental Protection (NJDEP) Bureau of Air Monitoring (BAM) operated 37 ambient air monitoring stations. The stations vary in the number and type of monitors operating at each site. The NJDEP 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 NAAQS for two different size fractions of particles. There are separate standards for inhalable particles, less than 10 microns in size (1 micron = one millionth of a meter), referred to as PM₁₀, and for fine particles, less than 2.5 microns, referred to as PM_{2.5}.

In New Jersey, O₃, CO, NO₂, and SO₂ are measured using USEPA-approved real-time monitoring methods, and data collected 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 web site (www.njaqinow.net) and to the USEPA's Air Now web site (www.airnow.gov). However, for lead, PM₁₀, PM_{coarse}, and some PM_{2.5} measurements, compliance with the NAAQS is determined using a USEPA-approved 24-hour sampler that uses a filter that must be installed and then removed for weighing and analysis. In order to provide hourly information to disseminate to the public in real time, NJDEP operates additional USEPA-equivalent-method PM_{2.5} instruments that continuously measure concentrations. The most recent of these, PM_{2.5} Beta Attenuation Analyzers, have been installed at numerous stations, replacing an earlier model of real-time particulate monitor, the Tapered Element Oscillating Microbalance (TEOM) analyzer.

Figure 1
Columbia Air Monitoring Station
Warren County



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 that the Bureau monitors 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.

At four monitoring sites, samples are collected and analyzed for non-criteria pollutants that are classified as “air toxics.” These are 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, and solar radiation. Figure 1 shows the monitoring station at the Columbia Wildlife Management Area in Warren County, which measures criteria pollutant data as well as weather parameters. Figure 2 shows a USEPA-approved manual PM_{2.5} sampler located on the roof of Atlantic Cape Community College in Atlantic City.

The map in Figure 3 shows the locations of all the sites that operated in 2015, and Table 1 lists the parameters that were measured at each site.

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



Figure 3
 New Jersey Air Monitoring Sites
 2015 Network Summary

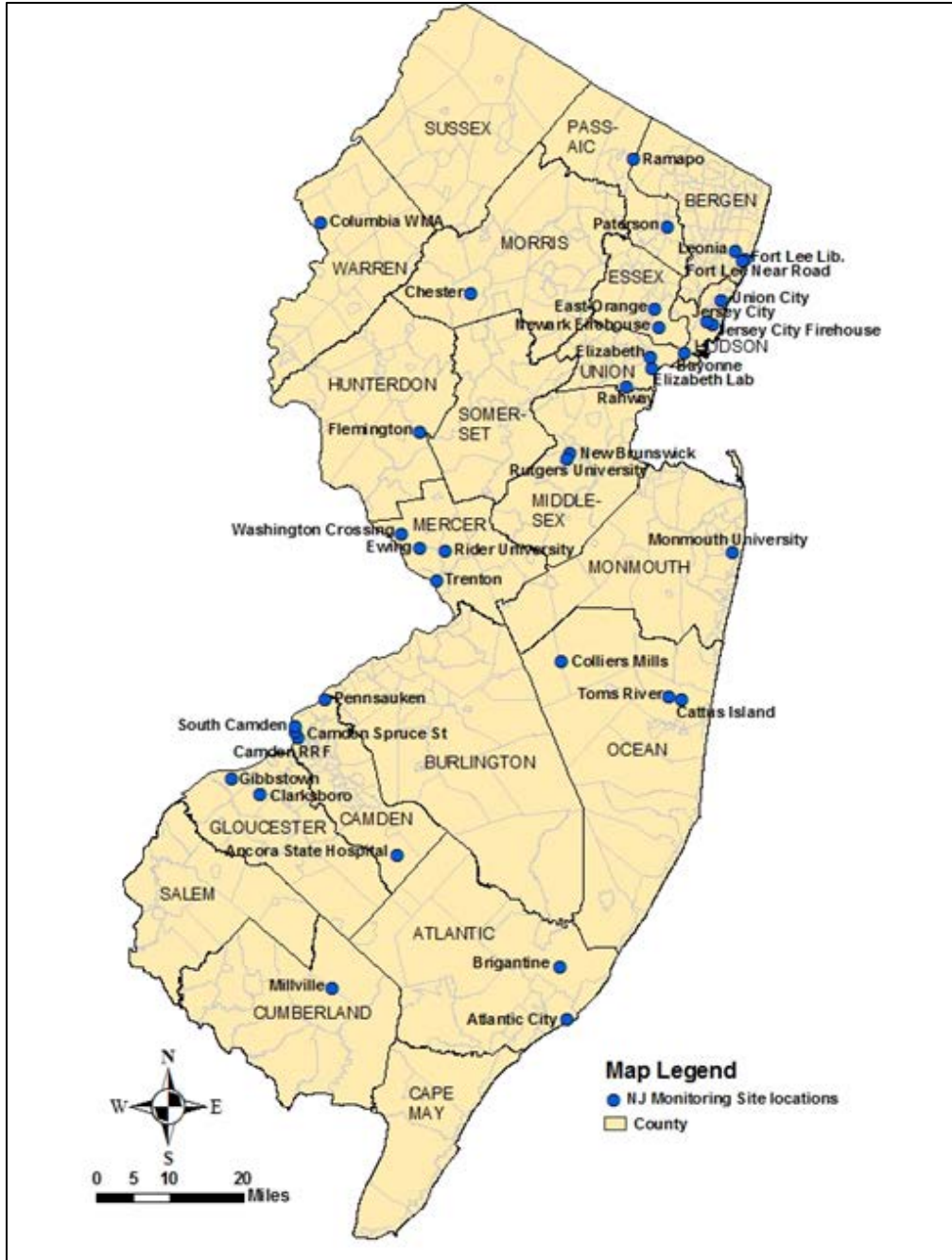




Table 1
2015 New Jersey Air Monitoring Network Summary

		CO	NOx	NOy	O ₃	SO ₂	Smoke Shade	PM _{2.5}	PM _{2.5} -Speciation	Real-Time PM _{2.5} TEOM	Real-Time PM _{2.5} Beta	Visibility	PM ₁₀	O ₃ Precursors - PAMS	Toxics	BTEX/Black Carbon	Lead/PM ₁₀ coarse	Acid Deposition	Mercury	Bar. Pres./ Rel. Humidity	Solar Radiation	Temperature	Wind Speed/ Direction
1	Ancora State Hospital				1																		
2	Atlantic City							1															
3	Bayonne		1		1	1										1				1		1	1
4	Brigantine				1	1		1			1	1						1	1				
5	Camden RRF												1										
6	Camden Spruce Street	1	1		1	1		1	1		1				1	1				1		1	1
7	Cattus Island																1						
8	Chester		1		1	1		1	1						1				1		1		
9	Clarksboro				1																		
10	Colliers Mills				1																		
11	Columbia WMA		1		1	1		1			1									1		1	1
12	East Orange	1	1																	1		1	1
13	Elizabeth	1				1	1																
14	Elizabeth Lab	1	1			1	1	2	1		1				1	1			1				1
15	Ewing									1													
16	Flemington				1					1										1	1	1	1
17	Fort Lee Library							1															
18	Fort Lee Near Road	1	1								1					1				1		1	1
19	Gibbstown							1															
20	Jersey City	1				1	1																
21	Jersey City Firehouse							2		1	1		2										
22	Leonia				1																		
23	Millville		1		1						1												
24	Monmouth University				1																		
25	New Brunswick							1	2		1				1								
26	Newark Firehouse	1	1	1	1	1		1	1		1					1	1			1	1	1	1
27	Paterson							1															
28	Pennsauken							1															
29	Rahway							1		1													
30	Ramapo				1																		
31	Rider University				1						1									1	1	1	1
32	Rutgers University		1		1						1			1									
33	South Camden									1													
34	Toms River							1															
35	Trenton							1															
36	Union City							1															
37	Washington Crossing																	1					
	TOTAL	7	10	1	16	9	3	20	6	5	11	1	3	1	4	5	1	3	3	8	4	8	9

1 - Parameter measured in 2015.

2 - Collocated parameter measured in 2015.

 Began measuring in 2015. See Table 2.
 Stopped measuring in 2015. See Table 2.

CHANGES TO THE NETWORK IN 2015

In 2015 the PM_{2.5} speciation sampling schedules at Chester and Camden Spruce Street were changed from every three days to every six days. This will conserve resources while still providing valuable data. The PM_{2.5} sampling sites in Morristown, Phillipsburg, and the Elizabeth Mitchell Building were shut down because they were close to other monitoring sites that were measuring very similar data. The Jersey City and Elizabeth smoke shade instruments finally stopped functioning after about forty years. They are not being replaced because the technology is obsolete. The New Brunswick site is gradually being replaced by the newly refurbished Rutgers University site, which is located approximately a mile away. The New Brunswick PM_{2.5} Beta analyzer was relocated to the Rutgers University site in August, and the toxics instrument will be installed there in 2016. PM_{2.5} TEOM analyzers at Flemington and the Jersey City Firehouse were both discontinued. New PM_{2.5} Beta analyzers were installed at the Jersey City Firehouse and Rider University.

Table 2
2015 Network Changes (by Date)

Monitoring Site	Parameter(s)	Action	Date
Chester	Speciation	Decreased sampling from every 3 days to every 6 days	1/1/2015
Camden Spruce St.	Speciation	Decreased sampling from every 3 days to every 6 days	1/1/2015
Elizabeth Mitchell Building	PM _{2.5}	Discontinued	1/1/2015
Morristown Ambulance	PM _{2.5}	Discontinued	1/1/2015
Phillipsburg	PM _{2.5}	Discontinued	1/1/2015
Jersey City	Smoke Shade	Discontinued	1/13/2015
Jersey City Firehouse	Real-time PM _{2.5} (TEOM Analyzer)	Discontinued	3/17/2015
Jersey City Firehouse	Real-time PM _{2.5} (Beta Analyzer)	Start-up	3/26/2015
Rider University	Real-time PM _{2.5} (Beta Analyzer)	Start-up	5/30/2015
New Brunswick	Real-time PM _{2.5} (Beta Analyzer)	Relocated to Rutgers	8/06/2015
Rutgers University	Real-time PM _{2.5} (Beta Analyzer)	Start-up	8/26/2015
Elizabeth	Smoke Shade	Discontinued	10/13/2015
Flemington	Real-time PM _{2.5} (TEOM Analyzer)	Shut down	12/31/2015
New Brunswick	Toxics	Relocated to Rutgers	12/31/2015

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