



# 2012 Network Summary

New Jersey Department of Environmental Protection

## NETWORK DESCRIPTION

In 2012, the New Jersey Department of Environmental Protection (NJDEP) operated 39 ambient air monitoring stations. The individual monitoring stations vary in terms of the number and type of measurements taken, and how the data collected from each site are used. Most of the monitoring program focuses on criteria pollutants which are pollutants for which National Ambient Air Quality Standards (NAAQS) have been established. Criteria pollutant monitoring is regulated by the United States Environmental Protection Agency (USEPA) which prescribes the minimum

number of sites that must be operated, the monitoring methods to be used, the general locations in which they must be placed, and quality assurance protocols that must be followed. Data which meet USEPA requirements can then be used to determine if the area being monitored meets the NAAQS for the pollutants measured. There are six criteria air pollutants: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter, and Sulfur Dioxide (SO<sub>2</sub>). In part 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 particles less than 10 microns (1 micron = one millionth of a meter) or PM<sub>10</sub>, and for particles less than 2.5 microns (PM<sub>2.5</sub>).

In New Jersey, all of the criteria air pollutants except for Particulate Matter are measured using a USEPA approved continuous monitoring method. Data on levels of these contaminants are thus available in near real-time. The NJDEP posts air quality updates to both its web site ([www.njaqinow.net](http://www.njaqinow.net)) and the USEPA's AirNow web site ([www.airnow.gov](http://www.airnow.gov)) once every hour. The USEPA's approved method for monitoring PM<sub>2.5</sub> is a manual sampling method. PM<sub>2.5</sub> samplers pull air through a filter for 24-hours and the filters are weighed before and after sampling. The concentration of particles is then calculated. While this method is quite accurate, it takes several weeks to get results. In order to include PM<sub>2.5</sub> levels in the hourly updates provided, the NJDEP uses continuous PM<sub>2.5</sub> monitors. Data from these monitors cannot be used for determining compliance with the PM<sub>2.5</sub> NAAQS but they do provide reasonable measures of PM<sub>2.5</sub> that can be made available on a near real-time basis.

Figure 1  
Elizabeth Air Monitoring Laboratory  
Union County, New Jersey



In addition to monitoring criteria pollutants, several other types of measurements are made. Non-criteria pollutants are important for a variety of reasons. They may play a role in chemical reactions that take place in the atmosphere. The Photochemical Assessment Monitoring Station (PAMS) program, for example, measures 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. The PAMS program is described in more detail in a separate section of this report.

Some sites in the monitoring network collect samples of particulate matter that are analyzed to determine the chemical makeup of the particles. These are termed “PM<sub>2.5</sub> Speciation Sites”. This data is used in helping to identify the primary sources of particles, and in assessing potential health effects.

At other locations samples are taken and analyzed for non-criteria pollutants that are classified as “air toxics”. These are pollutants that have known 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.

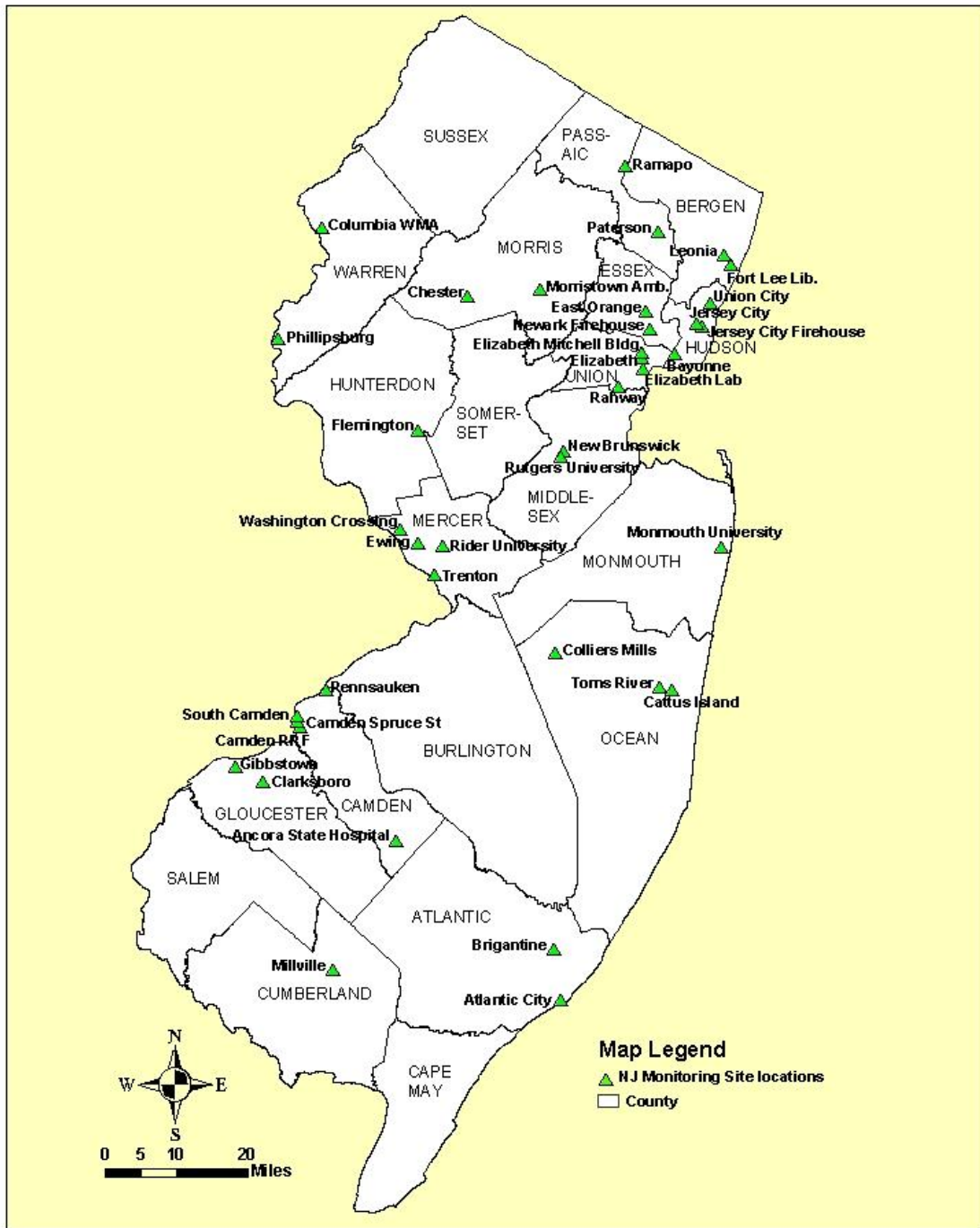
Other sites within the network take measurements of atmospheric deposition, visibility, mercury and weather parameters such as wind speed and direction. Some monitoring sites are suitable for measuring a wide variety of pollutants while others are suitable for only one or two. An example of a comprehensive air monitoring station is shown in Figure 1 which depicts the site at Exit 13 of the New Jersey Turnpike in Elizabeth. This site measures a wide variety of criteria and non-criteria pollutants as well as weather parameters. Figure 2 shows a monitoring site in Union City which has only a single particulate matter sampler.

The map in Figure 3 shows the location of all the sites that operated in 2012 and Table 1 shows which parameters were measured at each site.

Figure 2  
Photo of USEPA-approved PM<sub>2.5</sub> sampler on the roof of the Union City Health Department building in Hudson County



Figure 3  
 New Jersey Monitoring Sites 2012  
 Network Summary



**Table 1  
Monitoring Network Chart**

	CO	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	SO <sub>2</sub>	Smoke Shade	PM <sub>2.5</sub>	PM <sub>2.5</sub> -Speciation	Real-Time PM <sub>2.5</sub>	Visibility	PM <sub>10</sub>	O <sub>3</sub> Precursors - PAMS	VOCs	Carbonyls	Acid Deposition	Mercury	Barometric Pressure	Relative Humidity	Solar Radiation	Temperature	Wind Direction	Wind Speed
Ancora State Hospital				Y																		
Atlantic City							Y															
Bayonne		Y		Y	Y																	
Brigantine				Y	Y		Y		Y	Y					Y <sup>1</sup>	Y						
Camden RRF											Y											
Camden Spruce Street	Y	Y		Y	Y		Y															
Cattus Island															Y							
Chester		Y		Y	Y		Y	Y					Y	Y		Y				Y		
Clarksboro				Y																		
Colliers Mills				Y																		
Columbia WMA		Y		Y	Y		Y		Y								Y	Y		Y	Y	Y
East Orange	Y	Y															Y	Y		Y	Y	Y
Elizabeth	Y				Y	Y																
Elizabeth Lab	Y	Y			Y	Y	Y	Y	Y				Y	Y		Y					Y	Y
Elizabeth Mitchell Bldg							Y															
Ewing									Y													
Flemington				Y					Y								Y	Y	Y	Y	Y	Y
Fort Lee Library							Y															
Gibbstown							Y															
Jersey City	Y				Y	Y																
Jersey City Firehouse							Y		Y		Y											
Leonia				Y																		
Millville		Y		Y					Y													
Monmouth University				Y																		
Morristown Amb Squad							Y															
New Brunswick							Y	Y	Y				Y	Y		Y						
Newark Firehouse	Y	Y	Y	Y	Y		Y	Y	Y								Y	Y	Y	Y	Y	Y
Paterson							Y															
Pennsauken							Y															
Phillipsburg							Y															
Rahway							Y		Y													
Ramapo				Y																		
Rider University				Y													Y	Y	Y	Y	Y	Y
Rutgers University		Y		Y								Y					Y <sup>2</sup>	Y <sup>2</sup>	Y <sup>2</sup>	Y <sup>2</sup>	Y <sup>2</sup>	Y <sup>2</sup>
South Camden									Y													
Toms River							Y															
Trenton							Y															
Union City							Y															
Washington Crossing							Y								Y							
TOTAL	6	9	1	16	9	3	21	4	11	1	2	1	3	3	3	4	6	6	5	6	7	7

Y - Measuring Parameter Data in 2012

  Began measuring data in 2012. See Table 2 (page 5)

<sup>1</sup> The United States Fish and Wildlife Service is responsible for sample collection

  Temporary-shutdown from measuring data in 2012. See Table 2 (page 5)

<sup>2</sup> Meteorological measurements at the Site are collected by Rutgers University

## CHANGES TO THE NETWORK, 2012

On April 13, 2012, a new site was established at Spruce Street in the city of Camden, and monitoring began for CO, NO<sub>x</sub>, O<sub>3</sub>, and SO<sub>2</sub>. On April 21, 2012, a PM<sub>2.5</sub> sampler was added to the site. The previous site in Camden was shut down in 2008 due to site security issues, and the Spruce Street site is its replacement. On August 17, 2012, barometric pressure, wind speed, and wind direction were added to the meteorological parameters measured at the East Orange site. On October 29, 2012, the Bayonne site was damaged by severe flooding due to Hurricane Sandy. The NJDEP plans to have a new air monitoring shelter operating at the same site by the end of 2013. On December 4, 2012, an acid deposition sampler was installed at Cattus Island County Park in Toms River, New Jersey. The site is part of the National Atmospheric Deposition Program (NADP) network (<http://nadp.sws.uiuc.edu/>) and will be used to assess deposition to Barnegat Bay. On December 5, 2012, the Millville site was temporarily shutdown. The air monitoring site was in poor condition and will be replaced with a new shelter in 2013.

**Table 2**  
**2011-2012 Network Changes**

Monitoring Site	Parameter(s)	Action	Date
Bayonne	NO <sub>x</sub> , O <sub>3</sub> , SO <sub>2</sub>	Temporary-shutdown	10/29/12
Camden Spruce Street	CO, NO <sub>x</sub> , O <sub>3</sub> , SO <sub>2</sub>	Start-up	04/13/12
	PM <sub>2.5</sub>	Start-up	04/21/12
Cattus Island	Acid Deposition	Start-up	12/04/12
East Orange	WS,WD, Barometric Pressure	Start-up	08/17/12
Millville	NO <sub>x</sub> , O <sub>3</sub> , Real-Time PM <sub>2.5</sub>	Temporary-shutdown	12/05/12

## REFERENCES

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Watson, J. G., et. al., Guidance for Network Design and Optimum Site Exposure for PM<sub>2.5</sub> and PM<sub>10</sub>, EPA-454/R-99-022, Desert Research Institute, University and Community College System of Nevada, Reno, NV. Prepared for USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC, December 1997