Ozone National Ambient Air Quality Standard Health Exceedances on June 11, 2016

Exceedance Locations and Levels

On Saturday, June 11, 2016, there were 6 exceedances in New Jersey of the new 8-hour average ozone NAAQS of 70 ppb that became effective in December 2015 (See Table 1):

Table 1. Ozone NAAQS Exceedances in New Jersey on June 11, 2016

STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
Ancora State Hospital	86	Yes	Yes	Yes
Camden Spruce St	76	Yes	Yes	
Clarksboro	74	Yes		
Colliers Mills	73	Yes		
Monmouth University	73	Yes		
Rutgers University	72	Yes		

Two (2) stations exceeded the 75 ppb ozone NAAQS of 2008, and one (1) exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded on June 11, 2016 in New Jersey was 96 ppb at the Ancora station, which is below the 1-hour ozone NAAQS of 120 ppb.

Saturday marks the 7th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 11th of June in 2015, there were a total of three (3) days on which ozone exceedances were measured in New Jersey (based on the 75 ppb NAAQS of 2008), and there was one (1) day by this same date in 2014.

There is a group of monitoring stations in designated counties of five (5) states, New York, Connecticut, Pennsylvania, Delaware and Maryland, that are included in New Jersey's ozone nonattainment areas. From this group of stations in the other neighboring states, there were nine (9) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Saturday, June 11, 2016 (See Table 2):

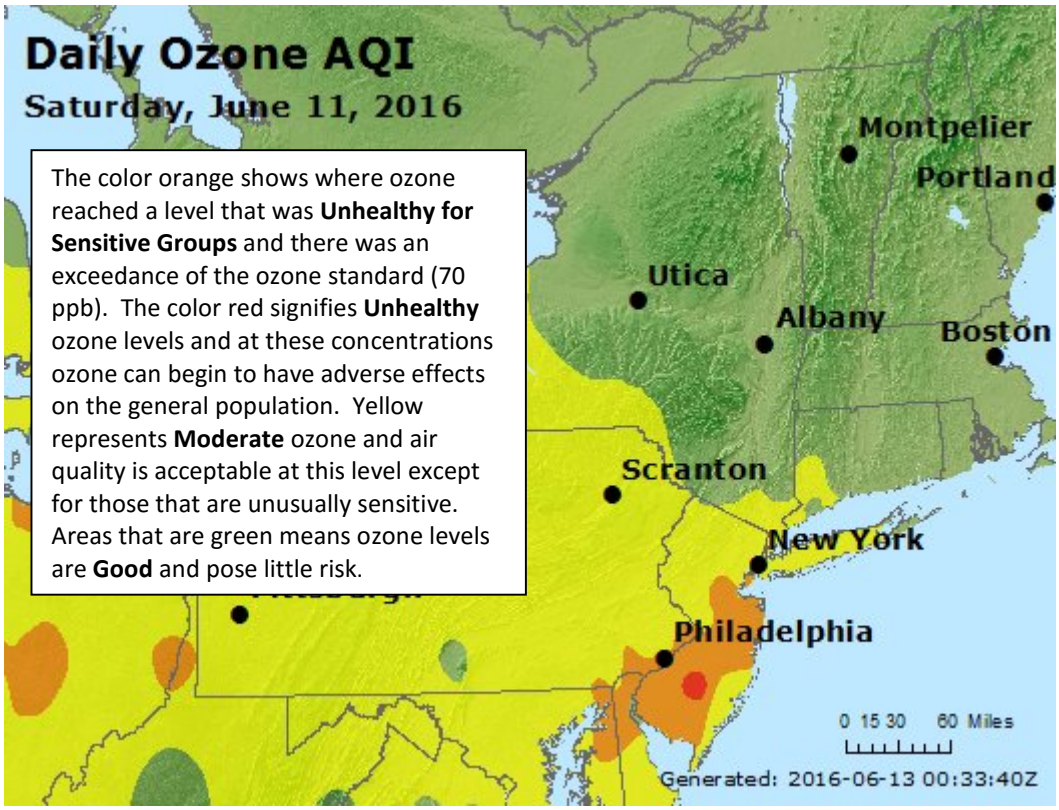
Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 11, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
DE	BCSP (New Castle Co.)	73	Yes		
DE	BELLFNT2 (New Castle Co.)	74	Yes		
DE	LUMS 2 (New Castle Co.)	72	Yes		
DE	MLK (New Castle Co.)	72	Yes		
MD	Fair Hill	71	Yes		
NY	Susan Wagner	71	Yes		
PA	BRIS (Bucks Co.)	75	Yes		
PA	NEA (Philadelphia Co.)	74	Yes		
PA	NEW (Philadelphia Co.)	71	Yes		

No station exceeded the 75 ppb ozone NAAQS of 2008, and none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 90 ppb at Bristol, PA, which is below the 1-hour ozone NAAQS of 120 ppb.

Saturday marks the 6th day in 2016 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in New York, the 4th day for Pennsylvania, and the 3rd day for Delaware and Maryland. The number of days on which exceedances were recorded in Connecticut remains at eight (8).

Figure 1. Ozone Air Quality Index for June 11, 2016



Source: www.airnow.gov

For ozone terminology definitions see NJDEP Air Quality Planning's Glossary and Acronyms webpage: http://nj.gov/dep/baqp/glossary.html

Weather

Meteorological data from across the region showed temperatures reached into the high 80°F's-low 90°F's, while winds were light and from the south/ southwest. A high pressure system was centered over the eastern Atlantic Seaboard leading to mostly sunny conditions across the region. A low pressure surface trough was also in place along the I-95 corridor from North Carolina all the way up through New Jersey, which creates conditions that allow polluted air aloft to mix down to the surface. This feature in combination with abundant sunlight, warm temperatures and light south/southwesterly winds, are all features commonly seen with an ozone exceedance.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories at different wind heights for selected monitored exceedances on June 11, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Twelve (12) monitoring stations with the highest 8-hr ozone readings from each state were chosen to run back trajectories. The selected sites and the maximum 8-hr ozone levels recorded are listed in Table 3 below.

Table 3. Monitoring Stations with 8-hr Ozone Exceedances that Were Selected to Run 48-hr Back Trajectories

Agency	Site Name	Maximum 8-hr Ozone Conc. (ppb)
DE	BCSP (New Castle Co.)	73
DE	BELLFNT2 (New Castle Co.)	74
MD	Fair Hill	71
NJ	Ancora	86
NJ	Camden Spruce St	76
NJ	Clarksboro	74
NJ	Colliers Mills	73
NJ	Monmouth	73
NJ	Rutgers University	72
NY	Susan Wagner	71
PA	BRIS (Bucks Co.)	75
PA	NEA (Philadelphia Co.)	74

The back trajectory map (Figure 2) for the low level winds (10 meter) illustrate that winds traveled through Pennsylvania to the Baltimore and Washington DC metropolitan area before turning northward and traveling up the I-95 corridor to monitors located in New Jersey. The back trajectory map (Figure 3) for the mid-level winds (500 meter) illustrate that most winds originated in Illinois and traveled through the Ohio River Valley and along southern Pennsylvania, while other trajectories followed a path similar to the low level winds. In all cases the winds brought in dirty air from a region that had ozone exceedances the day before and combined with local emissions from cars, trucks, and industry. The 1500 meter winds (Figure 4) originated in the lower Mississippi River Valley traveling through the Ohio valley and Pennsylvania bringing additional pollution from power plants from a region that had high ozone levels to start with. Figure 5 illustrates the ozone exceedances recorded in the Midwest and Mississippi Valley on June 10, 2016, the day before the high ozone event in our area.

The long range transport from the Midwest, Ohio Valley, and Pennsylvania mixed with local pollution created from cars, trucks, and industry along the I-95 corridor to cause the regional ozone exceedance event that occurred on June 11, 2016.

Figure 2. 48-hour Back Trajectories for June 11, 2016 at 10 meters

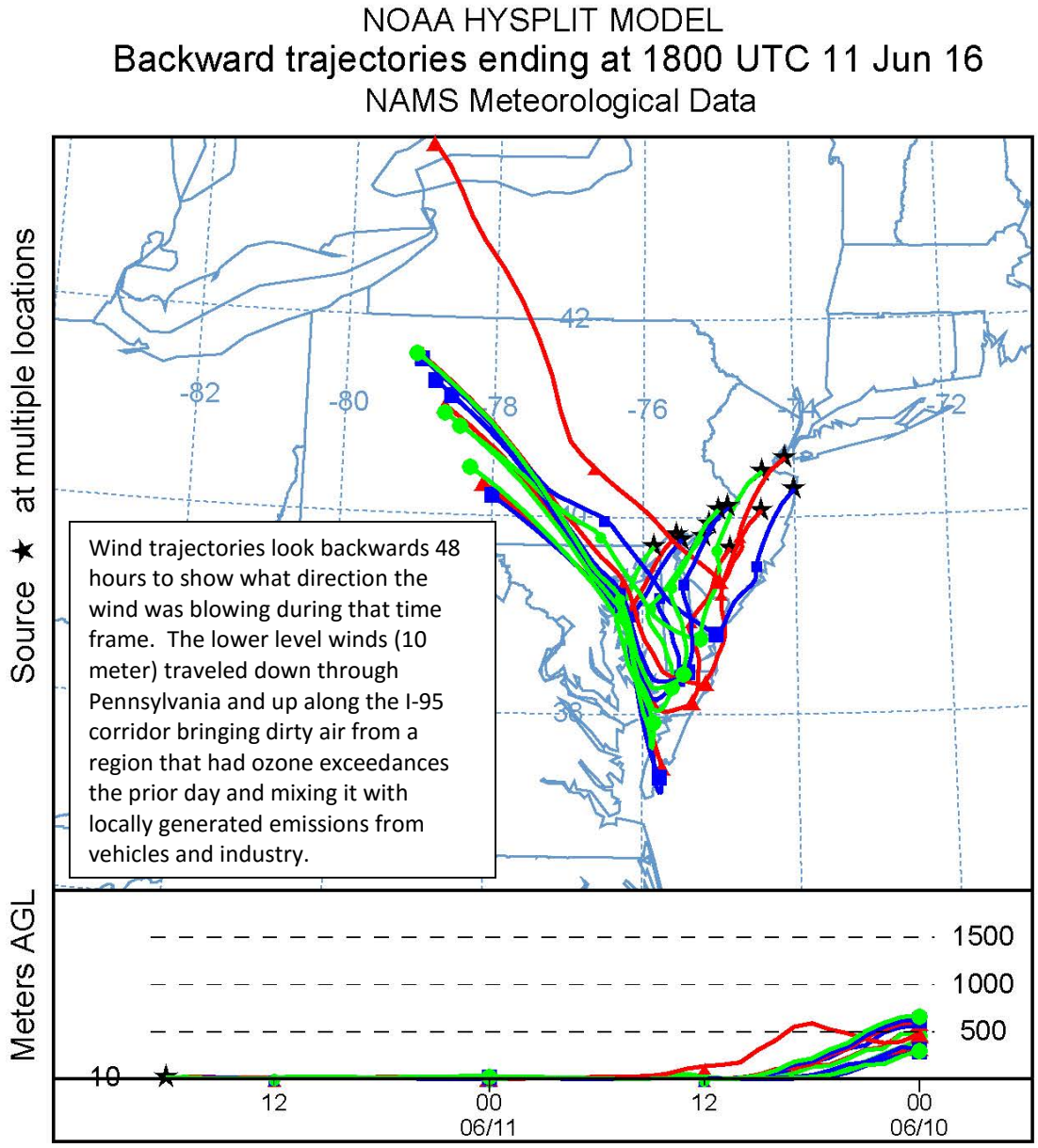


Figure 3. 48-hour Back Trajectories for June 11, 2016 at 500 meters

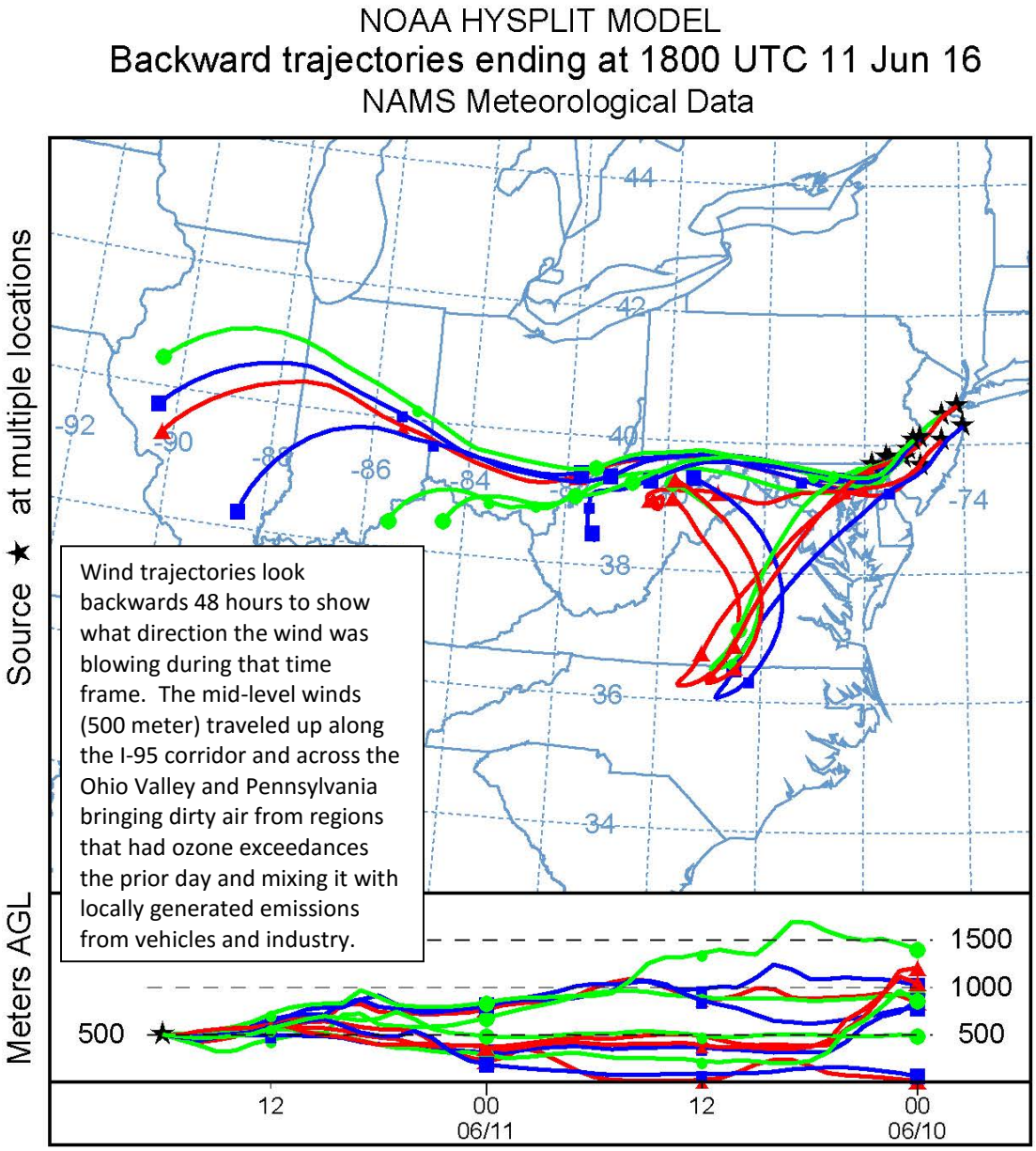


Figure 4. 48-hour Back Trajectories for June 11, 2016 at 1500 meters

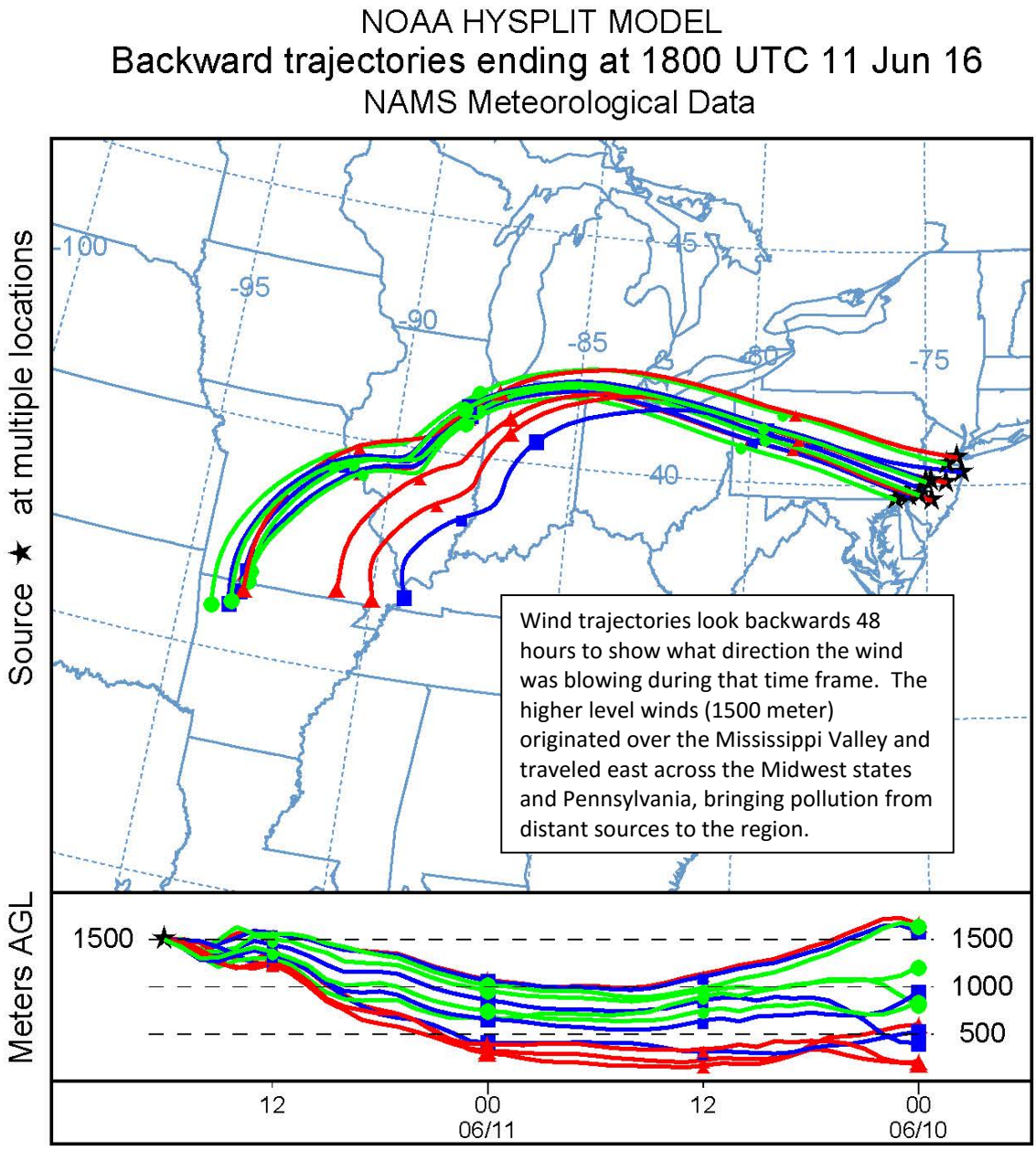
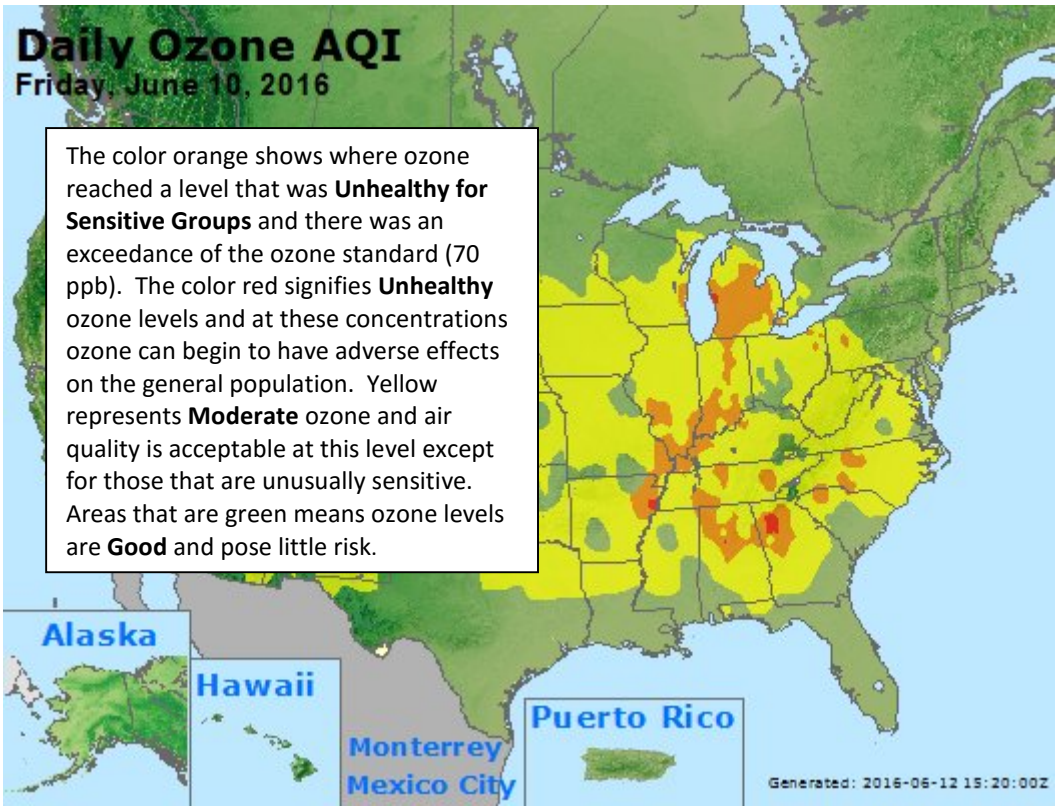


Figure 5. Ozone Air Quality Index for the Mid-Atlantic and Northeast Regions on June 10, 2016



How is Smog Created?

Ground-level ozone, also known as smog, is an air pollutant known to cause a number of health effects and negatively impact air quality and the environment in the state of New Jersey. Smog is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Smog can irritate any set of lungs, but those with lung-related deficiencies should take extra precautions on bad ozone days.

Find Out About Air Quality Every Day

The "What's Your Air Quality Today?" page at http://www.nj.gov/dep/cleanairnj/ tells you how to sign up to receive notifications and find out when your local air has reached unhealthy ozone levels.