Ozone National Ambient Air Quality Standard Health Exceedances on June 1, 2016

Exceedance Locations and Levels

On Wednesday, June 1, 2016, there were six (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 1, 2016

STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
Ancora State Hospital	77	Yes	Yes	
Chester	72	Yes		
Columbia	72	Yes		
Flemington	74	Yes		
Ramapo	72	Yes		
Washington Crossing*	71	Yes		

*The Washington Crossing station is operated and maintained by EPA as part of the nationwide Clear Air Status and Trends Network (CASTNET)

One (1) station also exceeded the 75 ppb ozone NAAQS of 2008, but none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded on June 1, 2016 in New Jersey was 85 ppb at the Columbia, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 6th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 1st of June in 2015, there were a total of 2 days on which ozone exceedances were measured in New Jersey (based on the 75 ppb NAAQS of 2008), and there was one 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 was one (1) exceedance of the new 8-hour ozone NAAQS of 70 ppb recorded on Wednesday, June 1, 2016 (See Table 2):

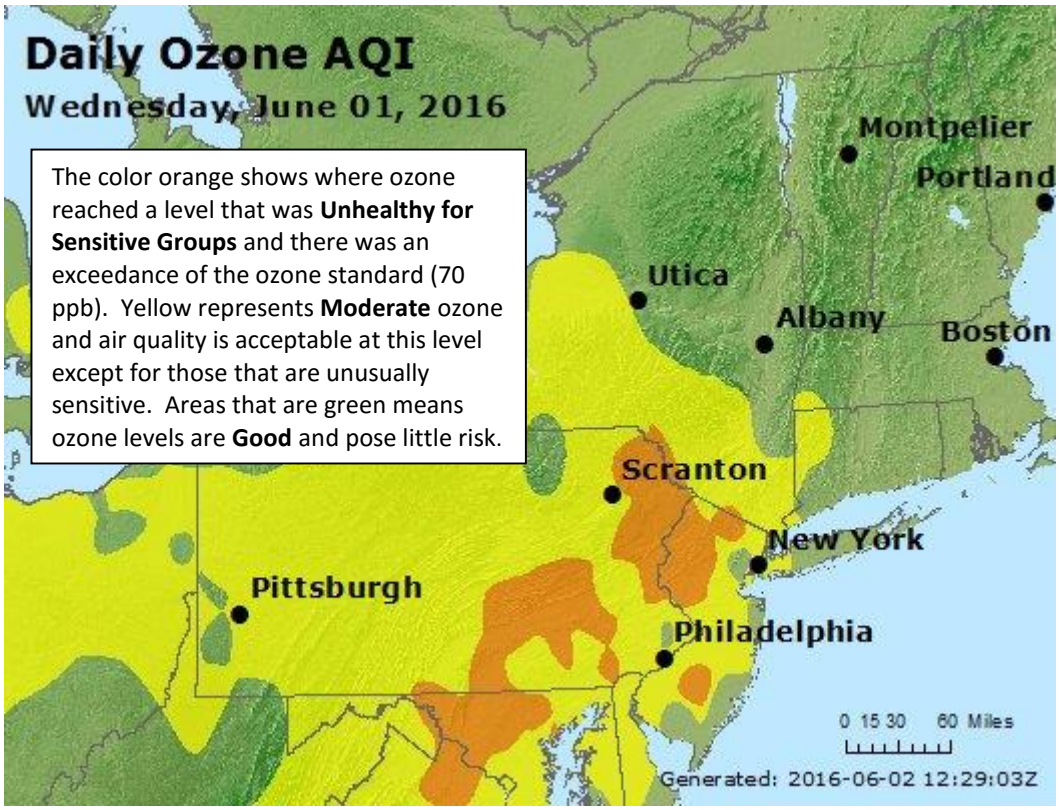
Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 1, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
PA	NEWG (Chester Co.)	71	Yes		

No stations 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 85 ppb at Chester (Delaware County), PA, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 3rd day in 2016 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in Pennsylvania. The number of days on which exceedances were recorded in Connecticut remains at seven (7), with four (4) days for New York, and two (2) days each for Delaware and Maryland.

Figure 1. Ozone Air Quality Index for June 1, 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 while winds were light and from the southeast. A high pressure system was centered over eastern Canada. The remnants of tropical storm Bonnie was located off the coast of North Carolina. Between these two systems, a cold front stalled over northern New Jersey leading to mostly sunny conditions and light recirculating winds across the region. The stationary front set up along central New Jersey and provided a mechanism for polluted air aloft to mix down to the surface. This feature, in combination with sufficient sunlight and warm temperatures, are all meteorological conditions commonly seen with ozone exceedances.

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 1, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Five (5) monitoring stations with 8-hour ozone exceedances were

chosen to run back trajectories. The selected sites and the maximum 8-hour 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)
NJ	Ancora Hospital	77
NJ	Chester	72
NJ	Columbia	72
NJ	Flemington	74
NJ	Ramapo	72

The back trajectory maps (Figures 2 and 3) for the low level (10 meter) and mid-level (500 meter) winds illustrate similar transport pathways to the exceedance monitors in northern New Jersey. Winds traveling to monitors located in northern New Jersey originated in the Great Lakes, traveled through New York State, and recirculated over the New York City and Northern New Jersey metropolitan areas. In addition, the trajectories show that air aloft was brought to the surface in the vicinity of the stationary frontal system. The winds brought background pollution from the Great Lakes Region and combined with local emissions from cars, trucks, and industry. The Ancora Hospital monitor was located to the south of the frontal system. The back trajectories for this monitor show general recirculation at the lower levels with winds traveling from the I-95 corridor at the 500-meter level. The 1500 meter winds (Figure 4) also came from the Great Lakes Region traveling through Pennsylvania and New York, recirculated in the vicinity of the stationary front, and continued to New Jersey, bringing additional pollution from power plants. Figure 5 illustrates the ozone exceedances recorded in Pennsylvania on May 31, 2016, the day before the high ozone event in our area.

The long range transport from the Great Lakes Region, mixed with local pollution created from cars, trucks, and industry along the I-95 corridor and the New York City metropolitan area to cause the regional ozone exceedance event that occurred on June 1, 2016.

Figure 2. 48-hour Back Trajectories for June 1, 2016 at 10 meters

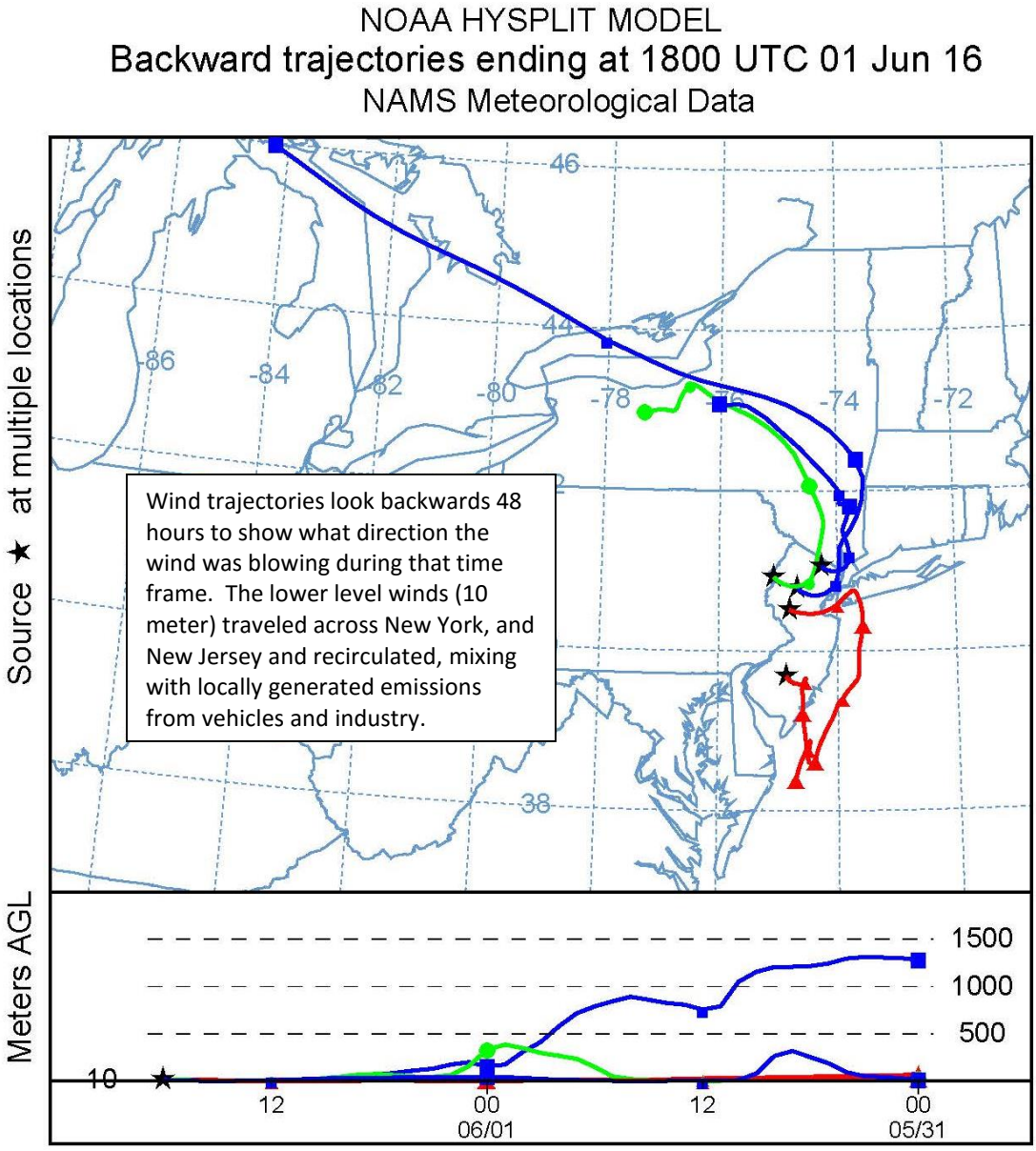


Figure 3. 48-hour Back Trajectories for June 1, 2016 at 500 meters

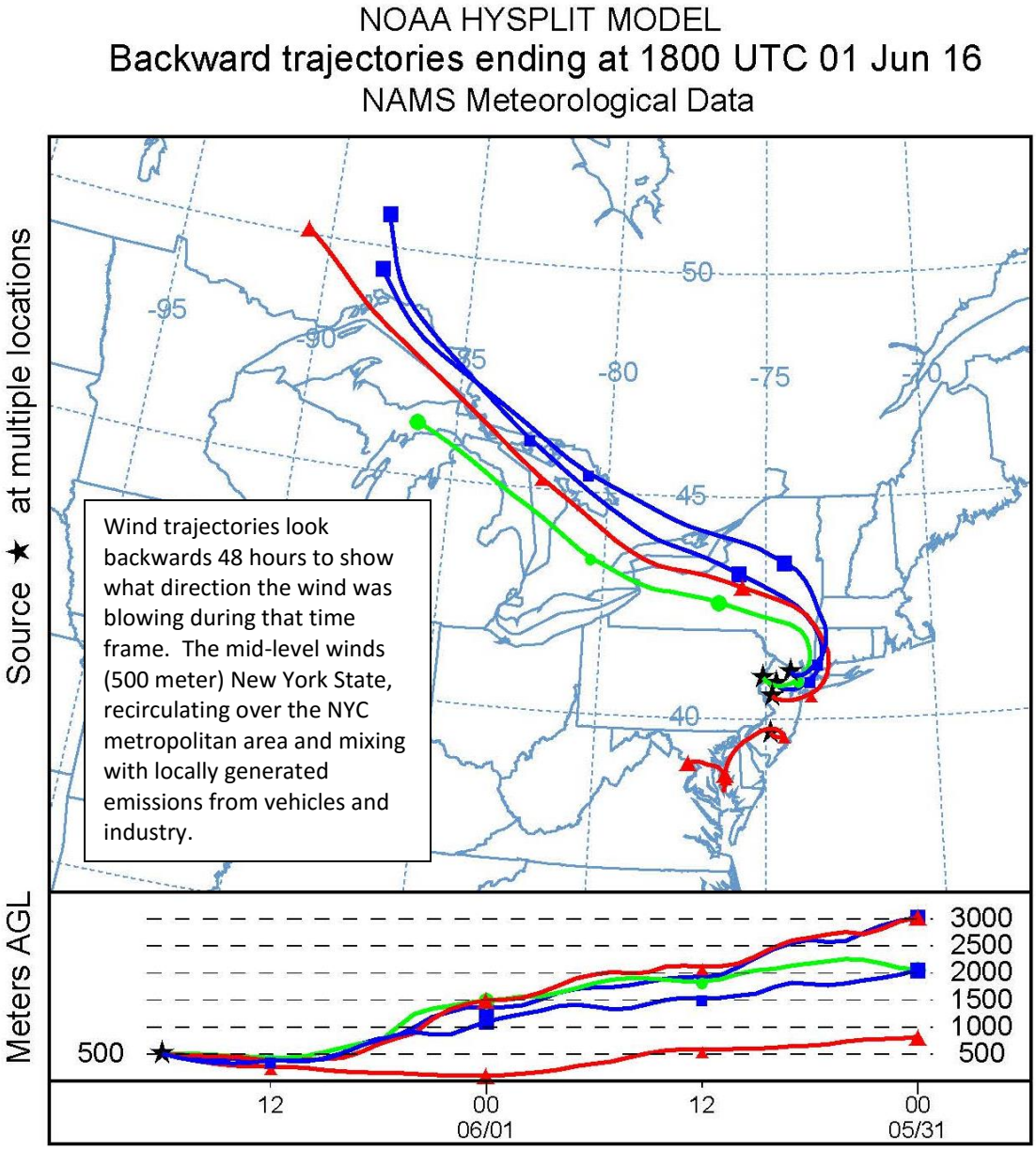


Figure 4. 48-hour Back Trajectories for June 1, 2016 at 1500 meters

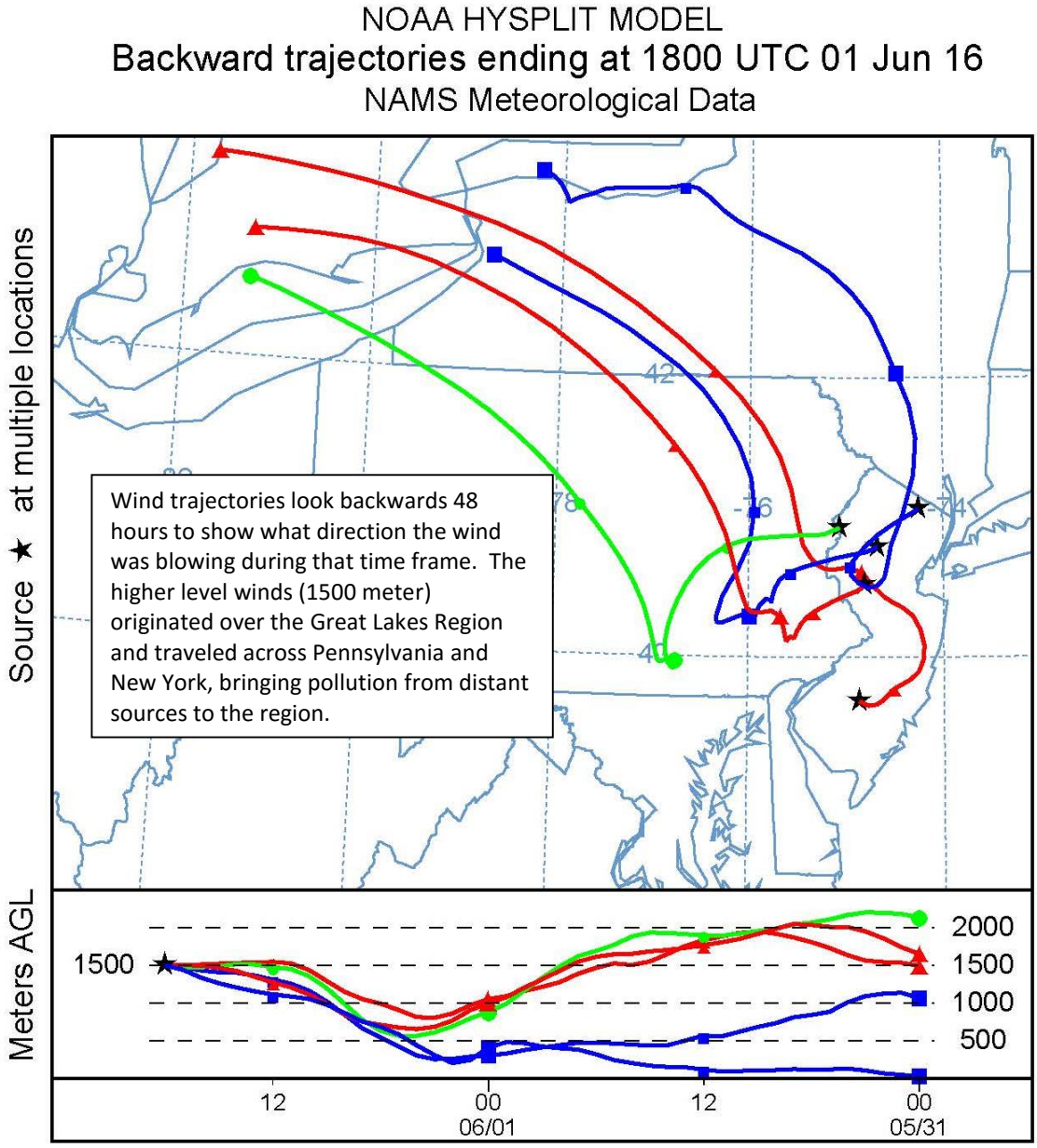
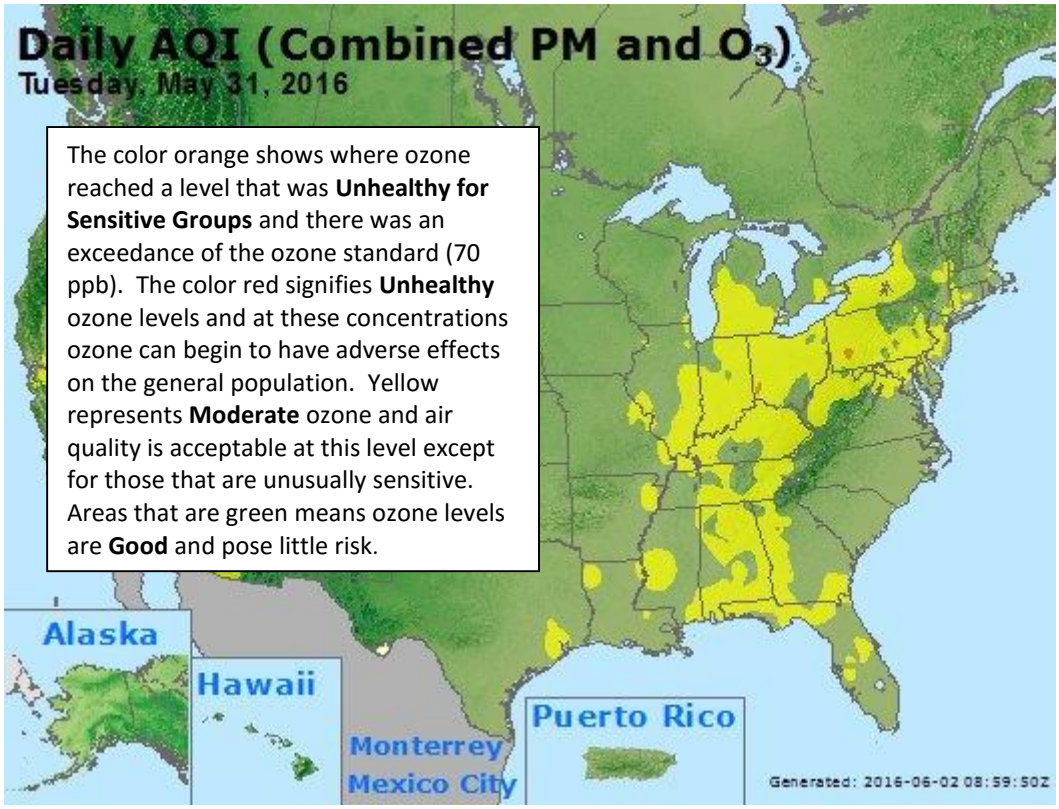


Figure 5. Ozone Air Quality Index for the Mid-Atlantic and Northeast Regions on May 31, 2016



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.