Ozone National Ambient Air Quality Standard Health Exceedances on June 20, 2016

Exceedance Locations and Levels

On Monday, June 20, 2016, there were five (5) 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 20, 2016

STATION	Daily Maximum 8-Hr Average (ppb)
Camden Spruce St	75
Flemington	73
Ramapo	79
Rutgers University	74
Washington Crossing*	72

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

The highest 1-hour average ozone concentration recorded on June 20, 2016 in New Jersey was 103 ppb at the Ramapo station, which is below the 1-hour ozone NAAQS of 120 ppb.

Monday marks the 10th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 20th of June in 2015, there were a total of five (5) days on which ozone exceedances were measured in New Jersey (based on the former 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 ten (10) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Monday, June 20, 2016 (See Table 2):

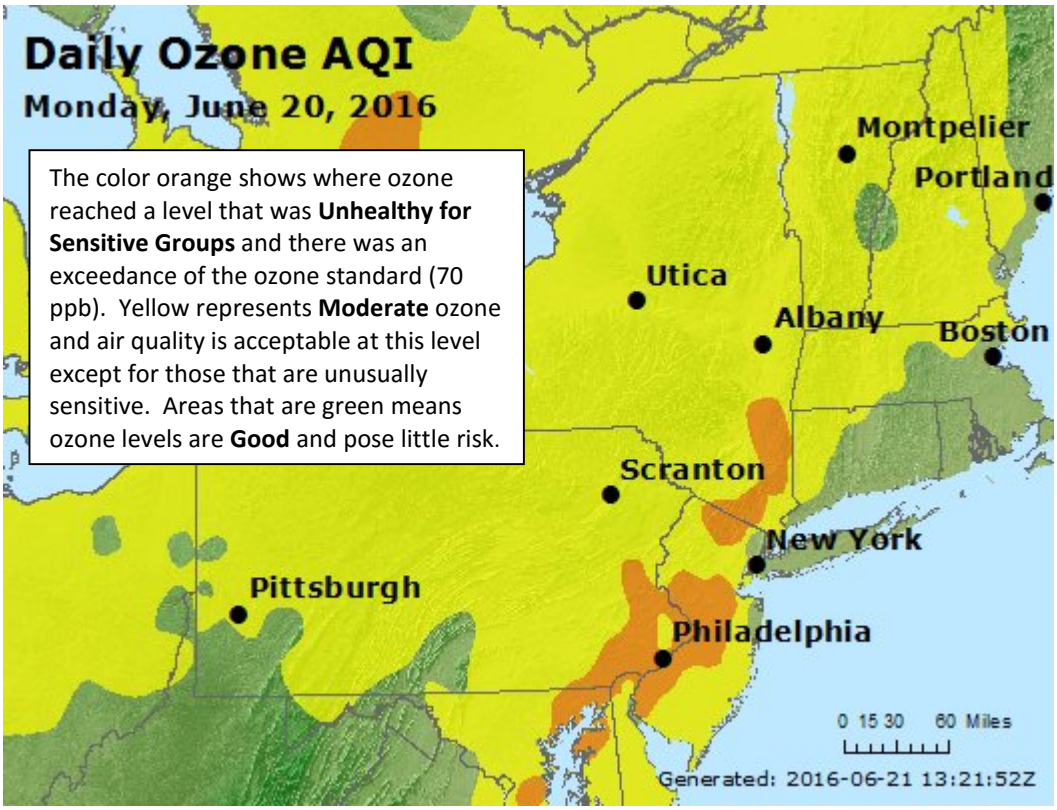
Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 20, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
DE	BCSP (New Castle Co.)	73
DE	BELLFNT2 (New Castle Co.)	72
MD	Fair Hill	80
NY	Rockland Cty	76
PA	BRIS (Bucks Co.)	74
PA	CHES (Delaware Co.)	71
PA	NEWG (Chester Co.)	75
PA	NORR (Montgomery Co.)	73
PA	NEA (Philadelphia Co.)	73
PA	NEW (Philadelphia Co.)	71

The highest 1-hour average ozone concentration recorded was 92 ppb at the Fair Hill station in Maryland, which is below the 1-hour ozone NAAQS of 120 ppb.

Monday marks the 8th day in 2016 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in New York, the 6th day for Pennsylvania, and the 4th day for Delaware and Maryland. The number of days for Connecticut remains at nine (9).

Figure 1. Ozone Air Quality Index for June 20, 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. Winds were calm in the morning hours and then shifted to a light west/southwest flow in the afternoon. A high pressure system was centered over the Smoky Mountains 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 eastern Pennsylvania and 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 west/southwesterly winds, are all meteorological conditions 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 20, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Eleven (11) 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
MD	Fair Hill	80
NJ	Camden Spruce St	75
NJ	Flemington	73
NJ	Ramapo	79
NJ	Rutgers University	74
NJ	Washington Crossing	72
NY	Rockland County	76
PA	BRIS (Bucks Co.)	74
PA	NEWG (Chester Co.)	75
PA	NORR (Montgomery Co.)	73

The back trajectory maps for the low level (Figure 2) and mid-level (Figure 3) winds illustrate similar transport pathways. Winds traveling to the Mid-Atlantic States and southern New Jersey came up the I-95 corridor and through eastern Pennsylvania, where they picked up emissions from cars, trucks and industry. Winds traveling to the exceedance sites in northern New Jersey and New York originated off the coast and passed through sections of northern New Jersey and New York, before developing a light recirculating flow around the exceedance monitor locations. The recirculation of air contaminant emissions picked up along the I-95 corridor and New York City metropolitan area allowed pollution to accumulate at the northern ozone monitors.

The 1500 meter winds (Figure 4) originated in New York and Pennsylvania, traveled south/southeast through New Jersey and the Philadelphia metropolitan area, and then recirculated over the I-95 corridor before heading back to the exceedance monitors. The winds picked up emission from motor vehicles, industry, and power plants and transported that pollution to the exceedance monitors in the Mid-Atlantic and Northeast regions.

The back trajectories indicate winds traveling up along the I-95 corridor and through the major metropolitan areas of Washington D.C., Baltimore, Philadelphia, and New York City, brought polluted air from a variety of mobile and stationary sources that later mixed with local emissions from cars, trucks, and industry around the exceedance monitor locations to cause the regional ozone exceedance event that occurred on June 20, 2016.

Figure 2. 48-hour Back Trajectories for June 20, 2016 at 10 meters

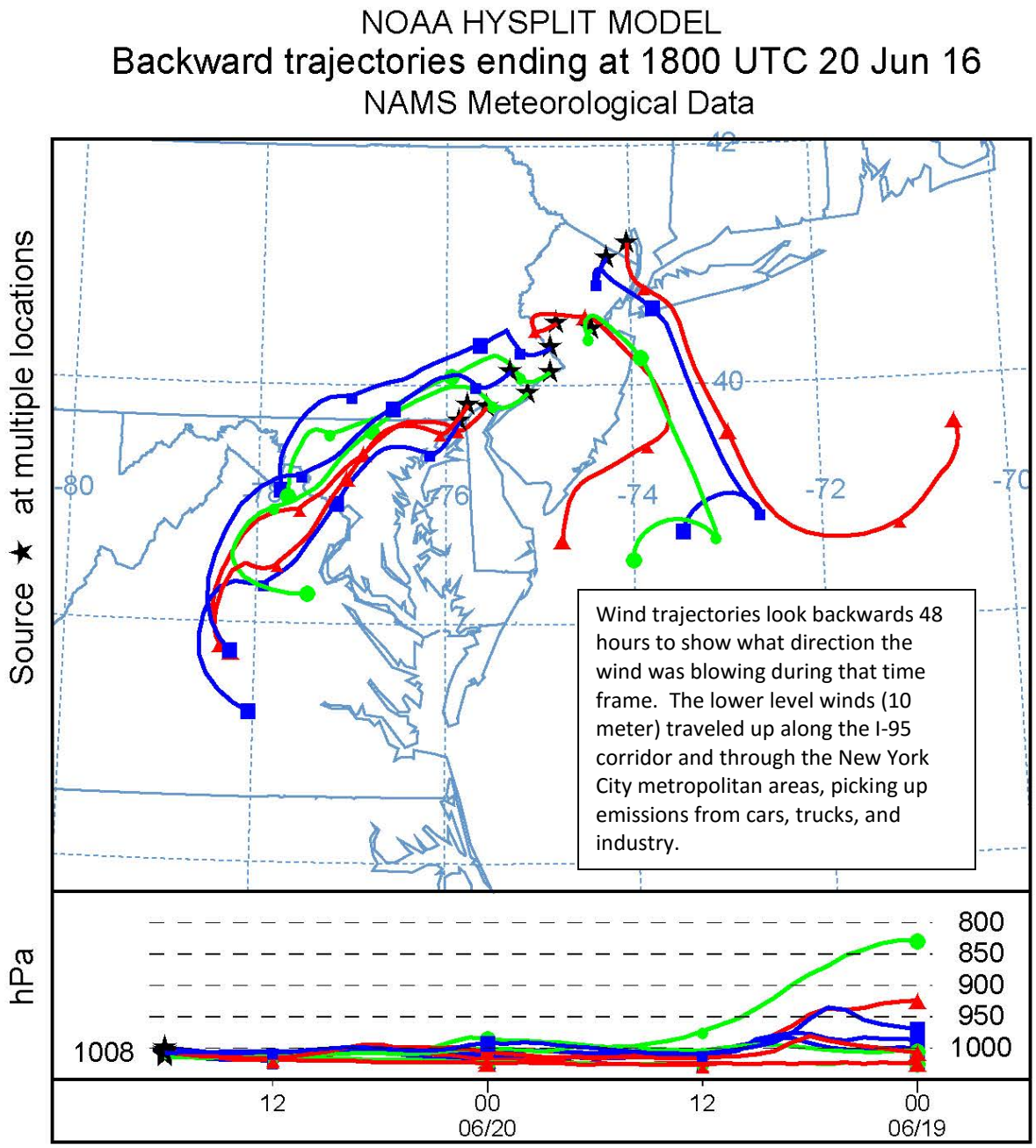


Figure 3. 48-hour Back Trajectories for June 20, 2016 at 500 meters

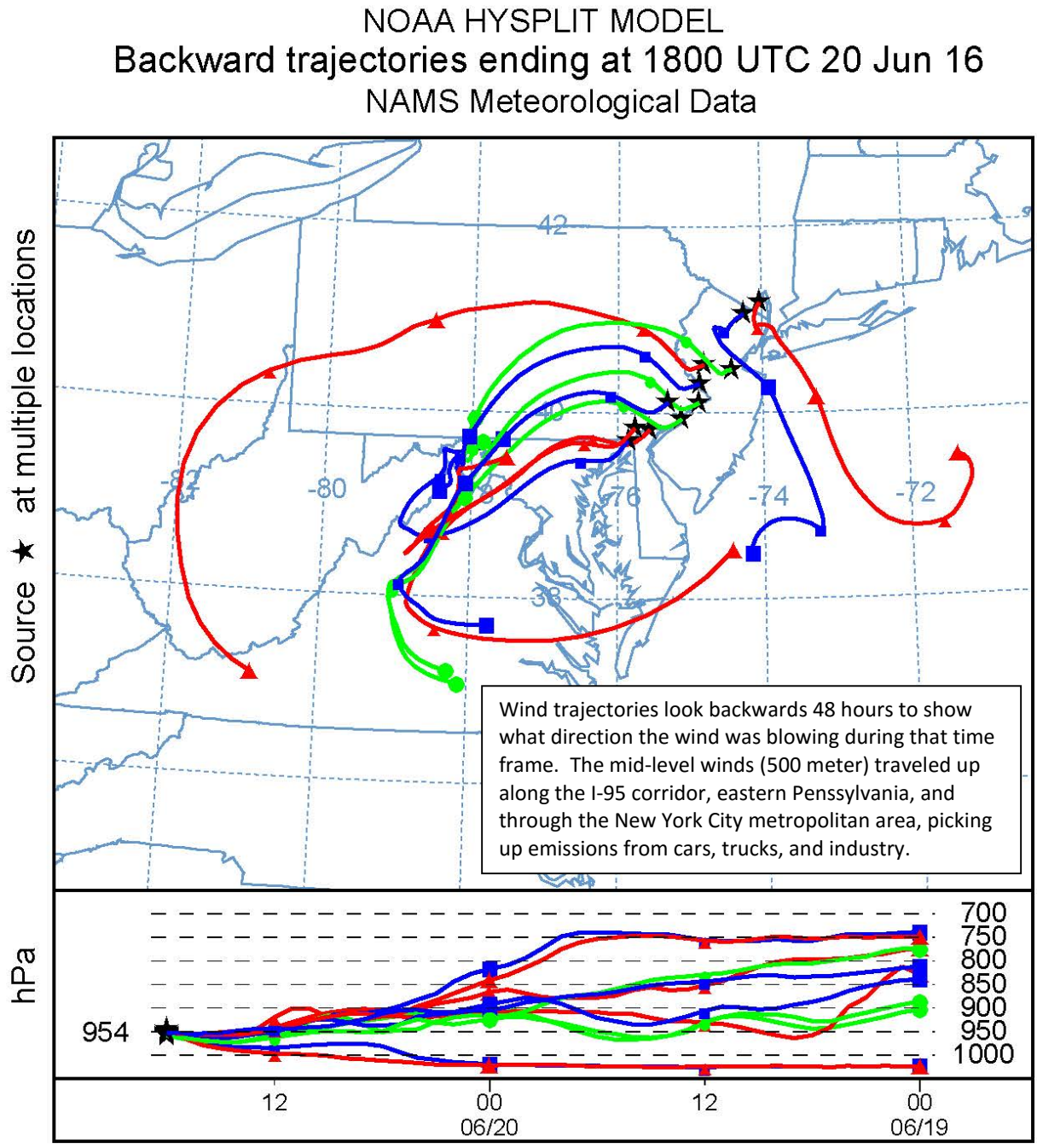
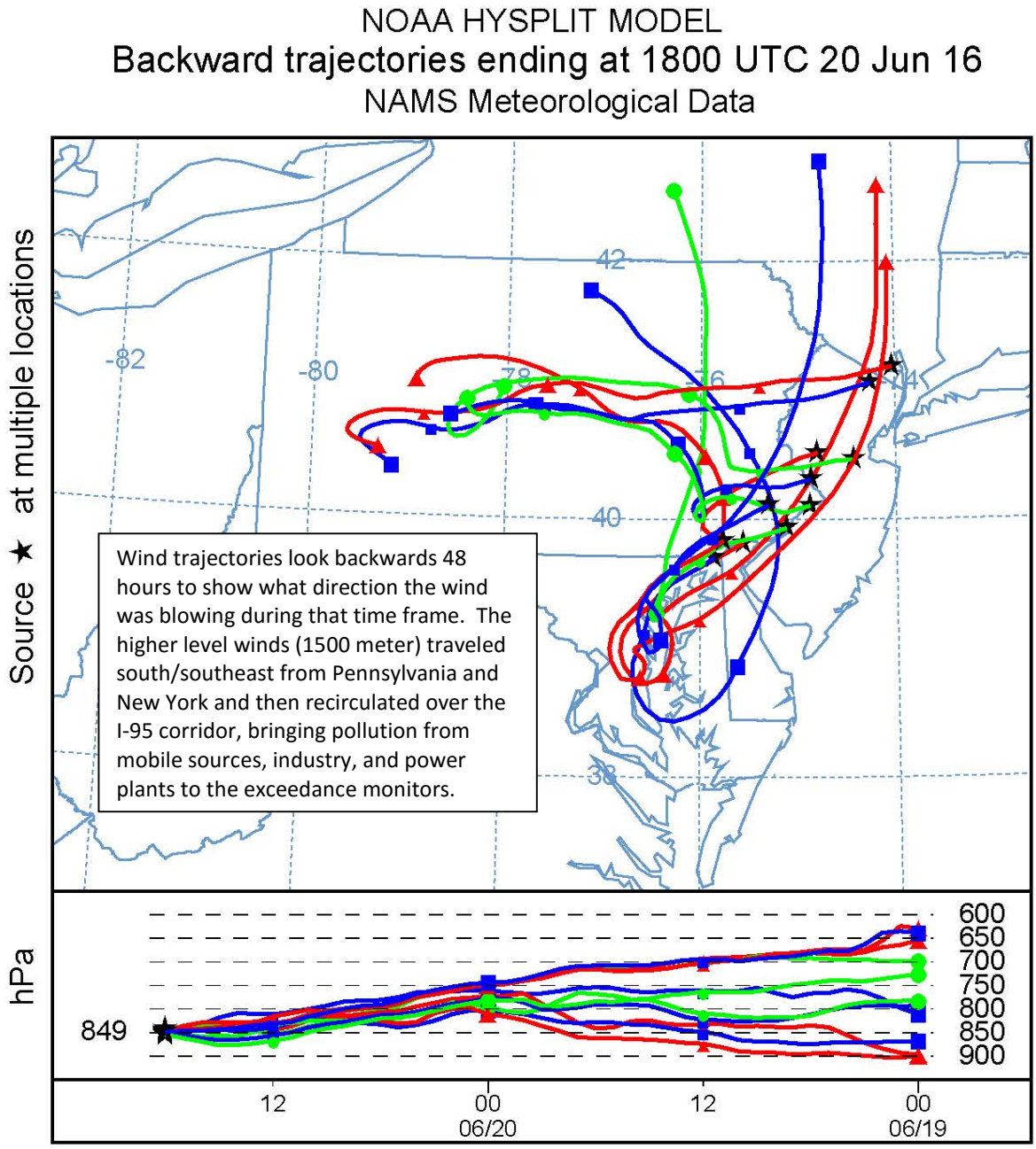


Figure 4. 48-hour Back Trajectories for June 20, 2016 at 1500 meters



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.