Ozone National Ambient Air Quality Standard Health Exceedances on September 14, 2016

Exceedance Locations and Levels

On Wednesday, September 14, 2016, there was one (1) exceedance in New Jersey of the new 8-hour average ozone NAAQS of 70 ppb that became effective in December 2015: Colliers Mills station with a concentration of 71 ppb.

The highest 1-hour average ozone concentration recorded on September 14, 2016, in New Jersey was 83 ppb, also at Colliers Mills, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 24th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 14th of September in 2015, there were a total of seventeen (17) days on which ozone exceedances were measured in New Jersey (based on the former 75 ppb NAAQS of 2008), and there were two (2) days 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 neighboring states, there were eight (8) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Wednesday, September 14, 2016 (see Table 1):

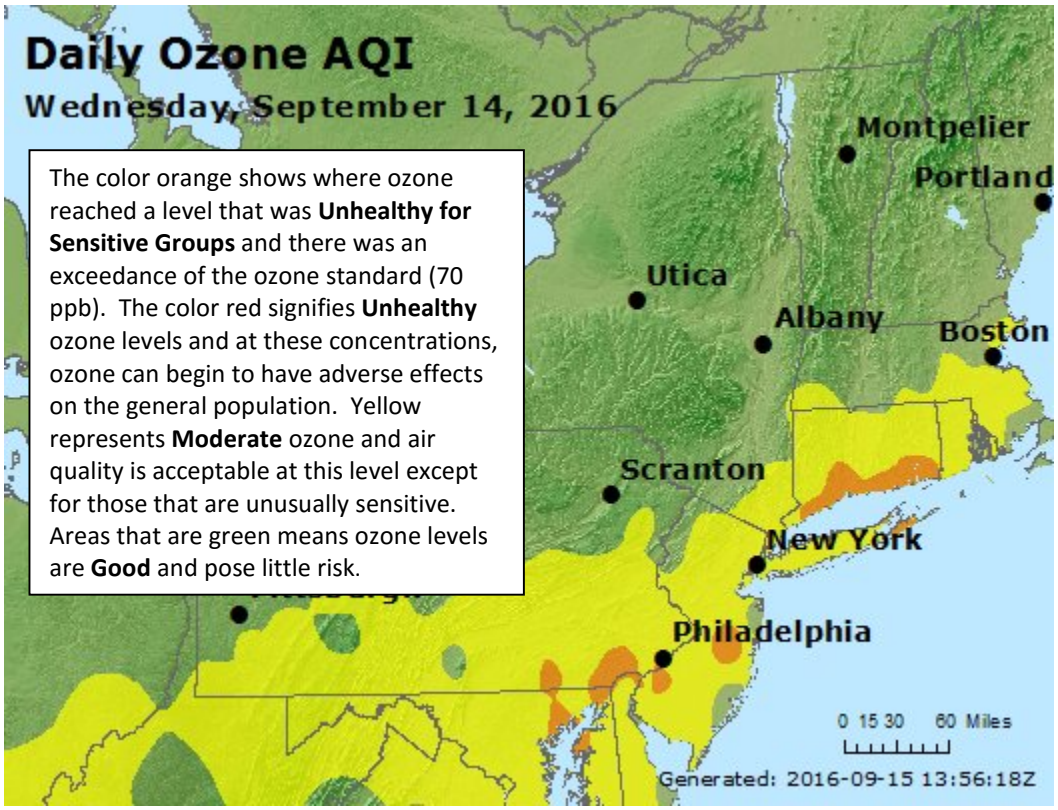
Table 1: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on September 14, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Madison-Beach Road	80
CT	New Haven	75
CT	Stratford	73
CT	Westport	73
DE	BCSP (New Castle Co.)	73
DE	BELLFNT2 (New Castle Co.)	71
MD	Fair Hill	72
PA	NEWG (Chester Co.)	71

The highest 1-hour average ozone concentration recorded was 107 ppb at the Westport station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 26th day in 2016 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in Connecticut, the 12th day for Pennsylvania, the 9th day for Delaware, and the 7th day for Maryland. The number of days remains at eighteen (18) for New York.

Figure 1. Ozone Air Quality Index for September 14, 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 low 90°F's, while winds were from the west/southwest with a cold front approaching the area and a high pressure system off the southeast Atlantic coast. The front passed through the region late, resulting in mostly sunny skies during the day. A low pressure surface trough was also in place along the I-95 corridor from Virginia to Connecticut, providing a mechanism for polluted air aloft to mix down to the surface. This weather feature, in combination with southwest winds, warm temperatures, and abundant sunlight, are all meteorological conditions commonly seen on high ozone days.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories at different wind heights for the monitored exceedances on September 14, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Six (6) monitoring stations were chosen to run back trajectories, based on the 8-hour ozone concentrations recorded and their location. The selected sites for running back trajectories and the maximum 8-hr ozone levels recorded are listed in Table 2 below.

Table 2. 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)
CT	Madison Beach Rd.	80
CT	New Haven	75
DE	BCSP (New Castle Co.)	73
MD	Fair Hill	72
NJ	Colliers Mills	71
PA	NEWG (Chester Co.)	71

The low level wind (Figure 2) originated offshore and then shifted northeast up the I-95 corridor, picking up air contaminant emissions from cars, trucks, and industry. The mid-level wind (Figure 3) originated over portions of the Ohio River Valley and Virginia and then traveled northeast across Pennsylvania, New Jersey, and New York, transporting emissions from motor vehicles and industry to the exceedance monitors.

The higher level wind (Figure 4) traveled across the Great Lakes and Ohio Valley regions, bringing emissions from large industrial sources and power plants to the exceedance monitors. The higher level wind, in combination with the low and mid-level winds, allowed air pollution from a variety of mobile and stationary sources to be transported into the areas of New Jersey, Delaware, Maryland, Pennsylvania, and Connecticut that experienced high ozone on September 14, 2016.

Figure 2. 48-hour Back Trajectories for September 14, 2016 at 10 meters

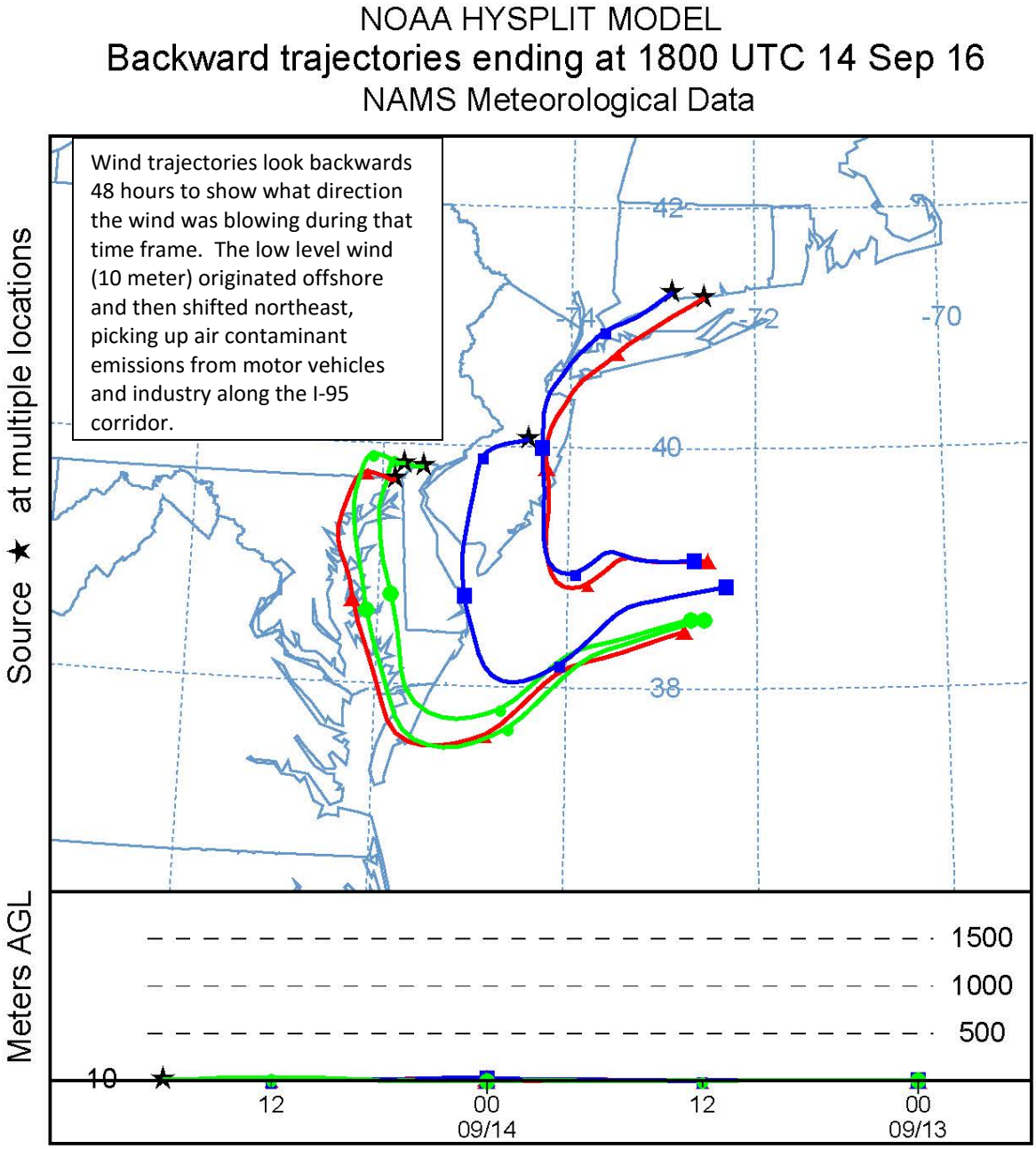


Figure 3. 48-hour Back Trajectories for September 14, 2016 at 500 meters

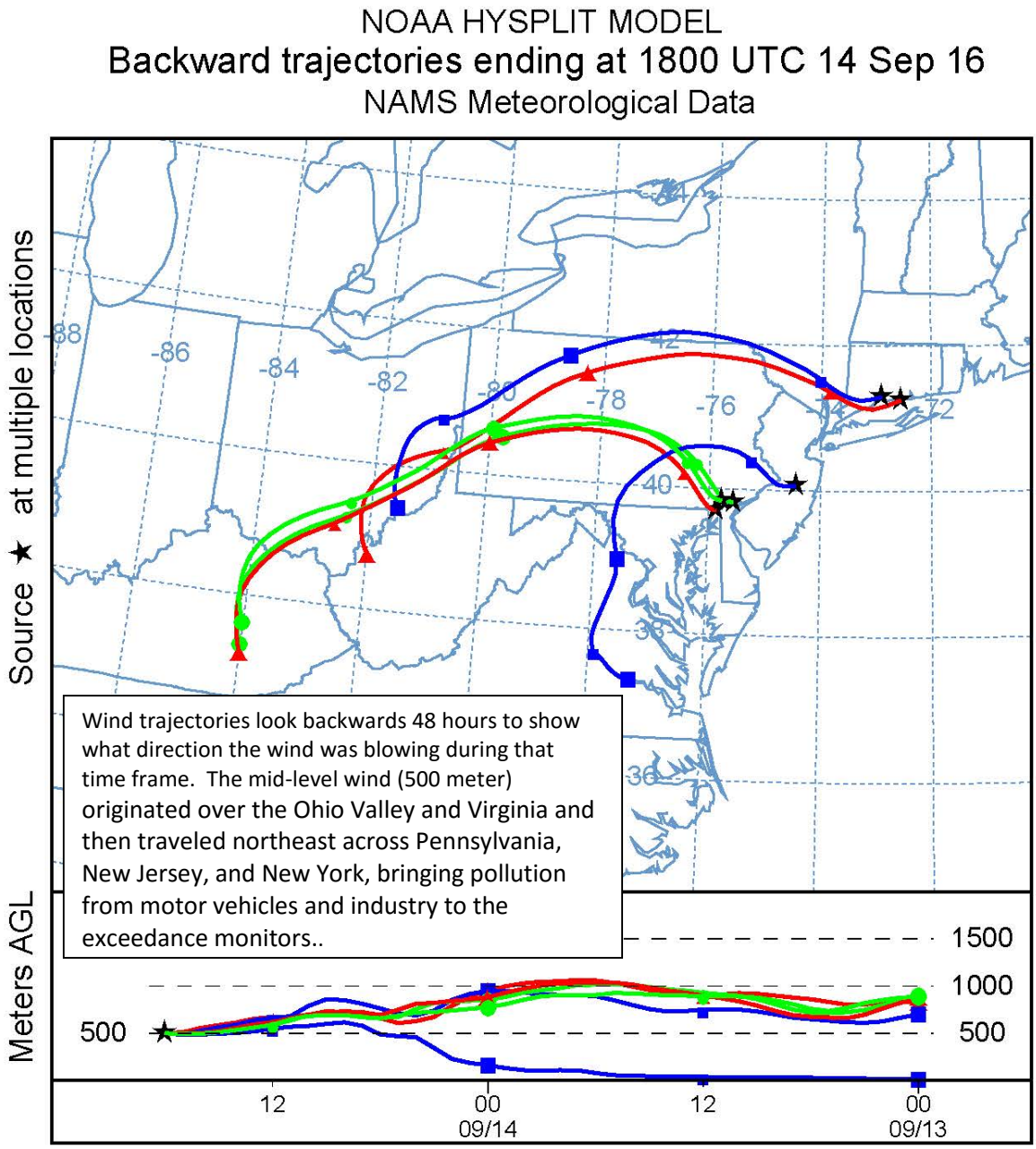
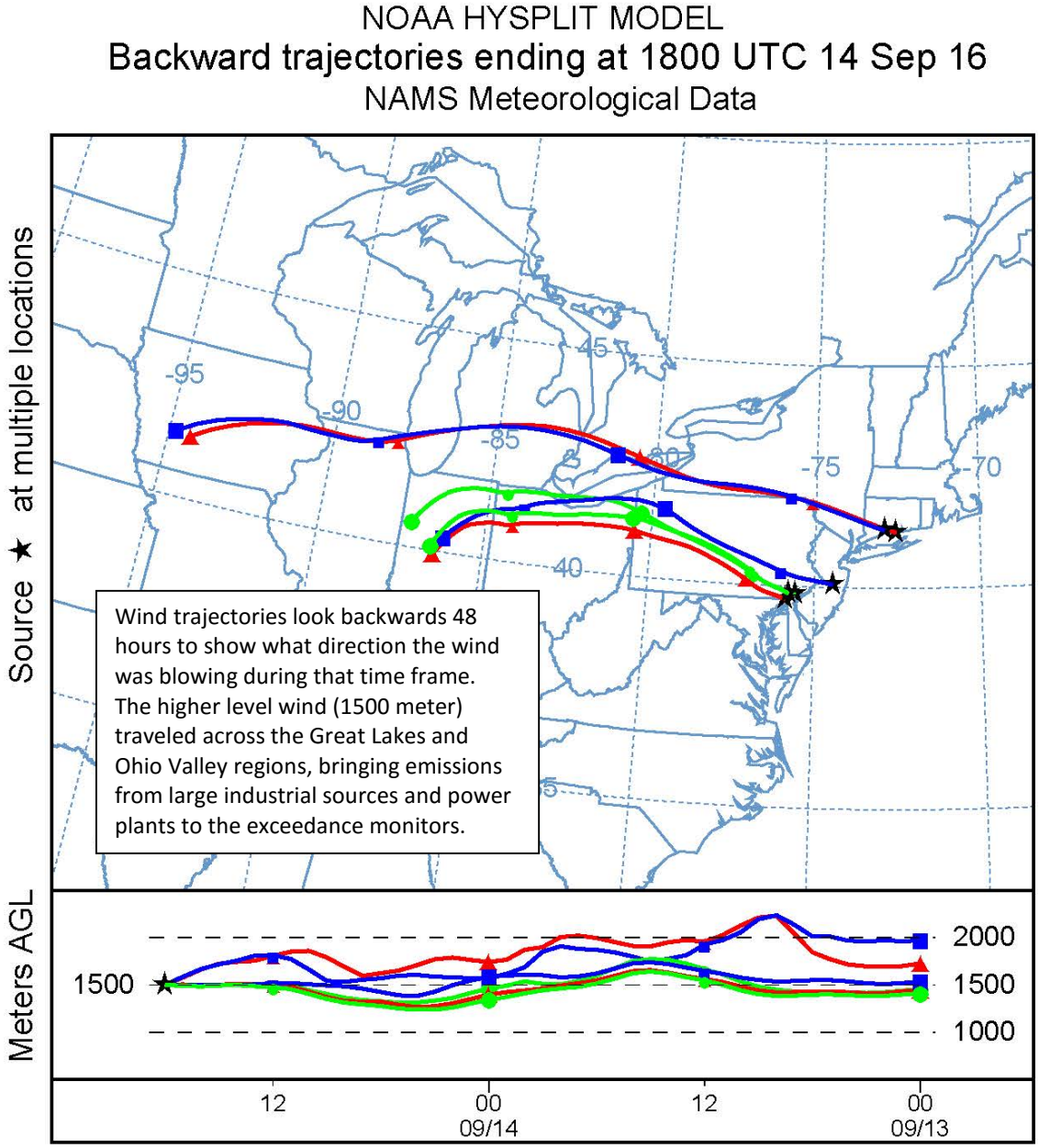


Figure 4. 48-hour Back Trajectories for September 14, 2016 at 1500 meters



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.