Ozone National Ambient Air Quality Standard Health Exceedances on May 18, 2017

Exceedance Locations and Levels

On Thursday, May 18, 2017, there were seven (7) exceedances in New Jersey of the 8-hour average ozone National Ambient Air Quality Standard (NAAQS) of 70 ppb that became effective in December 2015 (See Table 1):

Table 1. Ozone NAAQS Exceedances in New Jersey on May 18, 2017

STATION	Daily Maximum 8-Hr Average (ppb)
Camden Spruce St	83
Clarksboro	76
Flemington	72
Leonia	74
Rider University	80
Rutgers University	75
Washington Crossing*	71

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

Three (3) New Jersey stations 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 May 18, 2017, in New Jersey was 93 ppb at the Rider University station, which is below the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the 3rd day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey. By the 18th of May in 2016, there was one (1) day on which ozone exceedances were measured in New Jersey (based on the 70 ppb NAAQS of 2015), and there were two (2) days by this same date in 2015 (based on the former 75 ppb NAAQS of 2008).

There is a group of monitoring stations in designated counties of 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 23 exceedances of the 70 ppb ozone NAAQS of 2015 recorded on Thursday, May 18, 2017:

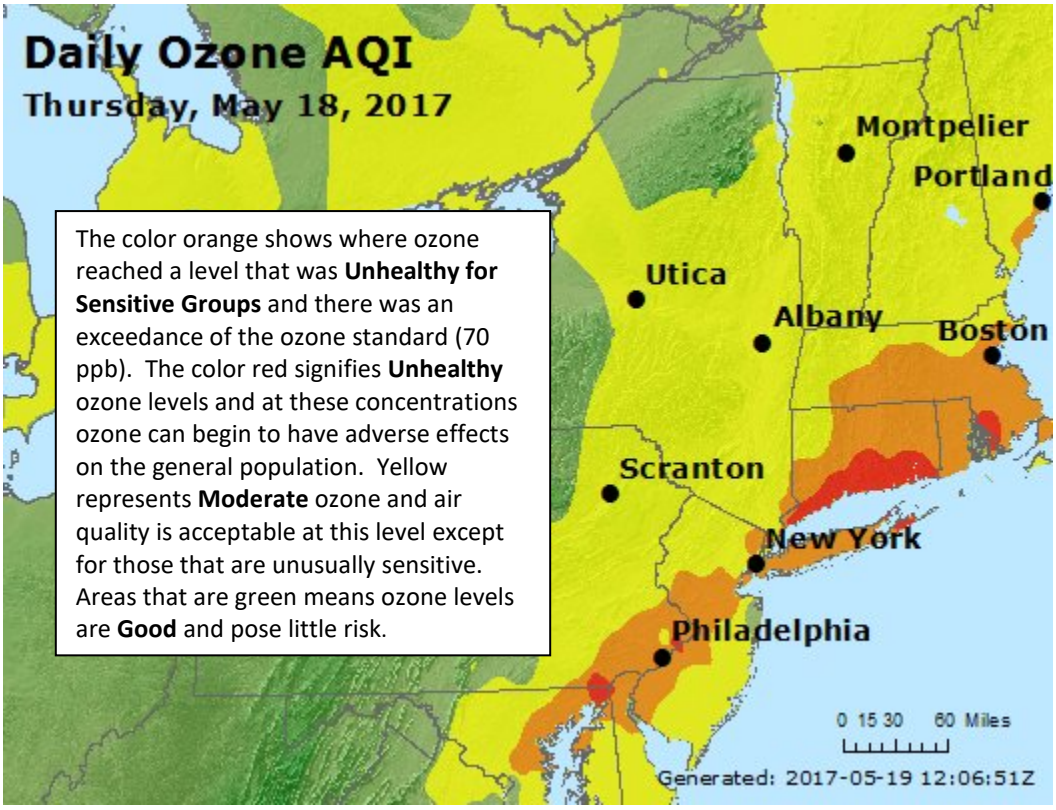
Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on May 18, 2017

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	72
CT	Greenwich	86
CT	Madison-Beach Road	90
CT	Middletown	86
CT	New Haven	85
CT	Stratford	91
CT	Westport	90
DE	BCSP (New Castle Co.)	82
DE	BELLFNT2 (New Castle Co.)	72
DE	LUMS 2 (New Castle Co.)	84
DE	MLK (New Castle Co.)	84
MD	Fair Hill	90
NY	Babylon	75
NY	Holtsville	71
NY	Queens	80
NY	Riverhead	82
NY	Susan Wagner	74
PA	BRIS (Bucks Co.)	83
PA	CHES (Delaware Co.)	75
PA	NEWG (Chester Co.)	81
PA	NORR (Montgomery Co.)	77
PA	NEA (Philadelphia Co.)	92
PA	NEW (Philadelphia Co.)	79

Seventeen (17) stations exceeded the 75 ppb ozone NAAQS of 2008, and eight (8) exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 114 ppb at the Middletown and Stratford stations in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the 3rd day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Maryland and Pennsylvania, and the 2nd day for Connecticut, Delaware and New York. Figure 1 shows graphically the regions ozone concentrations on May 18, 2017.

Figure 1. Ozone Air Quality Index for May 18, 2017



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 the low 90s, while winds were light and from the southwest. The eastern United States remained under the influence of a persistent Bermuda high-pressure system for the second day in a row. This persistent weather pattern allowed scorching temperatures and humidity to reach record levels in the Mid-Atlantic and Northeast. The high-pressure system lead to widespread sunshine and light winds. A low-pressure surface trough was also centered directly over 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 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 the monitored exceedances on May 18, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Ten (10) monitoring stations with 8-hr ozone exceedances 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)
CT	Madison-Beach Road	90
CT	Stratford	91
DE	LUMS 2	84
MD	Fair Hill	90
NJ	Camden Spruce St	83
NJ	Clarksboro	76
NJ	Leonia	74
NJ	Rutgers University	80
NJ	Rider University	82
PA	NEA	92

Surface level winds originated in North Carolina and traveled through the major metropolitan areas of Washington, D.C., Baltimore, Wilmington, and Philadelphia picking up locally generated emissions along the way. The winds at the lower level remained at the surface throughout the 48-hour trajectory and collected emissions from cars, trucks, and industry as it traveled into New Jersey. Mid-level trajectories (Figure 3) have slightly different pathways to their endpoints. Sites located in Northern NJ, NY, and CT at the mid-level started in Georgia and traversed through 5 states before branching off and traveling through West Virginia, the Ohio Valley, and Pennsylvania collecting emissions from power plants. Sites located in Southern NJ, MD, and DE at the mid-level also started in Georgia and passed through the I-95 corridor. The upper level trajectory (Figure 4) shows air passing through several southern states before reaching the Ohio Valley and Pennsylvania. Figure 5 shows graphically the ozone

concentrations in the New Jersey nonattainment area on the first day of the two-day ozone event. High ozone levels on May 17, 2017 were magnified on May 18, 2017 by the persistent weather pattern.

Figure 2. 48-hour Back Trajectories for May 18, 2017 at 10 meters

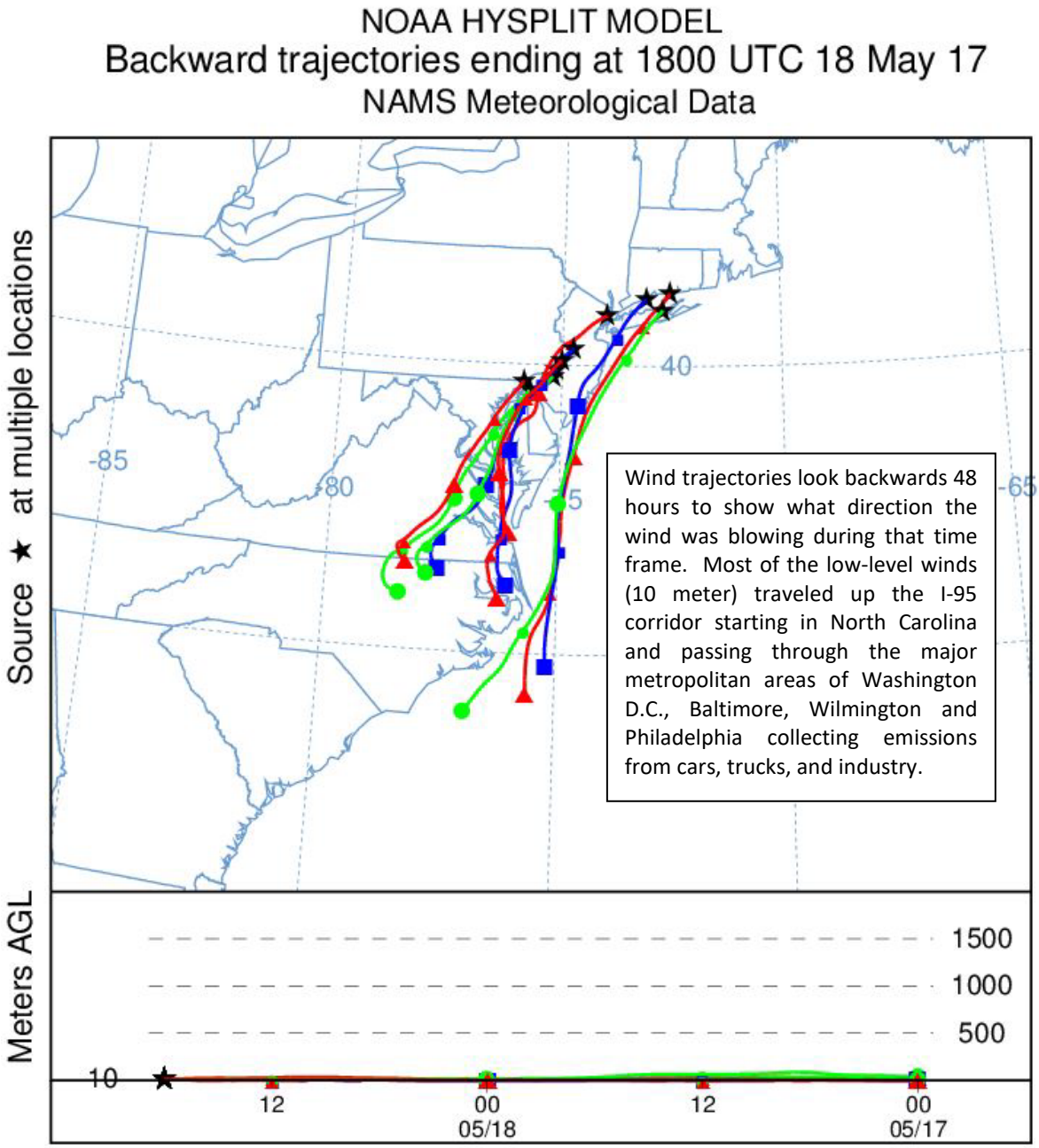


Figure 3. 48-hour Back Trajectories for May 18, 2017 at 500 meters

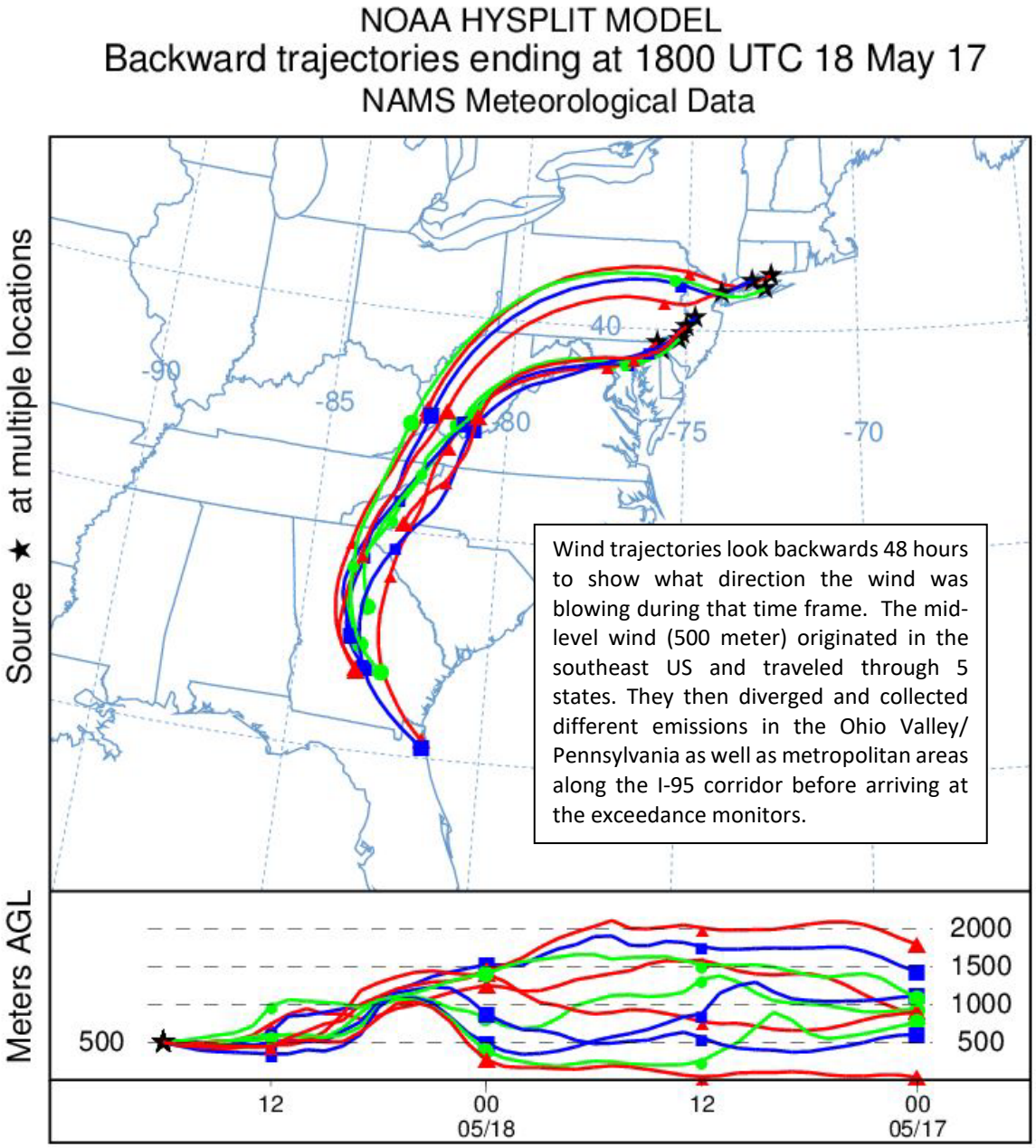


Figure 4. 48-hour Back Trajectories for May 18, 2017 at 1500 meters

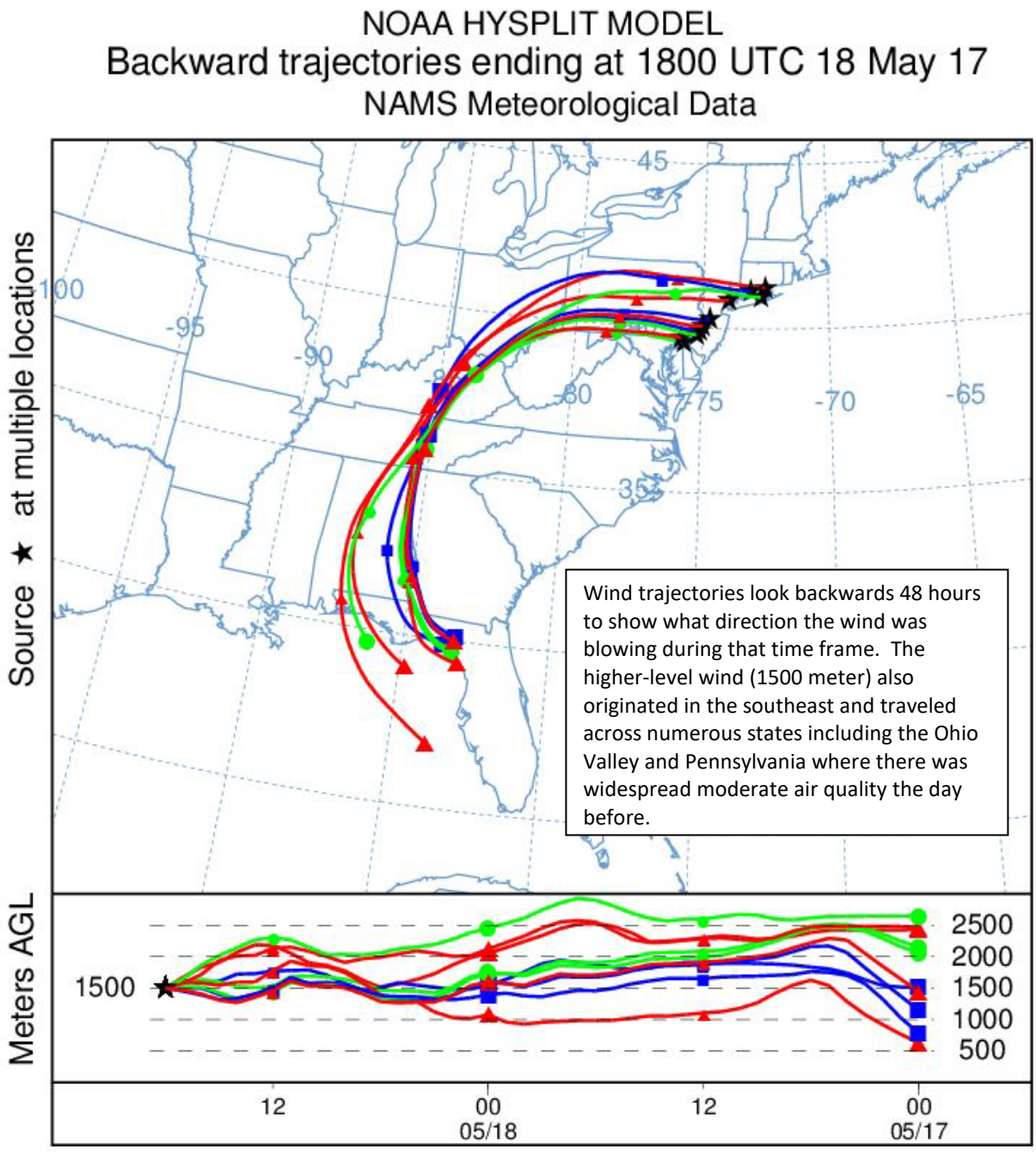
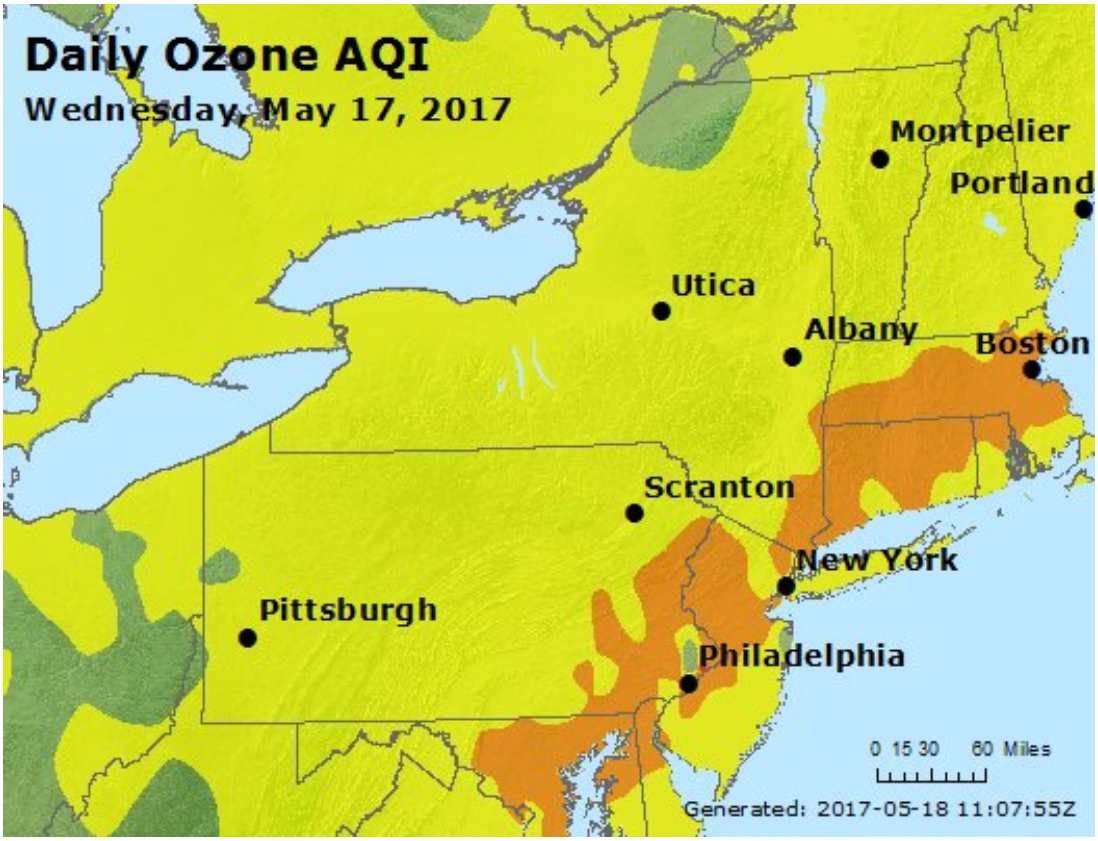


Figure 5. Ozone Air Quality Index for the Mid-Atlantic and Northeast Regions on May 17, 2017



How is Ozone Created?

Ground-level ozone is an air pollutant known to cause a number of health effects and negatively impact air quality and the environment in New Jersey. Ozone is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Ozone can irritate any person's lungs, but the effect may be more pronounced for those with existing lung-related deficiencies, and therefore, 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.