Ozone National Ambient Air Quality Standard Health Exceedances on June 10, 2017

Exceedance Locations and Levels

On Saturday, June 10, 2017, there were two (2) 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 June 10, 2017

STATION	Daily Maximum 8-Hr Average (ppb)
Camden Spruce St	76
Leonia	74

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

One (1) New Jersey station 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 10, 2017, in New Jersey was 80 ppb at the Camden Spruce Street station, which is below the 1-hour ozone NAAQS of 120 ppb.

Saturday marks the 4th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey. By the 10th of June in 2016, there were six (6) days 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 non-attainment areas. From this group of stations in the neighboring states, there were eleven (11) exceedances of the 70 ppb ozone NAAQS of 2015 recorded on Saturday, June 10, 2017 (See Table 2):

Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 10, 2017

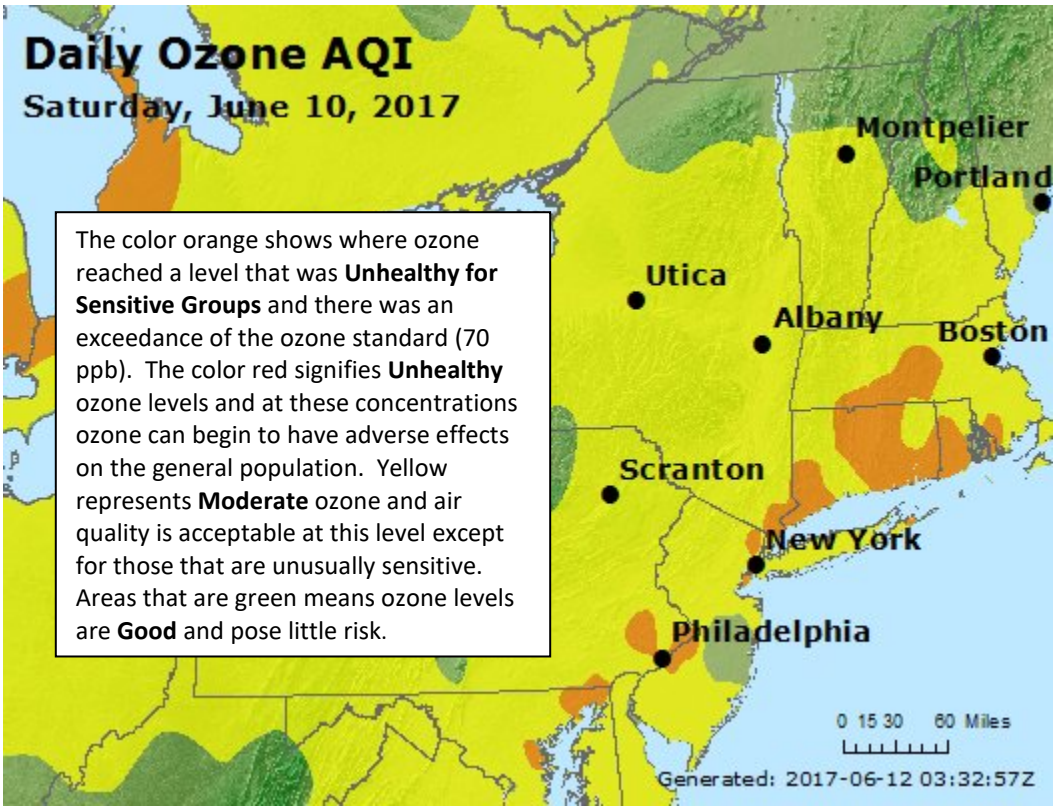
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	72
CT	Middletown	76
CT	Stratford	72
CT	Westport	75
MD	Fair Hill	72
NY	Susan Wagner	71
NY	White Plains	72

PA	BRIS (Bucks Co.)	74
PA	NORR (Montgomery Co.)	75
PA	NEA (Philadelphia Co.)	73
PA	NEW (Philadelphia Co.)	71

One (1) station 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 was 96 ppb at Middletown, CT, which is below the 1-hour ozone NAAQS of 120 ppb.

Saturday marks the 4th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Connecticut, Maryland, New York and Pennsylvania. The number of days remains at two (2) for Delaware. Figure 1 shows graphically the regions ozone concentrations on June 10, 2017.

Figure 1. Ozone Air Quality Index for June 10, 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 mid to upper 80s, while winds were light and from the west. New Jersey and much of the northeast remained under the influence of a Bermuda high that was anchored off the coast pumping warm air into the northeast. For much of the day, a low-pressure surface trough remained draped over of New Jersey extending from Massachusetts to North Carolina. This feature created conditions which allowed polluted air aloft to mix down to the surface. All of these conditions in combination with abundant sunlight are features commonly seen with an ozone exceedance. June 10th, 2017 started the first day of a multi-day ozone event occurring in the Mid-Atlantic and Northeast.

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 June 10, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Eight (8) 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	Middletown	76
CT	Westport	75
MD	Fair Hill	72
NJ	Camden Spruce St	76
NJ	Leonia	74
NY	White Plains	72
PA	BRIS	74
PA	NORR	75

Much of the surface winds (Figure 2) originated in western Pennsylvania and continued to travel through the state. Some of the southern trajectories originating near Pittsburgh followed a pathway southeastward into northern parts of Virginia before crossing through Baltimore, Wilmington, Philadelphia and parts of the I-95 corridor. The surface winds further to the north followed a more westerly path crossing through Scranton, Pennsylvania, Northern New Jersey, New York City and the Long Island Sound. The winds at the lower level mixed down from 1000m on June 9th before they skimmed the surface for the remainder of the trajectory and collected emissions from cars, trucks, and industry. Mid-level winds (Figure 3) show a pattern generally from the west with air mixing down from higher elevations. Originating in Ohio, Michigan, and Indiana, the mid-level trajectories traveled through a heavily industrialized area before reaching their endpoints. The upper level winds (Figure 4) showed a similar transport pattern from the west and traveled through four heavily industrialized states on its way to the

New Jersey nonattainment area. On June 9th, 2017, there was widespread high ozone in the Ohio Valley and Midwest (Figure 5) which was transported to the Northeast the following day.

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

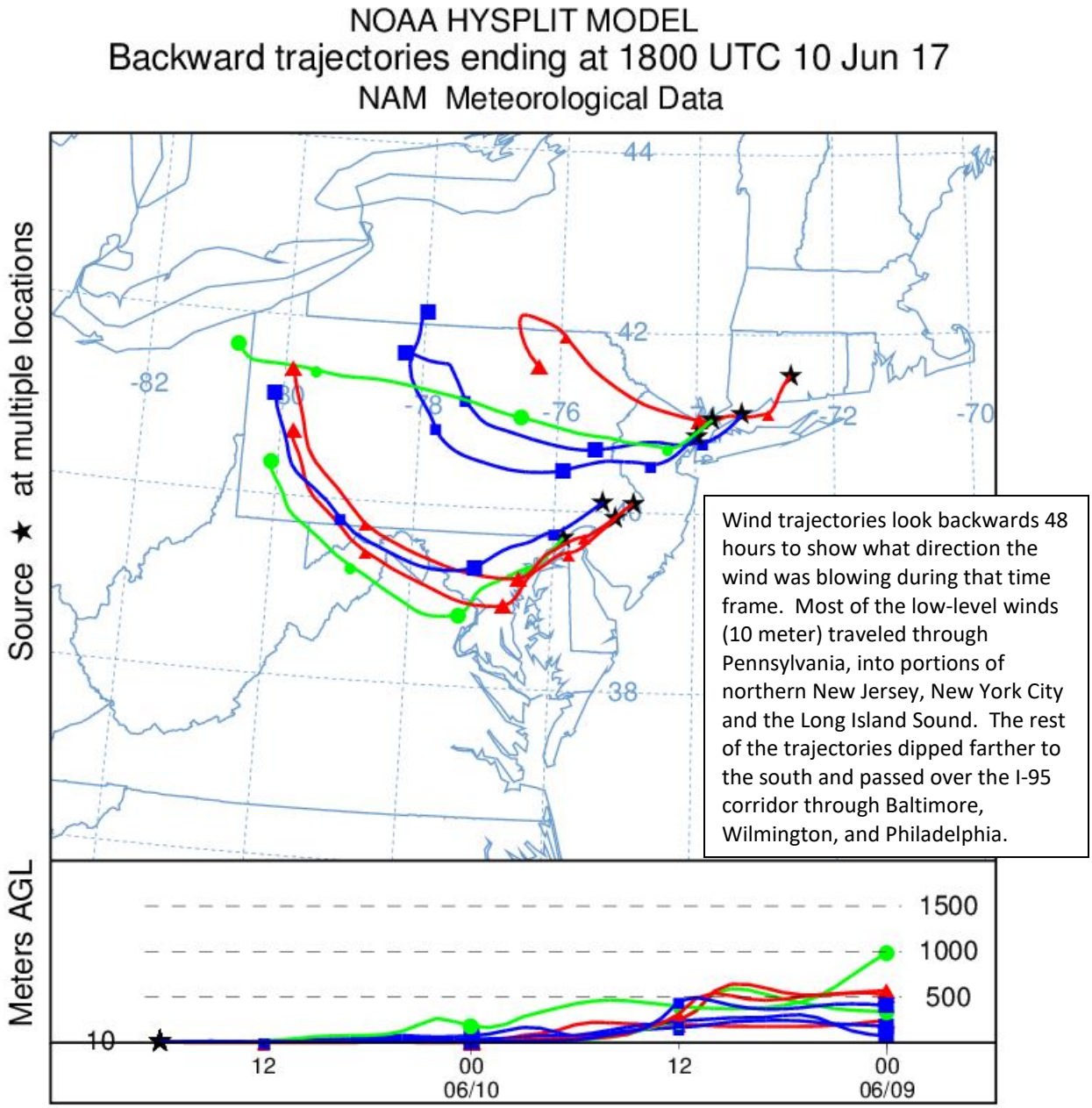


Figure 3. 48-hour Back Trajectories for June 10, 2017 at 500 meters

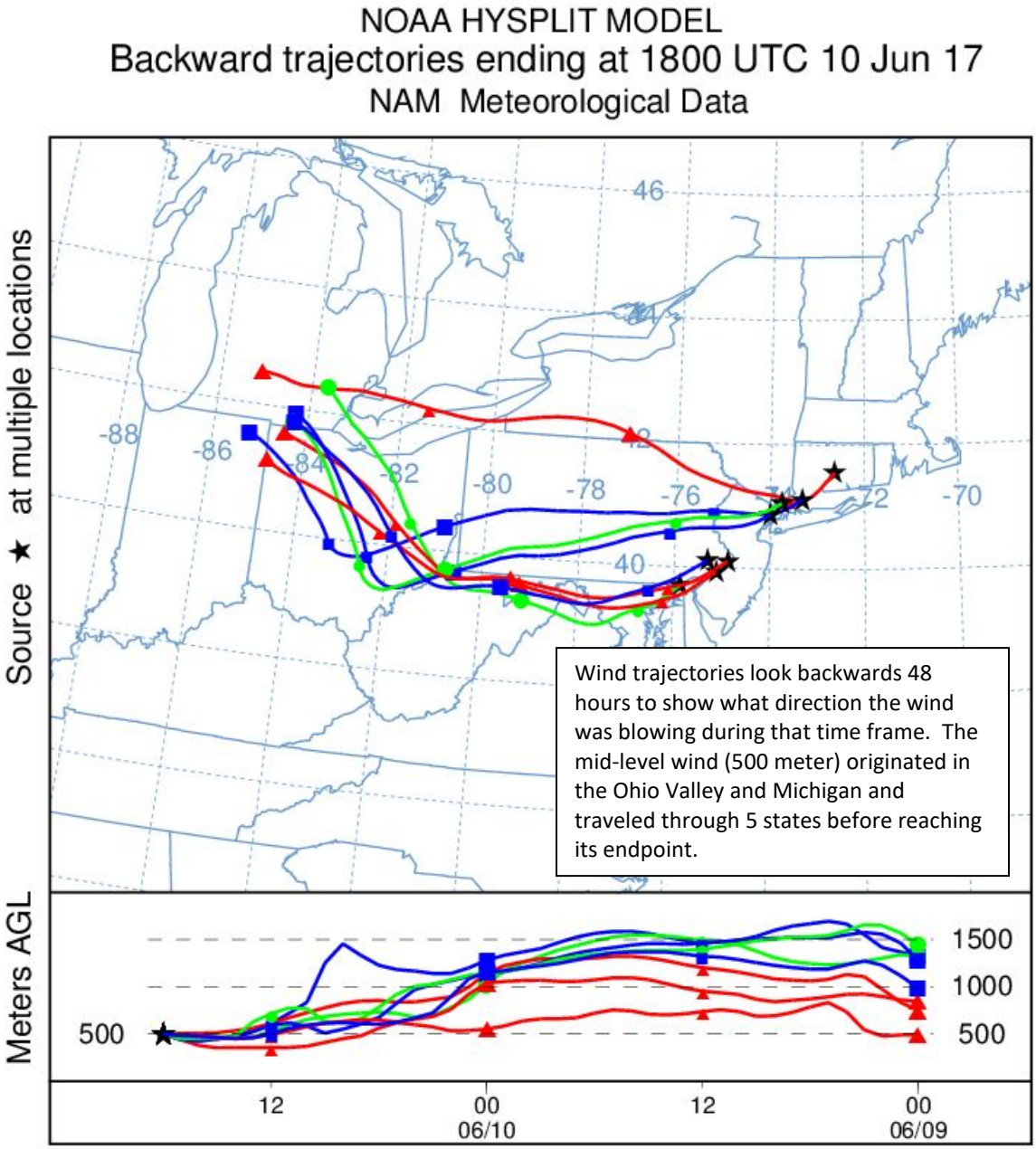


Figure 4. 48-hour Back Trajectories for June 10, 2017 at 1500 meters

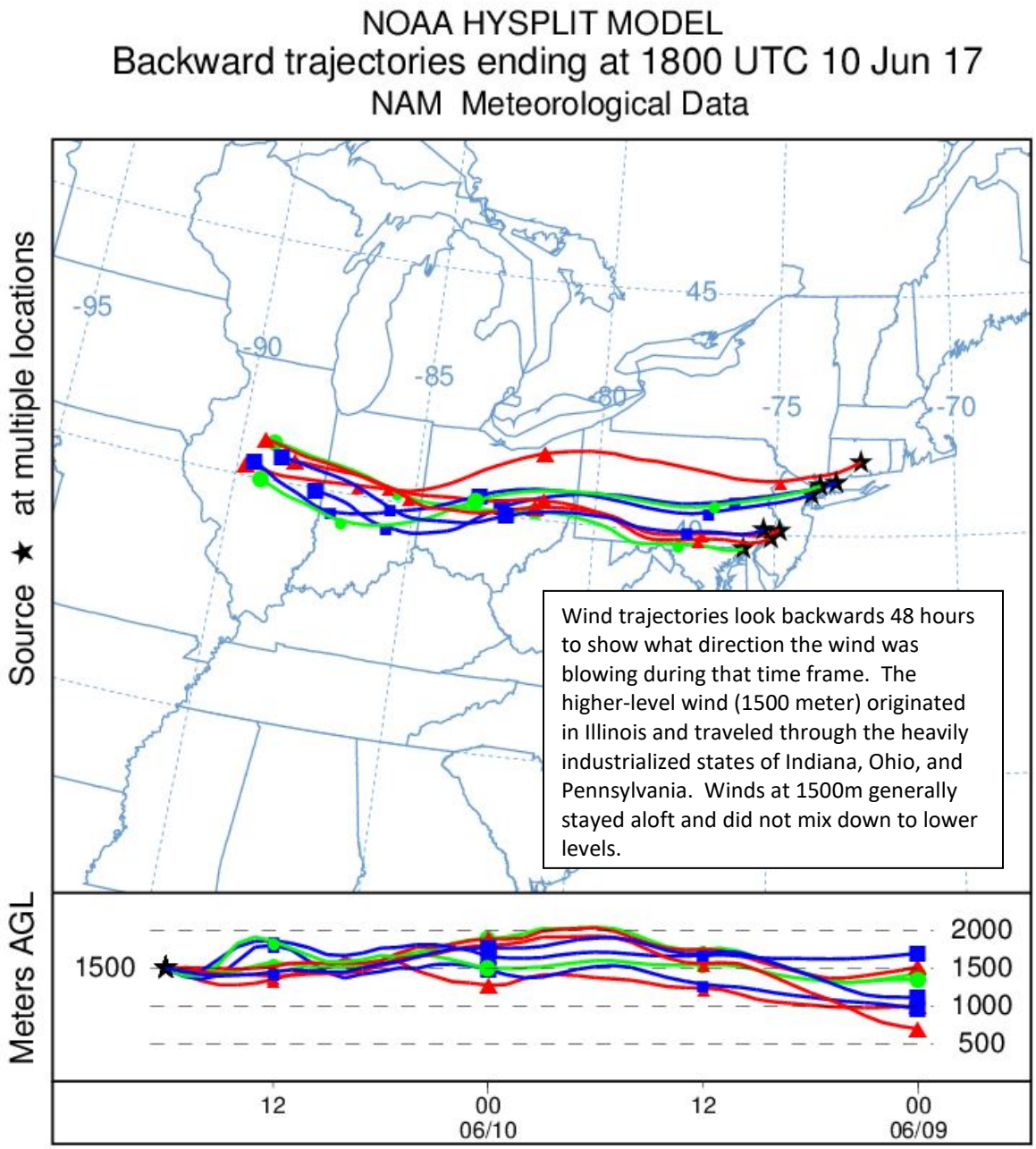
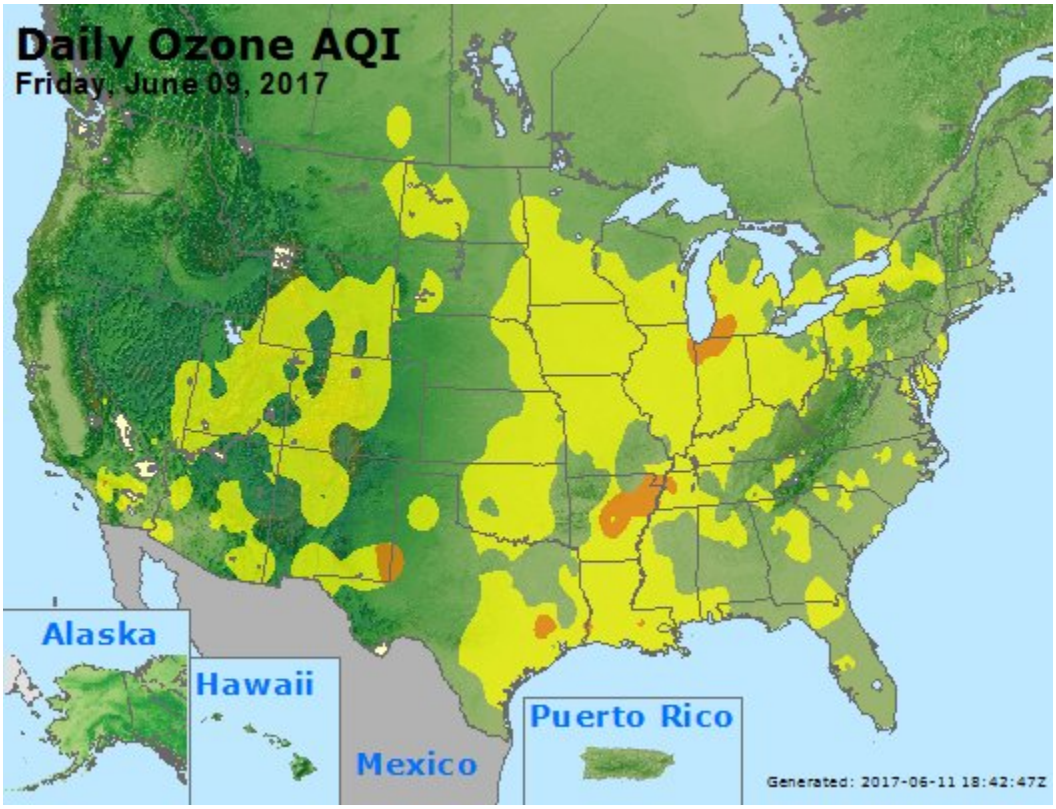


Figure 5. Ozone Air Quality Index for the United States on June 9, 2017



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, one 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.