

Ozone National Ambient Air Quality Standard Health Exceedances on June 11, 2017

Exceedance Locations and Levels

On Sunday, June 11, 2017, there was one (1) exceedance 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 11, 2017

STATION	Daily Maximum 8-Hr Average (ppb)
Camden Spruce St	71

No New Jersey station 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 on June 11, 2017, in New Jersey was 76 ppb at the Camden Spruce Street station, which is below the 1-hour ozone NAAQS of 120 ppb.

Sunday marks the 5th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey. By the 11th of June in 2016, there were seven (7) days on which ozone exceedances were measured in New Jersey (based on the former 70 ppb NAAQS of 2015), and there were three (3) days by this same date in 2015 (based on the 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 seven (7) exceedances of the 70 ppb ozone NAAQS of 2015 recorded on Sunday, June 11, 2017 (See Table 2):

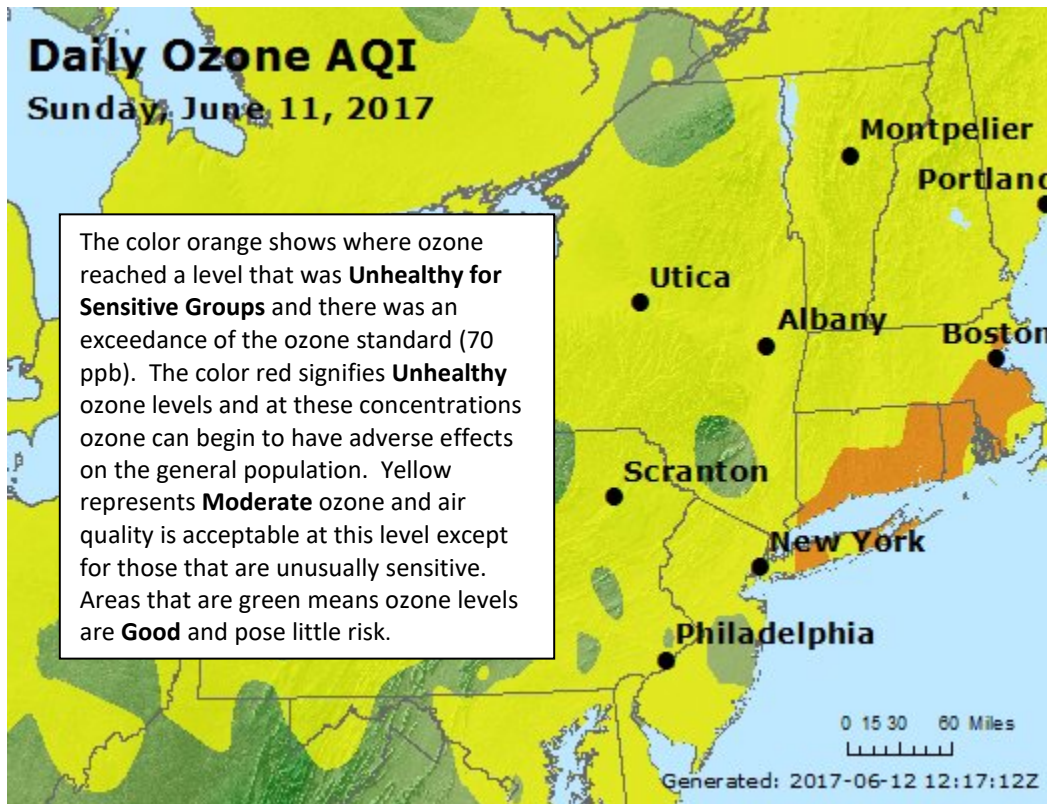
Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 11, 2017

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Madison-Beach Road	80
CT	Middletown	79
CT	New Haven	75
CT	Stratford	80
CT	Westport	79
NY	Babylon	73
NY	Riverhead	72

Four (4) 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 was 104 ppb at Stratford, CT, which is below the 1-hour ozone NAAQS of 120 ppb.

Sunday marks the 5th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Connecticut and New York. The number of days remains at four (4) for Maryland and Pennsylvania, and two (2) for Delaware. Figure 1 shows graphically the regions ozone concentrations on June 11, 2017.

Figure 1. Ozone Air Quality Index for June 11, 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 sunny skies with temperatures reaching the low 90s and winds from the southwest. New Jersey remained under the influence of a high pressure system which was anchored off the coast of North Carolina. In addition, a weak low pressure surface trough was noted over the region extending from southern Maine southwest across New Jersey into the Mid-Atlantic. This feature created conditions which allowed polluted air aloft to mix down to the surface in portions of New Jersey's nonattainment area. All of these conditions are 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 June 11, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Six (6) 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	80
CT	Middletown	79
CT	Stratford	80
NJ	Camden Spruce St	71
NY	Babylon	73
NY	Riverhead	72

Surface level winds (Figure 2) originated in Virginia and eastern North Carolina. Winds with an endpoint in Connecticut and Long Island traveled coastal while winds influencing southern New Jersey passed further west, traveling near metropolitan Washington DC and through Philadelphia. In both situations, winds at the lower level remained generally at the surface throughout the 48-hour trajectory, collecting and transporting emissions from cars, trucks, and industry into New Jersey's nonattainment area. Mid-level trajectories (Figure 3) originated in northern Alabama, Tennessee, and Kentucky and traversed northeastward through West Virginia and Pennsylvania before reaching its endpoint. Similarly, upper level winds (Figure 4) originated in Indiana and Kentucky before traveling northeastward through the Ohio River Valley, western Maryland, and Pennsylvania. It is worth noting that in both the middle and upper level trajectories winds mixed vertically in this 48hour time period. Any elevated ozone aloft would have had the opportunity to mix down to lower elevations. Figure 5 and 5a show graphically ozone concentrations on June 9th and 10th which contributed to exceedances on June 11, 2017.

Figure 2. 48-hour Back Trajectories for June 11, 2017 at 10 meters

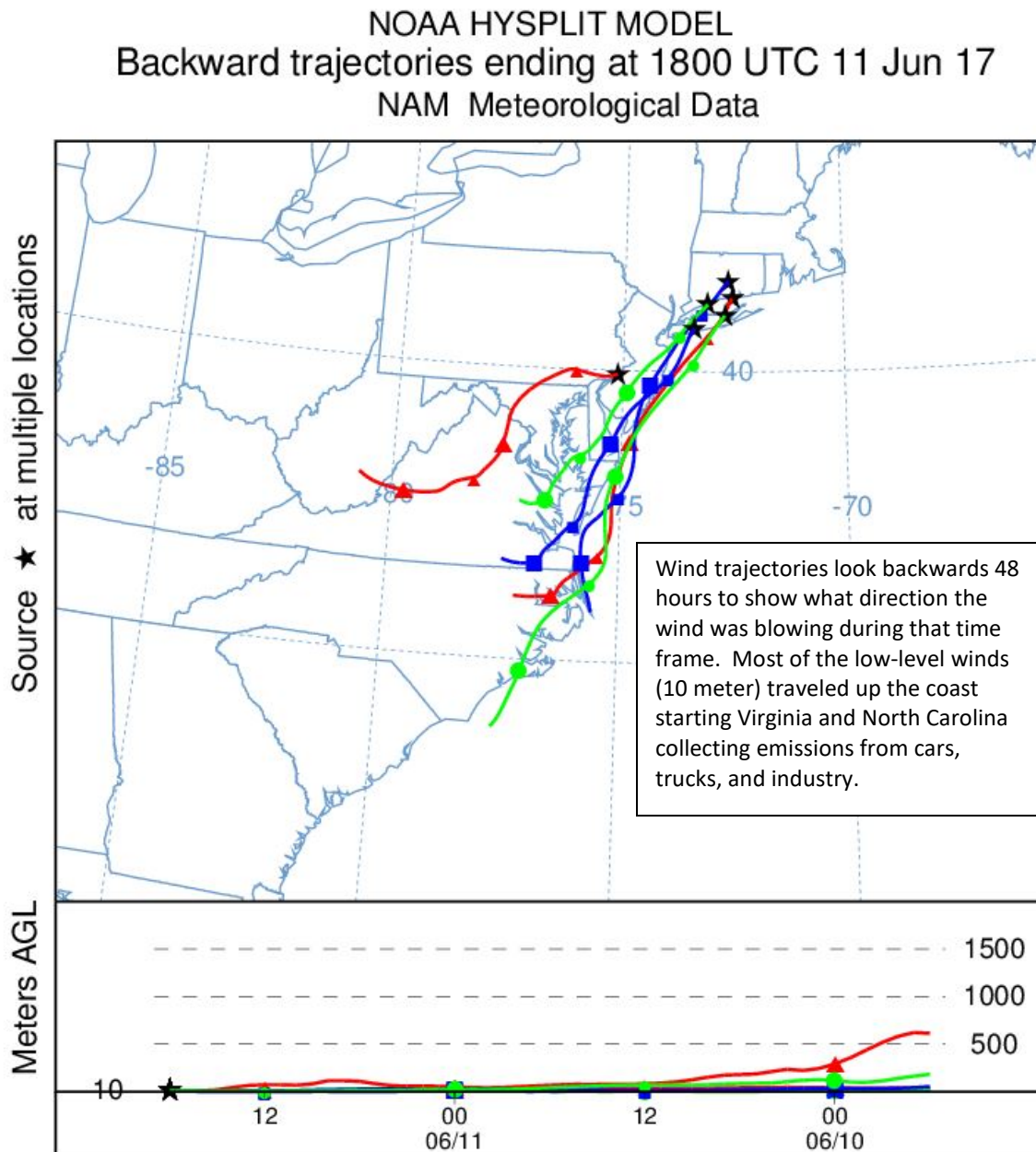


Figure 3. 48-hour Back Trajectories for June 11, 2017 at 500 meters

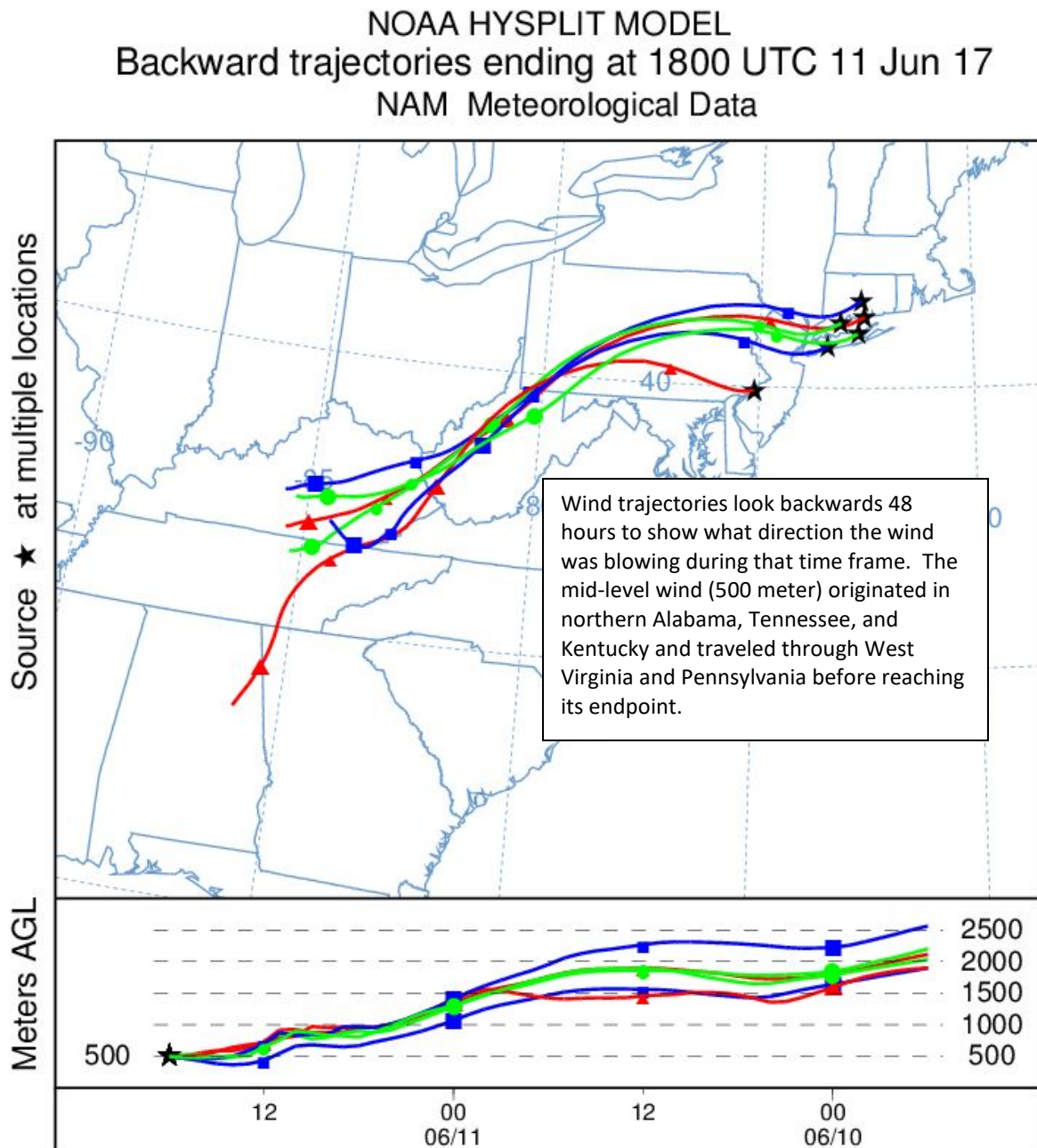


Figure 4. 48-hour Back Trajectories for June 11, 2017 at 1500 meters

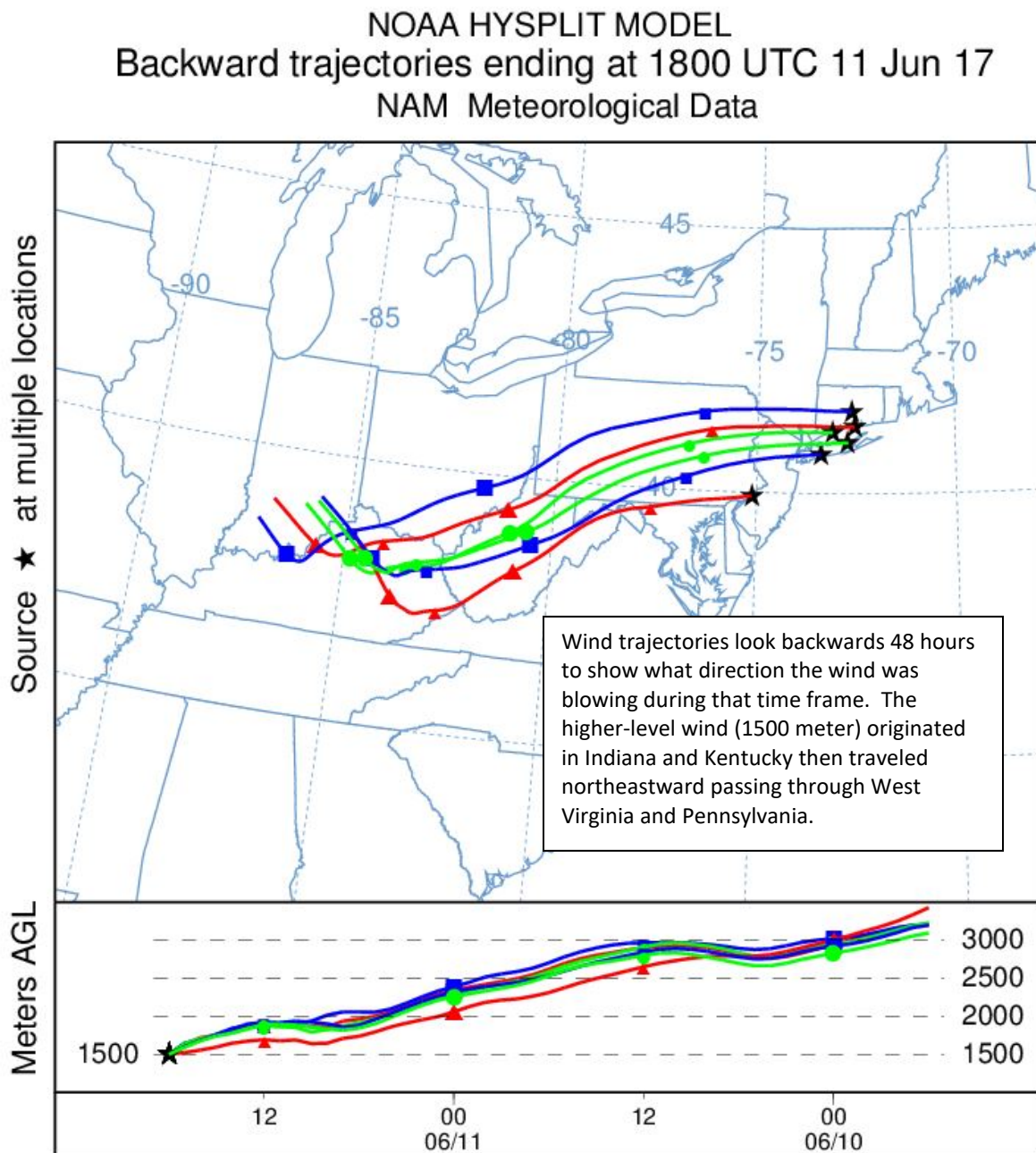


Figure 5. Ozone Air Quality Index for the United States on June 10, 2017

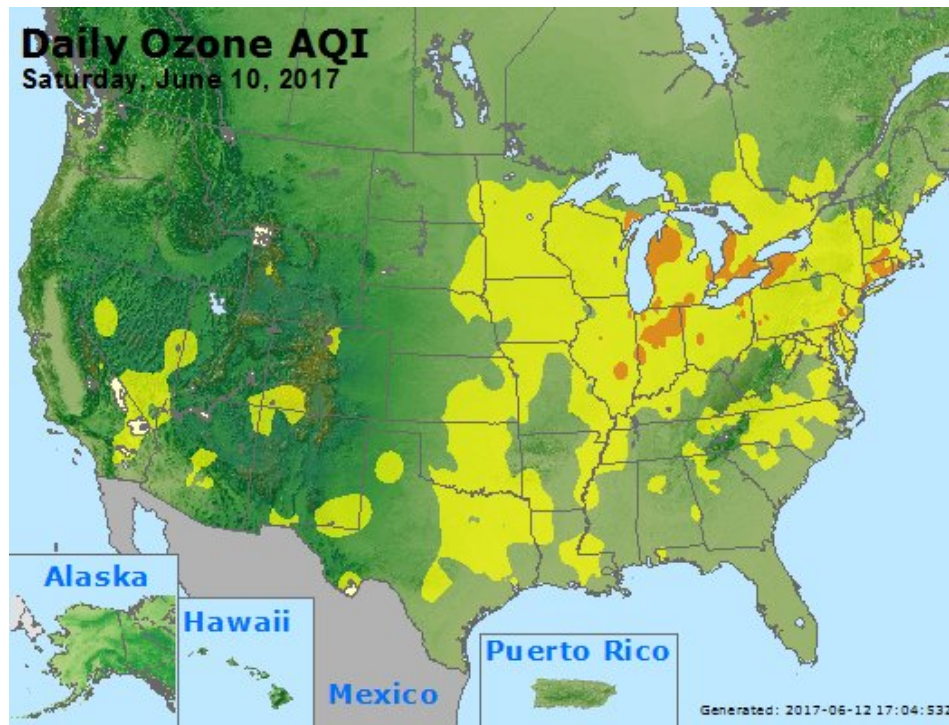
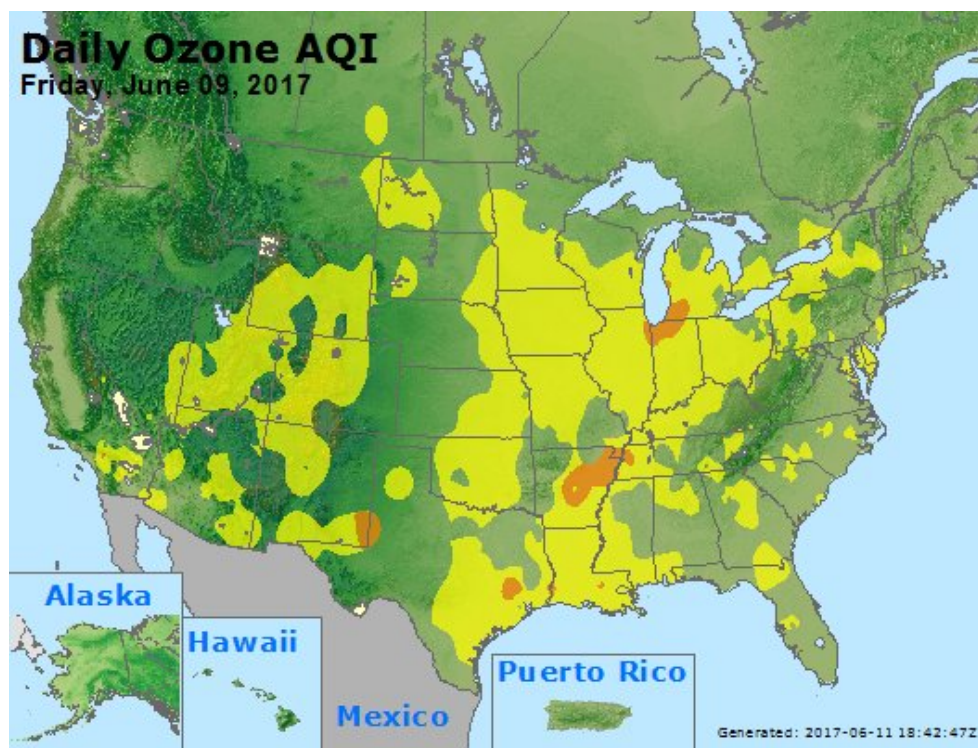


Figure 5a. Ozone Air Quality Index for the United States on June 9, 2017



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 (NO_x) 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.