Ozone National Ambient Air Quality Standard Health Exceedances on July 12, 2017

Exceedance Locations and Levels

On Wednesday, July 12, 2017, there were no 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.

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 July 12, 2017, in New Jersey was 68 ppb at the Ancora State Hospital station, which is below the 1-hour ozone NAAQS of 120 ppb.

The number of days in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey remains at nine (9). By the 12th of July in 2016, there were fourteen (14) days on which ozone exceedances were measured in New Jersey (based on the 70 ppb NAAQS of 2015), and there were seven (7) days by this same date in 2015 (based on the former 75 ppb NAAQS of 2008) (See Table 1).

Table 1: New Jersey Exceedance Count

	# of Days NAAQS was Exceeded January 1 - July 12, 2017 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - July 12, 2016 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - July 12, 2015 NAAQS = 75 ppb
New Jersey	9	14	7

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 three (3) exceedance of the 70 ppb ozone NAAQS of 2015 recorded on Wednesday, July 12, 2017 (See Table 2):

Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on July 12, 2017

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Madison-Beach Road	86
CT	Stratford	77
NY	Riverhead	73

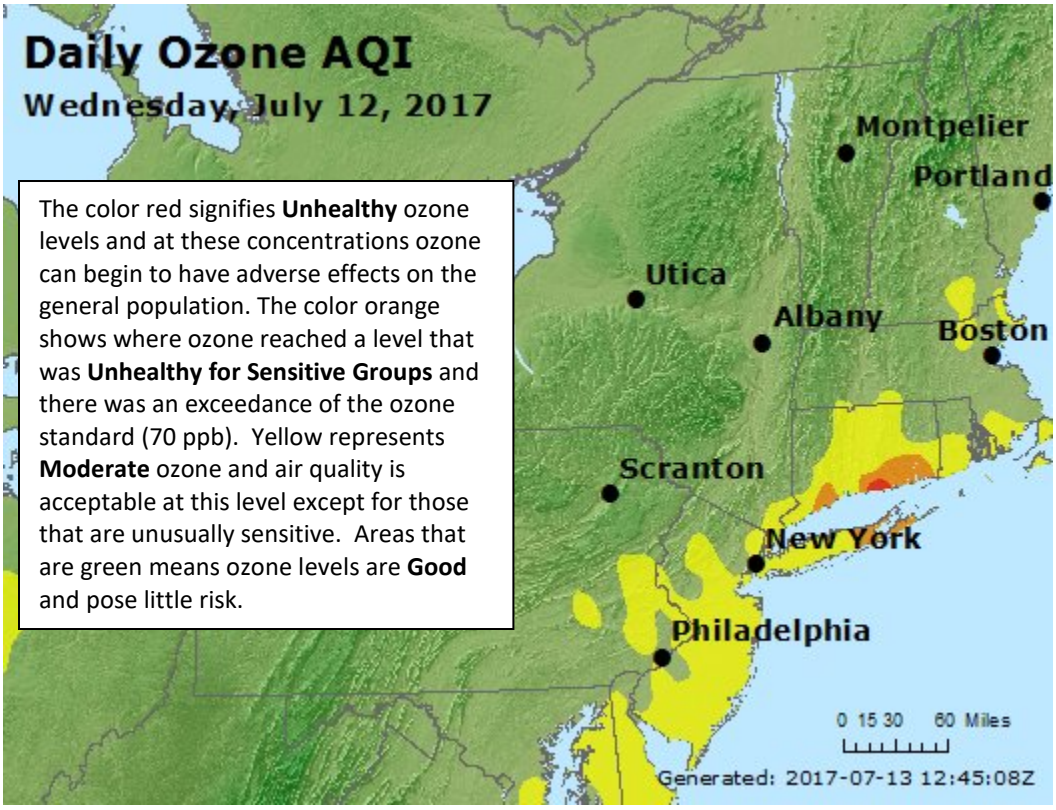
Two stations exceeded the 75 ppb ozone NAAQS of 2008, and one exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 102 ppb at the Madison-Beach Road station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 14th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Connecticut and the 9th day for New York. The number of days for Maryland and Pennsylvania remains at seven (7), and five (5) days for Delaware (See Table 3). Figure 1 shows graphically the region's ozone concentrations on July 12, 2017.

Table 3: Number of Ozone Exceedances by State

STATE	# of Days NAAQS was Exceeded January 1 - July 12, 2017 NAAQS = 70 ppb
Connecticut	14
Delaware	5
Maryland	7
New Jersey	9
New York	9
Pennsylvania	7

Figure 1. Ozone Air Quality Index for July 12, 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

High pressure remained anchored off the US east coast while a stationary front was draped over northern New England. A surface trough was also noted extending from central Connecticut southwest along the US east coast into the Mid-Atlantic region. Under the influence of all these features, the exceedance locations in southern Connecticut and eastern Long Island experienced temperatures near 90 degrees, periods of afternoon sunshine and calm winds becoming southwesterly throughout the day. All these weather conditions are commonly seen in 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 July 12, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Three (3) 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 4 below:

Table 4. 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	86
CT	Stratford	77
NY	Riverhead	73

Surface level back trajectories (Figure 2) show that elevated ozone at the monitored locations originated in the Mid-Atlantic and traveled northward to their endpoints. Winds affecting eastern Long Island traveled through Virginia, the Chesapeake Bay region, and portions of the I-95 corridor. Meanwhile, winds affecting southern Connecticut traveled more coastal, passing east of New Jersey and the New York City Metropolitan area. Overall, the back trajectories indicate that air not only remained at the surface, transporting locally generated emissions, but follow the path of the above mentioned surface trough, further collecting any polluted air that may have mixed down to the surface level. Mid-level back trajectories (Figure 3) originated in Kentucky and traveled northeast through the Ohio River Valley, Pennsylvania, and the Northern New Jersey/New York City metropolitan area. Trajectories remained at or near 500m for the length of their transit. Finally, upper-level back trajectories (Figure 4) originated in the Mid-West and traveled eastward through highly industrialized states such as Indiana, Ohio, and Pennsylvania. It is noted, that air started at 500m but was influenced by a nearby center of low pressure and quickly ascended to 1500m prior to arriving the affected monitor.

Figures 5 and 5a below show graphically national ozone concentrations on July 10th and 11th that contributed to exceedances on July 13, 2017.

Figure 2. 48-hour Back Trajectories for July 12, 2017 at 10 meters

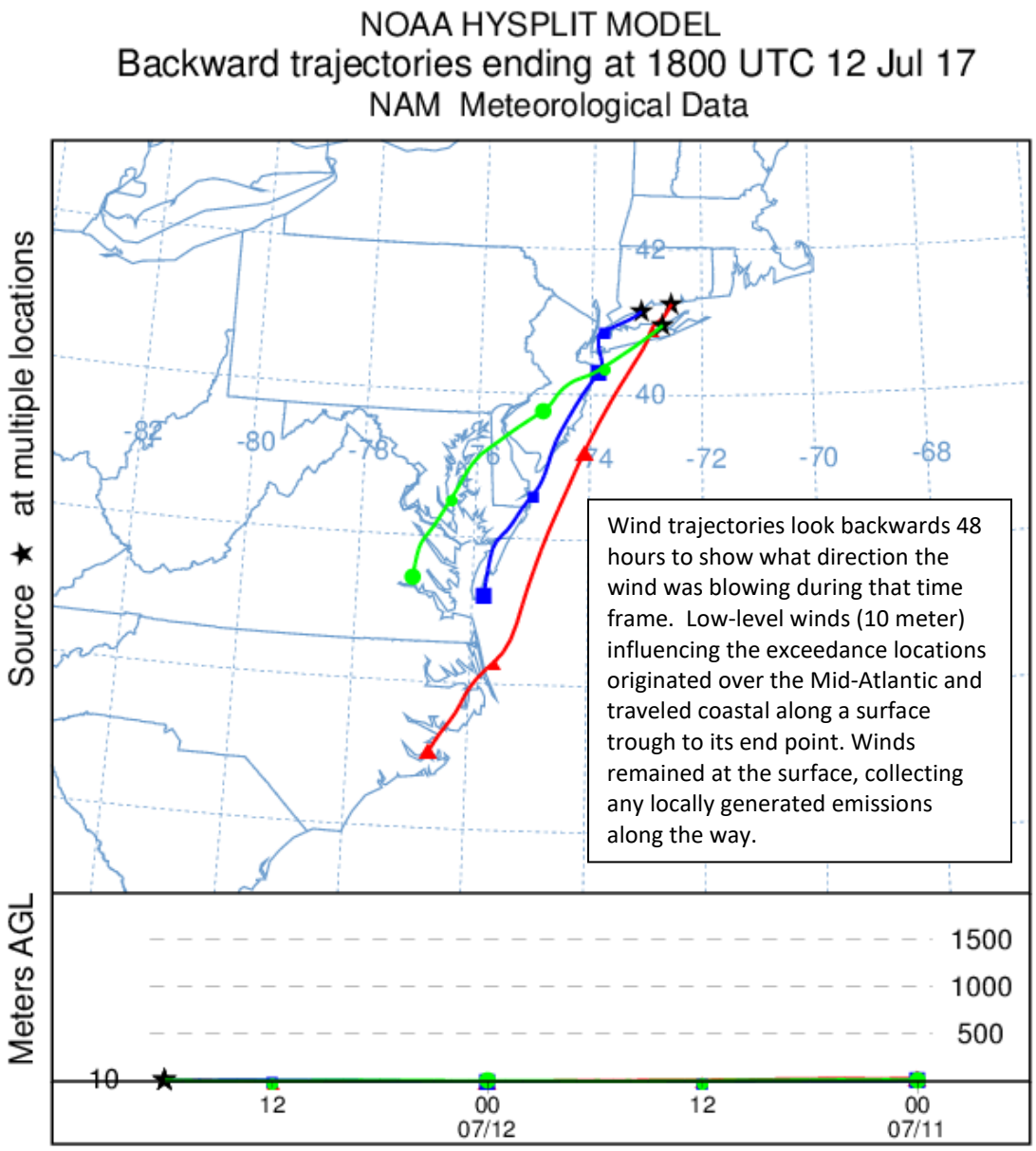


Figure 3. 48-hour Back Trajectories for July 12, 2017 at 500 meters

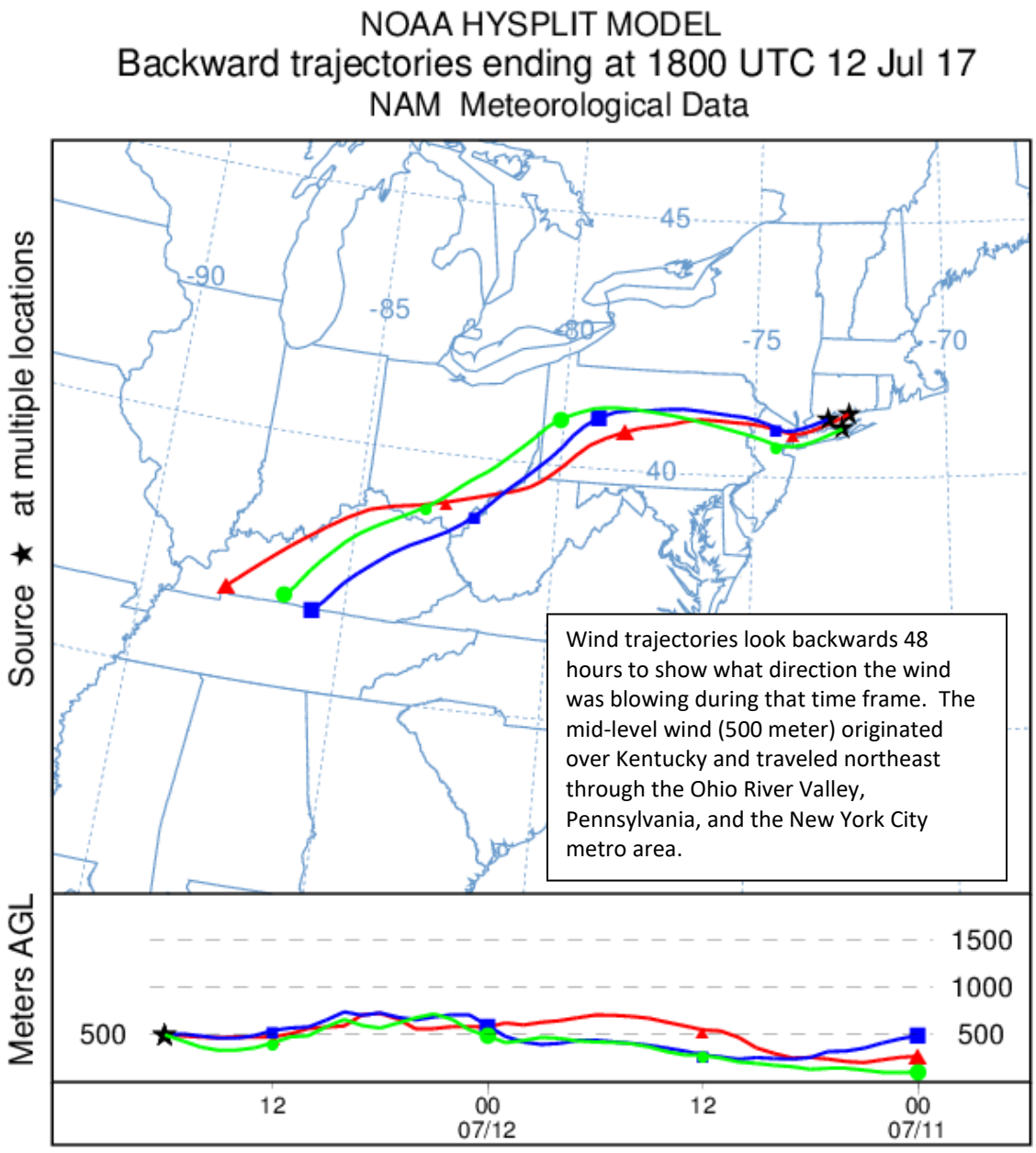


Figure 4. 48-hour Back Trajectories for July 12, 2017 at 1500 meters

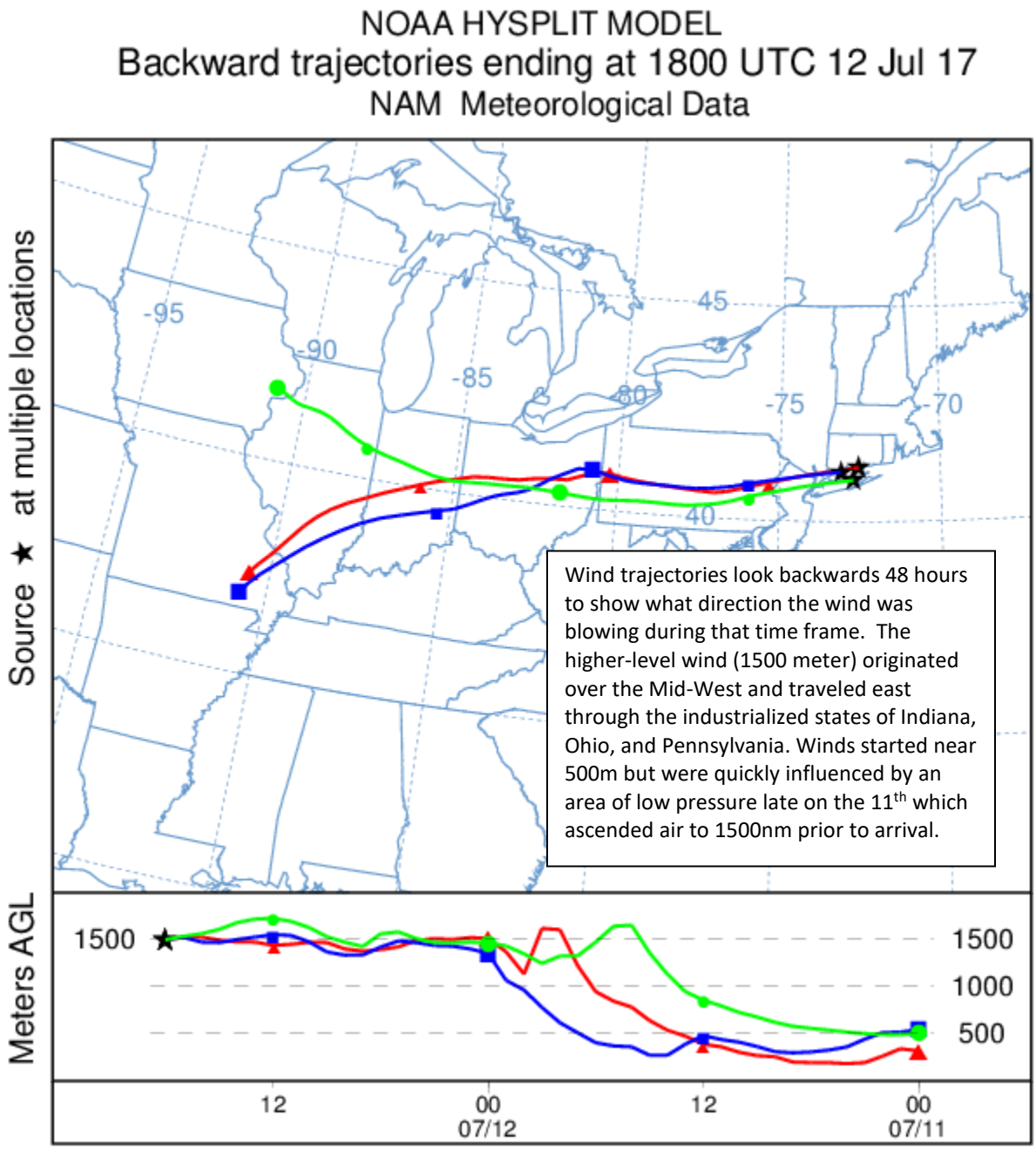


Figure 5. Ozone Air Quality Index for the United States on July 11, 2017

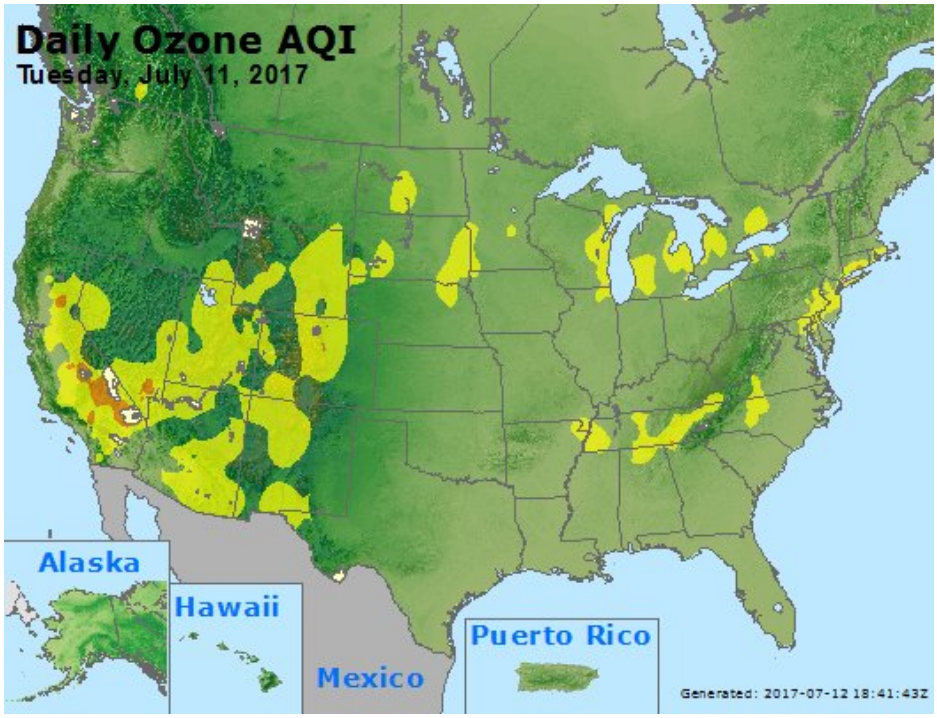
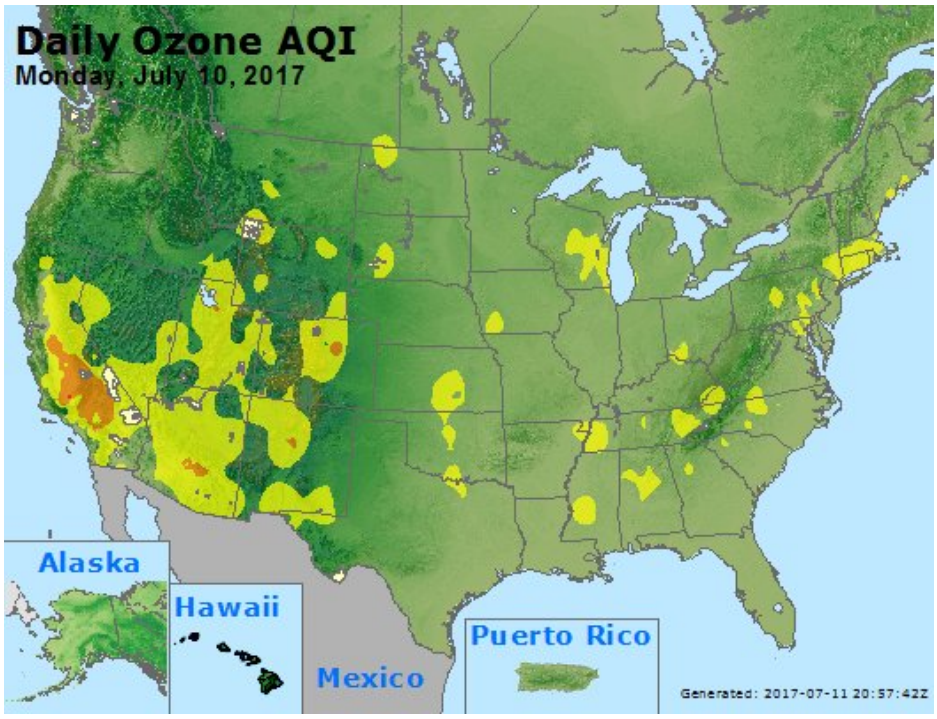


Figure 5a. Ozone Air Quality Index for the United States on July 10, 2017



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.