

Ozone National Ambient Air Quality Standard Health Exceedances on July 14, 2018

Exceedance Locations and Levels

On Saturday, July 14, 2018, there were zero (0) exceedances in New Jersey of the National Ambient Air Quality Standard (NAAQS) for ozone (daily maximum 8-hour average of 70 ppb). See Table 1.

Table 1. New Jersey 8-hr Maximum Ozone Concentrations on July 14, 2018

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	48
Bayonne	60
Brigantine	37
Camden Spruce St	57
Chester	58
Clarksboro	55
Colliers Mills	63
Columbia	54
Flemington	60
Leonia	63
Millville	42
Monmouth University	57
Newark Firehouse	59
Ramapo	59
Rider University	61
Rutgers University	59
Washington Crossing*	63
TOTAL EXCEEDANCES	0

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

From the out-of-state stations within New Jersey’s ozone non-attainment areas, there were three (3) exceedances of the ozone NAAQS. See Table 2.

Table 2. 8-hr Maximum Ozone Concentrations for Out-of-State Monitoring Stations in New Jersey’s Ozone Non-Attainment Areas on July 14, 2018

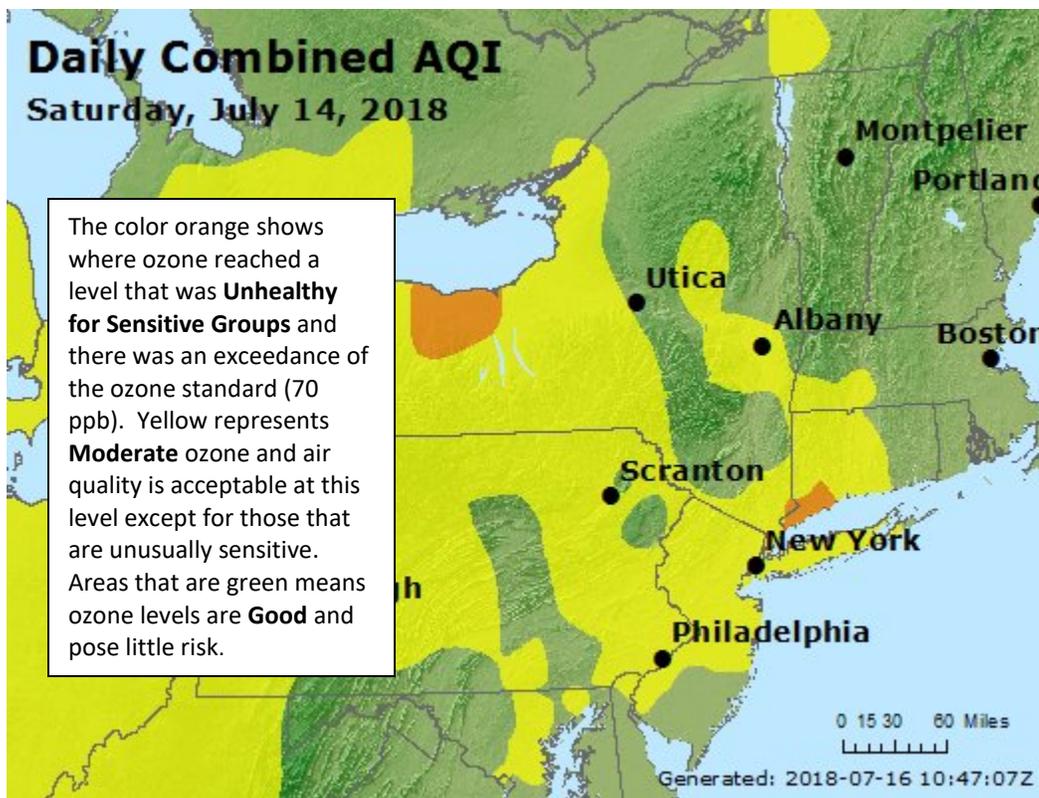
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	69
CT	Greenwich	77
CT	Madison-Beach Road	57
CT	Middletown-CVH-Shed	57
CT	New Haven	66
CT	Stratford	72
CT	Westport	77
DE	BCSP (New Castle Co.)	58
DE	BELLFNT2 (New Castle Co.)	61
DE	KILLENS (Kent Co.)	45
DE	LEWES (Sussex Co.)	45
DE	LUMS 2 (New Castle Co.)	48
DE	MLK (New Castle Co.)	56
DE	SEAFORD (Sussex Co.)	41
MD	Fair Hill	54
NY	Babylon	60
NY	Bronx - IS52	62
NY	CCNY	58
NY	Holtsville	63
NY	Pfizer Lab	63
NY	Queens	63
NY	Riverhead	67
NY	Rockland Cty	59
NY	White Plains	64
NY	Susan Wagner	No Data
PA	BRIS (Bucks Co.)	68
PA	CHES (Delaware Co.)	58
PA	NEWG (Chester Co.)	56
PA	NORR (Montgomery Co.)	61
PA	LAB (Philadelphia Co.)	59
PA	NEA (Philadelphia Co.)	62
PA	NEW (Philadelphia Co.)	61
	TOTAL EXCEEDANCES	3

The number of days in 2018 on which exceedances of the ozone NAAQS were recorded for all the states is summarized in Table 3. Figure 1 shows graphically the regions ozone concentrations on July 14, 2018.

Table 3. Number of Days Ozone NAAQS was Exceeded in NJ’s Non-Attainment Areas in 2018

STATE	# of Days NAAQS was Exceeded January 1 – July 14, 2018 NAAQS = 70 ppb
Connecticut	13
Delaware	8
Maryland	6
New Jersey	14
New York	13
Pennsylvania	11

Figure 1. Ozone Air Quality Index for July 14, 2018



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

The strong high pressure system centered over the northeast on Friday remained in control of the weather throughout the daytime hours on Saturday and had elongated from New England through the Mid-Atlantic. This elongated region of high pressure was accompanied by a surface ridge along the eastern seaboard. In addition, the northeast was also under the influence of an upper level ridge encompassing the entire eastern United States providing warm temperatures, sunny skies, and light winds.

By mid-afternoon, the surface high moved offshore as a front from the Great Lakes progressed toward the Northeast and stalled. While some convective development was present ahead of the front, not enough clouds had developed during the afternoon hours to limit ozone formation at the surface in Connecticut. At this time, winds aloft shifted to a more westerly direction in response to high pressure moving further offshore. This wind shift likely transported polluted air from the preceding day in locations west of Connecticut to the exceedance monitors.

In the later afternoon hours, weak low pressure had developed over the Lower Hudson Valley with a surface trough extending through New York City and along the coast of New Jersey. This resulted in converging winds at the surface in addition to winds traveling over Long Island and New York City where USG ozone levels were observed the preceding day.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories starting at different wind heights for the monitored exceedance July 14, 2018. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Three (3) monitoring stations with an 8-hr ozone exceedance were used 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

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Greenwich	77
CT	Stratford	72
CT	Westport	77

Surface-level back trajectories (Figure 2) originated over the Atlantic Ocean and traveled east toward the New Jersey coastline through late on July 13th. As air continued to be steered by high pressure, it made a turn more north/northeast on Friday traveling through portions of central New Jersey, the New York City Metropolitan area and Long Island Sound through arrival. Air remained at the surface for the entirety of its path, picking up locally generated emissions from cars, trucks and industry along the way. Mid-level back trajectories (Figure 3) also originated over the Atlantic Ocean. Under the influence of

high pressure, this air traveled southwest to the Maryland coastline through early July 13th before turning more northwest through the Chesapeake Bay vicinity and Washington DC Metropolitan area through late July 13th. Air then finally made a turn northeast and traveled through Pennsylvania, the Northern New Jersey/NYC metropolitan area, and portions of the Long Island Sound through arrival. Upper-level back trajectories (Figure 4) show that air took different paths as the upper atmosphere was under the influence of a changing synoptic flow pattern. Air affecting some portions of the southwestern Connecticut look to have originated in Maryland and then traveled generally northeast through northern New Jersey and the NYC Metropolitan area through arrival. Meanwhile, another upper-level back trajectory for this region shows air originating in northern New York State, traveling southward to central Pennsylvania through late July 13th before being pulled into a frontal passage and making a sharp turn northeastward, traveling through northern New Jersey and the NYC metropolitan area through arrival.

Figure 5 below shows the ozone air quality index values recorded for the United States on July 13, 2018.

Figure 2. 48-hour Back Trajectories for July 14, 2018 at 10 meters

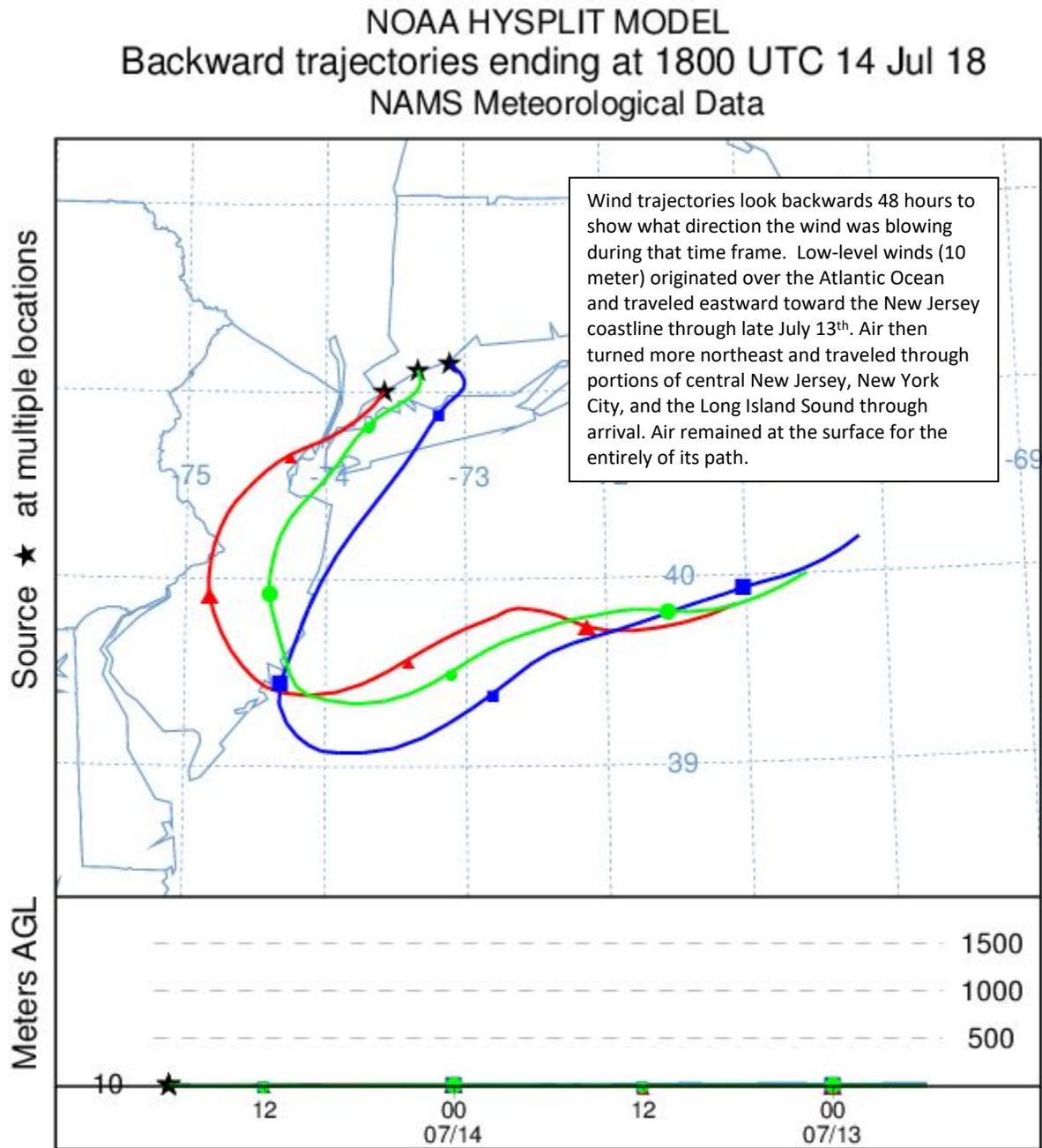


Figure 3. 48-hour Back Trajectories for July 14, 2018 at 500 meters

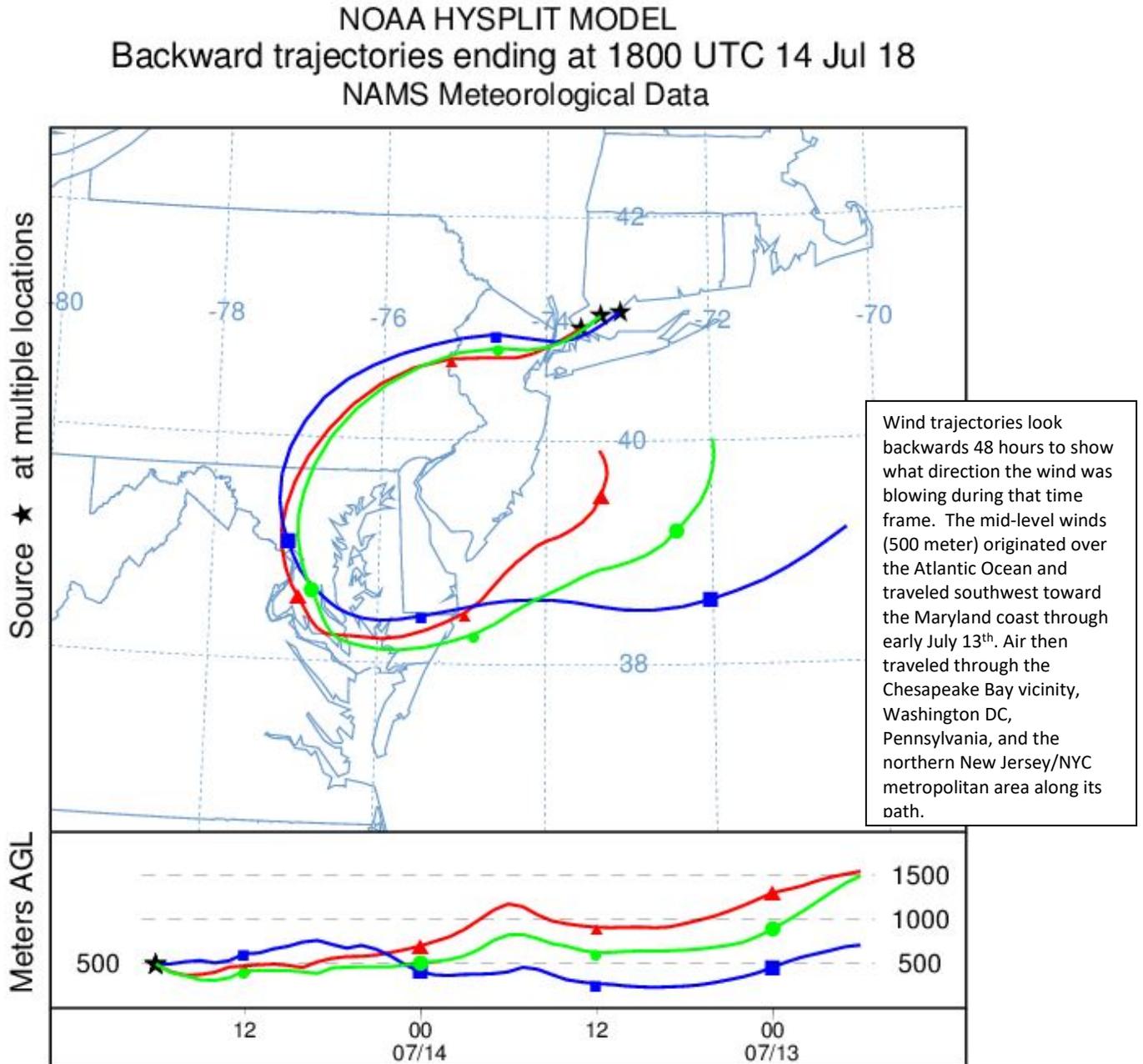


Figure 4. 48-hour Back Trajectories for July 14, 2018 at 1500 meters

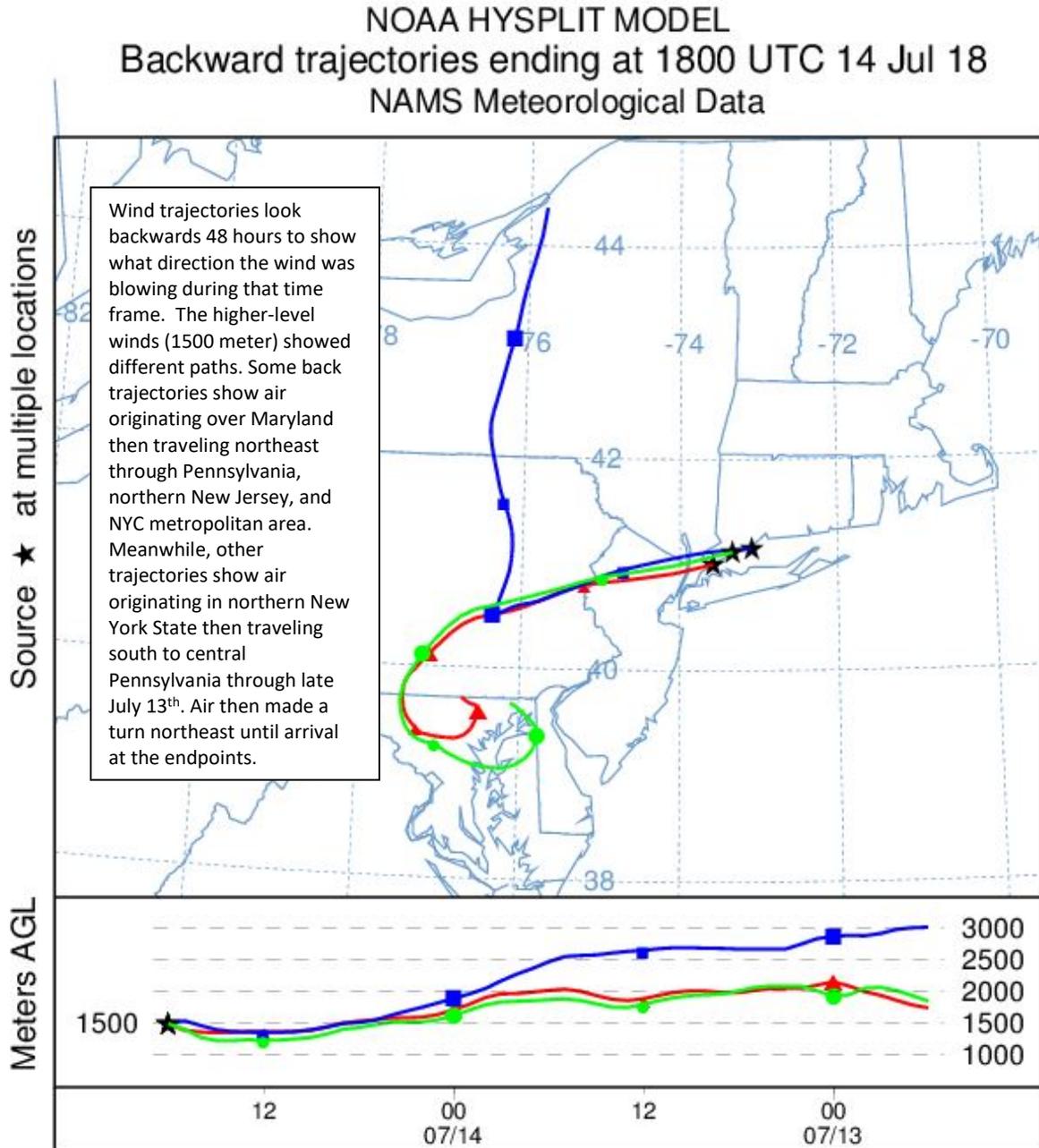
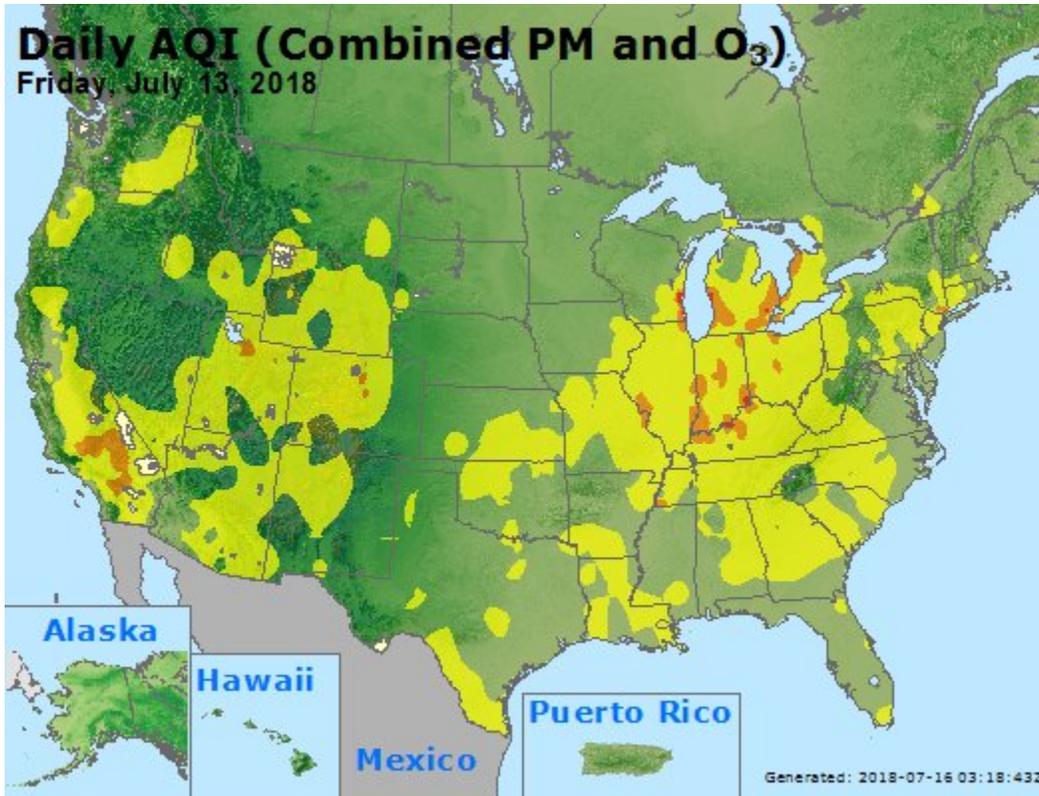


Figure 5. Ozone Air Quality Index for the United States on July 13, 2018



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.