Ozone National Ambient Air Quality Standard Health Exceedances on July 13, 2018

Exceedance Locations and Levels

On Friday, July 13, 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 13, 2018

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	42
Bayonne	60
Brigantine	33
Camden Spruce St	48
Chester	57
Clarksboro	46
Colliers Mills	49
Columbia	60
Flemington	61
Leonia	66
Millville	38
Monmouth University	37
Newark Firehouse	58
Ramapo	63
Rider University	59
Rutgers University	59
Washington Crossing*	64
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 13, 2018

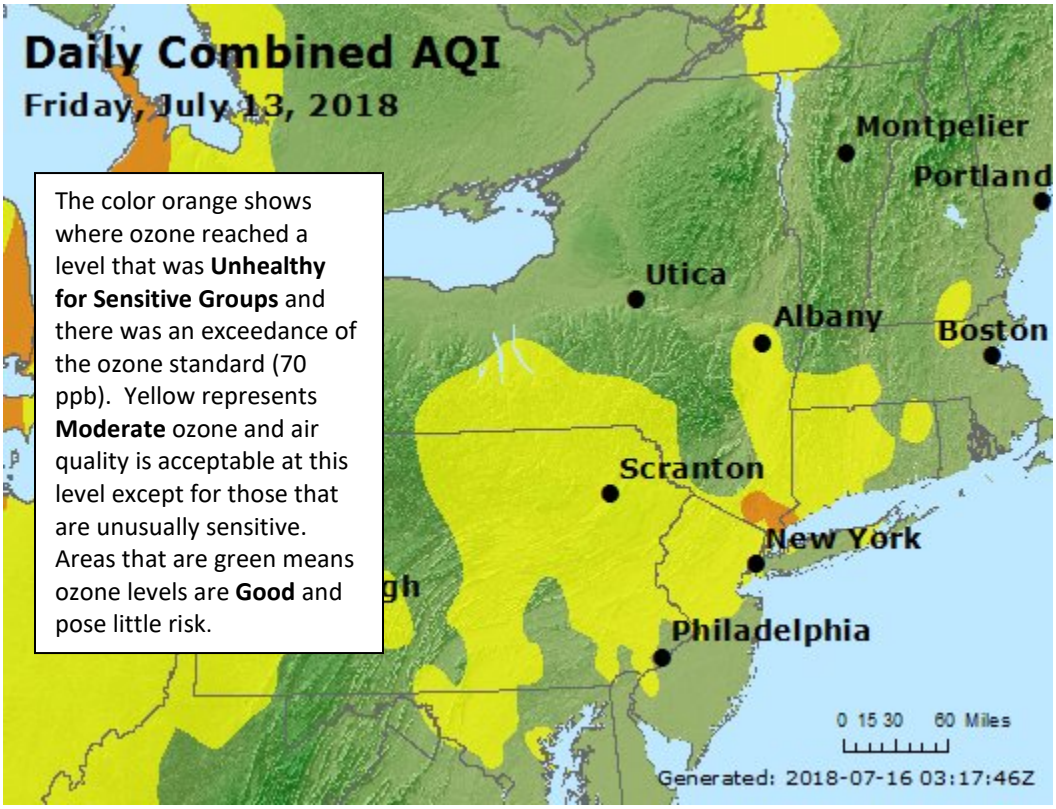
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	62
CT	Greenwich	72
CT	Madison-Beach Road	49
CT	Middletown-CVH-Shed	58
CT	New Haven	61
CT	Stratford	65
CT	Westport	64
DE	BCSP (New Castle Co.)	51
DE	BELLFNT2 (New Castle Co.)	51
DE	KILLENS (Kent Co.)	45
DE	LEWES (Sussex Co.)	36
DE	LUMS 2 (New Castle Co.)	47
DE	MLK (New Castle Co.)	52
DE	SEAFORD (Sussex Co.)	44
MD	Fair Hill	51
NY	Babylon	46
NY	Bronx - IS52	54
NY	CCNY	55
NY	Holtsville	49
NY	Pfizer Lab	59
NY	Queens	47
NY	Riverhead	55
NY	Rockland Cty	72
NY	White Plains	71
NY	Susan Wagner	No Data
PA	BRIS (Bucks Co.)	53
PA	CHES (Delaware Co.)	54
PA	NEWG (Chester Co.)	56
PA	NORR (Montgomery Co.)	63
PA	LAB (Philadelphia Co.)	50
PA	NEA (Philadelphia Co.)	52
PA	NEW (Philadelphia Co.)	52
	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 13, 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 13, 2018 NAAQS = 70 ppb
Connecticut	12
Delaware	8
Maryland	6
New Jersey	14
New York	13
Pennsylvania	11

Figure 1. Ozone Air Quality Index for July 13, 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

A broad, surface high pressure system was over the northeastern United States on Friday, July 13th, as a stationary front lingered off the eastern seaboard. This high pressure system was centered overhead in the morning hours before shifting east, off shore, later in the day. Given the broad nature of this high, a surface trough developed in the morning hours and extended from the Hudson Valley west-southwest into Pennsylvania. The combination of these weather features lead to increased sunshine in the lower Hudson Valley and caused temperatures to reach the upper 80s. Surface winds were calm in the morning and then became more southerly in the afternoon and evening. All these conditions are commonly seen with ozone exceedances.

In addition to the above, an upper level trough was noted over the northeastern United States, steering upper-level air from the northwest direction. As this is typically a clean air wind pattern, it is likely this strong upper level flow from the northwest kept exceedances from becoming more widespread on this 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 13, 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	72
NY	Rockland Cty	72
NY	White Plains	71

Surface level trajectories (Figure 2) originated over Massachusetts and the Atlantic Ocean and traveled southwestward through Long Island and The Sound. Trajectories at the surface made a turn southward traveling further away from the Long Island coast. Air at the surface then made a slight recirculation over the water and turned northward to travel back over Long Island and through the greater NYC metropolitan area picking up emissions from cars, trucks, and industry before reaching their endpoints. Trajectories at the surface remained at the surface for the duration of their path. Trajectories at the mid-level (Figure 3) originated in Vermont and just off the coast of Massachusetts and traveled southwest before being looped up into the circulation of high pressure causing air to recirculate aloft. Air circulated around Central New Jersey, Philadelphia, and New York City before reaching its destinations. Upper air trajectories originated in Canada and traveled southward through upstate New York, and the New York City metropolitan area before reaching their destinations in New York and Connecticut. Air at the upper levels originated at higher levels of the atmosphere and was brought

down to 1500m at the endpoints. Figure 5 shows the national ozone concentrations observed the previous day on July 12, 2018.

Figure 2. 48-hour Back Trajectories for July 13, 2018 at 10 meters

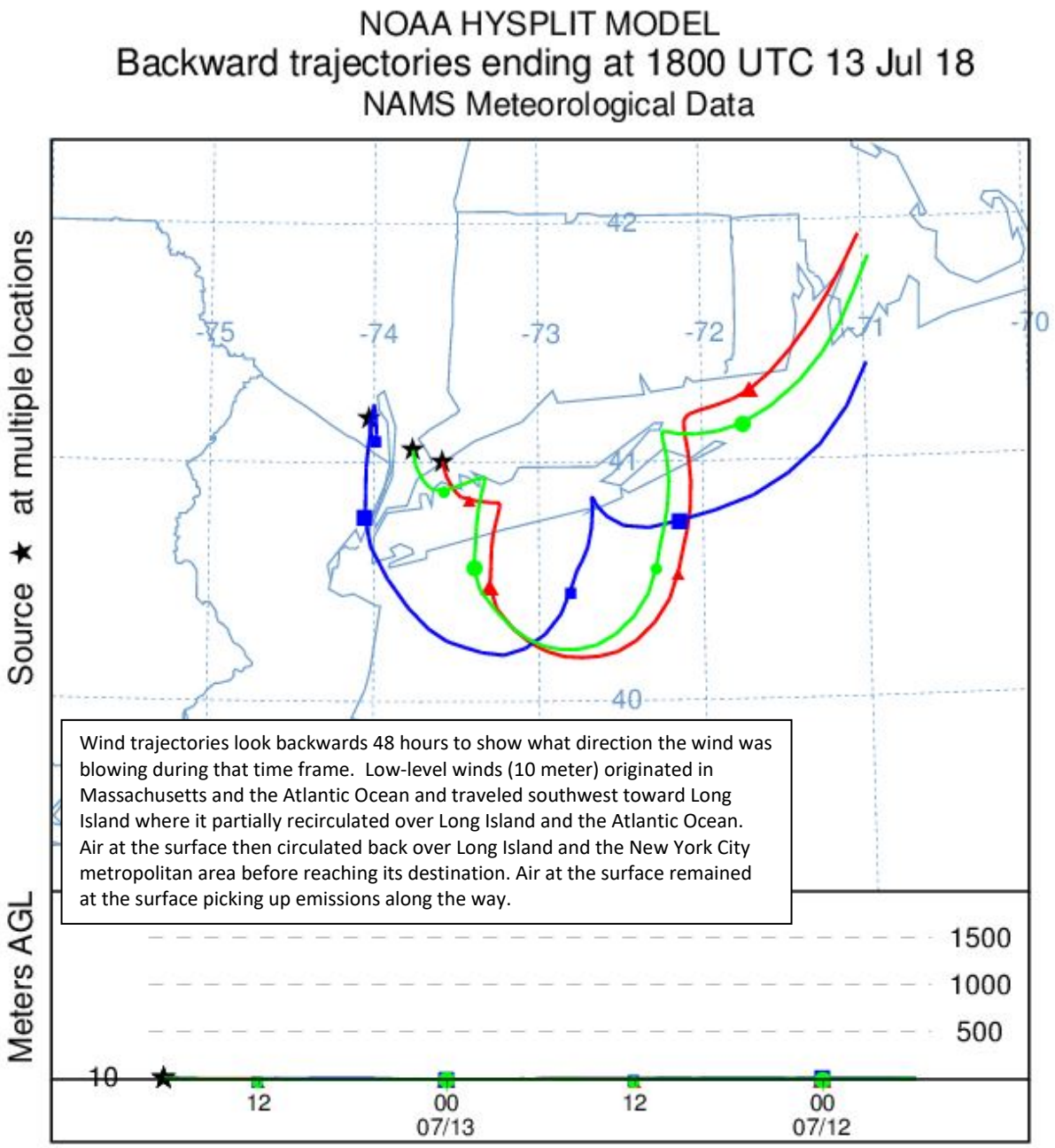


Figure 3. 48-hour Back Trajectories for July 13, 2018 at 500 meters

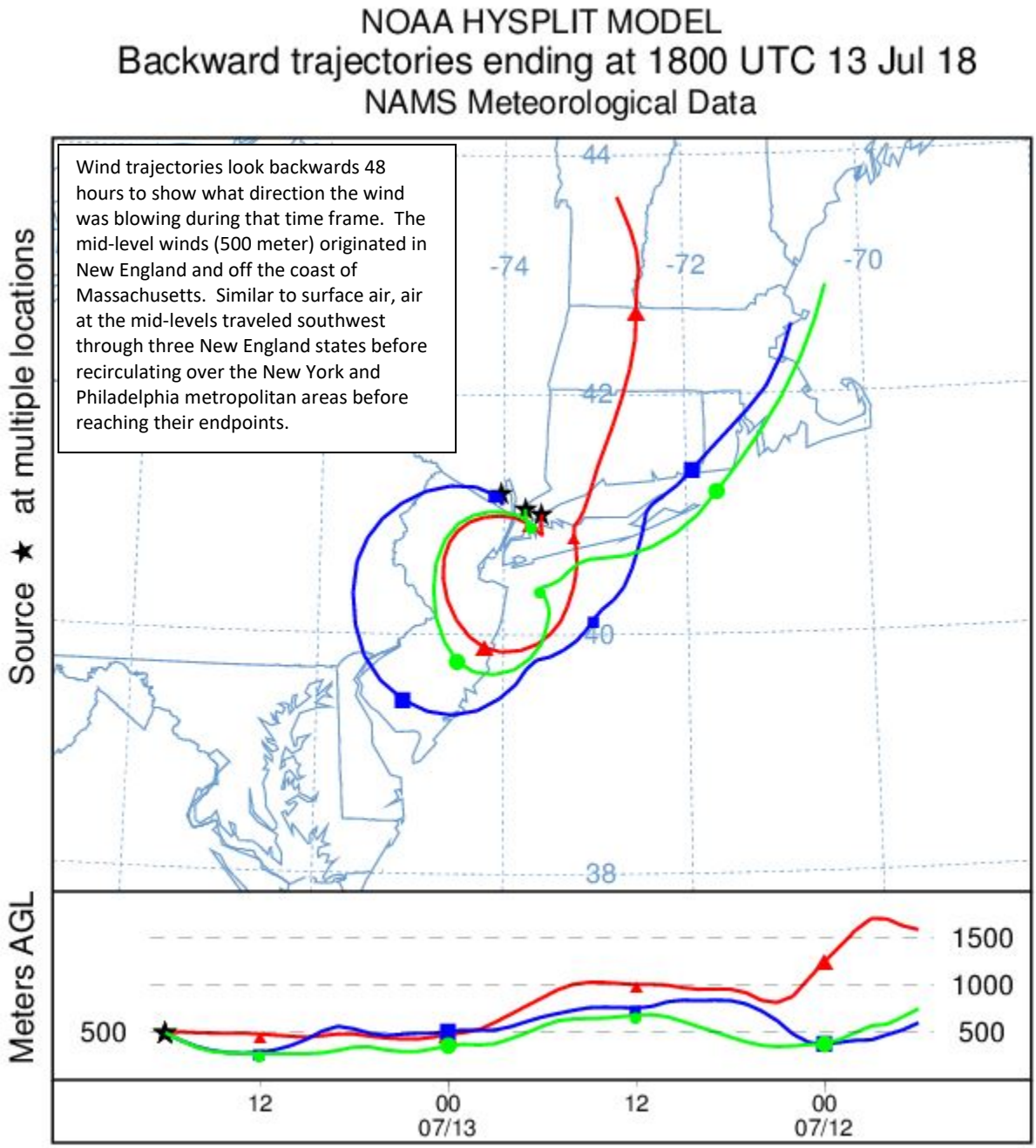


Figure 4. 48-hour Back Trajectories for July 13, 2018 at 1500 meters

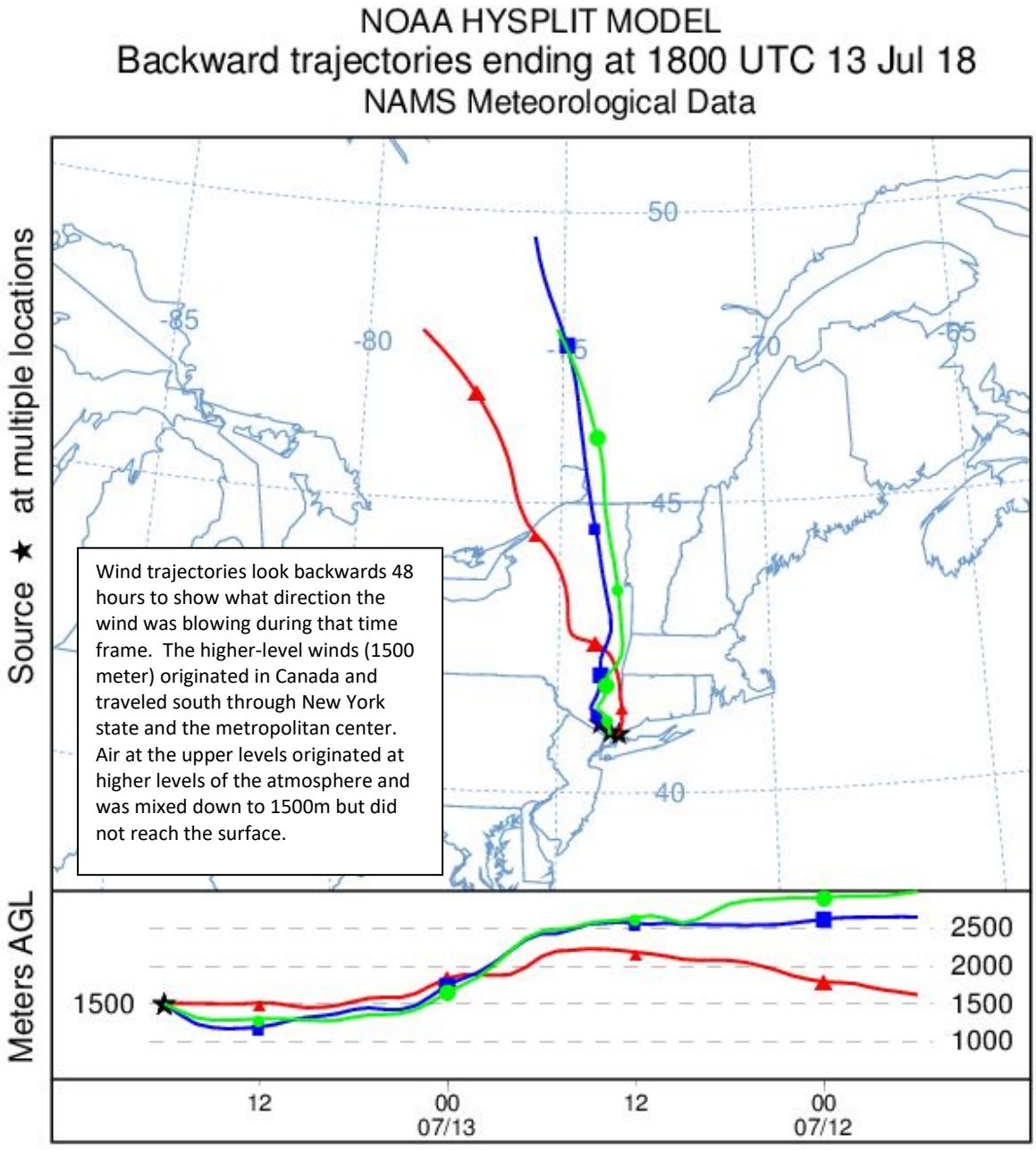
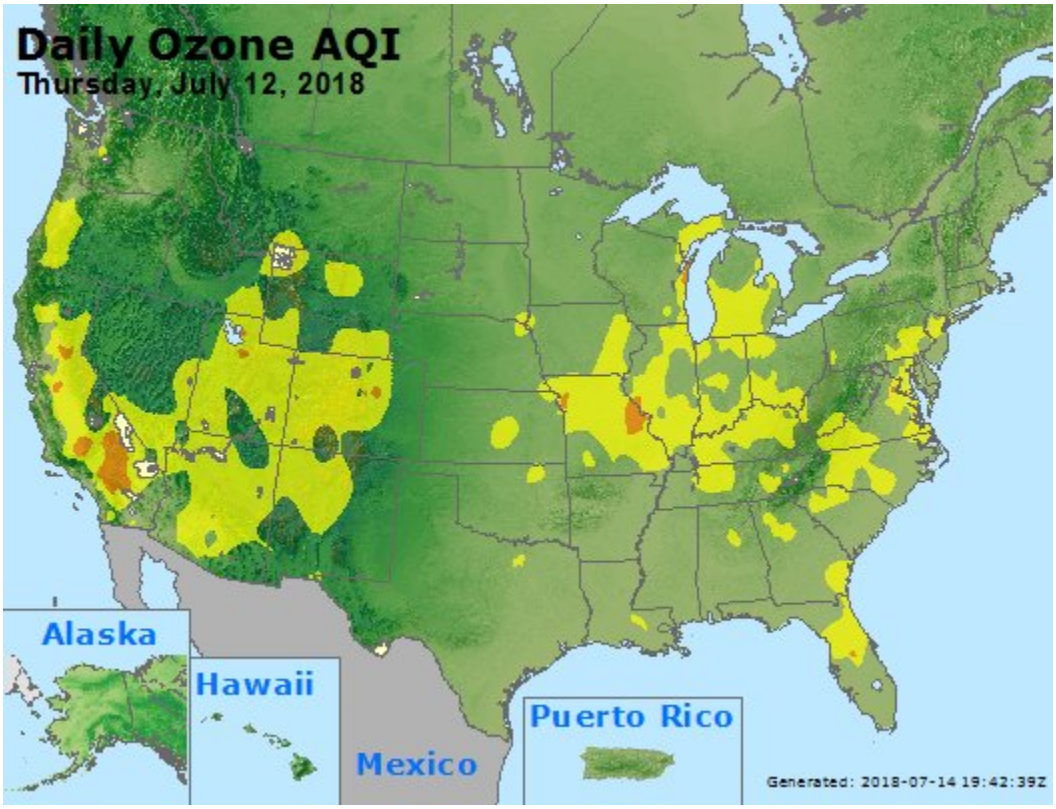


Figure 5. Ozone Air Quality Index for the United States on July 12, 2018



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 (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.