

Ozone National Ambient Air Quality Standard Health Exceedances on August 17, 2018

Exceedance Locations and Levels

On Friday, August 17, 2018, there were no 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 August 17, 2018

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	51
Bayonne	57
Brigantine	47
Camden Spruce St	47
Chester	52
Clarksboro	50
Colliers Mills	47
Columbia	40
Flemington	65
Leonia	65
Millville	51
Monmouth University	48
Newark Firehouse	55
Ramapo	52
Rider University	53
Rutgers University	57
Washington Crossing*	No Data
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 was one (1) exceedance 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 August 17, 2018

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	69
CT	Greenwich	65

CT	Madison-Beach Road	68
CT	Middletown-CVH-Shed	64
CT	New Haven	62
CT	Stratford	70
CT	Westport	66
DE	BCSP (New Castle Co.)	44
DE	BELLFNT2 (New Castle Co.)	47
DE	KILLENS (Kent Co.)	44
DE	LEWES (Sussex Co.)	49
DE	LUMS 2 (New Castle Co.)	50
DE	MLK (New Castle Co.)	51
DE	SEAFORD (Sussex Co.)	48
MD	Fair Hill	53
NY	Babylon	52
NY	Bronx - IS52	53
NY	CCNY	71
NY	Holtsville	54
NY	Pfizer Lab	59
NY	Queens	56
NY	Riverhead	59
NY	Rockland Cty	61
NY	White Plains	65
NY	Fresh Kills	52
PA	BRIS (Bucks Co.)	No Data
PA	CHES (Delaware Co.)	51
PA	NEWG (Chester Co.)	48
PA	NORR (Montgomery Co.)	53
PA	LAB (Philadelphia Co.)	No Data
PA	NEA (Philadelphia Co.)	55
PA	NEW (Philadelphia Co.)	53
	TOTAL EXCEEDANCES	1

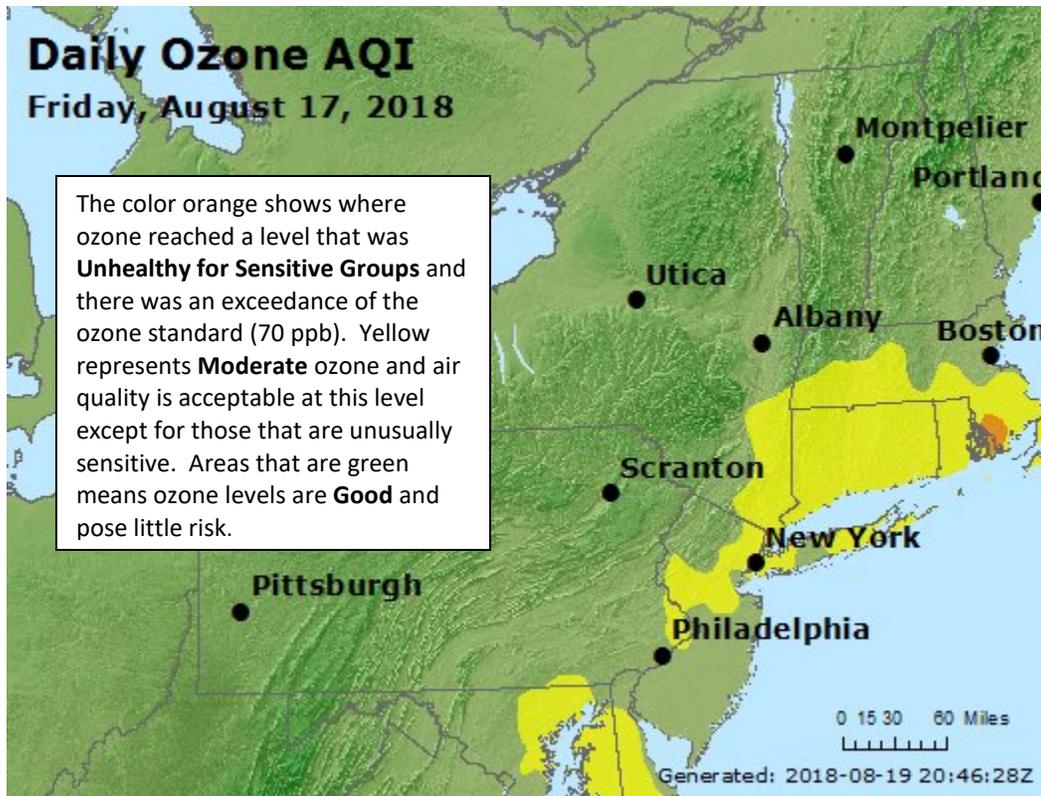
The number of days in 2018 on which exceedances of the ozone NAAQS were recorded for all the states is summarized in Table 3.

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 – August 17, 2018 NAAQS = 70 ppb
Connecticut	19

Delaware	8
Maryland	6
New Jersey	19
New York	18
Pennsylvania	14

Figure 1. Ozone Air Quality Index for August 17, 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

Light southwesterly surface winds and localized transport enhanced an already polluted air mass as it traveled northeastward through the nonattainment area. In addition, favorable ozone conditions observed around the New York City area in combination with the presence of wildfire smoke allowed for ozone levels to rise in isolated locations on Friday, August 17th.

High pressure persisted across the Mid-Atlantic throughout the day on Friday, August 17th before it slowly began to slide eastward providing light southwesterly surface winds and warm temperatures. The light southwesterly winds promoted localized transport from the Chesapeake Bay where moderate

air quality was observed the day prior. A stalled frontal boundary was tracking eastward the previous day and remained draped over the Ohio Valley while the center of low pressure passed to the north of our region leading to showers and thunderstorms throughout New England. Meanwhile, ahead of the front, the surface trough observed the previous day had strengthened, fueling clouds and afternoon showers and thunderstorms in scattered locations which helped to limit ozone production across New Jersey. While many locations throughout the nonattainment area saw mostly to partly cloudy skies, locations toward the northern portion of the nonattainment area saw less cloudiness and calm winds.

In addition to the weather conditions mentioned above, wildfire smoke transported into the region from the Californian wildfires may have contributed to the observed ozone exceedance in New York. The plume of wildfire smoke was observed over the nonattainment area the previous day and migrated northward over New York City, and New England on the 17th. This is consistent with the exceedance location in New York. The NJDEP’s Division of Air Quality will continue to evaluate the potential effects this smoke plume may have on the air quality within the state.

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 on August 17, 2018. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. One (1) monitoring station with an 8-hr ozone exceedance was used to run back trajectories. The selected site and the maximum 8-hr ozone level recorded is listed in Table 4 below:

Table 4. Monitoring Station with an 8-hr Ozone Exceedance that Was Selected to Run 48-hr Back Trajectories

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
NY	CCNY	71

Back trajectories for August 17th show localized transport from the Chesapeake Bay and industrialized areas of Pennsylvania. These locations recorded moderate ozone one and two days prior to the exceedance in New York. In the days leading up to this exceedance, air from these regions was transported into the nonattainment area where it was exacerbated under the presence of high pressure, and smoke from Californian wildfires.

Surface level back trajectories (Figure 2) originated over the Chesapeake Bay where moderate ozone levels were recorded the previous day. Air at the surface traveled slowly northeastward through Delaware and New Jersey before reaching Long Island. Air at the surface remained at the surface for the duration of its path picking up emissions from cars, trucks, and industry along the way. Mid-level back trajectories (Figure 3) followed a similar transport pathway. Originating in Virginia, air at the mid-levels traveled through Maryland, the Chesapeake Bay and the metropolitan area of Wilmington, Delaware. This air then traveled up the I-95 corridor picking up emissions from cars and trucks along the way as it entered New York City. In addition, air at the mid-levels, which may have been carrying the abovementioned wildfire smoke, originated at an elevation of 2000m and descended to 500m under the

presence of high pressure. Air at the upper-levels (Figure 4) originated in Ohio and traveled eastward through industrialized areas of Pennsylvania including the city of Lancaster. Upper level back trajectories then turned northeastward and traveled across New Jersey and into New York City where it reached its endpoint.

Figure 5 shows the national ozone concentrations observed on August 16th, the day prior to the exceedance. As shown in the figure, Pennsylvania and the Chesapeake Bay observed moderate air quality on August 16th. The trajectories suggest that air from these regions was transported into the nonattainment area where the combination of favorable weather conditions and the presence of wildfire smoke enhanced ozone levels at the exceedance monitor.

Figure 2. 48-hour Back Trajectories for August 17, 2018 at 10 meters

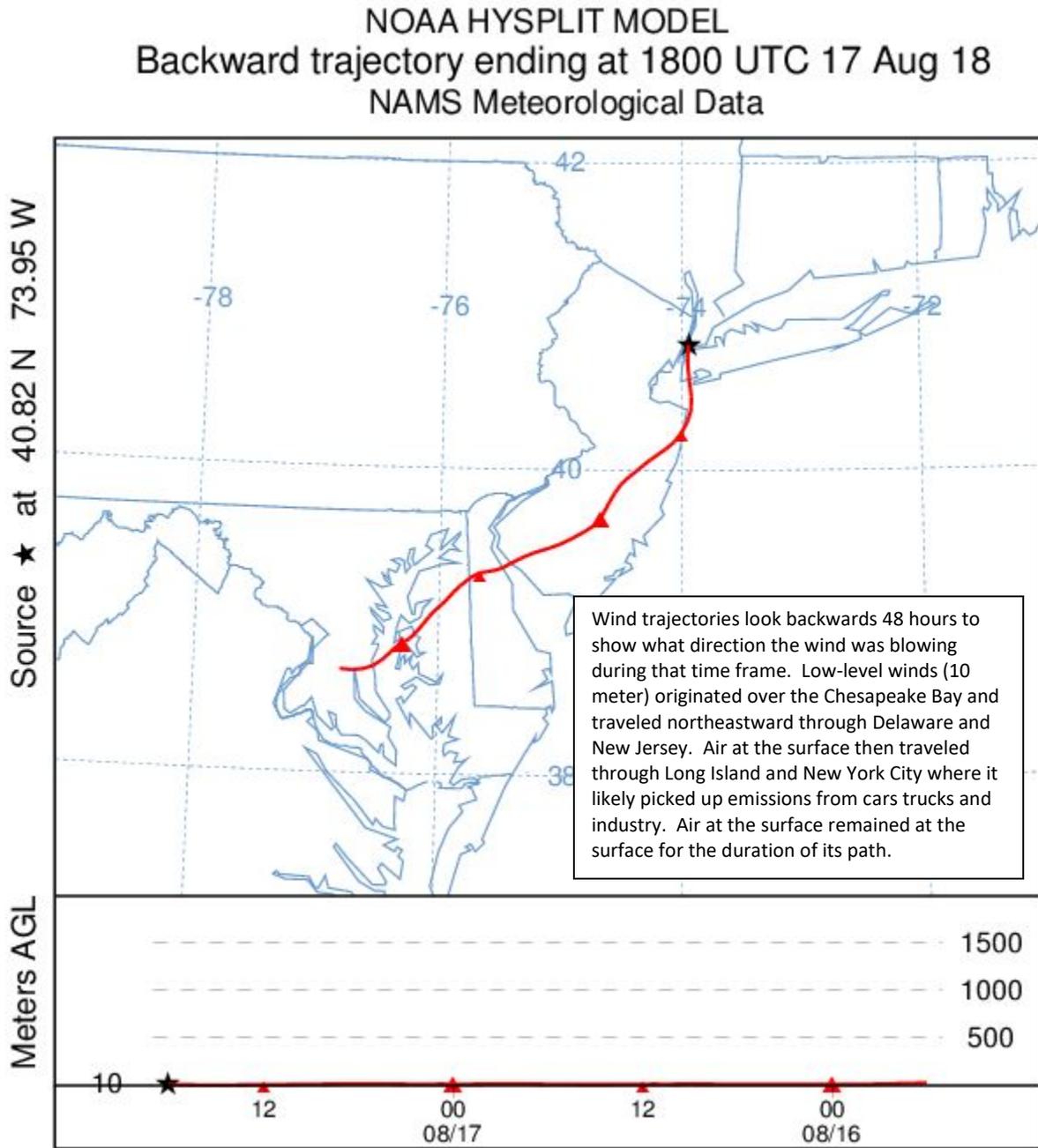


Figure 3. 48-hour Back Trajectories for August 17, 2018 at 500 meters

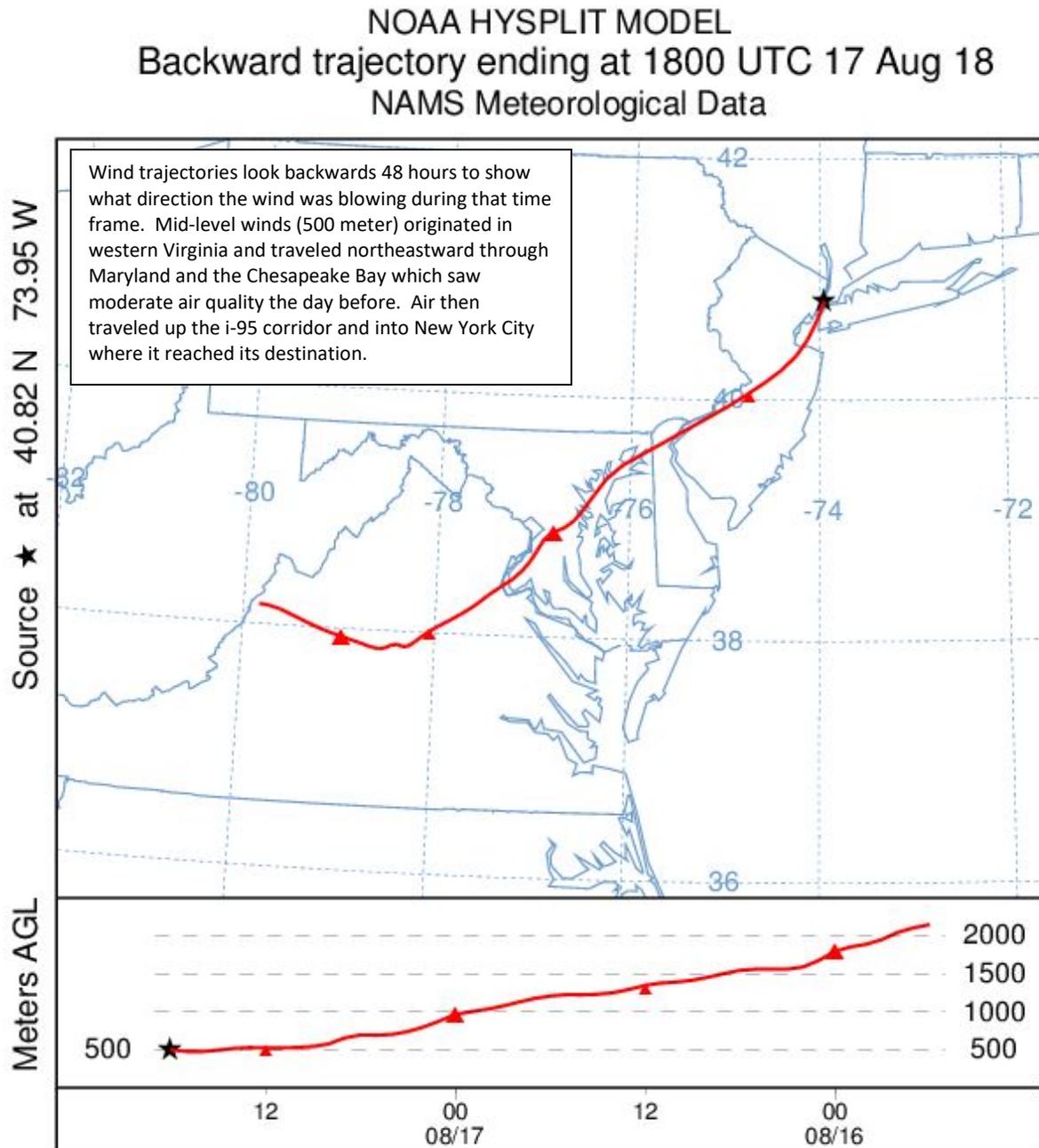


Figure 4. 48-hour Back Trajectories for August 17, 2018 at 1500 meters

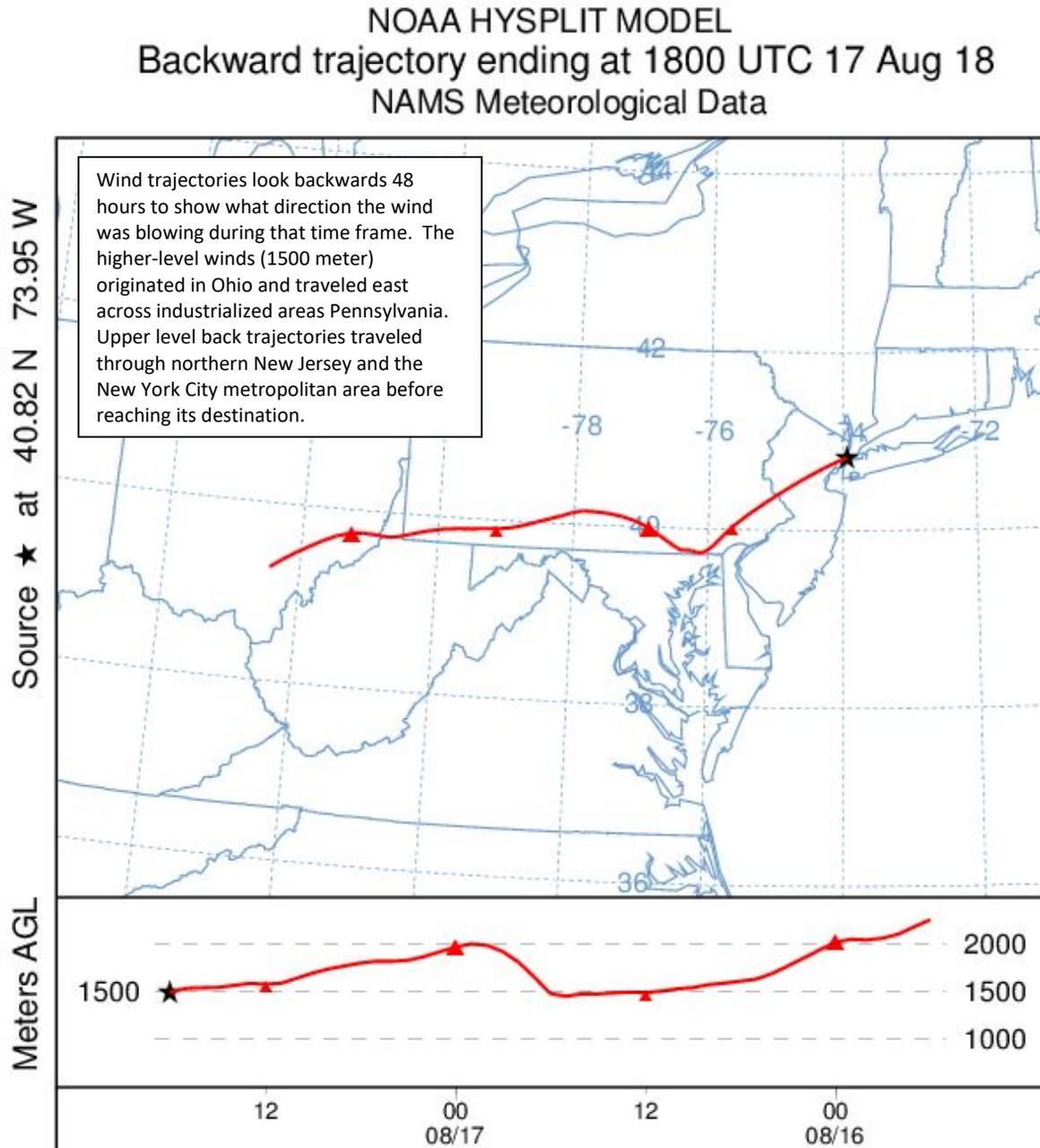
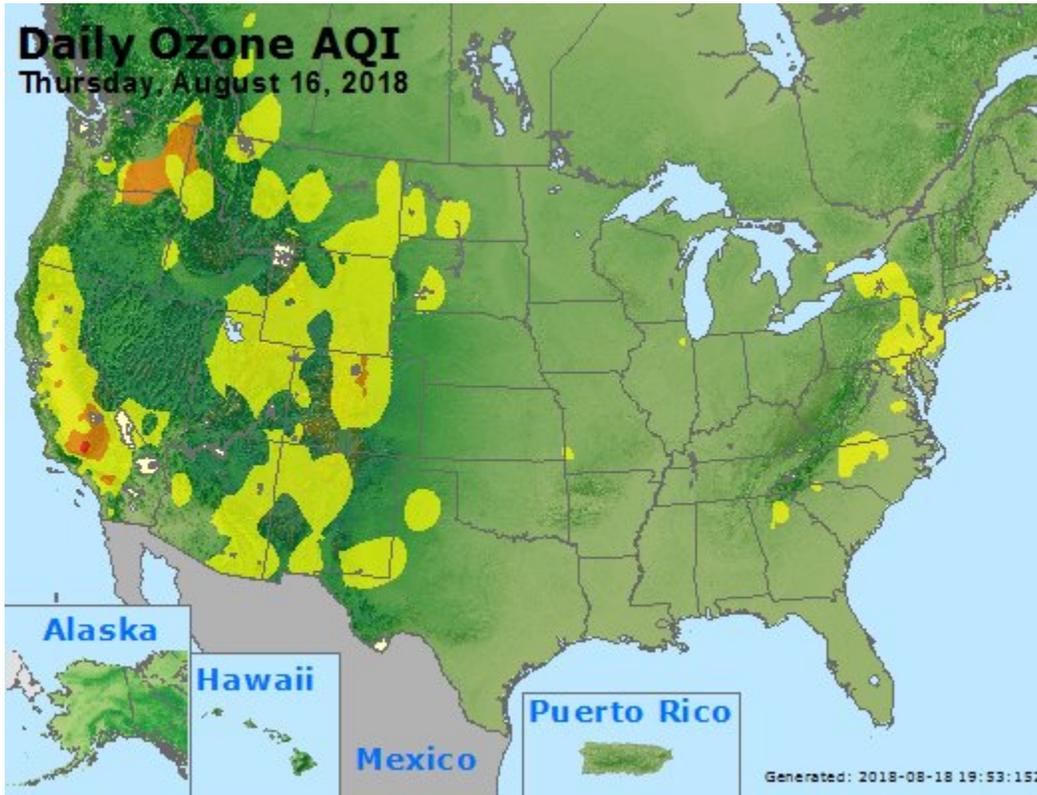


Figure 5. Ozone Air Quality Index for the United States on August 16, 2018



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.