Ozone National Ambient Air Quality Standard Health Exceedances on June 21, 2018

Exceedance Locations and Levels

On Thursday, June 21, 2018, there was one (1) exceedance 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 June 21, 2018

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	56
Bayonne	64
Brigantine	52
Camden Spruce St	55
Chester	38
Clarksboro	61
Colliers Mills	71
Columbia	32
Flemington	51
Leonia	48
Millville	46
Monmouth University	68
Newark Firehouse	54
Ramapo	41
Rider University	52
Rutgers University	55
Washington Crossing*	No Data
TOTAL EXCEEDANCES	1

*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 no 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 June 21, 2018

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	37
CT	Greenwich	63

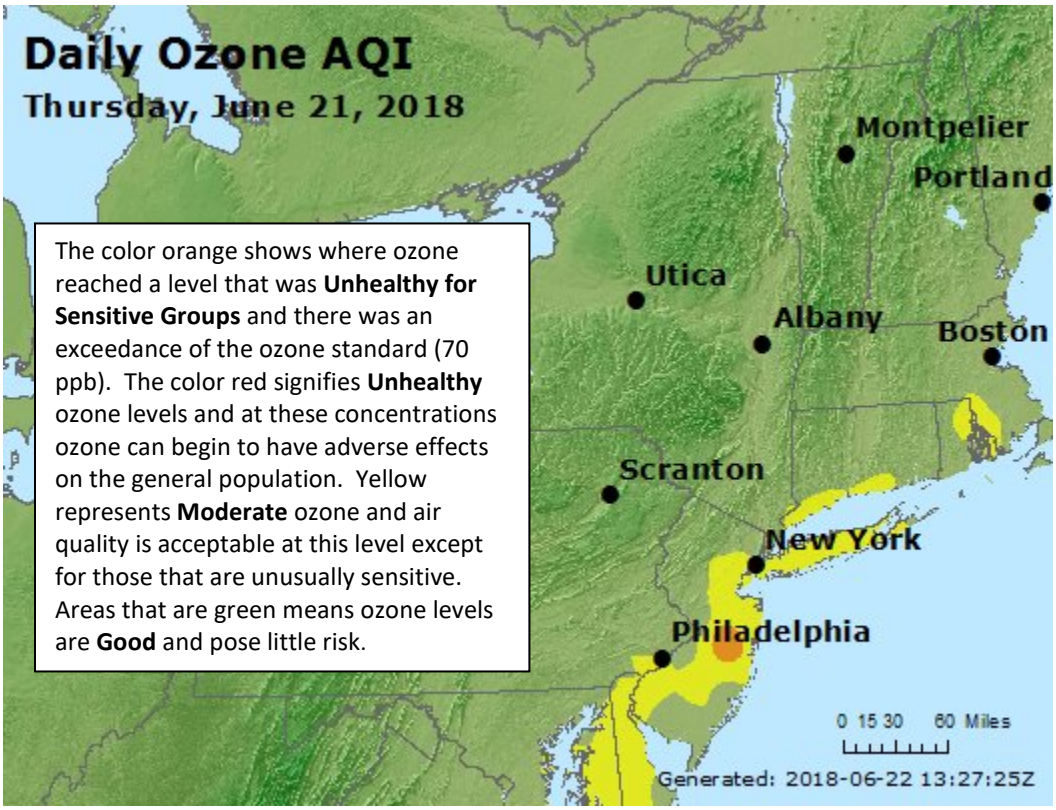
CT	Madison-Beach Road	60
CT	Middletown-CVH-Shed	46
CT	New Haven	54
CT	Stratford	No Data
CT	Westport	63
DE	BCSP (New Castle Co.)	53
DE	BELLFNT2 (New Castle Co.)	54
DE	KILLENS (Kent Co.)	58
DE	LEWES (Sussex Co.)	52
DE	LUMS 2 (New Castle Co.)	58
DE	MLK (New Castle Co.)	57
DE	SEAFORD (Sussex Co.)	57
MD	Fair Hill	50
NY	Babylon	59
NY	Bronx - IS52	48
NY	CCNY	46
NY	Holtsville	57
NY	Pfizer Lab	43
NY	Queens	65
NY	Riverhead	57
NY	Rockland Cty	40
NY	White Plains	42
NY	Susan Wagner	No Data
PA	BRIS (Bucks Co.)	No Data
PA	CHES (Delaware Co.)	57
PA	NEWG (Chester Co.)	53
PA	NORR (Montgomery Co.)	48
PA	LAB (Philadelphia Co.)	48
PA	NEA (Philadelphia Co.)	52
PA	NEW (Philadelphia Co.)	50
	TOTAL EXCEEDANCES	0

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 region's ozone concentrations on June 21, 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 – June 21, 2018 NAAQS = 70 ppb
Connecticut	6
Delaware	3
Maryland	3
New Jersey	8
New York	7
Pennsylvania	5

Figure 1. Ozone Air Quality Index for June 21, 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 stalled frontal boundary remained draped over the Mid-Atlantic region for a second day. A wave of low pressure pushed west to east along this boundary early on June 21st, providing scattered shower activity to much of New Jersey. As this disturbance pushed off-shore mid-morning, gradual clearing occurred throughout our nonattainment area as high pressure attempted to build into the region. Northeastern portions of New Jersey saw sunshine return early in the afternoon while central and southern portions of the state saw clearing in the evening hours. The presence of sunshine, allowed temperatures in northern portions of New Jersey to reach the mid to upper 80s. Meanwhile, winds tended from the northerly direction for much of the day before becoming light and more variable in the afternoon/evening hours.

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 June 21, 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 Stations with 8-hr Ozone Exceedances that Were Selected to Run 48-hr Back Trajectories

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
NJ	Colliers Mills	71

Surface level back trajectories (Figure 2) originated in eastern New York State and traveled southeastward through western Connecticut before a turn southwest over Long Island early on June 20th. Air then recirculated over the Northern New Jersey/New York City metropolitan area in the evening hours as it was influenced by a period of light and variable winds. As seen in Figure 5 below, moderate and isolated USG ozone levels were noted in this vicinity during this time. After recirculation, air traveled south-southwestward to its destination in central New Jersey. Air remained at the surface for much of its path picking up emissions from cars, trucks, and industry along the way. Meanwhile, mid-level back trajectories (Figure 3) originated in western New York. Air traveled southeastward into Pennsylvania before a turn east early on the 20th. Air traveled through Pennsylvania toward the Hudson Valley region before making a sharp turn south to its end point. For the most part, air remained in the mid-levels however, some vertical motion was noted in the evening/overnight hours on June 20th-21st due to the presence of a surface tough lingering along the east coast. Finally, upper level back trajectories (Figure 4) originated in western Pennsylvania near the surface. As this air traveled east through Pennsylvania and northwestern New Jersey, it was noted to ascend to the upper levels of the atmosphere through arrival.

Figure 2. 48-hour Back Trajectories for June 21, 2018 at 10 meters

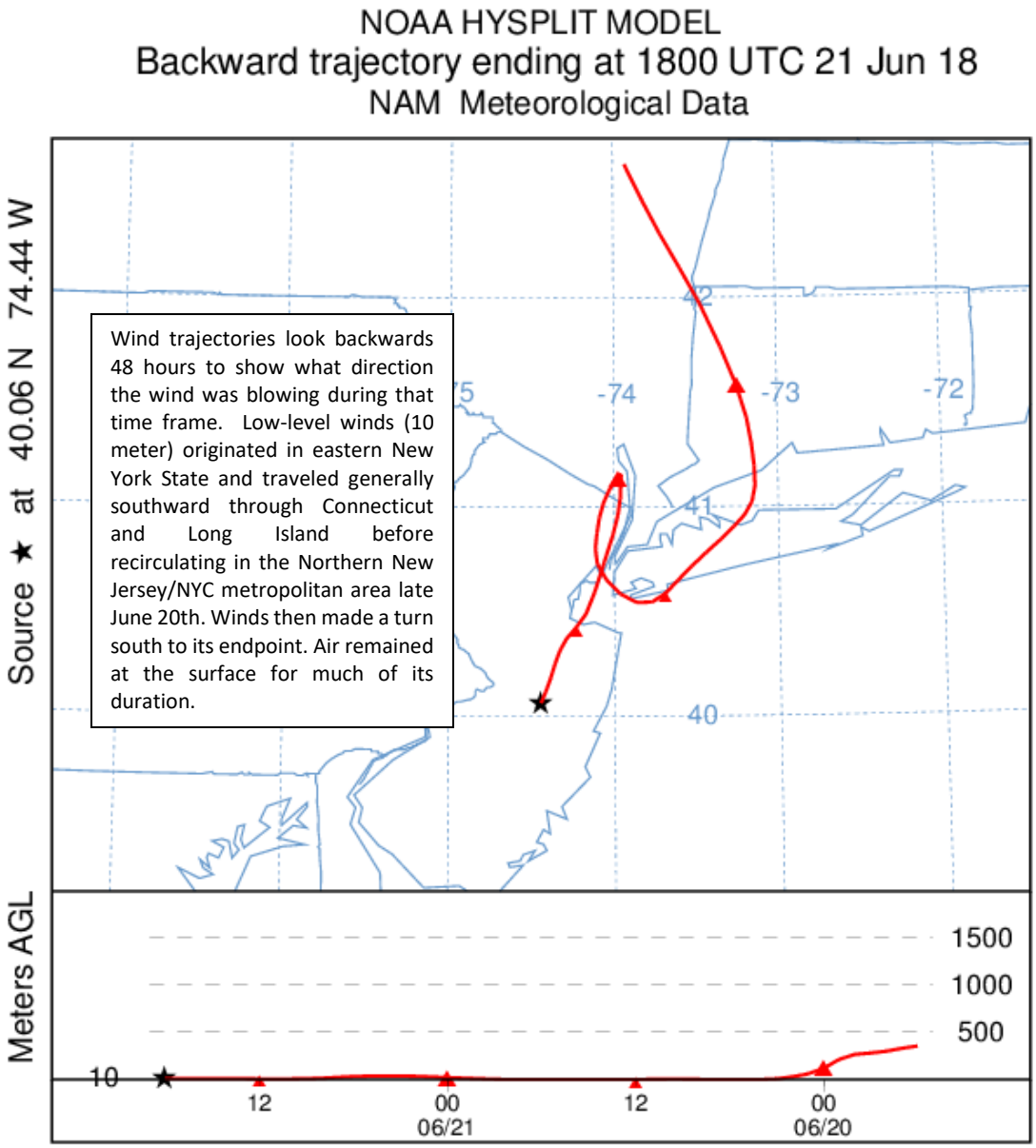


Figure 3. 48-hour Back Trajectories for June 21, 2018 at 500 meters

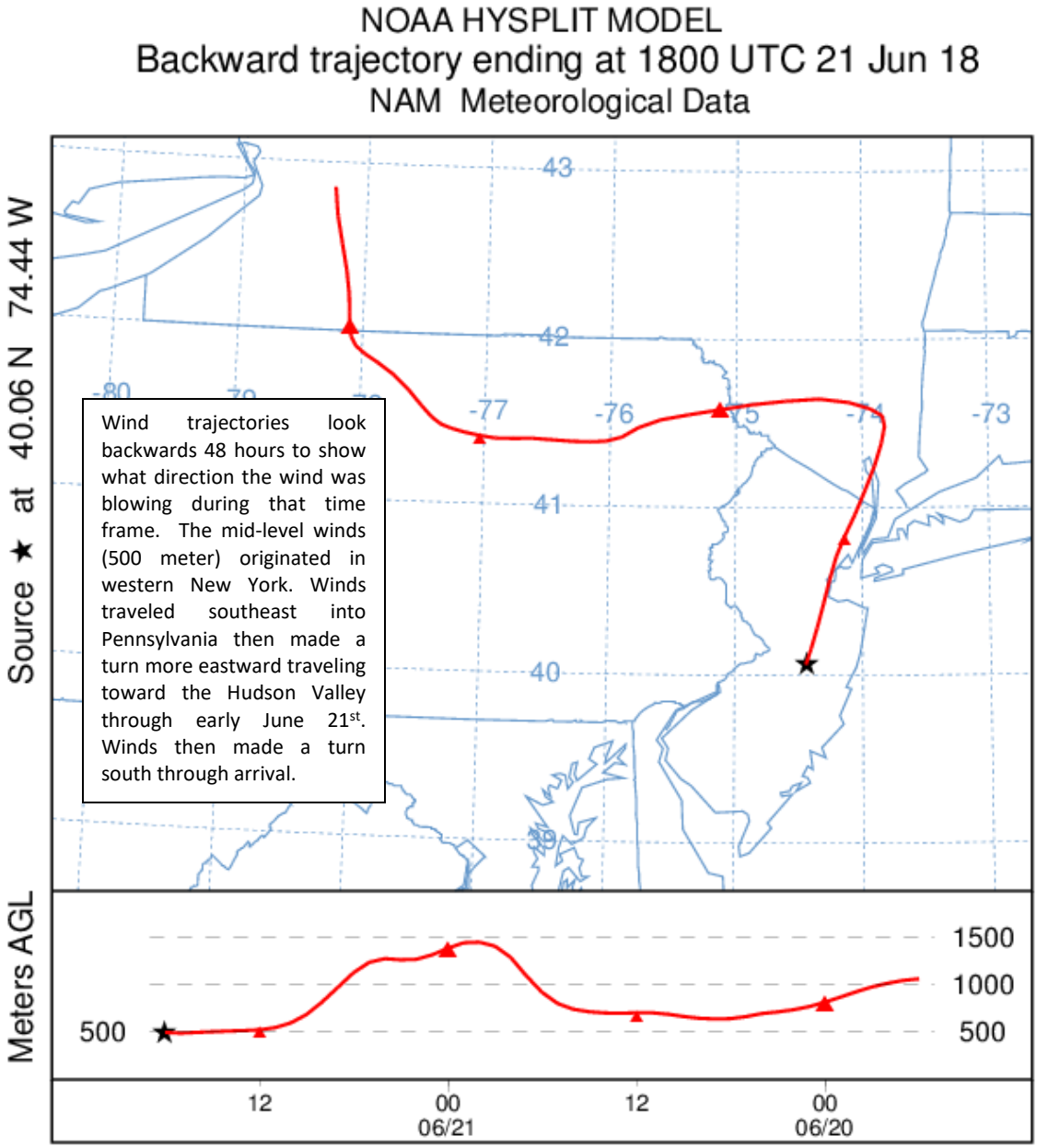


Figure 4. 48-hour Back Trajectories for June 21, 2018 at 1500 meters

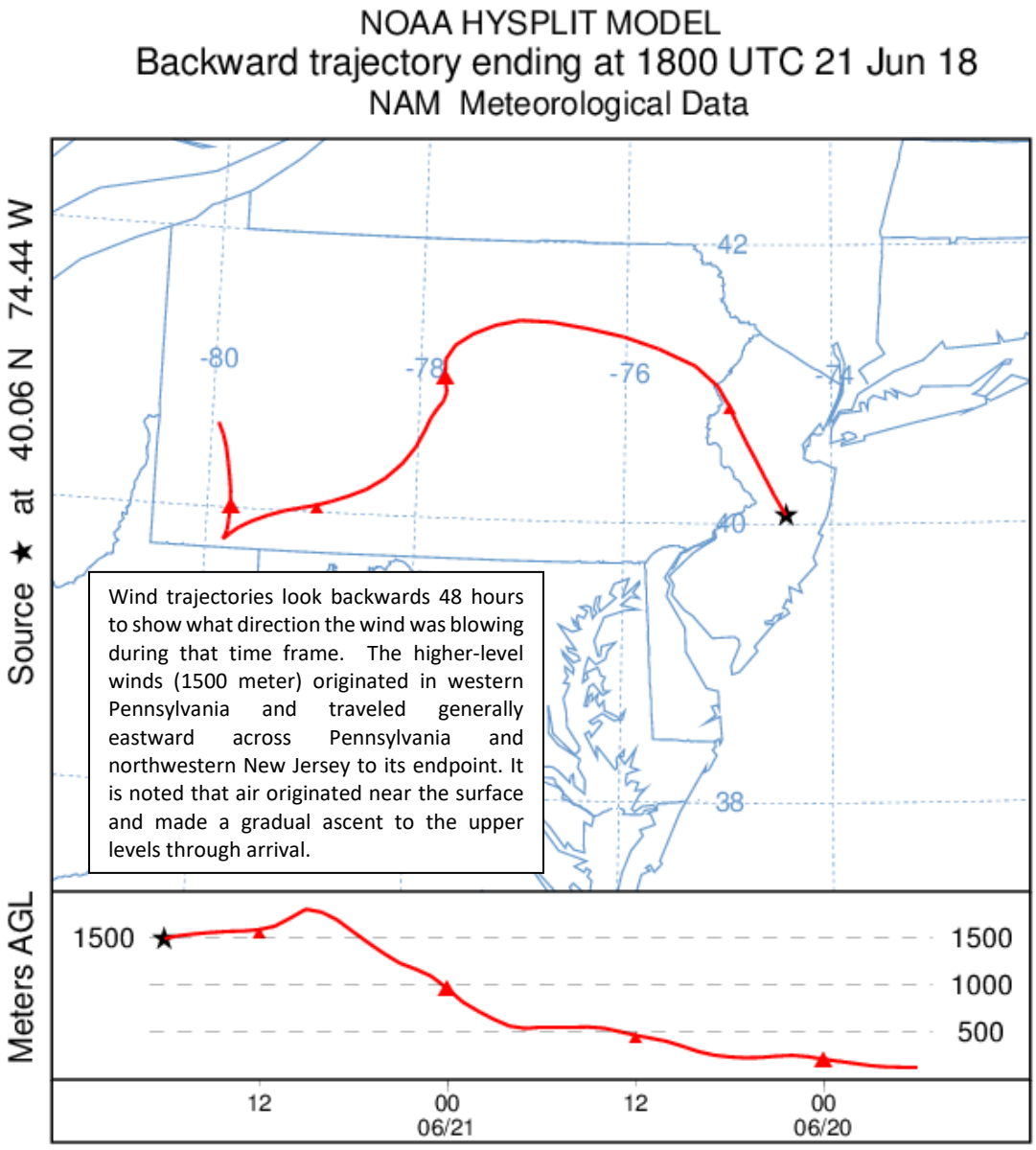


Figure 5. Ozone Air Quality Index for the Northeastern United States on June 20, 2018

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.