

Ozone National Ambient Air Quality Standard Health Exceedances on May 3, 2018

Exceedance Locations and Levels

On Thursday, May 3, 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. Maximum 8-Hour Average Ozone Concentrations in New Jersey on May 3, 2018

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	59
Bayonne	61
Brigantine	61
Camden Spruce St	64
Chester	61
Clarksboro	63
Colliers Mills	62
Columbia	60
Flemington	63
Leonia	63
Millville	57
Monmouth University	53
Newark Firehouse	59
Ramapo	61
Rider University	68
Rutgers University	68
Washington Crossing*	66
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: Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey’s Ozone Non-Attainment Areas on 5/3/2018

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	66
CT	Greenwich	68
CT	Madison-Beach Road	64

Preliminary Evaluation – May 3, 2018

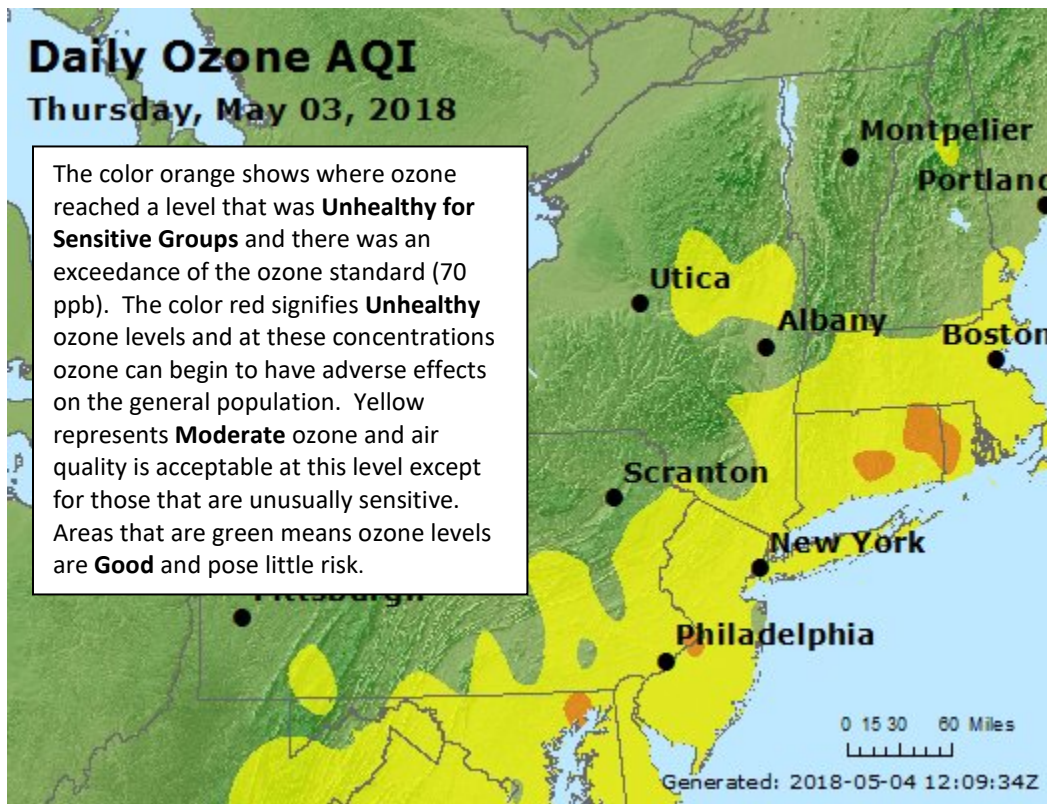
CT	Middletown	No Data
CT	New Haven	59
CT	Stratford	67
CT	Westport	70
DE	BCSP (New Castle Co.)	62
DE	BELLFNT2 (New Castle Co.)	66
DE	KILLENS (Kent Co.)	62
DE	LEWES (Sussex Co.)	62
DE	LUMS 2 (New Castle Co.)	65
DE	MLK (New Castle Co.)	65
DE	SEAFORD (Sussex Co.)	62
MD	Fair Hill	70
NY	Babylon	63
NY	CCNY	61
NY	Holtsville	62
NY	IS52	58
NY	Pfizer Lab	60
NY	Queens	No Data
NY	Riverhead	64
NY	Rockland Cty	60
NY	Susan Wagner	No Data
NY	White Plains	64
PA	BRIS (Bucks Co.)	72
PA	CHES (Delaware Co.)	56
PA	NEWG (Chester Co.)	58
PA	NORR (Montgomery Co.)	69
PA	LAB (Philadelphia Co.)	62
PA	NEA (Philadelphia Co.)	69
PA	NEW (Philadelphia Co.)	65
	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. Figure 1 shows graphically the region’s ozone concentrations on May 3, 2018.

Table 3: Number of Ozone Exceedances by State

STATE	# of Days NAAQS was Exceeded January 1 – May 3, 2018 NAAQS = 70 ppb
Connecticut	1
Delaware	2
Maryland	2
New Jersey	2
New York	1
Pennsylvania	2

Figure 1. Ozone Air Quality Index for May 3, 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

An area of high pressure was anchored off the coast of the Southeastern United States on May 3rd and continued to dominate the weather pattern in the Mid-Atlantic for a third day resulting in a multi-day ozone event. Temperatures reached the low 90s in eastern Pennsylvania where the exceedance was recorded. A surface trough developed in the later afternoon hours on May 3rd that stretched from New York to North Carolina and crossed through eastern Pennsylvania. This surface trough provided a mechanism for polluted air aloft to mix down to the surface.

In the days preceding May 3rd, the northeast saw widespread levels of moderate and scattered locations of unhealthy for sensitive groups air quality. Moderate air quality lingered in the northeast for the final day of the three-day event. Locations downwind of Bristol, also experienced sunny conditions for much of the day. Surface transport from the southwest likely provided opportunity for ozone concentrations to migrate and increase northeastward.

This exceedance being exclusive to Bristol is likely due to the increasing humidity and cloud cover associated with the line of showers that passed through Northern New Jersey, portions of New York and Connecticut in the late afternoon on May 3rd. Locations closer to the coast had the benefit of a maritime influence and experienced a wind shift to the south in the early evening, which typically provides cleaner air to the coastal monitors. In addition, the wind direction at the Bristol monitor remained breezy from the southwest later into the evening than the monitors in New Jersey allowing locally generated emissions from cars, trucks, and industry to be transported northeastward.

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 May 3rd, 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)
PA	BRIS	72

The surface level back trajectory (Figure 2) associated with the May 3rd exceedance originated in the Mid-Atlantic, along the Virginia and North Carolina boarder. Air traveled north-northeast through the Chesapeake Bay region and the metropolitan areas of Wilmington and Philadelphia before arriving to its endpoint. Air remained at the surface for the entire duration of its path collecting emissions from cars, trucks, and industry along the way. Meanwhile, mid- and upper-level back trajectories (Figures 3 & 4), followed very similar paths. Originating in the lower Mississippi River Valley, air traveled through Tennessee, Kentucky, the Ohio River Valley, and along the Maryland/Pennsylvania boarder through

arrival. This air followed the periphery of the abovementioned high-pressure system and was vertically mixed due to the sinking motion associated with this system. Figure 5 shows the ozone air quality index values recorded on May 2nd.

Figure 2. 48-hour Back Trajectories for May 3, 2018 at 10 meters

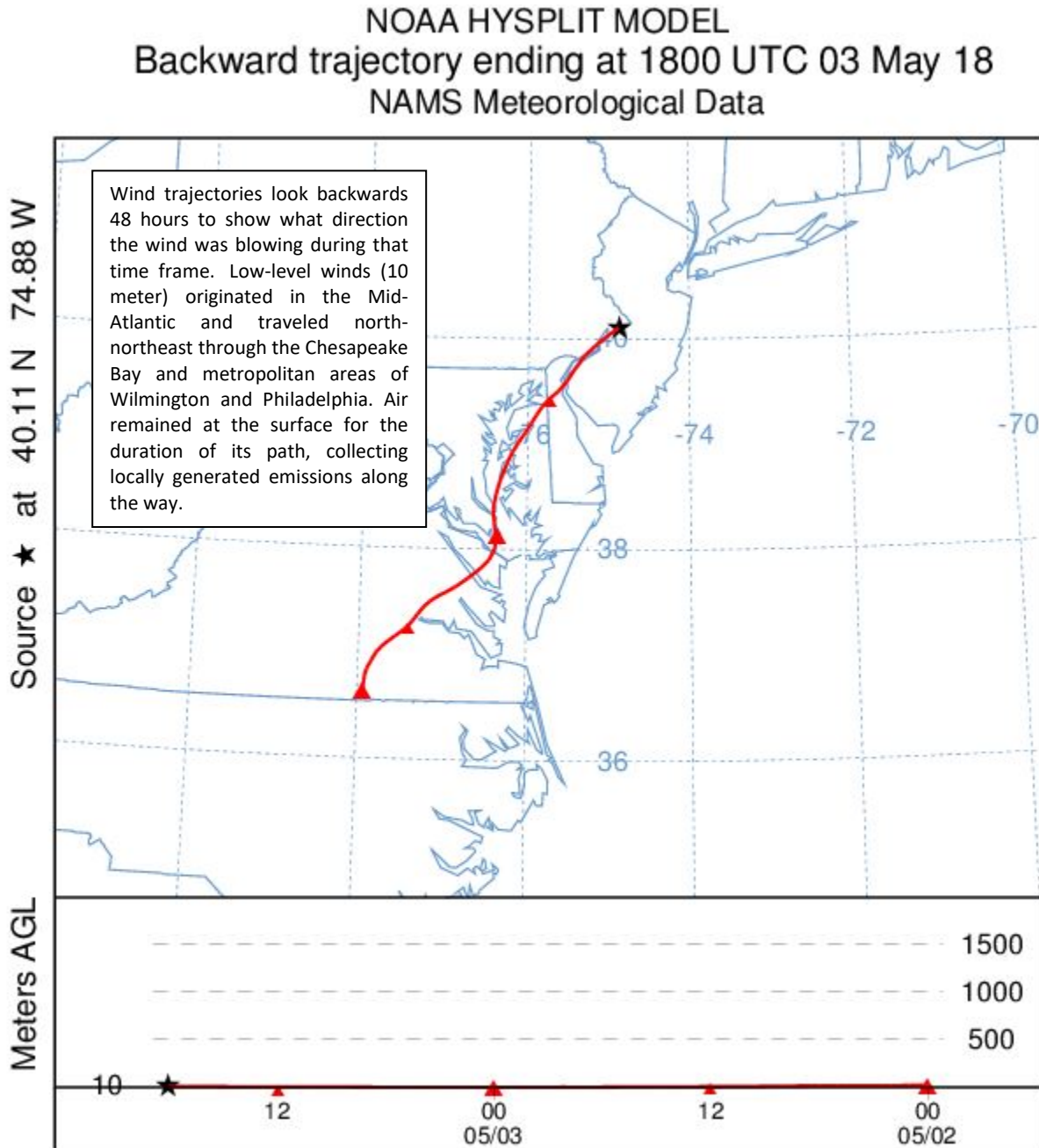


Figure 3. 48-hour Back Trajectories for May 3, 2018 at 500 meters

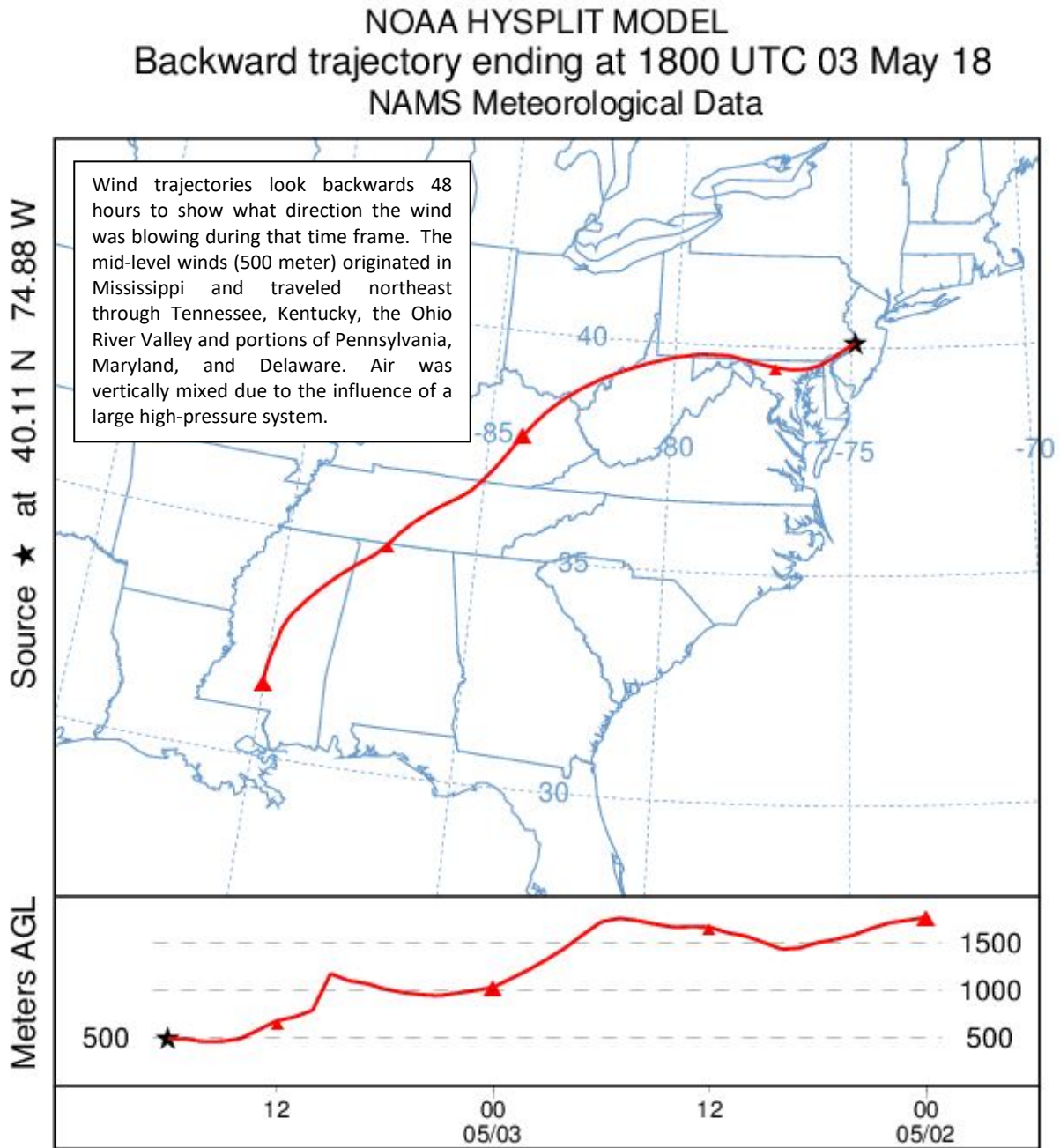


Figure 4. 48-hour Back Trajectories for May 3, 2018 at 1500 meters

NOAA HYSPLIT MODEL
Backward trajectory ending at 1800 UTC 03 May 18
NAMS Meteorological Data

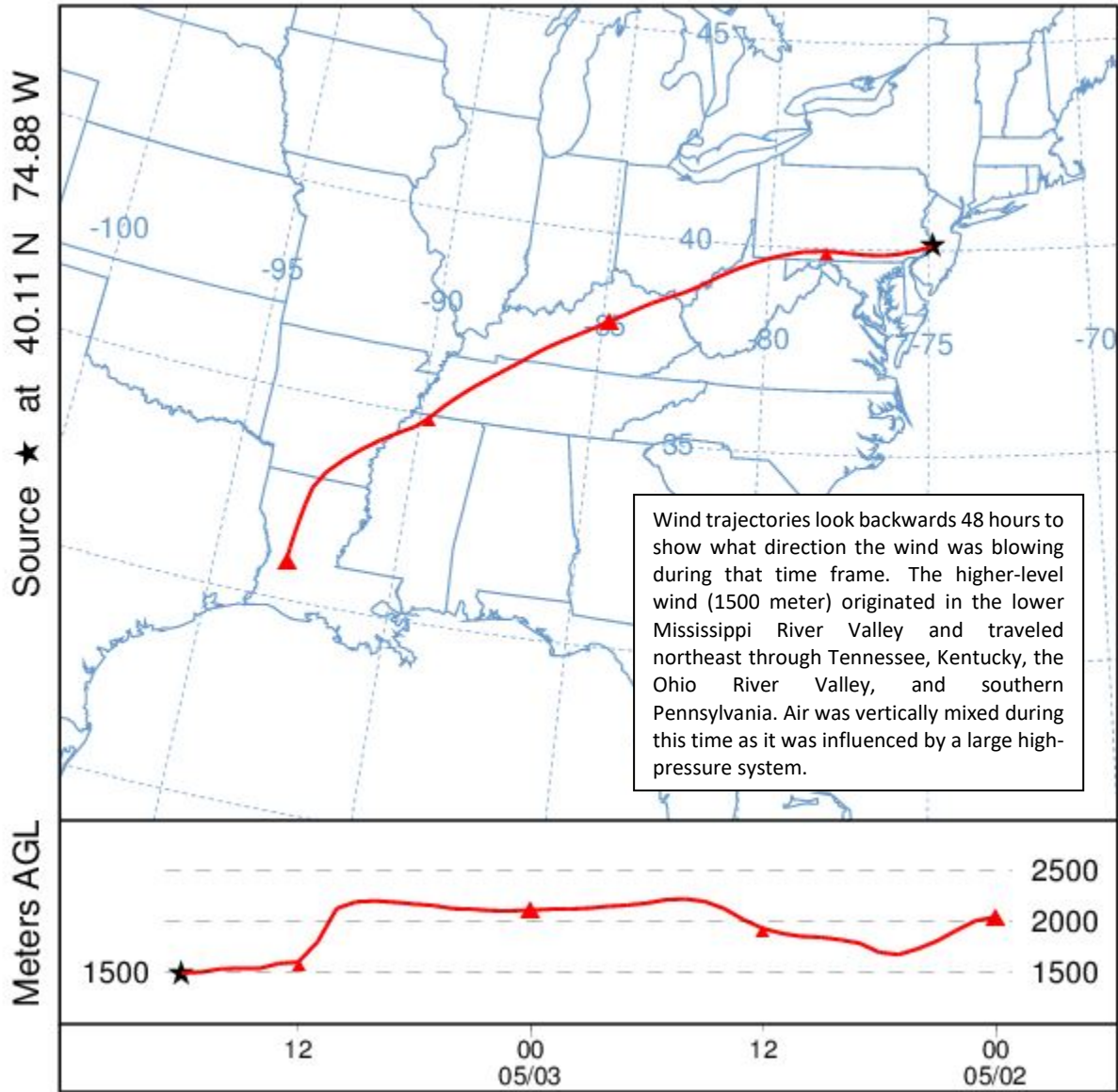
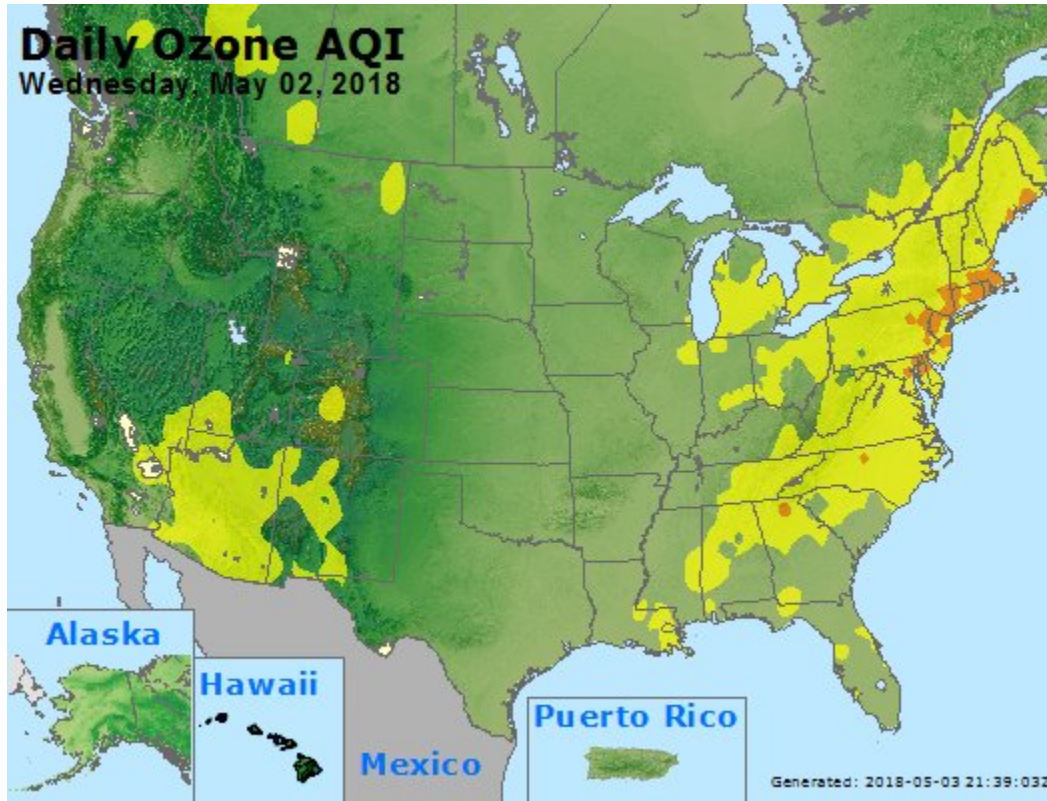


Figure 5. Ozone Air Quality Index for the United States on May 2, 2018



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.