Ozone National Ambient Air Quality Standard Health Exceedances on June 19, 2023

Exceedance Locations and Levels

On Monday, June 19, 2023, 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 Ozone Concentrations on 6/19/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	61
Bayonne	47
Brigantine	45
Camden Spruce St	63
Chester	66
Clarksboro	68
Colliers Mills	56
Columbia	51
Flemington	65
Leonia	47
Millville	62
Monmouth University	45
Ramapo	53
Rider University	59
Rutgers University	61
Washington Crossing*	64
TOTAL EXCEEDANCES	0

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

From the out-of-state stations within New Jersey's ozone nonattainment 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 Nonattainment Areas on 6/19/2023

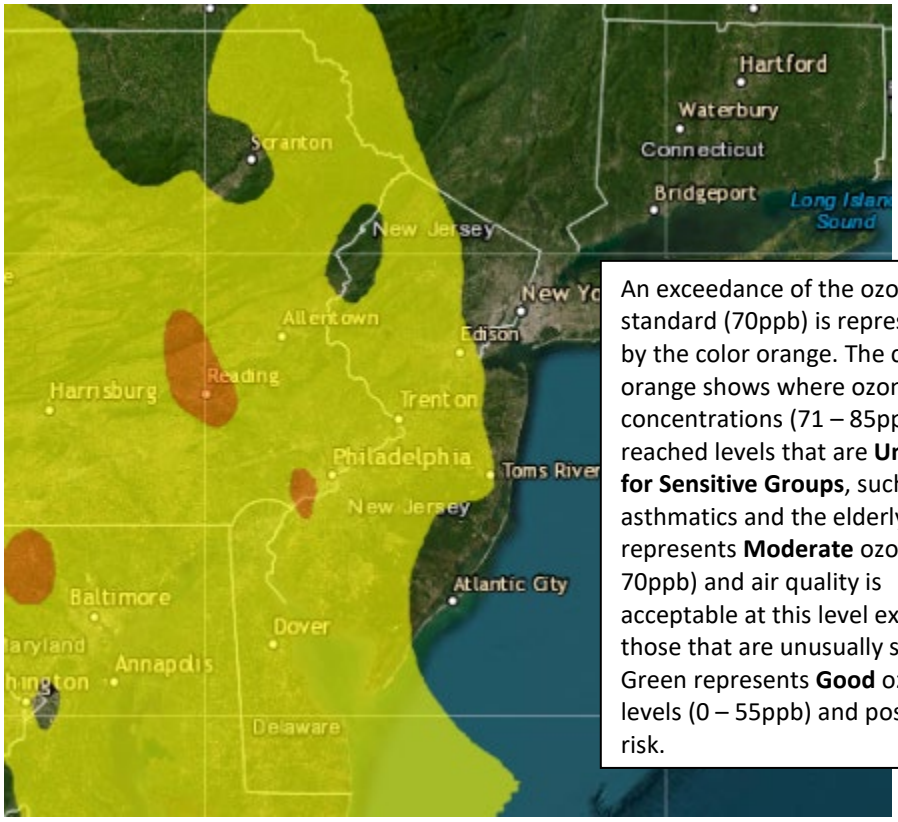
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	41
CT	Greenwich	41
CT	Madison-Beach Road	38
CT	Middletown-CVH-Shed	38
CT	New Haven	39
CT	Stratford	40
CT	Westport	40
DE	BCSP (New Castle Co.)	61
DE	BELLFNT2 (New Castle Co.)	63
DE	KILLENS (Kent Co.)	61
DE	LEWES (Sussex Co.)	57
DE	LUMS 2 (New Castle Co.)	64
DE	MLK (New Castle Co.)	64
DE	SEAFORD (Sussex Co.)	61
MD	Fair Hill	67
NY	Babylon	43
NY	Bronx - IS52	43
NY	CCNY	46
NY	Flax Pond	39
NY	Fresh Kills	47
NY	Holtsville	41
NY	Pfizer Lab	44
NY	Queens	48
NY	Riverhead	37
NY	Rockland Cty	46
NY	White Plains	41
PA	BRIS (Bucks Co.)	67
PA	CHES (Delaware Co.)	73
PA	NEWG (Chester Co.)	70
PA	NORR (Montgomery Co.)	66
PA	LAB (Philadelphia Co.)	60
PA	NEA (Philadelphia Co.)	68
PA	NEW (Philadelphia Co.)	68
	TOTAL EXCEEDANCES	1

The number of days in 2023 on which exceedances of the ozone NAAQS were recorded for all the states within New Jersey's ozone nonattainment areas is summarized in Table 3.

Table 3. Number of Days Ozone NAAQS was Exceeded in NJ's Nonattainment Areas in 2023

STATE	# of Days NAAQS was Exceeded January 1 – June 19, 2023 NAAQS = 70 ppb
Connecticut	6
Delaware	2
Maryland	2
New Jersey	6
New York	4
Pennsylvania	4

Figure 1. Ozone Air Quality Index for June 19, 2023



Source: www.airnow.gov

For ozone terminology definitions see NJDEP Air Quality Planning's Glossary and Acronyms webpage: https://www.nj.gov/dep/airmon/glossary.html

Weather

On Monday, June 19th, an area of high pressure centered over the Great Lakes Region continued to build into the region, providing clear skies and plenty of sunshine in the morning hours. Light east to southeasterly flow was observed throughout the area, along with some scattered cloud cover. Temperatures reached the mid-80s throughout most of the region except for coastal areas, where slightly cooler temperatures were observed due to a sea breeze moving inland. As the day progressed, portions of the northern nonattainment area saw increased cloud cover and some isolated showers, suppressing ozone formation in these areas. The sea breeze pushed further inland, eventually moving past the I-95 corridor. This caused any ozone precursors to be pushed further into Pennsylvania, where warm temperatures and abundant sunshine were observed throughout much of the day. These conditions allowed ozone levels in Chester Pennsylvania to reach the unhealthy for sensitive groups category. Meanwhile, in other parts of the southern nonattainment area, ozone levels were able to remain elevated in the moderate category, with a combination of cloud cover and the sea breeze keeping any other areas from exceeding.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories of different wind heights for the monitored exceedance(s) on this day. The figures illustrate where the air came from during the 48 hours preceding the 8-hour ozone standard exceedances. A transport analysis is provided with each figure shown below along with a map of the National Air Quality Index for the previous day (Figure 5). The monitoring station(s) that were chosen to model back trajectories are listed in Table 4.

Table 4. Monitoring Stations with an 8-hr Ozone Exceedance that were selected to Run 48-hr Back Trajectories

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
PA	Chester	73

Figure 2. 48-hour Back Trajectories for June 19, 2023 at 10 meters

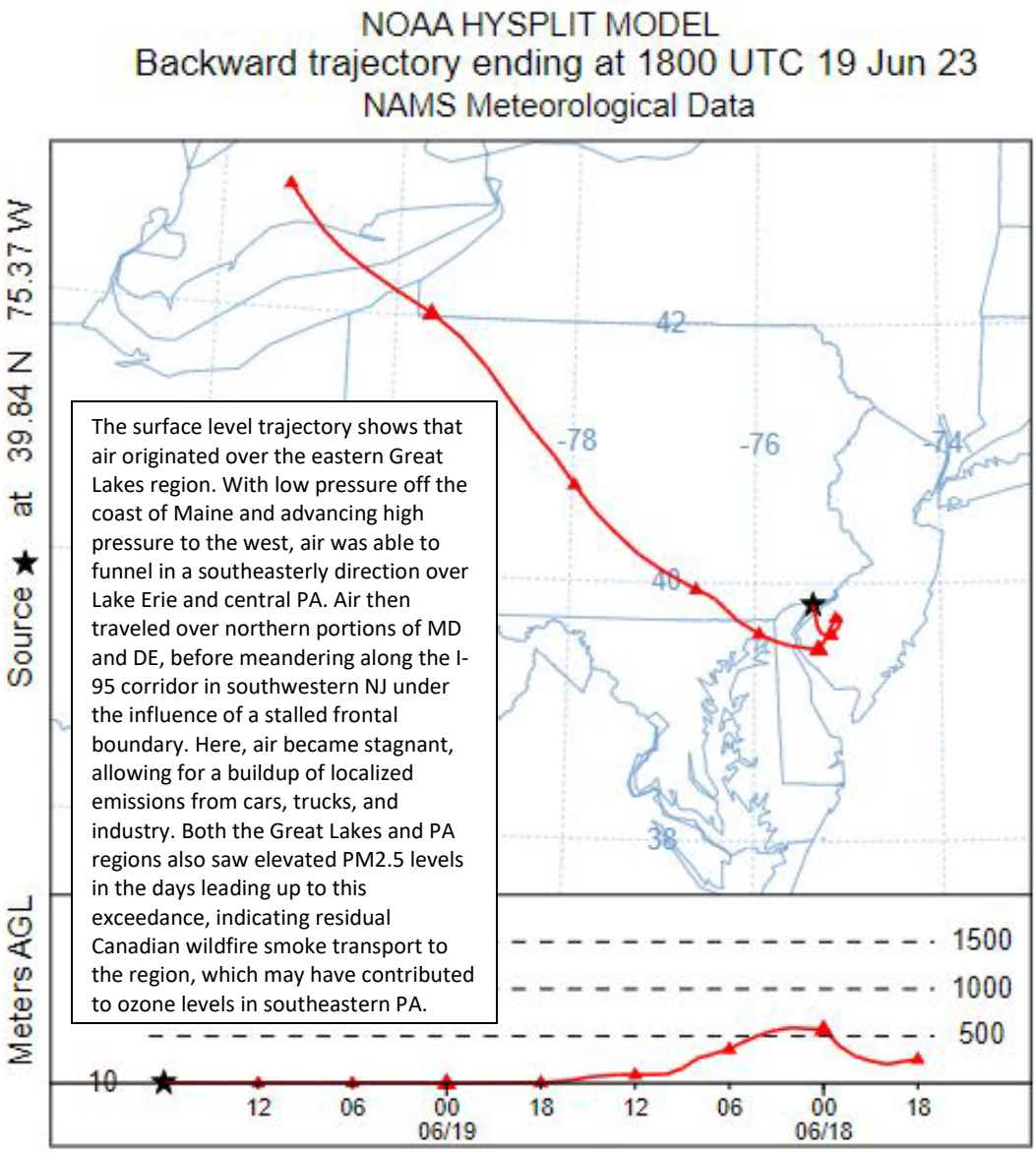
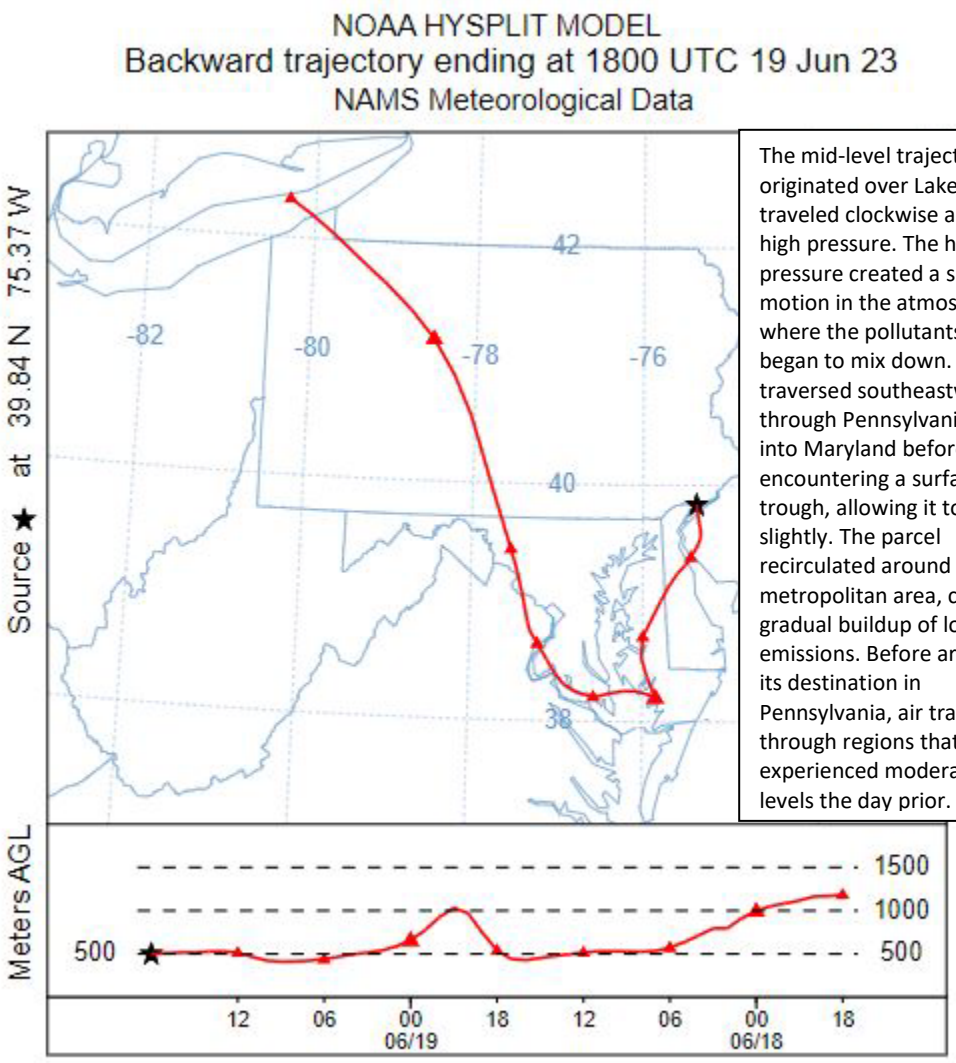
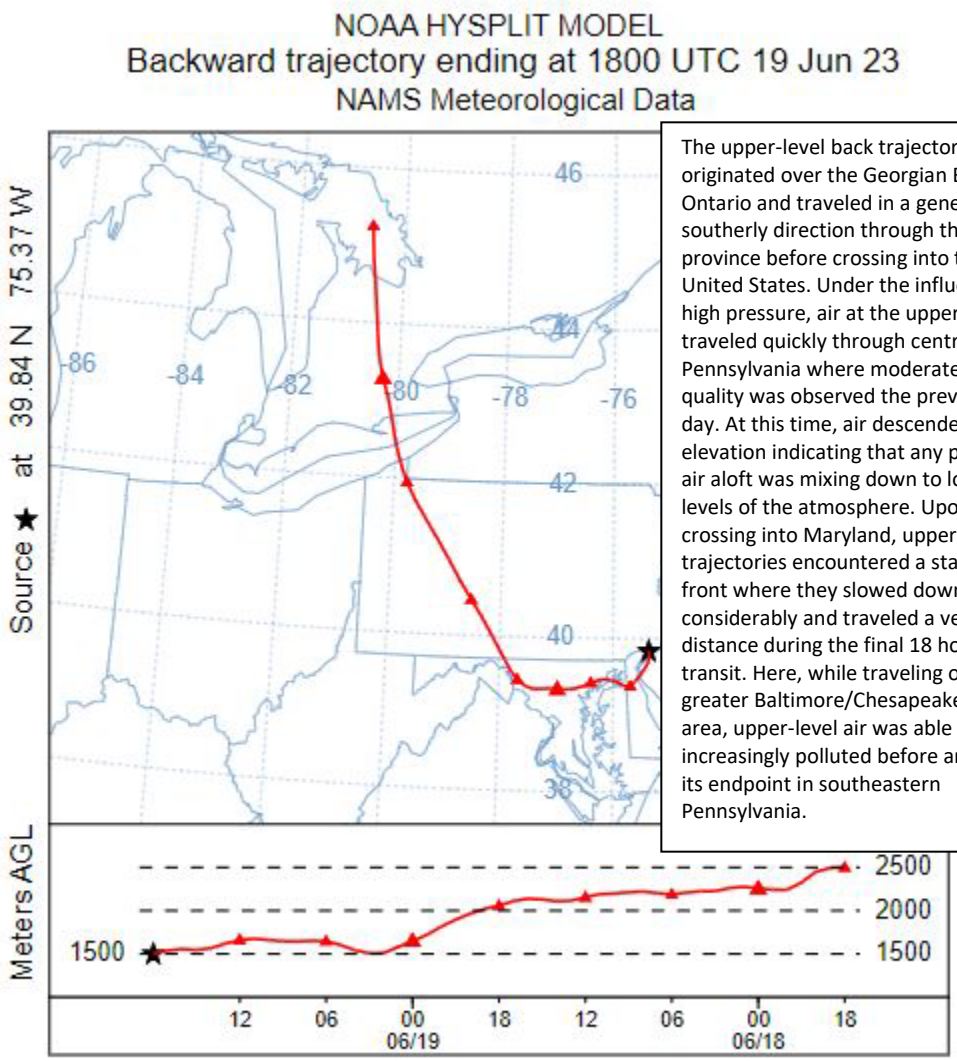


Figure 3. 48-hour Back Trajectories for June 19, 2023 at 500 meters



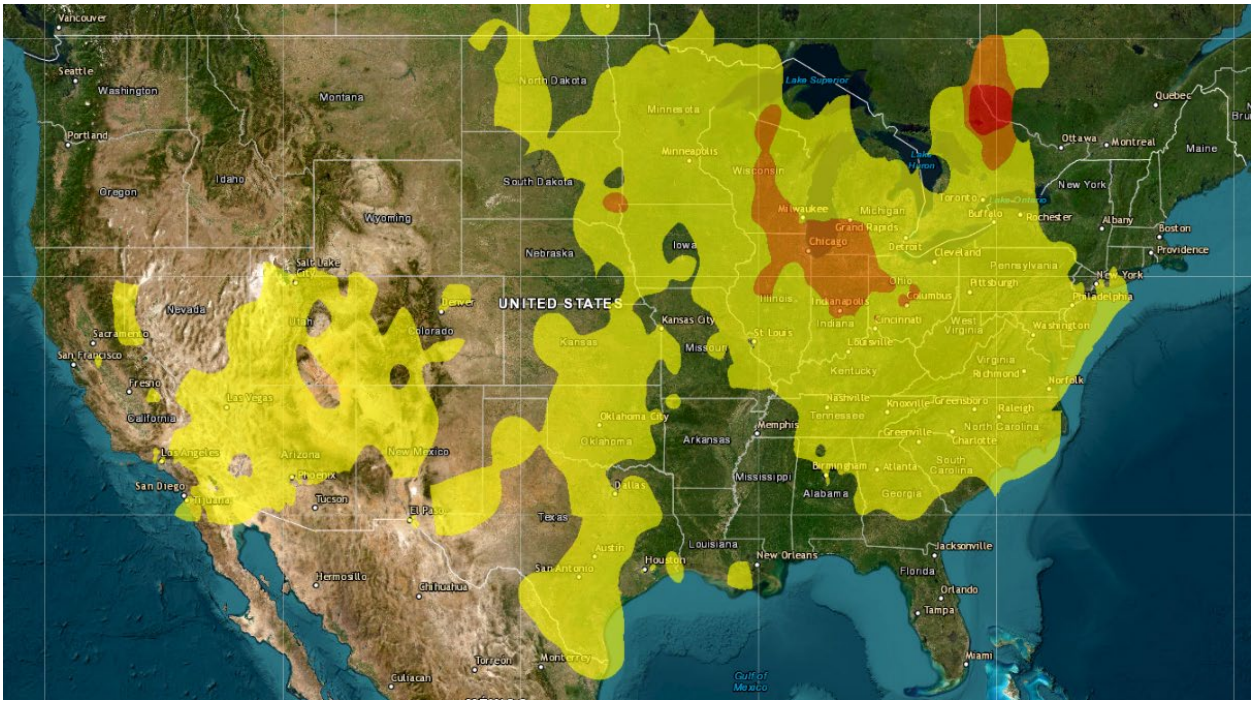
The mid-level trajectory originated over Lake Erie and traveled clockwise around high pressure. The high pressure created a sinking motion in the atmosphere, where the pollutants aloft began to mix down. Air traversed southeastward through Pennsylvania and into Maryland before encountering a surface trough, allowing it to rise slightly. The parcel recirculated around the DC metropolitan area, causing a gradual buildup of localized emissions. Before arriving at its destination in Pennsylvania, air traveled through regions that experienced moderate ozone levels the day prior.

Figure 4. 48-hour Back Trajectories for June 19, 2023 at 1500 meters



The upper-level back trajectory originated over the Georgian Bay in Ontario and traveled in a general southerly direction through the province before crossing into the United States. Under the influence of high pressure, air at the upper levels traveled quickly through central Pennsylvania where moderate air quality was observed the previous day. At this time, air descended in elevation indicating that any polluted air aloft was mixing down to lower levels of the atmosphere. Upon crossing into Maryland, upper air trajectories encountered a stationary front where they slowed down considerably and traveled a very short distance during the final 18 hours of transit. Here, while traveling over the greater Baltimore/Chesapeake Bay area, upper-level air was able to grow increasingly polluted before arriving at its endpoint in southeastern Pennsylvania.

Figure 5. Air Quality Index for the United States on June 18, 2023



Source: www.airnow.gov

How is Ozone Created?

Ground-level ozone is an air pollutant known to cause several 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

Learn more about your local ozone air quality forecast by visiting the "What's Your Air Quality Today?" page at https://www.nj.gov/dep/baqp/aqitoday.html .