Ozone National Ambient Air Quality Standard Health Exceedances on September 13, 2024

Exceedance Locations and Levels

On Friday, September 13, 2024, 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 Ozone Concentrations on 9/13/2024

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	38
Bayonne	43
Brigantine	42
Chester	73
Clarksboro	56
Colliers Mills	51
Columbia	49
Flemington	70
Leonia	60
Millville	47
Monmouth University	40
Ramapo	66
Rider University	58
Rutgers University	54
South Camden	61
Washington Crossing*	61
TOTAL EXCEEDANCES	3

*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 were no exceedances 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 9/13/2024

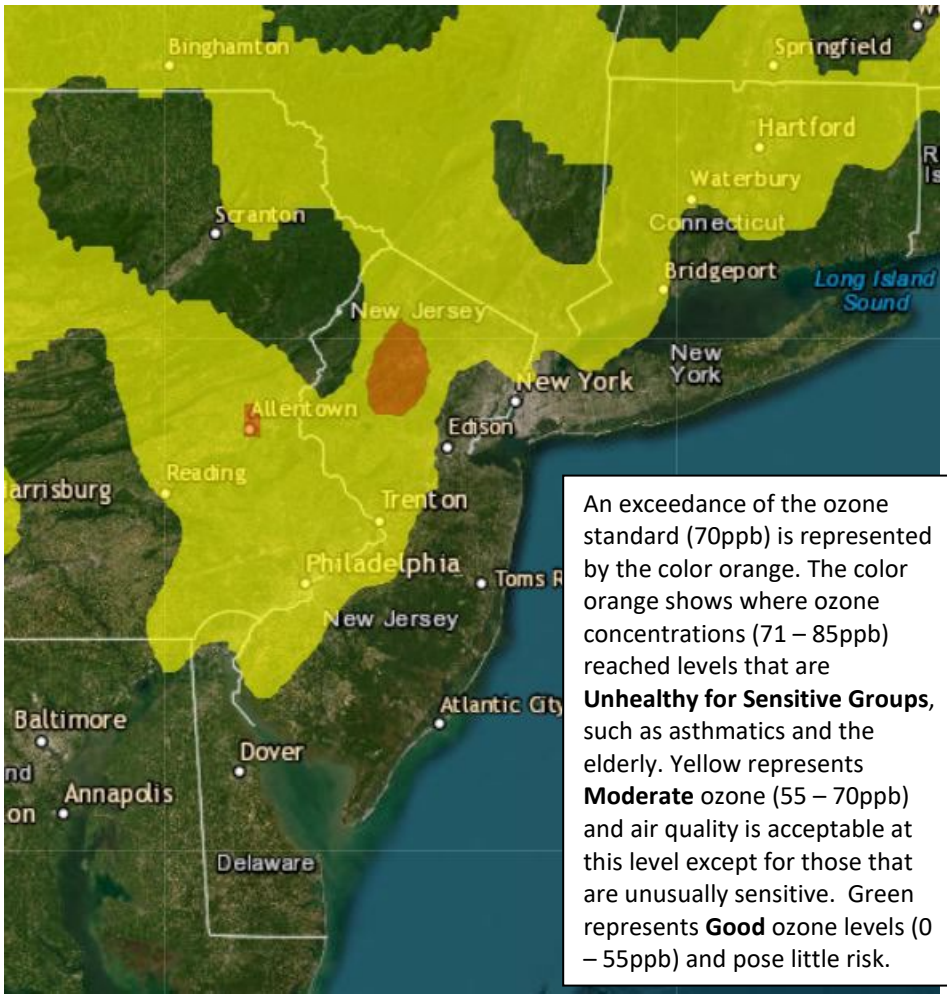
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	58
CT	Greenwich	60
CT	Madison-Beach Road	50
CT	Middletown-CVH-Shed	68
CT	New Haven	53
CT	Stratford	53
CT	Westport	61
DE	BCSP (New Castle Co.)	58
DE	BELLFNT2 (New Castle Co.)	60
DE	KILLENS (Kent Co.)	46
DE	LEWES (Sussex Co.)	41
DE	LUMS 2 (New Castle Co.)	51
DE	MLK (New Castle Co.)	54
DE	SEAFORD (Sussex Co.)	45
MD	Fair Hill	57
NY	Babylon	48
NY	Bronx - IS52	54
NY	CCNY	54
NY	Flax Pond	47
NY	Fresh Kills	42
NY	Holtsville	49
NY	Pfizer Lab	54
NY	Queens	49
NY	Riverhead	48
NY	Rockland Cty	57
NY	White Plains	64
PA	BRIS (Bucks Co.)	58
PA	CHES (Delaware Co.)	67
PA	NEWG (Chester Co.)	61
PA	NORR (Montgomery Co.)	56
PA	LAB (Philadelphia Co.)	55
PA	NEA (Philadelphia Co.)	62
PA	NEW (Philadelphia Co.)	56
	TOTAL EXCEEDANCES	0

The number of days in 2024 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 2024

STATE	# of Days NAAQS was Exceeded January 1 – September 13, 2024 NAAQS = 70 ppb
Connecticut	22
Delaware	4
Maryland	3
New Jersey	20
New York	15
Pennsylvania	12

Figure 1. Ozone Air Quality Index for September 13, 2024



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 Friday, September 13th, favorable meteorological conditions throughout the nonattainment area resulted in an isolated ozone exceedance in Chester, NJ. High pressure remained anchored over the northeastern seaboard on Friday for the 6th day in a row, accompanied by a light and variable flow across the region. Northern portions of the Garden State observed light winds out of the north, funneling in air from regions that saw moderate air quality the day prior, whereas coastal regions experienced an onshore flow that brought in clean air. As the morning progressed, temperatures were able to quickly rise into the mid-80s as clear skies were observed. In addition, fog and passing clouds were noted in the southern nonattainment area, inhibiting ozone production. Despite the lack of exceedances throughout the nonattainment areas, favorable meteorological conditions along with transport of previously polluted air caused an exceedance of the NAAQS in Chester, New Jersey.

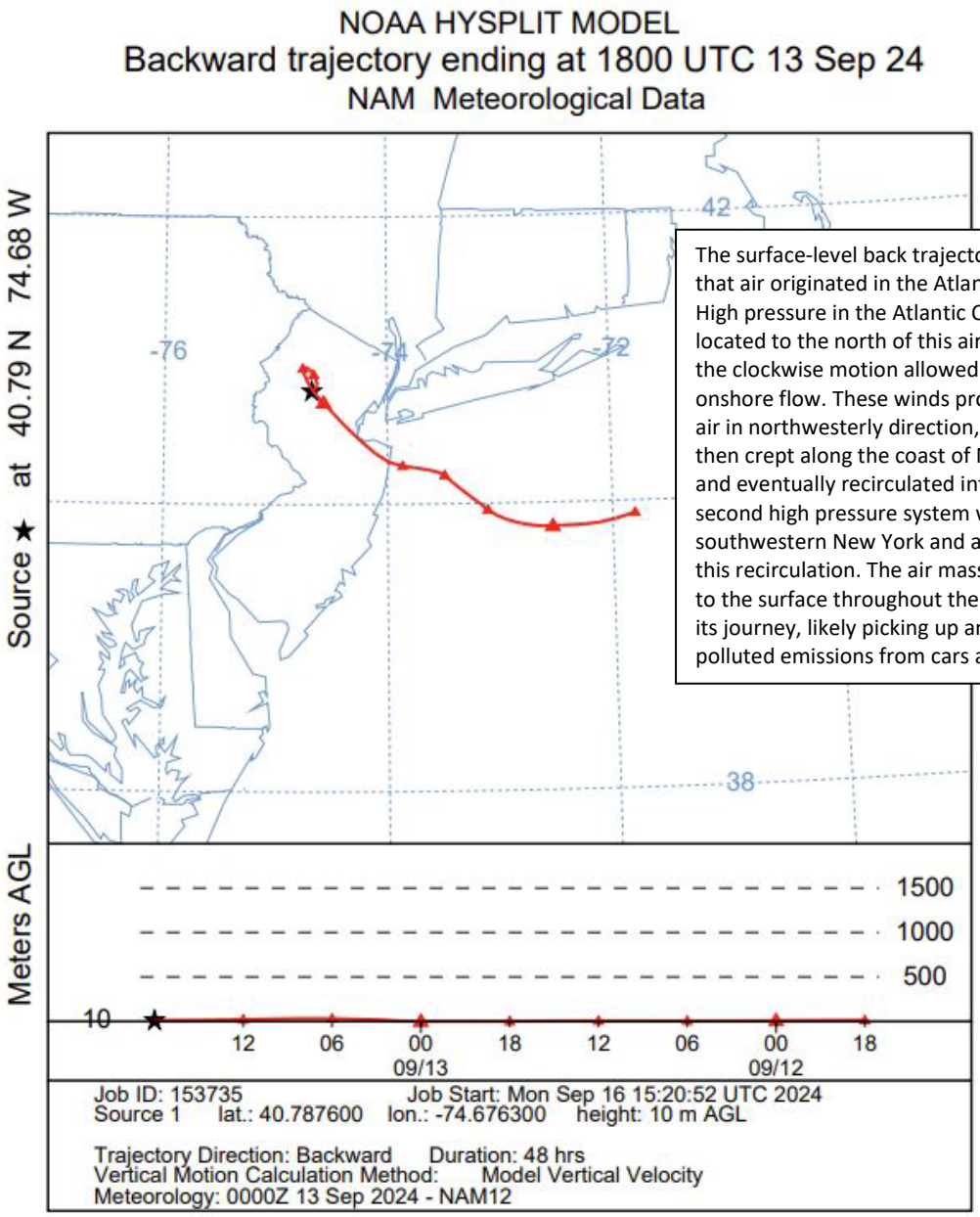
Where Did the Air Pollution that Caused Ozone Come From?

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

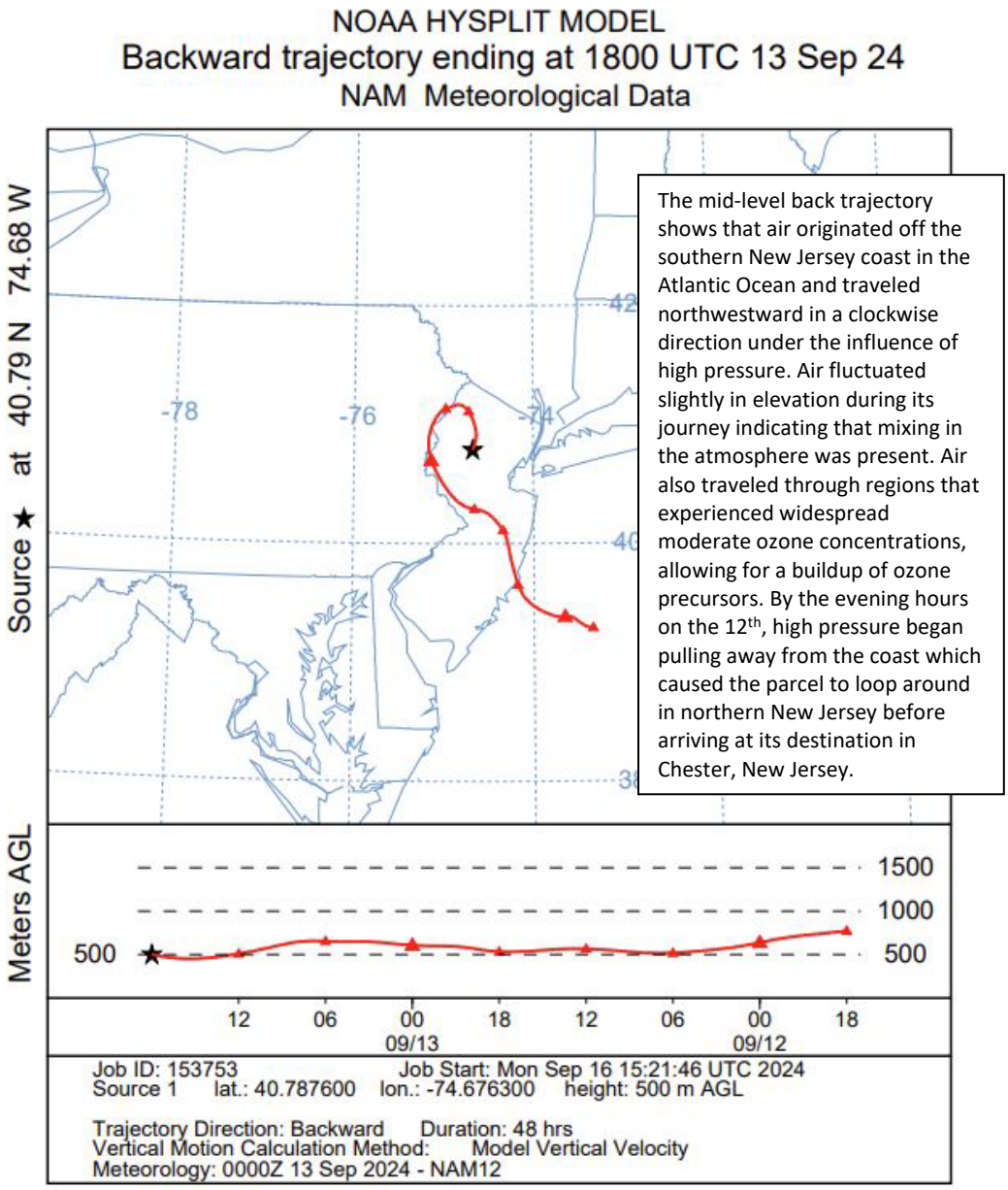
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
NJ	Chester	73

Figure 2. 48-hour Back Trajectories for September 13, 2024 at 10 meters



The surface-level back trajectory shows that air originated in the Atlantic Ocean. High pressure in the Atlantic Ocean was located to the north of this air mass, and the clockwise motion allowed for an onshore flow. These winds projected the air in northwesterly direction, where it then crept along the coast of New Jersey and eventually recirculated into Chester. A second high pressure system was in southwestern New York and allowed for this recirculation. The air mass stayed close to the surface throughout the duration of its journey, likely picking up any previously polluted emissions from cars and industry.

Figure 3. 48-hour Back Trajectories for September 13, 2024 at 500 meters



The mid-level back trajectory shows that air originated off the southern New Jersey coast in the Atlantic Ocean and traveled northwestward in a clockwise direction under the influence of high pressure. Air fluctuated slightly in elevation during its journey indicating that mixing in the atmosphere was present. Air also traveled through regions that experienced widespread moderate ozone concentrations, allowing for a buildup of ozone precursors. By the evening hours on the 12th, high pressure began pulling away from the coast which caused the parcel to loop around in northern New Jersey before arriving at its destination in Chester, New Jersey.

Figure 4. 48-hour Back Trajectories for September 13, 2024 at 1500 meters

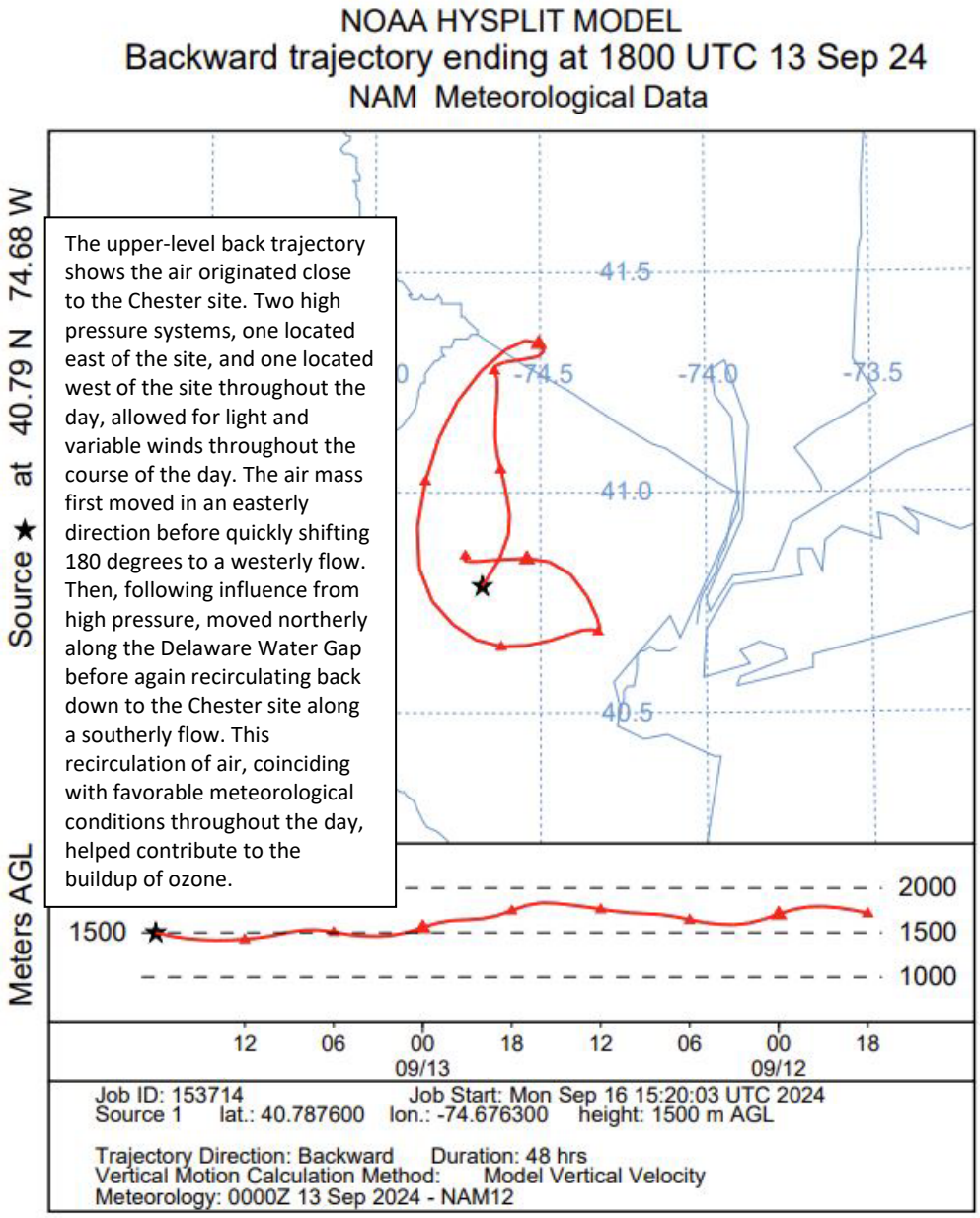
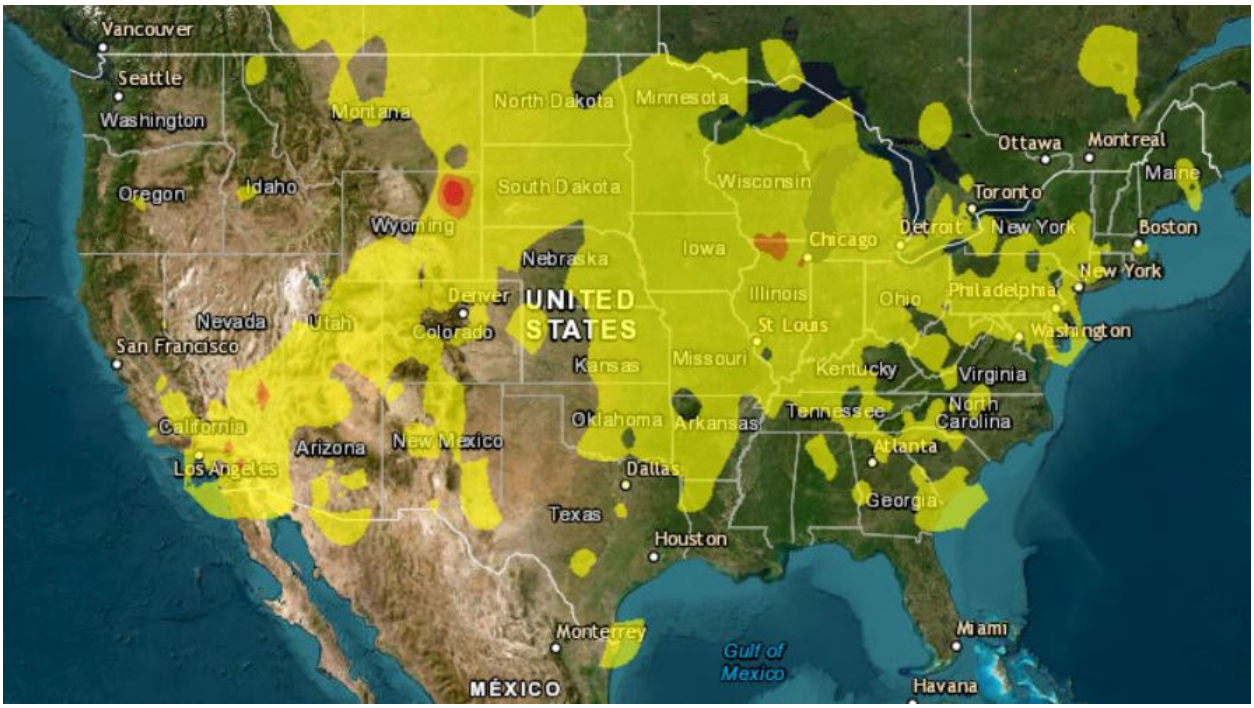


Figure 5. Air Quality Index for the United States on September 12, 2024



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://dep.nj.gov/airplanning/aqi-today/.