Ozone National Ambient Air Quality Standard Health Exceedances on July 17, 2024

Exceedance Locations and Levels

On Wednesday, July 17, 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 7/17/2024

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	54
Bayonne	60
Brigantine	49
Camden Spruce St	No Data
Chester	60
Clarksboro	67
Colliers Mills	67
Columbia	48
Flemington	59
Leonia	76
Millville	52
Monmouth University	52
Ramapo	59
Rider University	67
Rutgers University	70
Washington Crossing*	63
TOTAL EXCEEDANCES	1

*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 six (6) 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 7/17/2024

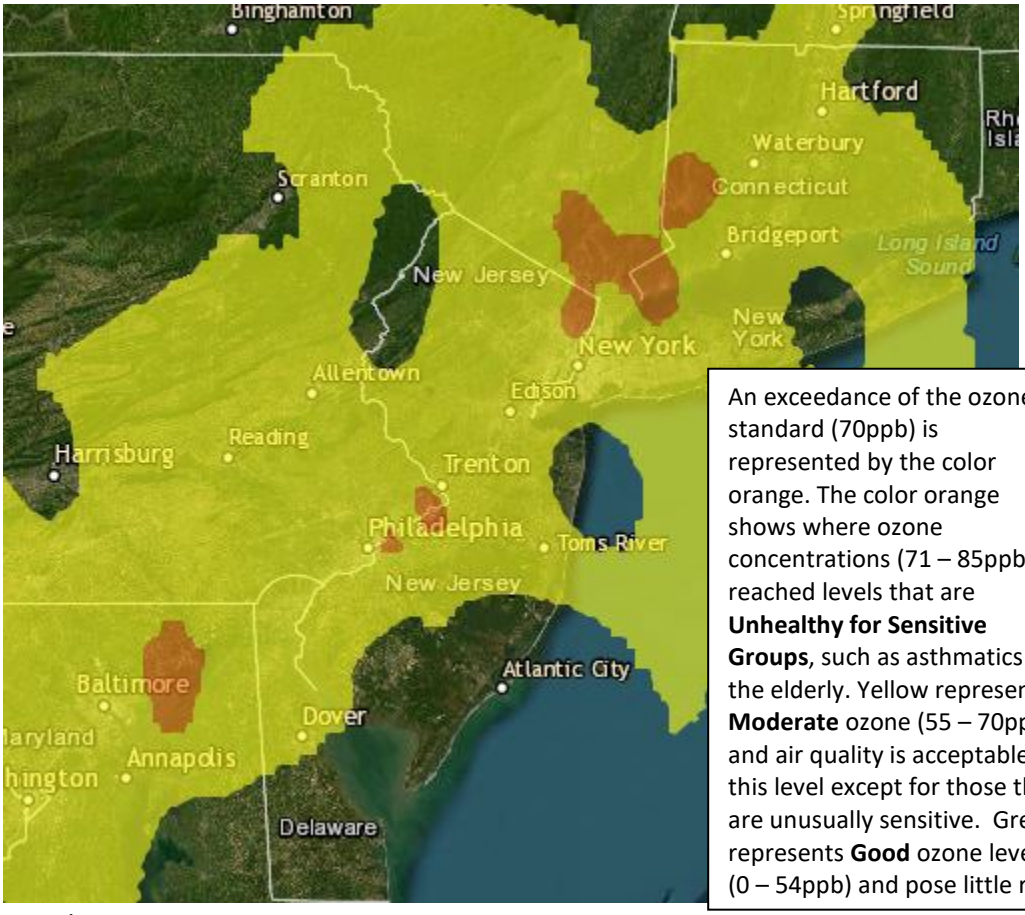
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	73
CT	Greenwich	73
CT	Madison-Beach Road	58
CT	Middletown-CVH-Shed	59
CT	New Haven	64
CT	Stratford	66
CT	Westport	62
DE	BCSP (New Castle Co.)	36
DE	BELLFNT2 (New Castle Co.)	59
DE	KILLENS (Kent Co.)	54
DE	LEWES (Sussex Co.)	49
DE	LUMS 2 (New Castle Co.)	63
DE	MLK (New Castle Co.)	60
DE	SEAFORD (Sussex Co.)	50
MD	Fair Hill	64
NY	Babylon	57
NY	Bronx - IS52	62
NY	CCNY	65
NY	Flax Pond	56
NY	Fresh Kills	58
NY	Holtsville	55
NY	Pfizer Lab	67
NY	Queens	60
NY	Riverhead	53
NY	Rockland Cty	72
NY	White Plains	71
PA	BRIS (Bucks Co.)	72
PA	CHES (Delaware Co.)	66
PA	NEWG (Chester Co.)	No Data
PA	NORR (Montgomery Co.)	55
PA	LAB (Philadelphia Co.)	65
PA	NEA (Philadelphia Co.)	63
PA	NEW (Philadelphia Co.)	73
	TOTAL EXCEEDANCES	6

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 – July 17, 2024 NAAQS = 70 ppb
Connecticut	14
Delaware	4
Maryland	2
New Jersey	13
New York	12
Pennsylvania	9

Figure 1. Ozone Air Quality Index for July 17, 2024



An exceedance of the ozone standard (70ppb) is represented by the color orange. The color orange shows where ozone concentrations (71 – 85ppb) reached levels that are **Unhealthy for Sensitive Groups**, such as asthmatics and the elderly. Yellow represents **Moderate** ozone (55 – 70ppb) and air quality is acceptable at this level except for those that are unusually sensitive. Green represents **Good** ozone levels (0 – 54ppb) and pose little risk.

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 Wednesday, July 17th, widespread ozone exceedances were observed throughout the nonattainment area, marking the third day of a multi-day exceedance event. Another day of Bermuda high pressure once again provided favorable conditions for ozone production with light southwesterly winds and hot and humid temperatures. Throughout the day a surface trough was noted over the nonattainment area, enhancing atmospheric mixing which allowed previously polluted air from a stagnant air mass to mix down to the surface. With the surface trough in place and a slow-moving frontal boundary approaching the region, instability began to grow across New Jersey. Showers and thunderstorms began to form and travel across the state by late afternoon/early evening, which helped limit ozone production. In addition, smoke from the Whip-poor-will wildfire that was burning in Burlington County was also present in portions of the nonattainment area. These favorable conditions, along with plenty of sunshine throughout the morning and early afternoon, allowed ozone levels to increase into the Unhealthy for Sensitive Groups (USG) category along the I-95 corridor in New Jersey, New York, Connecticut, and Pennsylvania.

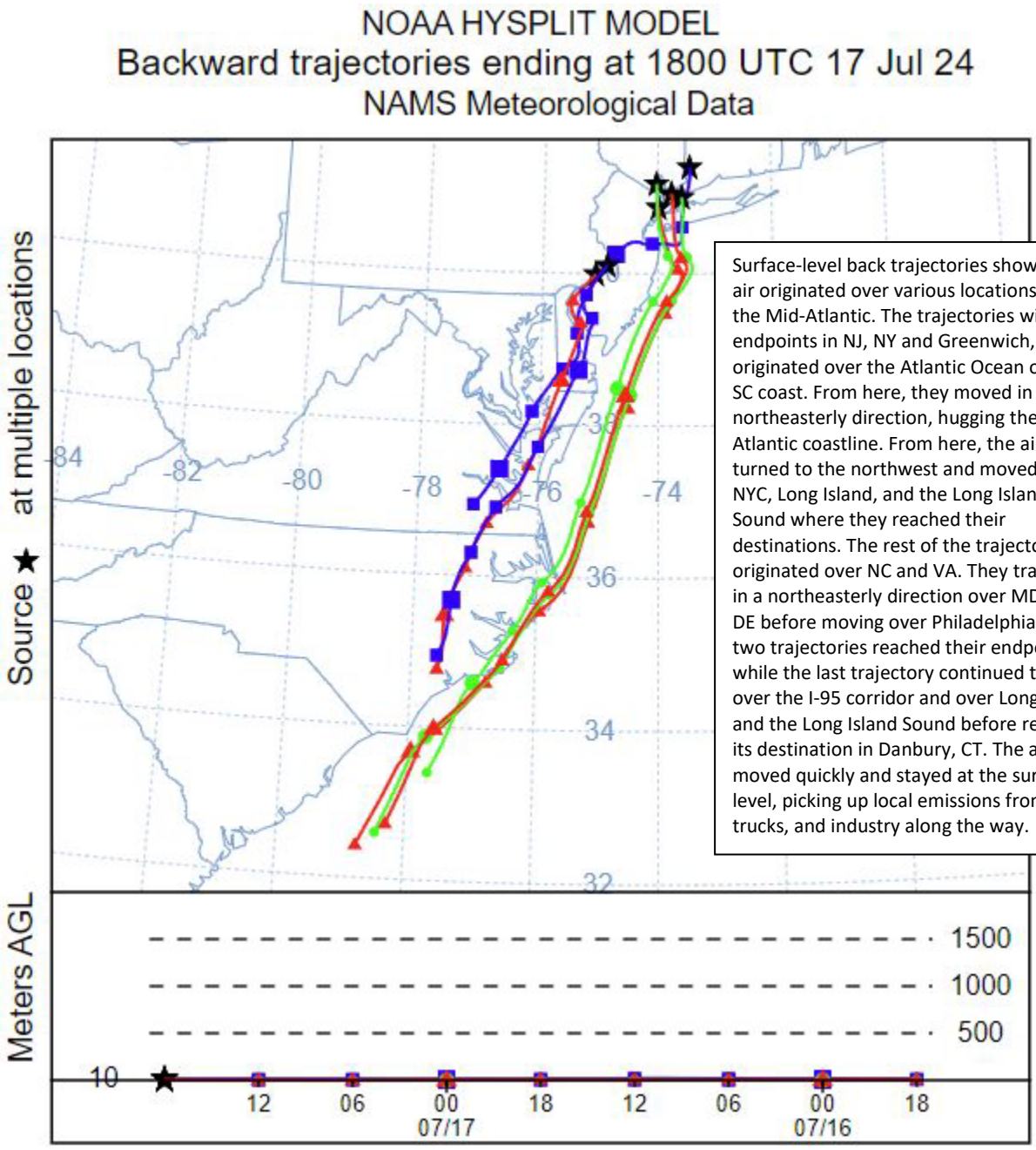
Where Did the Air Pollution that Caused Ozone Come From?

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	Leonia	76
CT	Danbury	73
CT	Greenwich	73
NY	Rockland Cty	72
NY	White Plains	71
PA	BRIS (Bucks Co.)	72
PA	NEW (Philadelphia Co.)	73

Figure 2. 48-hour Back Trajectories for July 17, 2024 at 10 meters



Surface-level back trajectories show that air originated over various locations over the Mid-Atlantic. The trajectories with endpoints in NJ, NY and Greenwich, CT originated over the Atlantic Ocean off the SC coast. From here, they moved in a northeasterly direction, hugging the Mid-Atlantic coastline. From here, the air turned to the northwest and moved across NYC, Long Island, and the Long Island Sound where they reached their destinations. The rest of the trajectories originated over NC and VA. They traveled in a northeasterly direction over MD and DE before moving over Philadelphia. Here, two trajectories reached their endpoints, while the last trajectory continued to move over the I-95 corridor and over Long Island and the Long Island Sound before reaching its destination in Danbury, CT. The air moved quickly and stayed at the surface level, picking up local emissions from cars, trucks, and industry along the way.

Figure 3. 48-hour Back Trajectories for July 17, 2024 at 500 meters

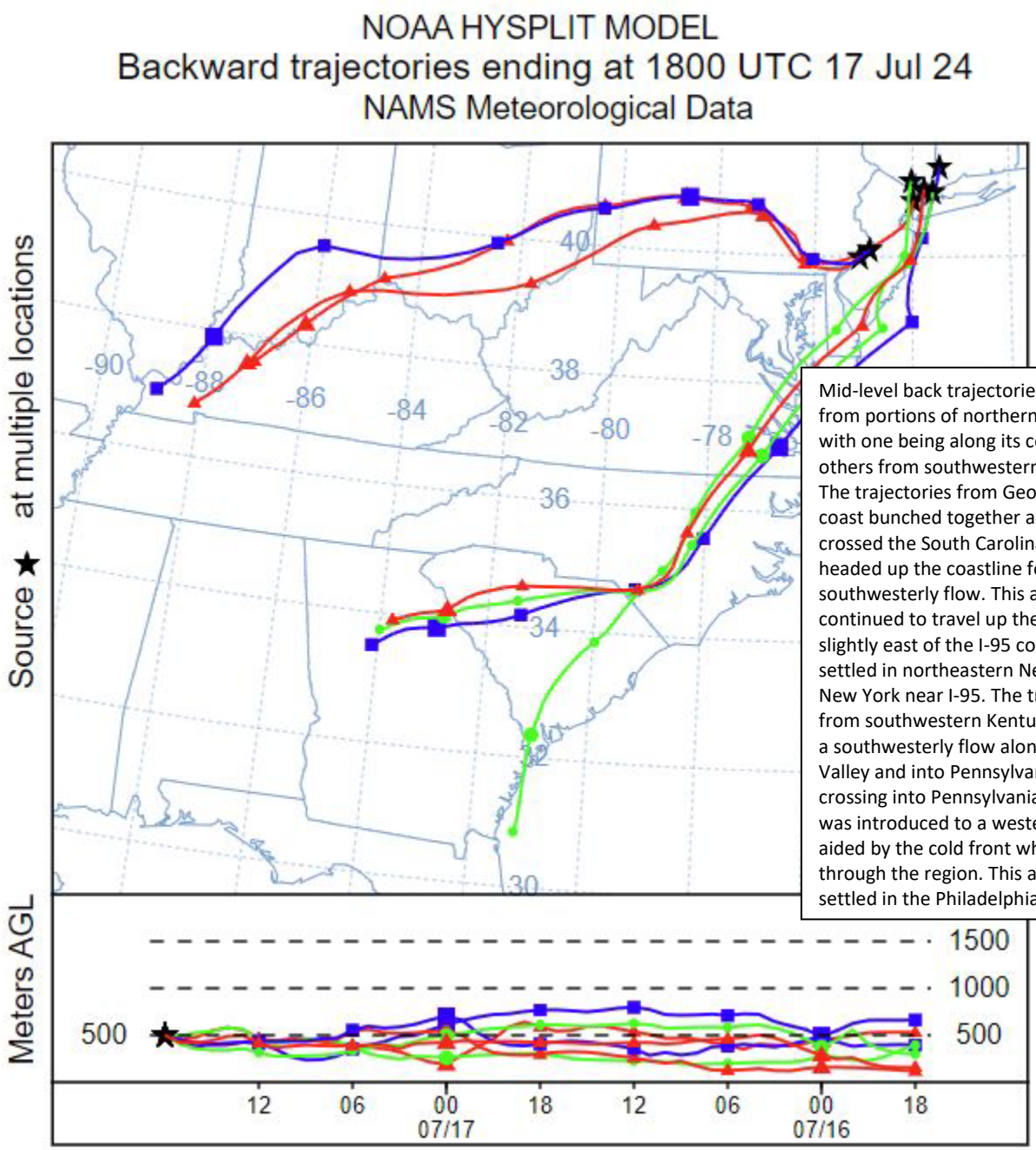
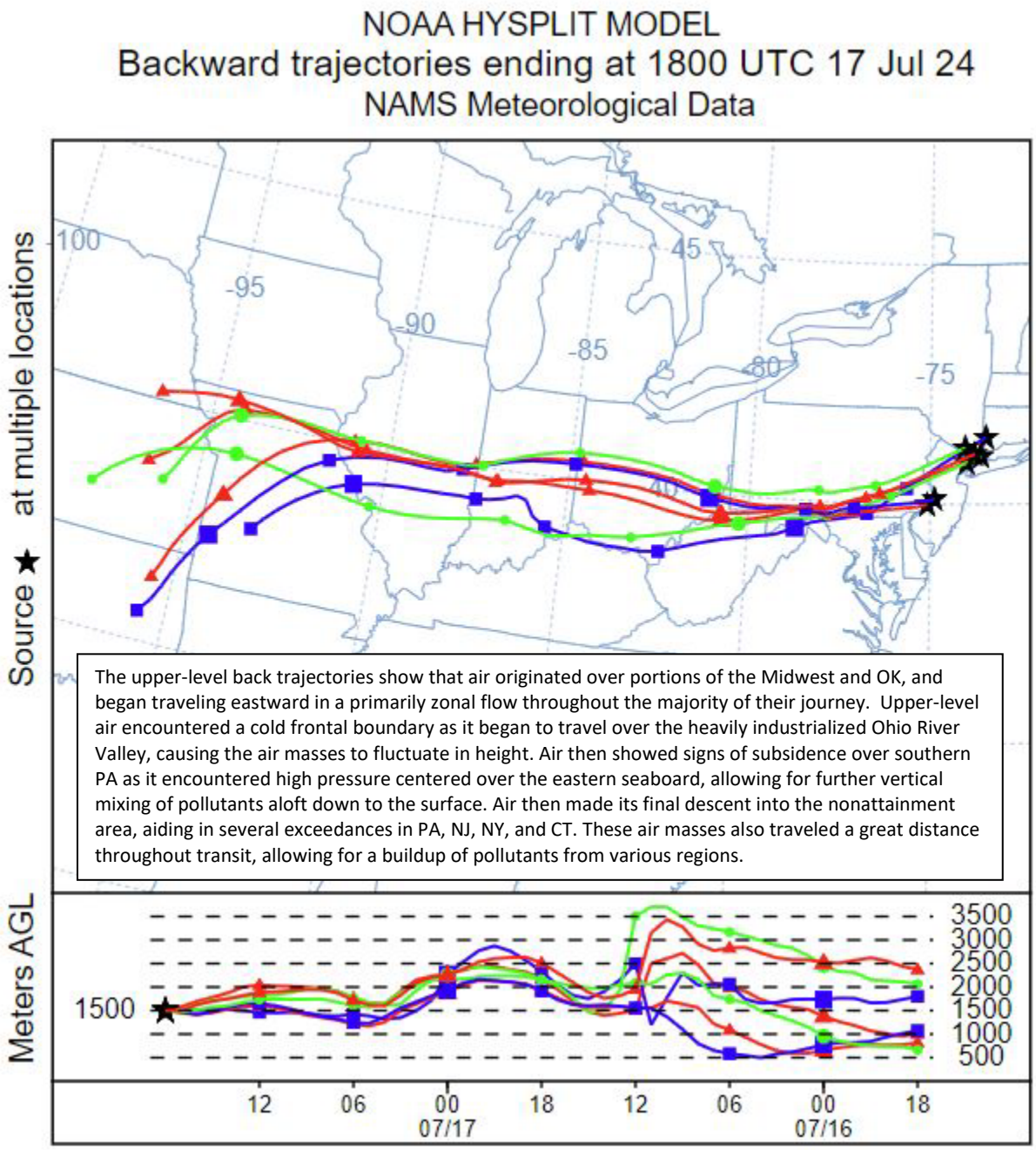
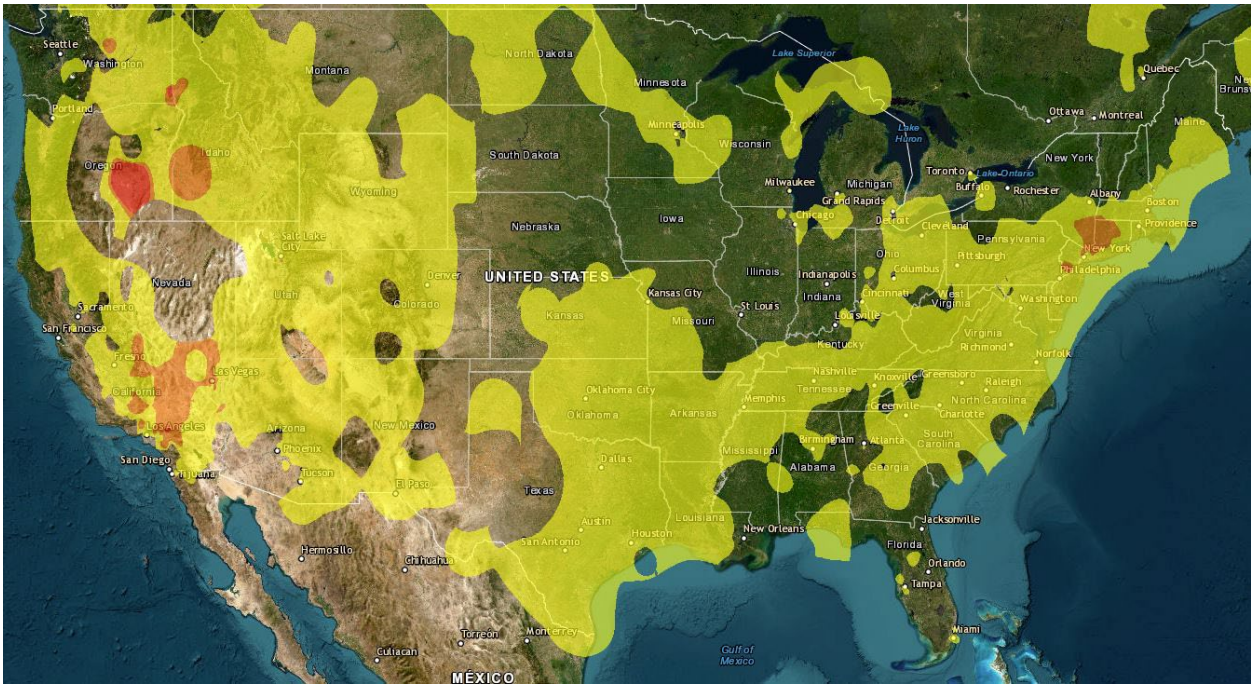


Figure 4. 48-hour Back Trajectories for July 17, 2024 at 1500 meters



The upper-level back trajectories show that air originated over portions of the Midwest and OK, and began traveling eastward in a primarily zonal flow throughout the majority of their journey. Upper-level air encountered a cold frontal boundary as it began to travel over the heavily industrialized Ohio River Valley, causing the air masses to fluctuate in height. Air then showed signs of subsidence over southern PA as it encountered high pressure centered over the eastern seaboard, allowing for further vertical mixing of pollutants aloft down to the surface. Air then made its final descent into the nonattainment area, aiding in several exceedances in PA, NJ, NY, and CT. These air masses also traveled a great distance throughout transit, allowing for a buildup of pollutants from various regions.

Figure 5. Air Quality Index for the United States on July 16, 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/.