Ozone National Ambient Air Quality Standard Health Exceedances on June 20 & June 21, 2024

Exceedance Locations and Levels

On Thursday, June 20, 2024, there were four (4) exceedances in New Jersey of the National Ambient Air Quality Standard (NAAQS) and on Friday, June 21, 2024, there were six (6) exceedances of the NAAQS for ozone (daily maximum 8-hour average of 70 ppb). See Table 1.

Table 1. New Jersey Ozone Concentrations on 6/20/2024 and 6/21/2024

STATION	Daily Maximum 8-Hr Average (ppb) 6/20/2024	Daily Maximum 8-Hr Average (ppb) 6/21/2024
Ancora State Hospital	45	49
Bayonne	77	82
Brigantine	32	40
Camden Spruce St	55	68
Chester	58	67
Clarksboro	55	66
Colliers Mills	51	64
Columbia	67	71
Flemington	61	68
Leonia	82	88
Millville	44	51
Monmouth University	42	54
Ramapo	62	60
Rider University	80	80
Rutgers University	72	77
Washington Crossing*	69	72
TOTAL EXCEEDANCES	4	6

*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 eight (8) exceedances of the ozone NAAQS on Thursday, June 20, 2024 and sixteen (16) exceedances of the ozone NAAQS on Friday, June 21, 2024. See Table 2.

Table 2. Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey's Ozone Nonattainment Areas on 6/20/2024 and 6/21/2024

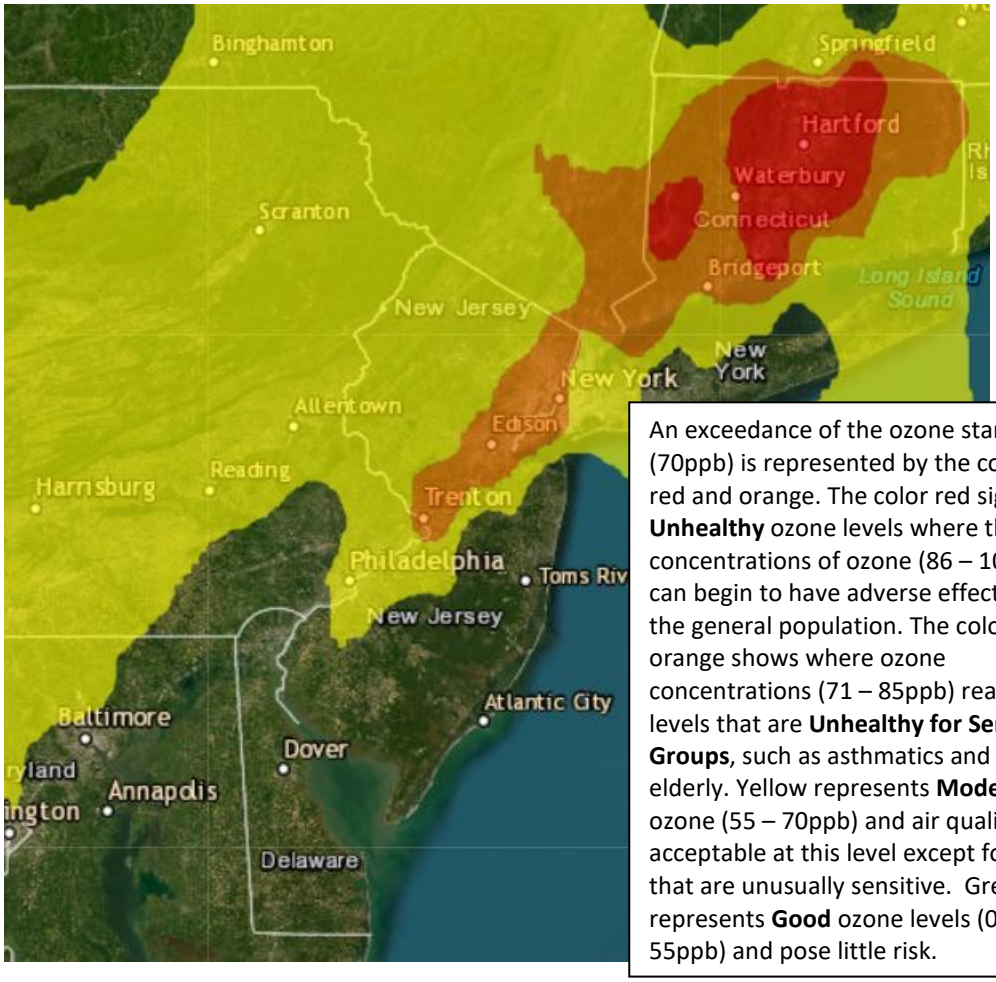
STATE	STATION	Daily Maximum 8-Hr Average (ppb) 6/20/2024	Daily Maximum 8-Hr Average (ppb) 6/21/2024
CT	Danbury	87	59
CT	Greenwich	74	85
CT	Madison-Beach Road	69	75
CT	Middletown-CVH-Shed	96	56
CT	New Haven	88	78
CT	Stratford	72	79
CT	Westport	89	87
DE	BCSP (New Castle Co.)	46	55
DE	BELLFNT2 (New Castle Co.)	49	57
DE	KILLENS (Kent Co.)	46	49
DE	LEWES (Sussex Co.)	37	45
DE	LUMS 2 (New Castle Co.)	44	58
DE	MLK (New Castle Co.)	50	60
DE	SEAFORD (Sussex Co.)	40	44
MD	Fair Hill	48	70
NY	Babylon	49	65
NY	Bronx - IS52	67	83
NY	CCNY	70	85
NY	Flax Pond	66	79
NY	Fresh Kills	72	74
NY	Holtsville	46	64
NY	Pfizer Lab	67	98
NY	Queens	58	67
NY	Riverhead	53	70
NY	Rockland Cty	69	69
NY	White Plains	77	83
PA	BRIS (Bucks Co.)	58	82
PA	CHES (Delaware Co.)	46	61
PA	NEWG (Chester Co.)	54	72
PA	NORR (Montgomery Co.)	59	63
PA	LAB (Philadelphia Co.)	57	72
PA	NEA (Philadelphia Co.)	56	74
PA	NEW (Philadelphia Co.)	58	75
	TOTAL EXCEEDANCES	8	16

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

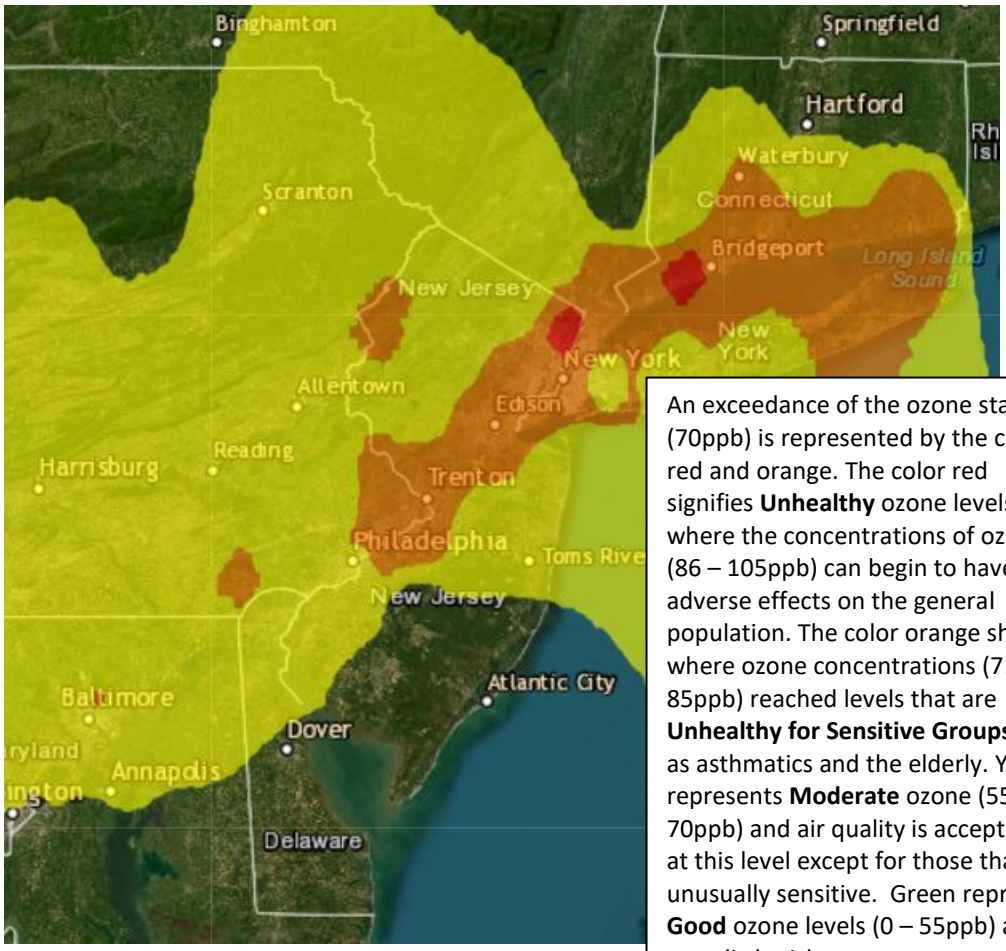
STATE	# of Days NAAQS was Exceeded January 1 – June 21, 2024 NAAQS = 70 ppb
Connecticut	8
Delaware	2
Maryland	0
New Jersey	6
New York	7
Pennsylvania	3

Figure 1. Ozone Air Quality Index for Thursday, June 20, 2024



An exceedance of the ozone standard (70ppb) is represented by the colors red and orange. The color red signifies **Unhealthy** ozone levels where the concentrations of ozone (86 – 105ppb) can begin to have adverse effects on the general population. 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 – 55ppb) and pose little risk.

Figure 2. Ozone Air Quality Index for Friday, June 21, 2024



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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

Thursday, June 20th and Friday, June 21st were days one and two of a three-day ozone exceedance event that occurred throughout the nonattainment area, which saw high pressure dominating the area in the days prior. With an excessive heat watch and heat advisory in effect, abundant sunshine blanketed the area, while temperatures reached the low-to-mid 90s throughout the region, with heat indices reaching just over 100. Dew points in the low-70s aided in the development of humid conditions. The winds remained light, with a south-southwesterly flow, which produced a stagnant air mass, causing a buildup of regional and localized pollutants and allowed for steady transport up the I-95 corridor. Throughout the day a surface trough was noted over the nonattainment area, enhancing atmospheric mixing, causing previously polluted air to mix down to the surface. These favorable conditions, along with ample sunshine throughout the day, allowed ozone levels to increase into the Unhealthy for Sensitive Groups

(USG) category along the I-95 corridor in New Jersey and New York, and the Unhealthy category in Connecticut.

Going into Friday, June 21st, a cold front began to move into the region and by late morning stalled over the nonattainment area, leading to a stagnant air mass and for residual pollution aloft to mix down to the surface, further enhancing ozone. Continued high pressure, plentiful sunshine, and increasing hot temperatures were again observed throughout the nonattainment area. The recirculation of previously polluted air and ozone conducive conditions caused ozone levels to once again rise into the USG and Unhealthy levels in NJ, NY, CT, and PA.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 3, 4, and 5 show the back trajectories of different wind heights for the monitored exceedance(s) on these days. The figures illustrate where the air came from during the approximate 72 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 days (Figures 6 & 7). 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 72-hr Back Trajectories

STATE	DATE	STATION	Daily Maximum 8-Hr Average (ppb)
NJ	6/20, 6/21	Leonia	82, 88
NJ	6/20, 6/21	Rider University	80, 80
NJ	6/20, 6/21	Bayonne	77, 82
NJ	6/20, 6/21	Rutgers University	72, 77
CT	6/20, 6/21	New Haven	88, 78
CT	6/20, 6/21	Greenwich	74, 85
CT	6/20, 6/21	Stratford	72, 79
NY	6/20, 6/21	White Plains	77, 83
NY	6/20, 6/21	Fresh Kills	72, 74
PA	6/21	BRIS (Bucks Co.)	82

Figure 3. 72-hour Back Trajectories for June 21, 2024 at 10 meters

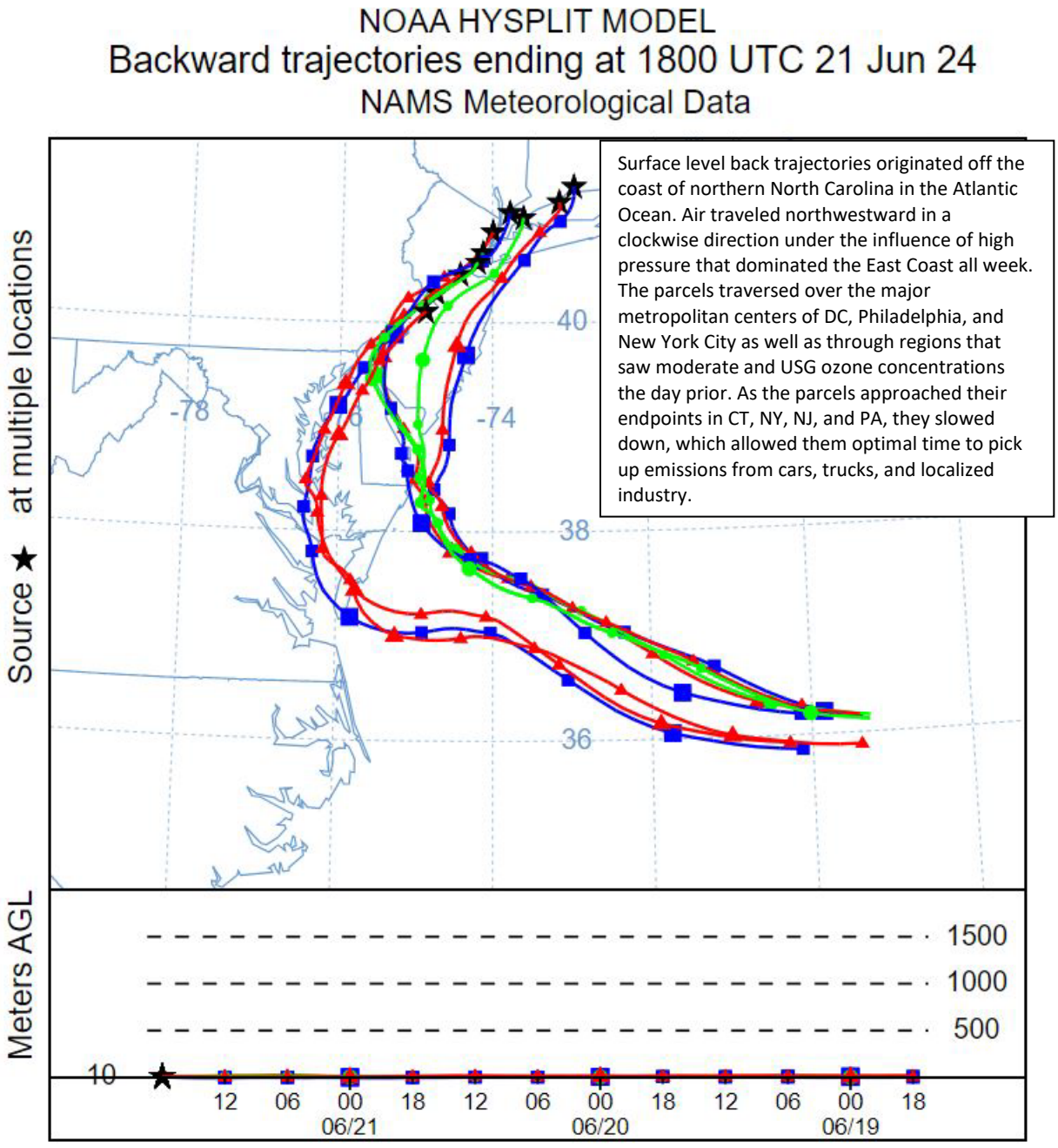


Figure 4. 72-hour Back Trajectories for June 21, 2024 at 500 meters

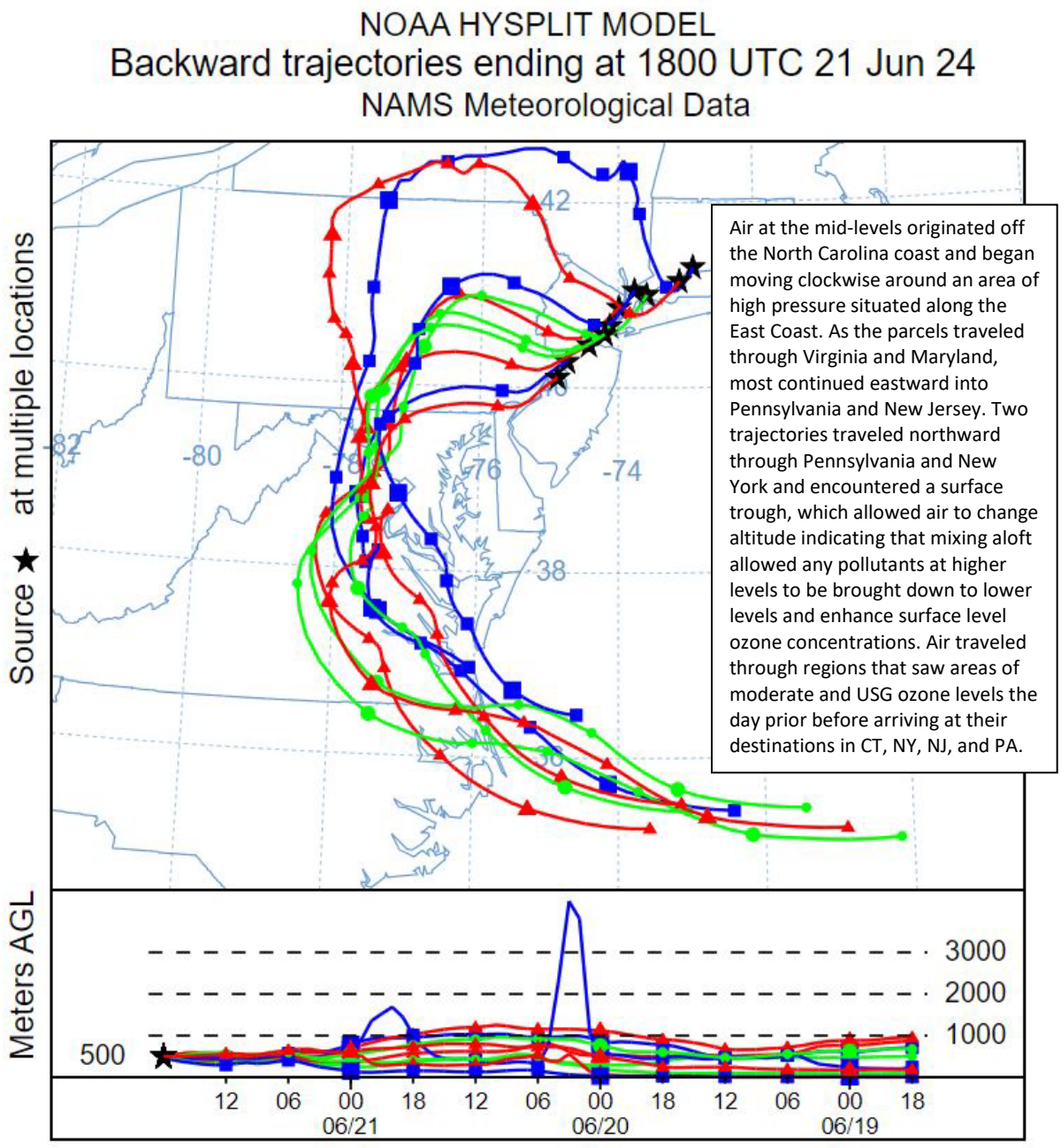
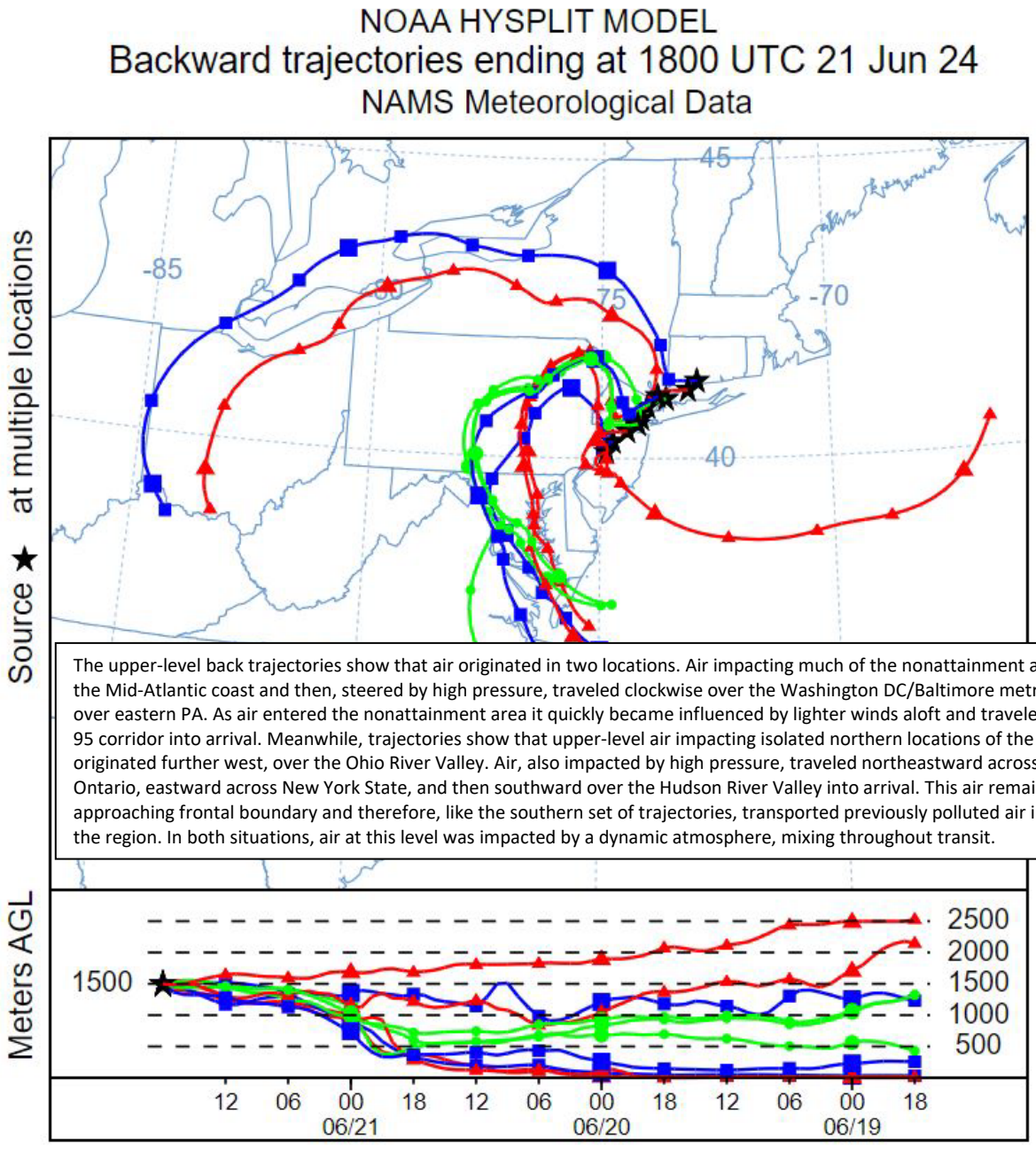


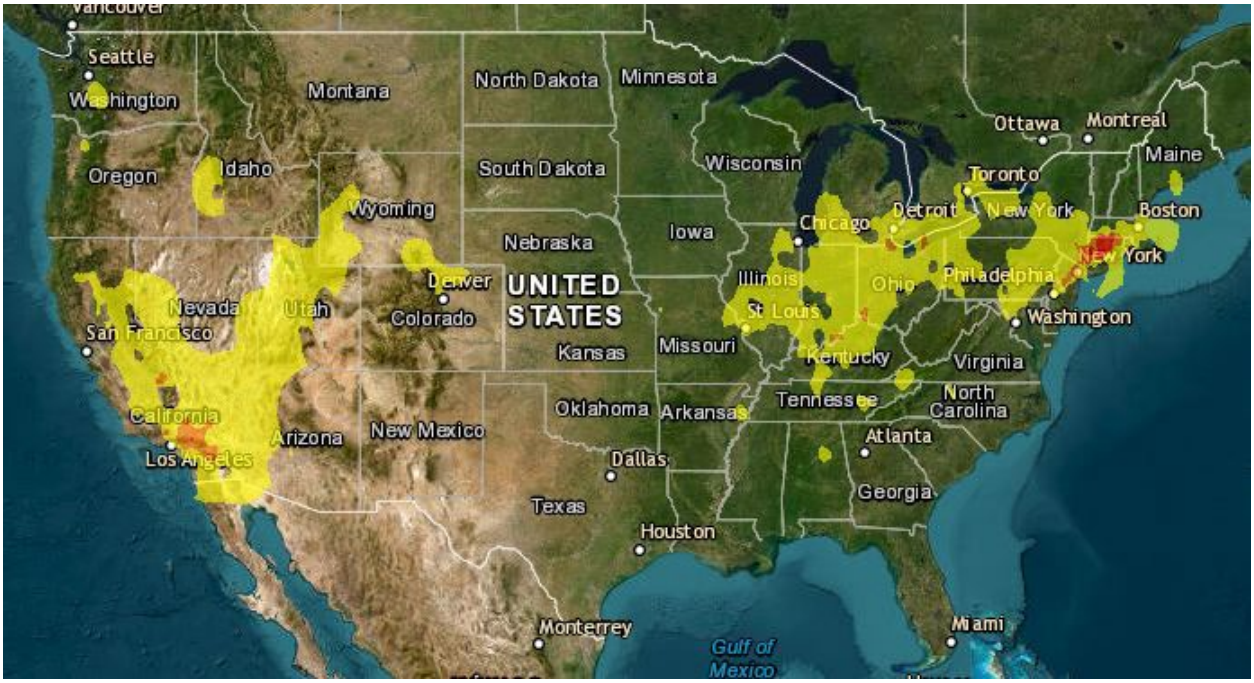
Figure 5. 72-hour Back Trajectories for June 21, 2024 at 1500 meters



The upper-level back trajectories show that air originated in two locations. Air impacting much of the nonattainment area originated off the Mid-Atlantic coast and then, steered by high pressure, traveled clockwise over the Washington DC/Baltimore metropolitan areas and over eastern PA. As air entered the nonattainment area it quickly became influenced by lighter winds aloft and traveled slowly along the I-95 corridor into arrival. Meanwhile, trajectories show that upper-level air impacting isolated northern locations of the nonattainment area originated further west, over the Ohio River Valley. Air, also impacted by high pressure, traveled northeastward across Lake Erie and Ontario, eastward across New York State, and then southward over the Hudson River Valley into arrival. This air remained ahead of an approaching frontal boundary and therefore, like the southern set of trajectories, transported previously polluted air into and throughout the region. In both situations, air at this level was impacted by a dynamic atmosphere, mixing throughout transit.

Figure 6. Air Quality Index for the United States on June 19, 2024

Figure 7. Air Quality Index for the United States on June 20, 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/.