## Ozone National Ambient Air Quality Standard Health Exceedances on July 7 & July 8, 2024

### Exceedance Locations and Levels

On Sunday, July 7, 2024, there was one (1) exceedance in New Jersey of the National Ambient Air Quality Standard (NAAQS) and on Monday, July 8, 2024, there were four (4) exceedances of the NAAQS for ozone (daily maximum 8-hour average of 70 ppb). See Table 1.

**Table 1. New Jersey Ozone Concentrations on 7/7/2024 and 7/8/2024**

| STATION | Daily Maximum 8-Hr Average (ppb) 7/7/2024 | Daily Maximum 8-Hr Average (ppb) 7/8/2024 |
|---|---|---|
| Ancora State Hospital | 60 | 48 |
| Bayonne | 65 | 62 |
| Brigantine | 55 | 57 |
| Camden Spruce St | No Data | No Data |
| Chester | 46 | 63 |
| Clarksboro | 67 | 68 |
| Colliers Mills | 53 | 62 |
| Columbia | 48 | 65 |
| Flemington | 48 | 69 |
| Leonia | 60 | 83 |
| Millville | 55 | 49 |
| Monmouth University | 43 | 48 |
| Ramapo | 42 | 68 |
| Rider University | 69 | 76 |
| Rutgers University | 81 | 81 |
| Washington Crossing* | 52 | 71 |
| **TOTAL EXCEEDANCES** | 1 | 4 |

*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 on Sunday, July 7, 2024 and ten (10) exceedances of the ozone NAAQS on Monday, July 8, 2024. See Table 2.

**Table 2. Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey's Ozone Nonattainment Areas on 7/7/2024 and 7/8/2024**

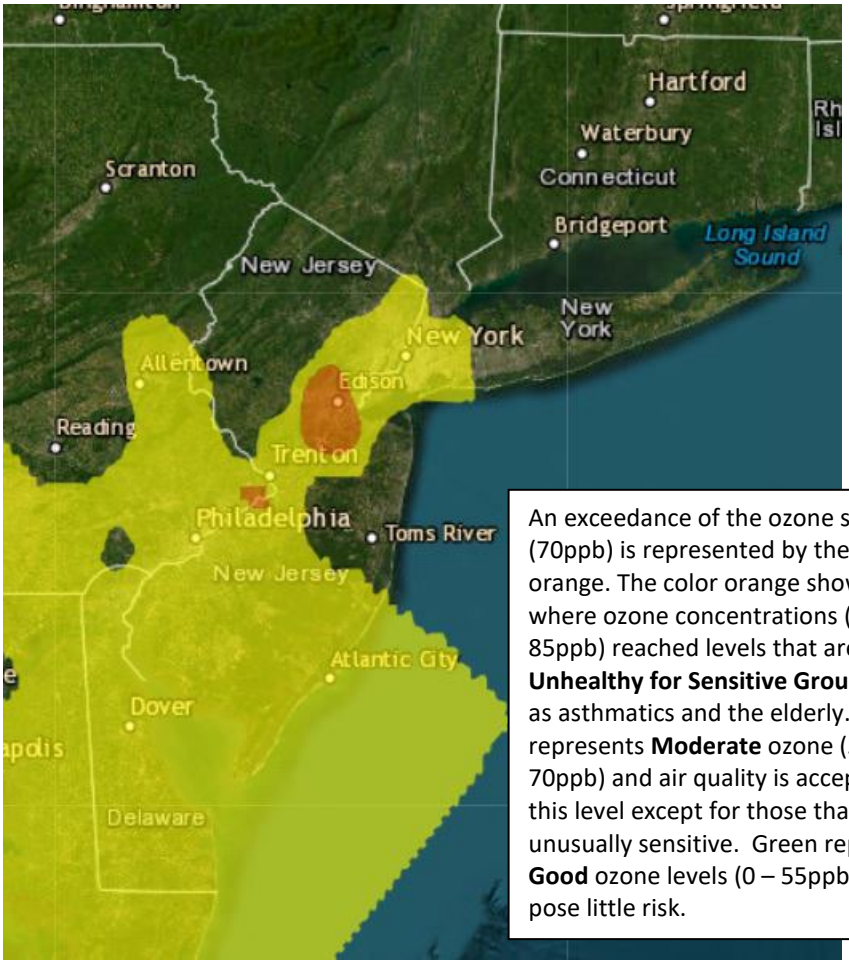
| STATE | STATION | Daily Maximum 8-Hr Average (ppb) 7/7/2024 | Daily Maximum 8-Hr Average (ppb) 7/8/2024 |
|---|---|---|---|
| CT | Danbury | 47 | 54 |
| CT | Greenwich | 52 | 59 |
| CT | Madison-Beach Road | 34 | 54 |
| CT | Middletown-CVH-Shed | 46 | 54 |
| CT | New Haven | No Data | No Data |
| CT | Stratford | 35 | 62 |
| CT | Westport | 48 | 60 |
| DE | BCSP (New Castle Co.) | 50 | 73 |
| DE | BELLFNT2 (New Castle Co.) | 65 | 64 |
| DE | KILLENS (Kent Co.) | 59 | 67 |
| DE | LEWES (Sussex Co.) | 61 | 54 |
| DE | LUMS 2 (New Castle Co.) | 56 | 70 |
| DE | MLK (New Castle Co.) | 62 | 74 |
| DE | SEAFORD (Sussex Co.) | 62 | 65 |
| MD | Fair Hill | 57 | 78 |
| NY | Babylon | 47 | 57 |
| NY | Bronx - IS52 | 58 | 70 |
| NY | CCNY | 62 | 79 |
| NY | Flax Pond | 31 | 51 |
| NY | Fresh Kills | 59 | 64 |
| NY | Holtsville | 40 | 52 |
| NY | Pfizer Lab | 52 | 66 |
| NY | Queens | 56 | 62 |
| NY | Riverhead | 45 | 47 |
| NY | Rockland Cty | 48 | 63 |
| NY | White Plains | 45 | 62 |
| PA | BRIS (Bucks Co.) | 71 | 75 |
| PA | CHES (Delaware Co.) | 67 | 81 |
| PA | NEWG (Chester Co.) | 56 | 83 |
| PA | NORR (Montgomery Co.) | 56 | 82 |
| PA | LAB (Philadelphia Co.) | 57 | 65 |
| PA | NEA (Philadelphia Co.) | 64 | 73 |
| PA | NEW (Philadelphia Co.) | 65 | 71 |
| | **TOTAL EXCEEDANCES** | 1 | 10 |

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**

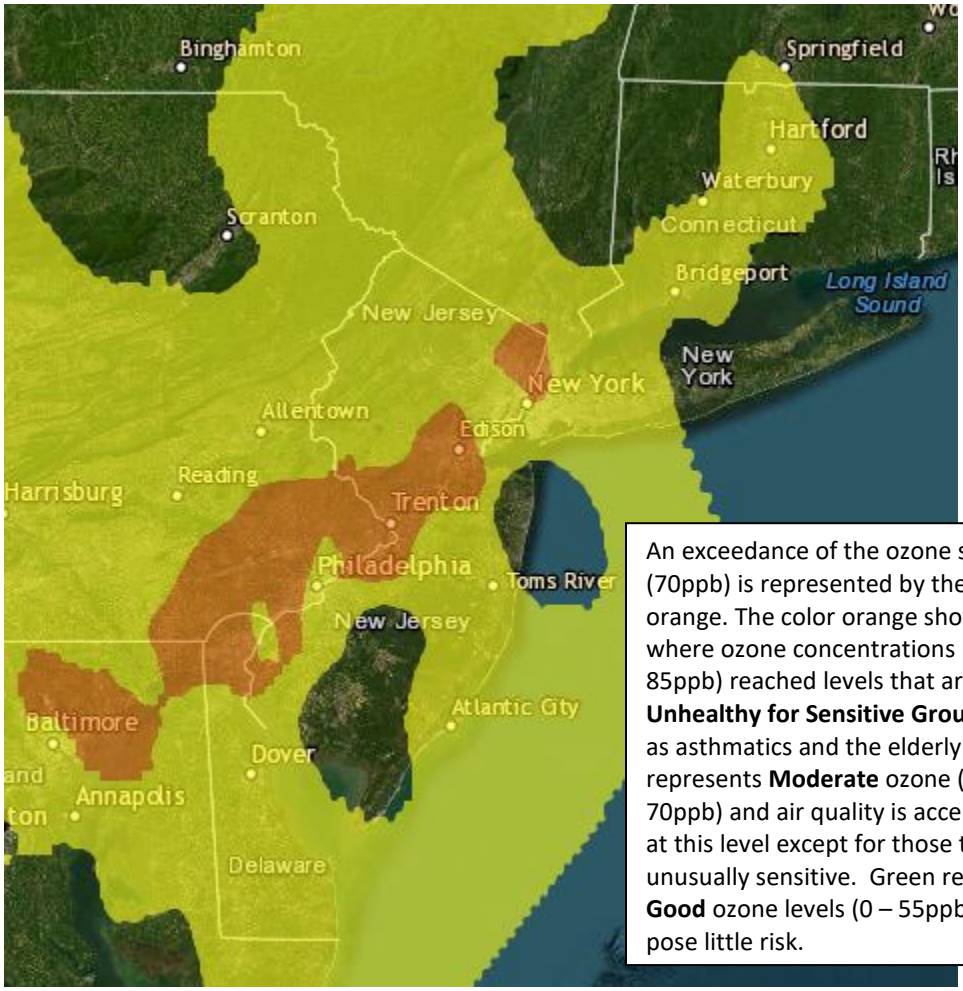
| STATE | # of Days NAAQS was Exceeded January 1 – July 8, 2024 NAAQS = 70 ppb |
|---|---|
| Connecticut | 10 |
| Delaware | 4 |
| Maryland | 2 |
| New Jersey | 10 |
| New York | 9 |
| Pennsylvania | 7 |

**Figure 1. Ozone Air Quality Index for Sunday, July 7, 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 – 55ppb) and pose little risk.

**Figure 2. Ozone Air Quality Index for Monday, July 8, 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

Sunday, July 7th and Monday, July 8th were days one and two of a two-day ozone exceedance event that occurred throughout the nonattainment area. Early Sunday morning, a cold front moved across the area before stalling along the I-95 corridor, triggering some scattered rain showers over southern New Jersey and southeastern Pennsylvania. Hot and humid conditions, light variable winds, and mostly sunny skies were observed during the day, creating favorable conditions for ozone development. As the day progressed, a sea breeze developed along the New Jersey coast and overcast skies were observed, suppressing ozone formation in these areas. Monitors along the stalled frontal boundary saw elevated ozone levels throughout the day, with the front providing ample mixing for pollutants aloft. In addition, smoke from the Tea Time Hill wildfire that was burning in Wharton State Forest was also present in portions of the nonattainment area. Favorable conditions along the I-95 corridor allowed monitors in Bristol, PA and Rutgers University, NJ to reach the Unhealthy for Sensitive Groups (USG) category.

By Monday, July 8th, the frontal boundary remained stalled over the area and little change to the airmass occurred. Hot and humid conditions continued along with light onshore flow. Air was able to recirculate on Monday as the front slowly meandered around the I-95 corridor. This recirculation of previously polluted air and meteorological conditions conducive for ozone formation led to widespread exceedances across the nonattainment area from New York to Maryland.

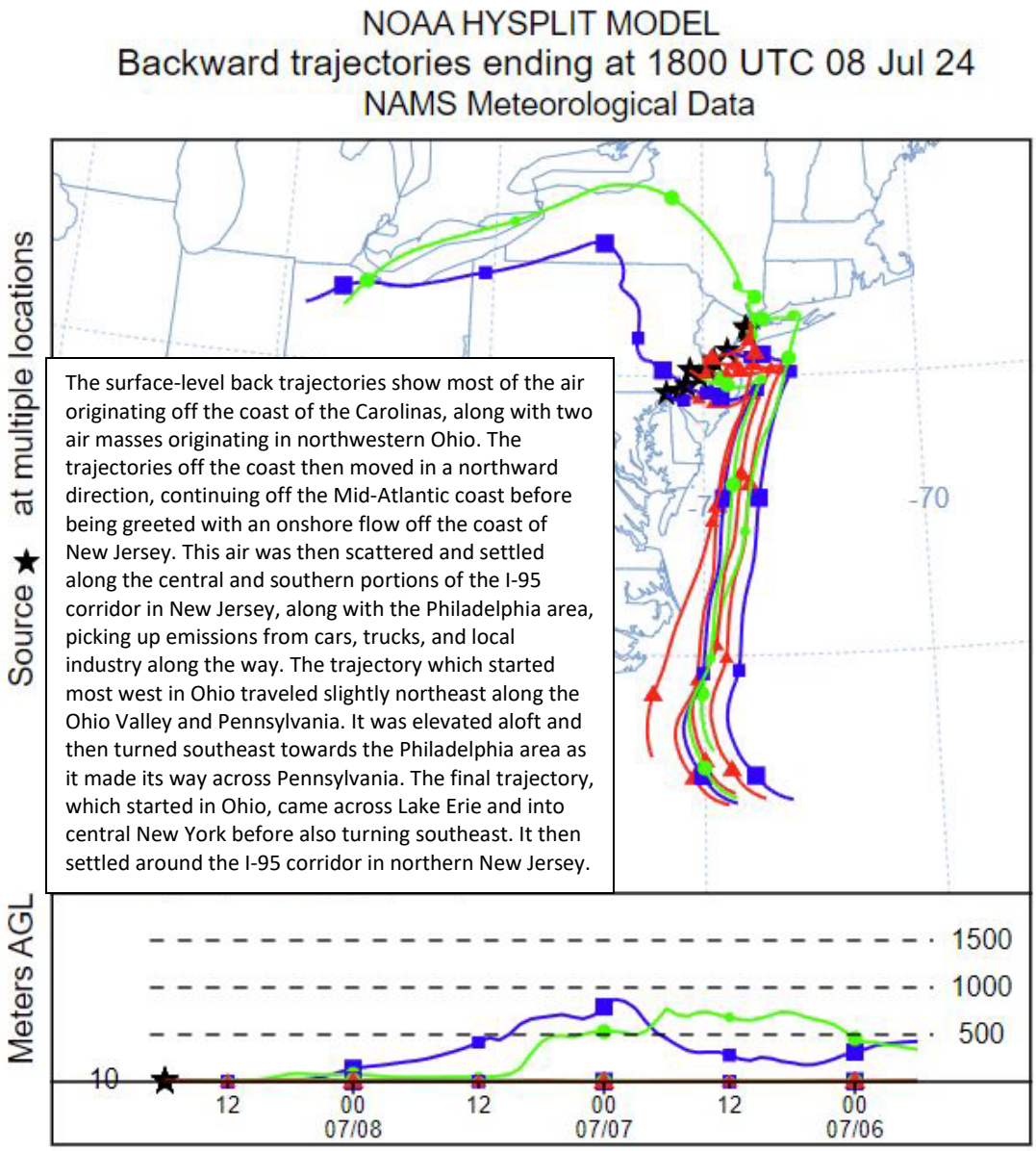
**Where Did the Air Pollution that Caused Ozone Come From?**

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 | 7/8 | Leonia | 83 |
| NJ | 7/8 | Rider University | 76 |
| NJ | 7/7, 7/8 | Rutgers University | 81, 81 |
| DE | 7/8 | MLK | 74 |
| MD | 7/8 | Fair Hill | 78 |
| NY | 7/8 | CCNY | 79 |
| PA | 7/7, 7/8 | BRIS (Bucks Co.) | 71, 75 |
| PA | 7/8 | CHES (Delaware Co.) | 81 |
| PA | 7/8 | NEW (Philadelphia Co.) | 71 |
| PA | 7/8 | NORR (Montgomery Co.) | 82 |

**Figure 3. 72-hour Back Trajectories for July 8, 2024 at 10 meters**




The surface-level back trajectories show most of the air originating off the coast of the Carolinas, along with two air masses originating in northwestern Ohio. The trajectories off the coast then moved in a northward direction, continuing off the Mid-Atlantic coast before being greeted with an onshore flow off the coast of New Jersey. This air was then scattered and settled along the central and southern portions of the I-95 corridor in New Jersey, along with the Philadelphia area, picking up emissions from cars, trucks, and local industry along the way. The trajectory which started most west in Ohio traveled slightly northeast along the Ohio Valley and Pennsylvania. It was elevated aloft and then turned southeast towards the Philadelphia area as it made its way across Pennsylvania. The final trajectory, which started in Ohio, came across Lake Erie and into central New York before also turning southeast. It then settled around the I-95 corridor in northern New Jersey.

**Figure 4. 72-hour Back Trajectories for July 8, 2024 at 500 meters**

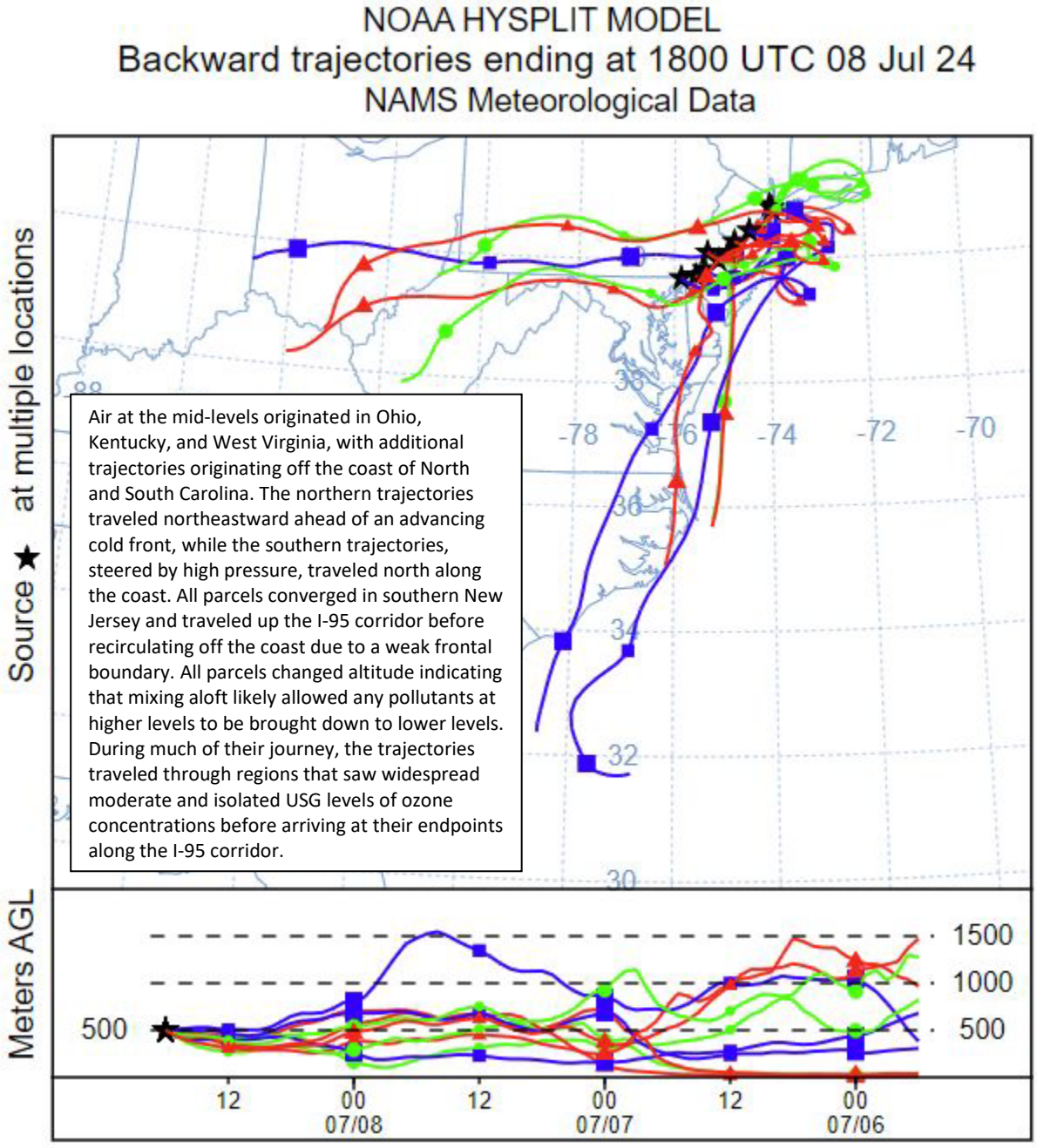
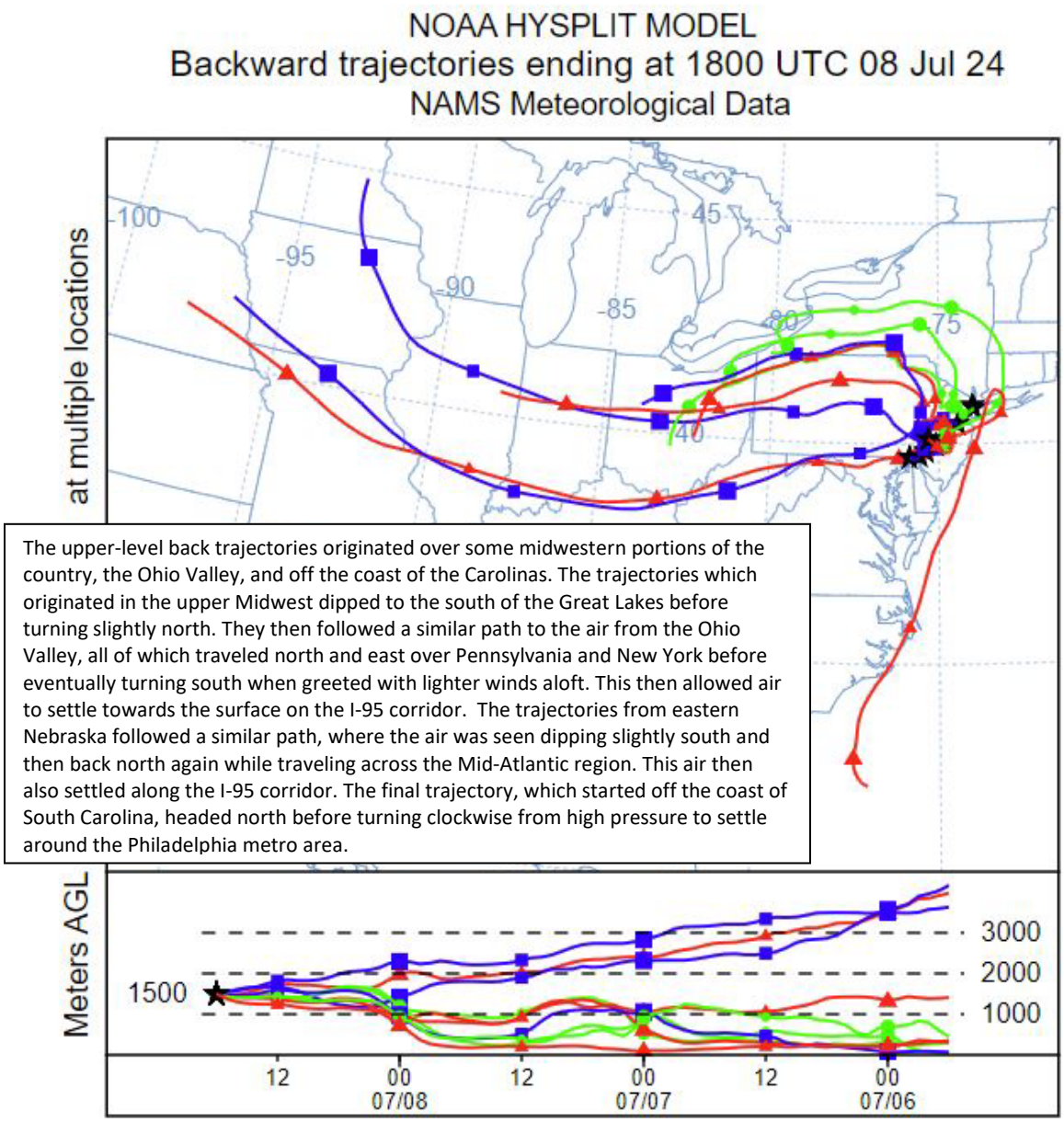


**Figure 5. 72-hour Back Trajectories for July 8, 2024 at 1500 meters**




The upper-level back trajectories originated over some midwestern portions of the country, the Ohio Valley, and off the coast of the Carolinas. The trajectories which originated in the upper Midwest dipped to the south of the Great Lakes before turning slightly north. They then followed a similar path to the air from the Ohio Valley, all of which traveled north and east over Pennsylvania and New York before eventually turning south when greeted with lighter winds aloft. This then allowed air to settle towards the surface on the I-95 corridor. The trajectories from eastern Nebraska followed a similar path, where the air was seen dipping slightly south and then back north again while traveling across the Mid-Atlantic region. This air then also settled along the I-95 corridor. The final trajectory, which started off the coast of South Carolina, headed north before turning clockwise from high pressure to settle around the Philadelphia metro area.

**Figure 6. Air Quality Index for the United States on July 6, 2024**

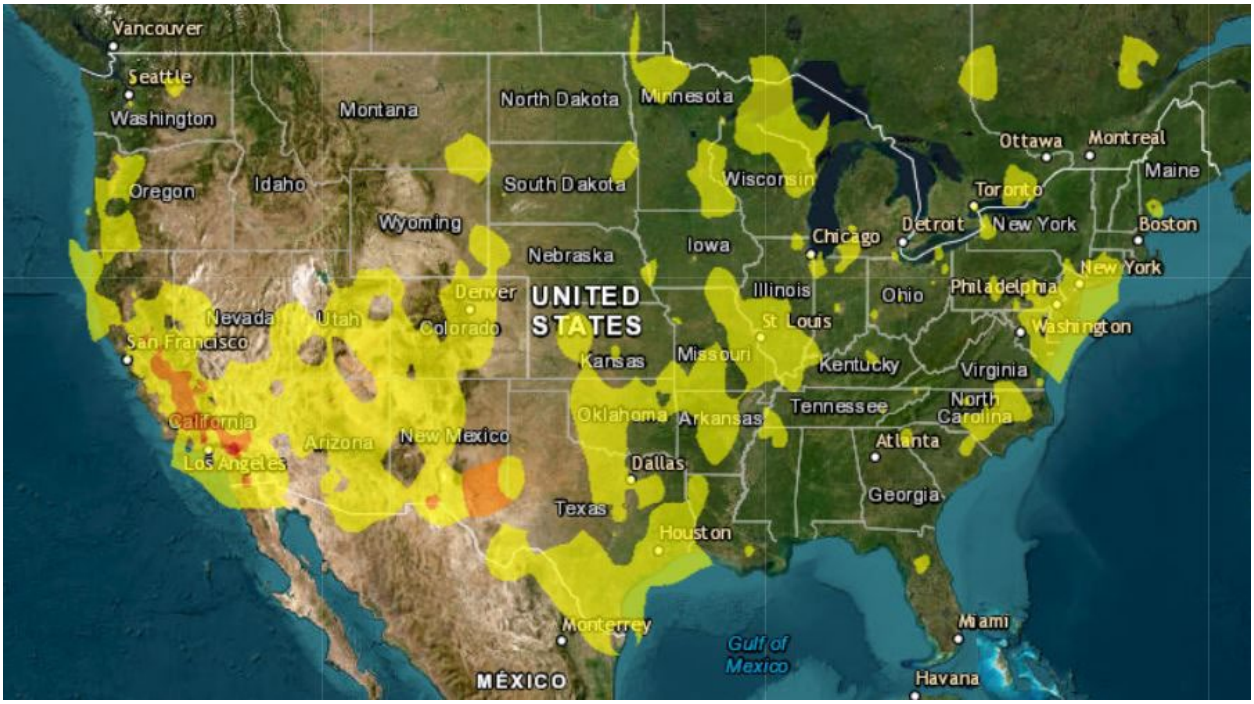
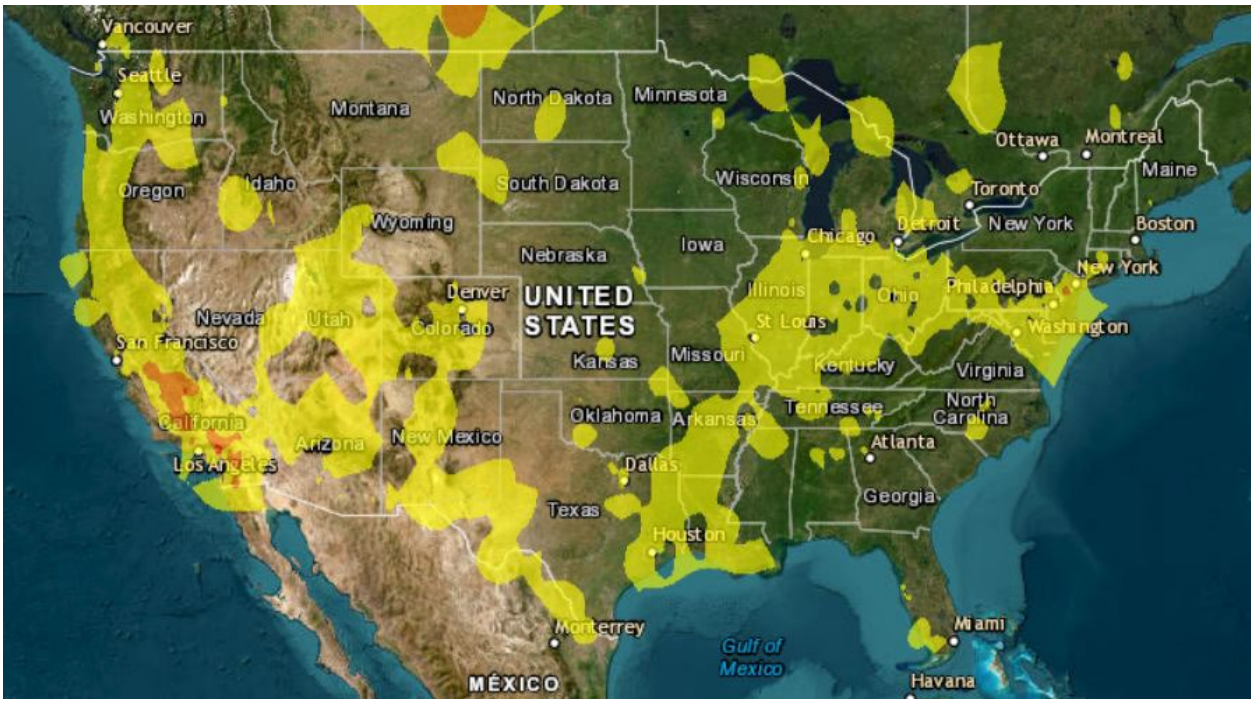



**Figure 7. Air Quality Index for the United States on July 7, 2024**




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/ .