## Ozone National Ambient Air Quality Standard Health Exceedances on July 22, 2016

### Exceedance Locations and Levels

On Friday, July 22, 2016, there were seven (7) exceedances in New Jersey of the new 8-hour average ozone NAAQS of 70 ppb that became effective in December 2015 (see Table 1):

**Table 1: Ozone NAAQS Exceedances in New Jersey on July 22, 2016**

| STATION | Daily Maximum 8-Hr Average (ppb) |
|---|---|
| Camden Spruce St | 81 |
| Clarksboro | 74 |
| Flemington | 73 |
| Leonia | 75 |
| Rider University | 72 |
| Rutgers University | 78 |
| Washington Crossing* | 72 |

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

The highest 1-hour average ozone concentration recorded on July 22, 2016 in New Jersey was 90 ppb at the Rutgers University station, which is below the 1-hour ozone NAAQS of 120 ppb.

Friday marks the 17th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 22nd of July in 2015, there were a total of seven (7) days on which ozone exceedances were measured in New Jersey (based on the former 75 ppb NAAQS of 2008), and there were two (2) days by this same date in 2014.

There is a group of monitoring stations in designated counties of five (5) states, New York, Connecticut, Pennsylvania, Delaware and Maryland, that are included in New Jersey's ozone nonattainment areas. From this group of stations in the other neighboring states, there were twenty-four (24) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Friday, July 22, 2016 (see Table 2):

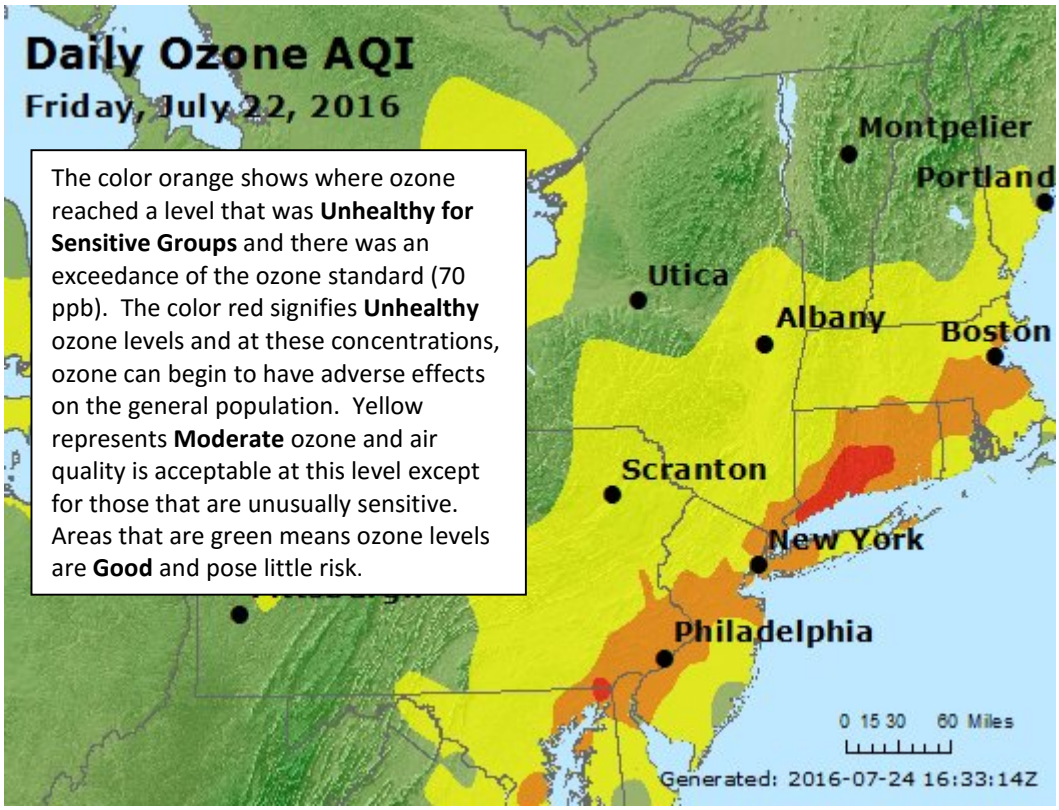
**Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on July 22, 2016**

| STATE | STATION | Daily Maximum 8-Hr Average (ppb) |
|---|---|---|
| CT | Greenwich | 79 |
| CT | Madison-Beach Road | 78 |
| CT | Middletown | 100 |
| CT | New Haven | 91 |
| CT | Stratford | 96 |
| CT | Westport | 97 |
| DE | BCSP (New Castle Co.) | 84 |
| DE | BELLFNT2 (New Castle Co.) | 83 |
| DE | LUMS 2 (New Castle Co.) | 76 |
| DE | MLK (New Castle Co.) | 84 |
| MD | Fair Hill | 87 |
| NY | CCNY | 72 |
| NY | IS52 | 73 |
| NY | Pfizer Lab | 72 |
| NY | Queens | 82 |
| NY | Susan Wagner | 81 |
| NY | White Plains | 76 |
| PA | BRIS (Bucks Co.) | 72 |
| PA | CHES (Delaware Co.) | 82 |
| PA | NEWG (Chester Co.) | 78 |
| PA | NORR (Montgomery Co.) | 81 |
| PA | LAB (Philadelphia Co.) | 71 |
| PA | NEA (Philadelphia Co.) | 74 |
| PA | NEW (Philadelphia Co.) | 84 |

The highest 1-hour average ozone concentration recorded was 123 ppb at the Stratford station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb (the data rounding convention for the 1-hour ozone NAAQS is concentrations of 125 ppb and higher are exceedances, while concentrations of 124 ppb and lower are not exceedances).

Friday marks the 19th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in Connecticut, the 15th day for New York, the 10th day for Pennsylvania, the 6th day for Delaware, and the 5th day for Maryland.

**Figure 1. Ozone Air Quality Index for July 22, 2016**




Source: www.airnow.gov

**For ozone terminology definitions see NJDEP Air Quality Planning's Glossary and Acronyms webpage:** http://nj.gov/dep/baqp/glossary.html

## Weather

Meteorological data from across the region showed temperatures reached into the mid 90°F, while winds were from the southwest. High pressure systems over the eastern seaboard and Smokey Mountains resulted in mostly sunny skies across the region. In addition, a low pressure surface trough was in place just west of the I-95 corridor from Maryland all the way up through to southern New England, which provided a mechanism that enabled polluted air aloft to mix down to the surface. This weather feature, in combination with adequate sunlight, southwest winds, and warm temperatures, are all meteorological conditions commonly seen on high ozone days.

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

Figures 2, 3, and 4 show the back trajectories at different wind heights for the monitored exceedances on July 22, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Eleven (11) monitoring stations were chosen to run back trajectories, based on the 8-hour ozone concentrations recorded and their location. The selected sites for running back trajectories and the maximum 8-hr ozone levels recorded are listed in Table 3 below.

**Table 3. Monitoring Stations with 8-hr Ozone Exceedances that Were Selected to Run 48-hr Back Trajectories**

| Agency | Site Name | Maximum 8-hr Ozone Conc. (ppb) |
|---|---|---|
| CT | Middletown | 100 |
| CT | Westport | 97 |
| DE | BCSP (New Castle Co.) | 84 |
| MD | Fairhill | 87 |
| NJ | Camden Spruce St. | 81 |
| NJ | Leonia | 75 |
| NJ | Rutgers University | 78 |
| NY | Queens | 82 |
| NY | Susan Wagner | 81 |
| PA | NEW (Philadelphia Co.) | 84 |
| PA | CHES (Chester Co.) | 82 |

The low level winds (Figure 2) originated in the vicinity of the Chesapeake Bay and off-shore of New Jersey. Winds traveled across the Baltimore Metropolitan area and along the I-95 through the Philadelphia and New York City metropolitan areas. These winds picked up air contaminant emissions generated by cars, trucks, and industry along the I-95 corridor and transported them to the exceedance monitors.

Mid-level wind (Figure 3) originating in the Ohio River valley traveled across Pennsylvania, New Jersey, and New York on their way to monitors located in New Jersey, New York, and Pennsylvania, while mid-level winds originating over Virginia traveled to monitors located in Maryland, Delaware, Pennsylvania, and New Jersey. These winds mixed with local emissions from cars, trucks, and industry along the I-95 corridor and where the monitors are located.

Higher level wind (Figure 4) traveled from the Midwest across the lower Great Lakes and down through Pennsylvania, New York, and New Jersey, bringing emissions from large industrial sources and power plants to the exceedance monitors. The higher level wind, in combination with the low and mid-level winds, caused air pollution from a variety of mobile and stationary sources to be transported to the exceedance monitors along the I-95 corridor from Maryland through Connecticut on July 22, 2016.

**Figure 2. 48-hour Back Trajectories for July 22, 2016 at 10 meters**

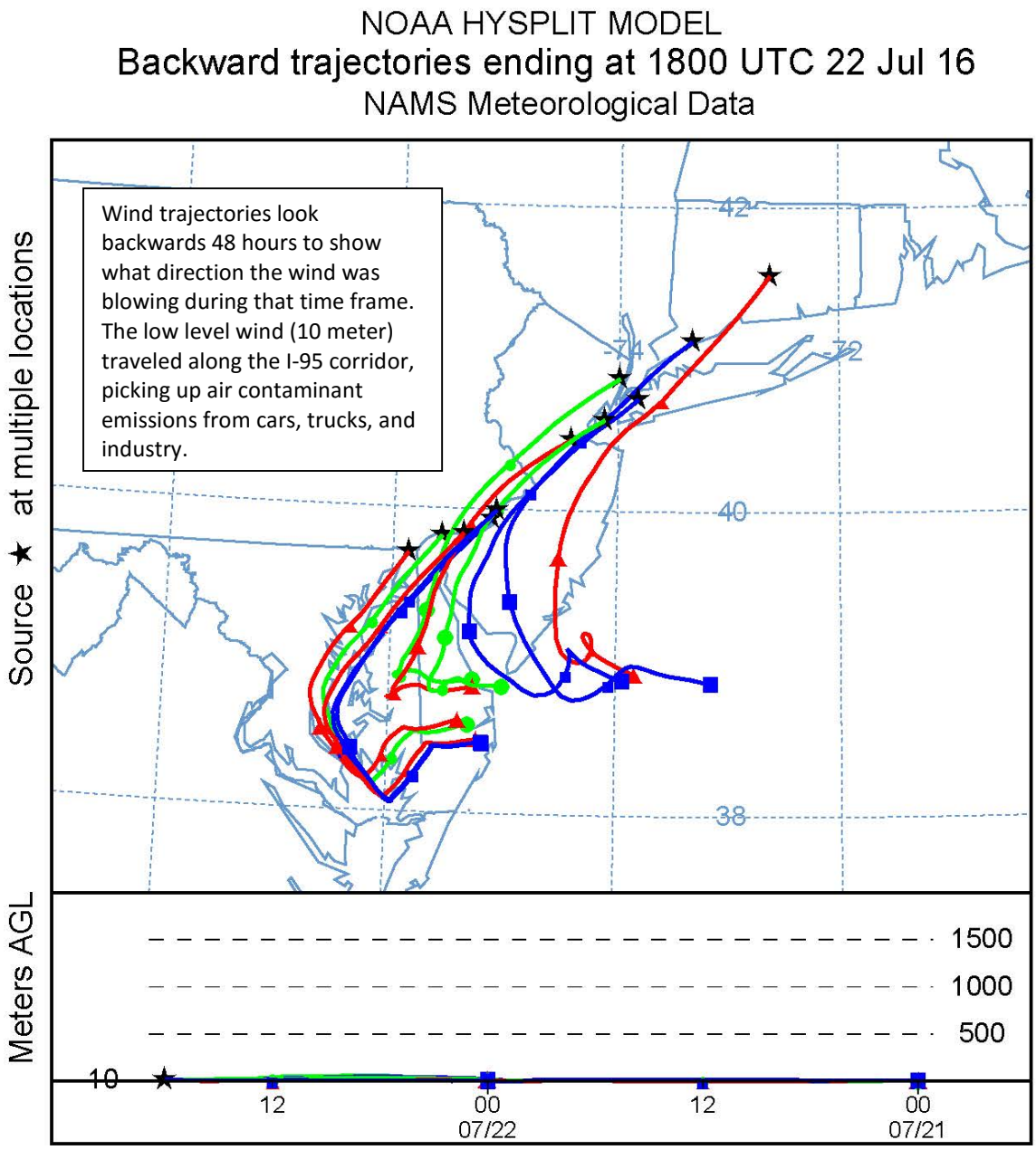


**Figure 3. 48-hour Back Trajectories for July 22, 2016 at 500 meters**

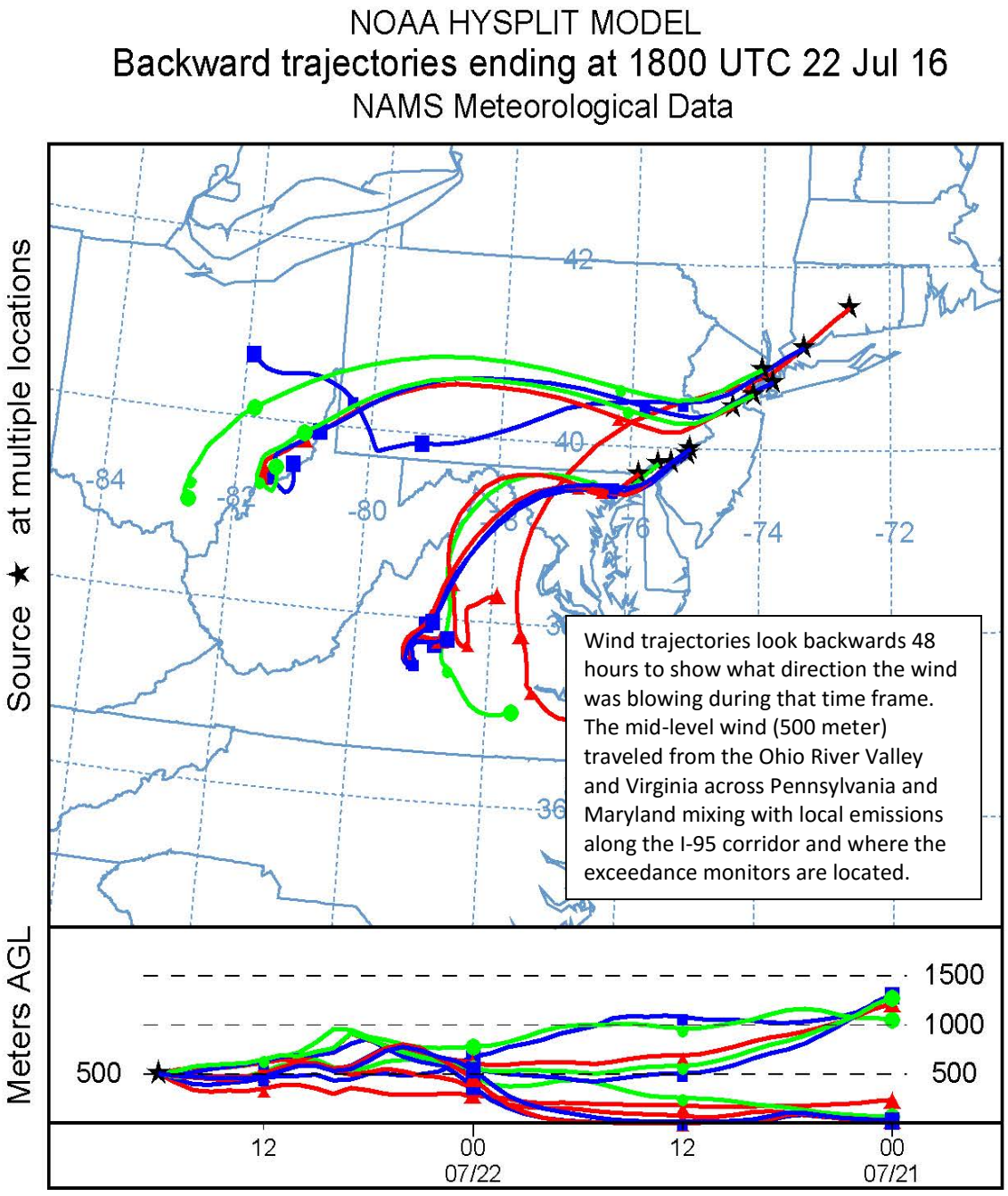
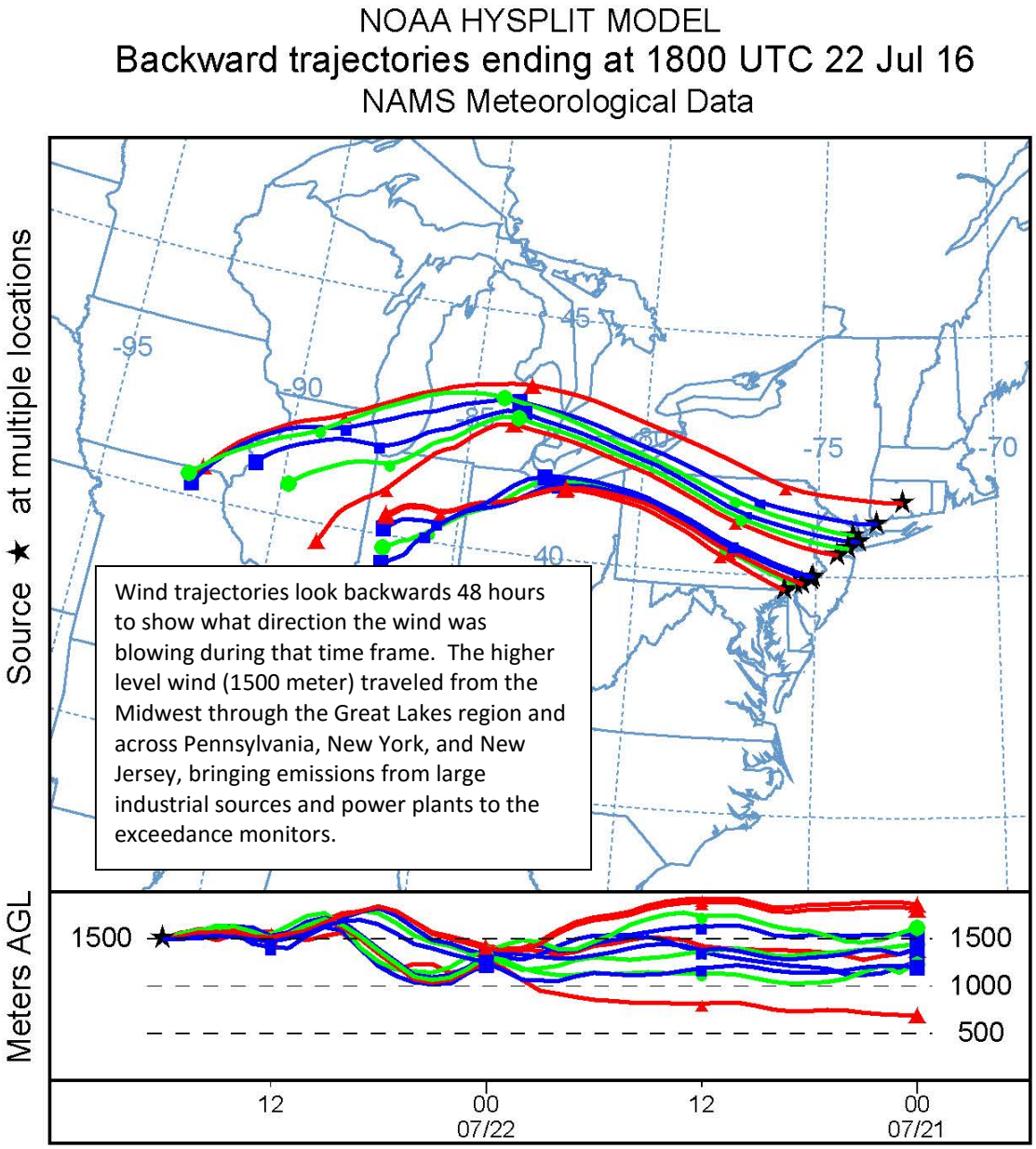


**Figure 4. 48-hour Back Trajectories for July 22, 2016 at 1500 meters**



## How is Smog Created?

Ground-level ozone, also known as smog, is an air pollutant known to cause a number of health effects and negatively impact air quality and the environment in the state of New Jersey. Smog is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Smog can irritate any set of lungs, but those with lung-related deficiencies should take extra precautions on bad ozone days.

## Find Out About Air Quality Every Day

The "What's Your Air Quality Today?" page at http://www.nj.gov/dep/cleanairnj/ tells you how to sign up to receive notifications and find out when your local air has reached unhealthy ozone levels.