# Ozone National Ambient Air Quality Standard Health Exceedances on April 11, 2017

## Exceedance Locations and Levels

Ozone Update, April 12, 2017 – Exceedances on 4/11/17 in MD, NJ & PA

On Tuesday, April 11, 2017, there were five (5) 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 April 11, 2017**

| STATION | Daily Maximum 8-Hr Average (ppb) | Exceeds 70 ppb NAAQS |
|---|---|---|
| Chester | 75 | Yes |
| Flemington | 77 | Yes |
| Ramapo | 74 | Yes |
| Rutgers University | 71 | Yes |
| Washington Crossing* | 71 | Yes |

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

One New Jersey station exceeded the 75 ppb ozone NAAQS of 2008, but none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded on April 11, 2017, in New Jersey was 84 ppb at the Flemington and Rutgers University stations, which is below the 1-hour ozone NAAQS of 120 ppb.

Tuesday marks the first day in 2017 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 11$^{th}$ of April in 2016, there were zero (0) days on which ozone exceedances were measured in New Jersey (based on the former 75 ppb NAAQS of 2008), and there were zero (0) days by this same date in 2015.

There is a group of monitoring stations in designated counties of 5 states, New York, Connecticut, Pennsylvania, Delaware and Maryland, that are included in New Jersey's ozone non-attainment areas. From this group of stations in the neighboring states, there were three (3) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Tuesday, April 11, 2017:

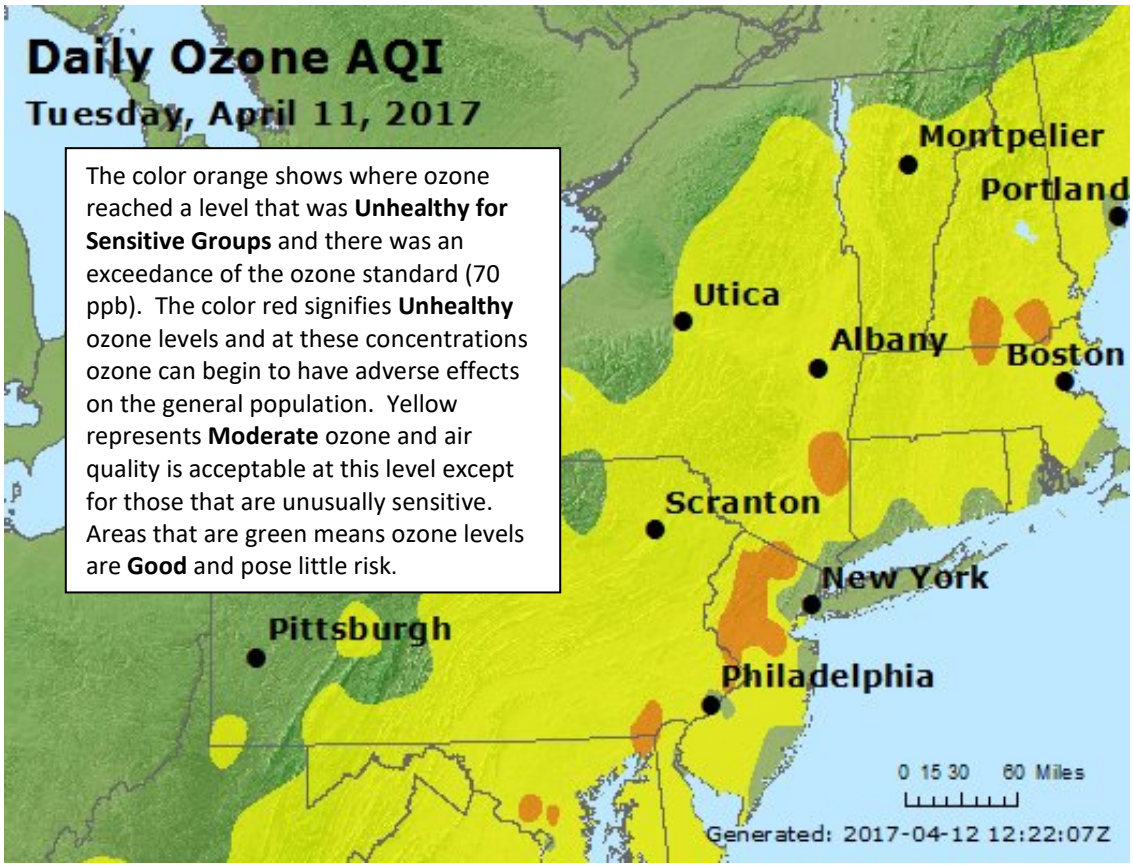
**Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on April 11, 2017**

| STATE | STATION | Daily Maximum 8-Hr Average (ppb) | Exceeds 70 ppb NAAQS |
|---|---|---|---|
| MD | Fair Hill | 73 | Yes |
| PA | NEWG (Chester Co.) | 71 | Yes |
| PA | NEA (Philadelphia Co.) | 73 | Yes |

No station exceeded the 75 ppb ozone NAAQS of 2008, and none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 82 ppb at the Fair Hill station in Connecticut and the Northeast Airport station in Philadelphia, PA, which is below the 1-hour ozone NAAQS of 120 ppb.

Tuesday marks the first day in 2017 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in Maryland, and Pennsylvania. Connecticut, Delaware and New York have not yet recorded any ozone exceedances in 2017.

**Figure 1. Ozone Air Quality Index for April 11, 2017**




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 80°F's, while winds were light and from the south/ southwest. A high-pressure system was centered over the eastern Atlantic Seaboard leading to mostly sunny conditions across the region. A low-pressure surface trough remained in place slightly west of New Jersey stretching from Virginia into New York; this feature creates conditions that allow polluted air aloft to mix down to the surface. This feature in combination with abundant sunlight, warm temperatures and light south/southwesterly winds, are all features commonly seen with an ozone exceedance.

**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 April 11, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. The eight (8) monitoring stations with 8-hr ozone exceedances were chosen to run back trajectories. The selected sites 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) |
|---|---|---|
| MD | Fair Hill | 73 |
| NJ | Chester | 75 |
| NJ | Flemington | 77 |
| NJ | Ramapo | 74 |
| NJ | Rutgers | 71 |
| OAP | Washington Crossing | 71 |
| PA | NEWG (Chester Co.) | 71 |
| PA | NEA (Philadelphia Co.) | 73 |

The low-level winds (Figure 2) traveled along the coast and the I-95 corridor through the major metropolitan areas of Baltimore and Philadelphia to monitors located in New Jersey's nonattainment areas. The winds collected emissions from cars, trucks, and industry as it traveled into New Jersey. The back trajectories for the mid-level (Figure 3) and higher level (Figure 4) winds illustrate similar transport pathways. The mid and upper level winds brought in polluted air from the south/southwest which had widespread moderate air quality the day before stretching from Alabama into New England. Figure 5 illustrates the areas of moderate ozone recorded along the eastern seaboard on April 10, 2017 the day before the high ozone event in our area. These winds mixed with local emissions from cars, trucks, and industry along the I-95 corridor.

**Figure 2. 48-hour Back Trajectories for April 11, 2017 at 10 meters**

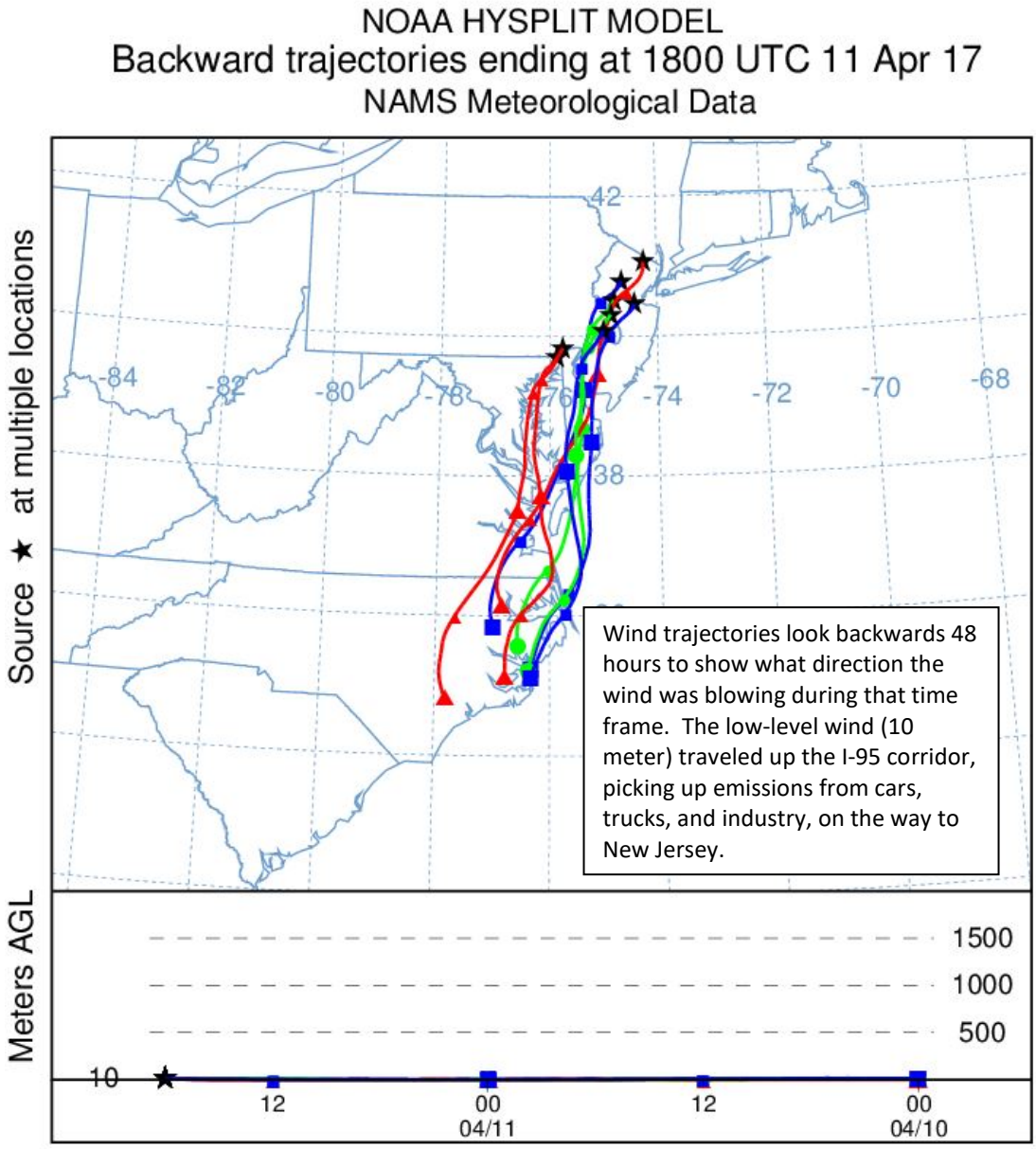


**Figure 3. 48-hour Back Trajectories for April 11, 2017 at 500 meters**

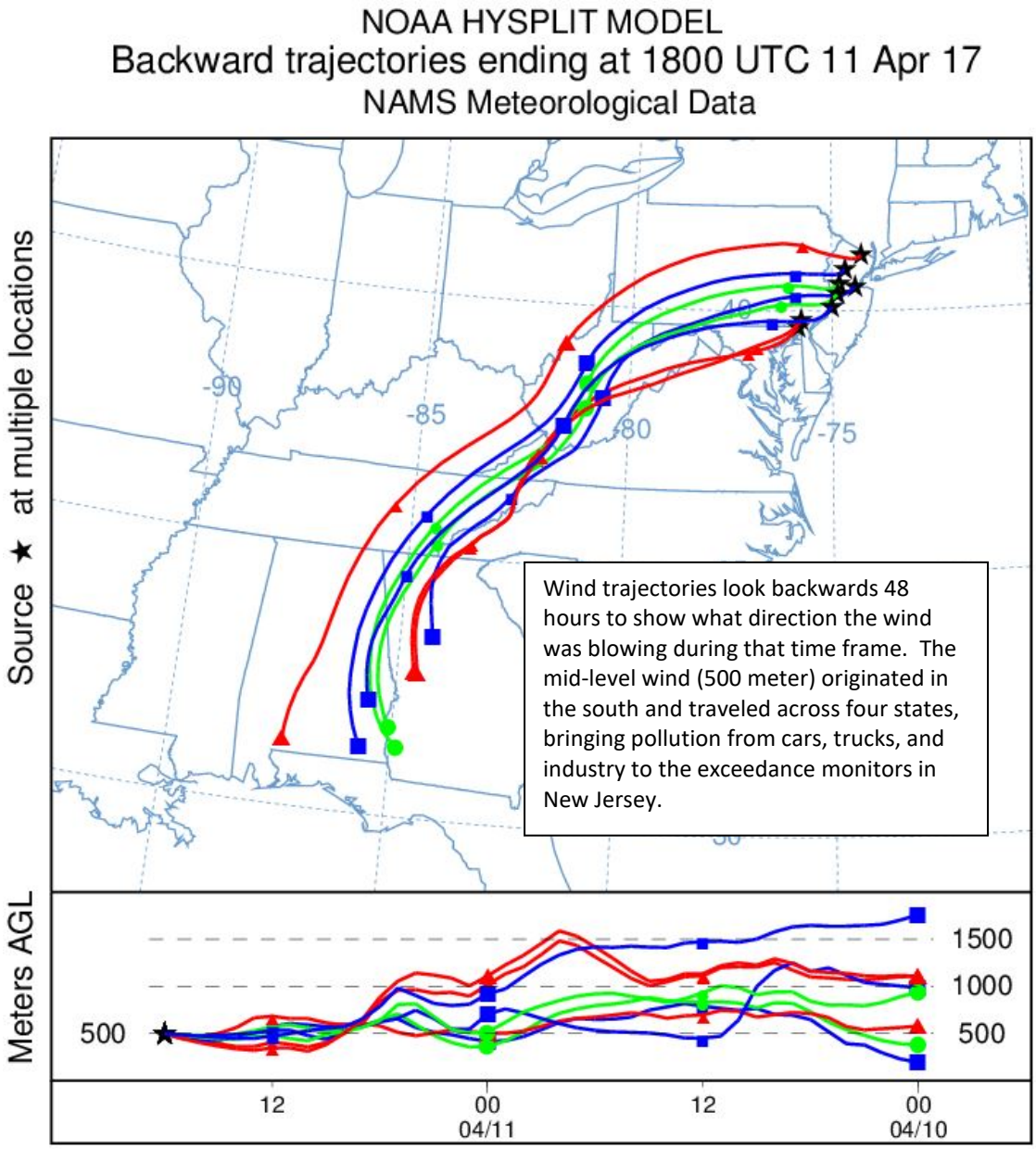


**Figure 4. 48-hour Back Trajectories for April 11, 2017 at 1500 meters**

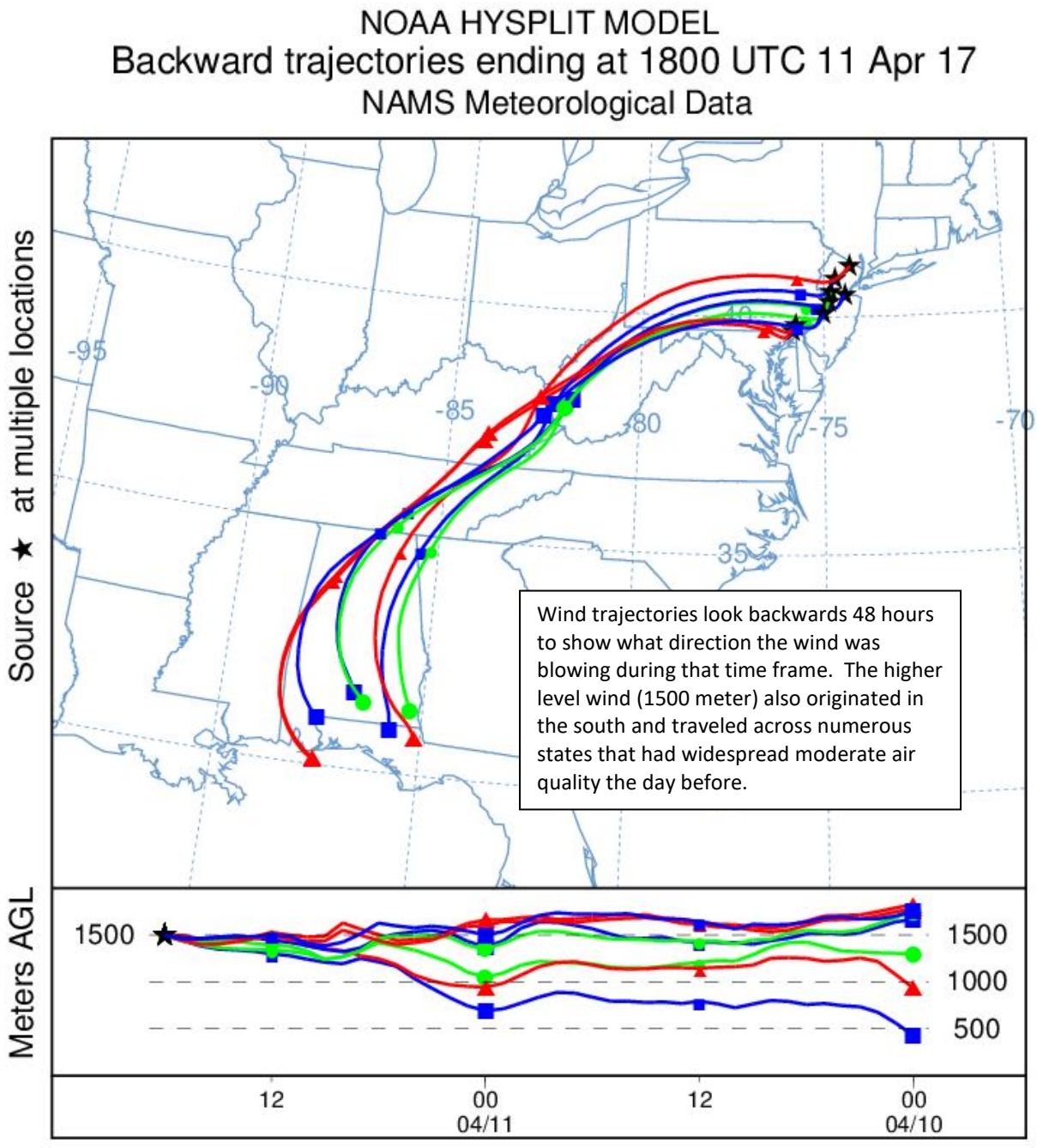
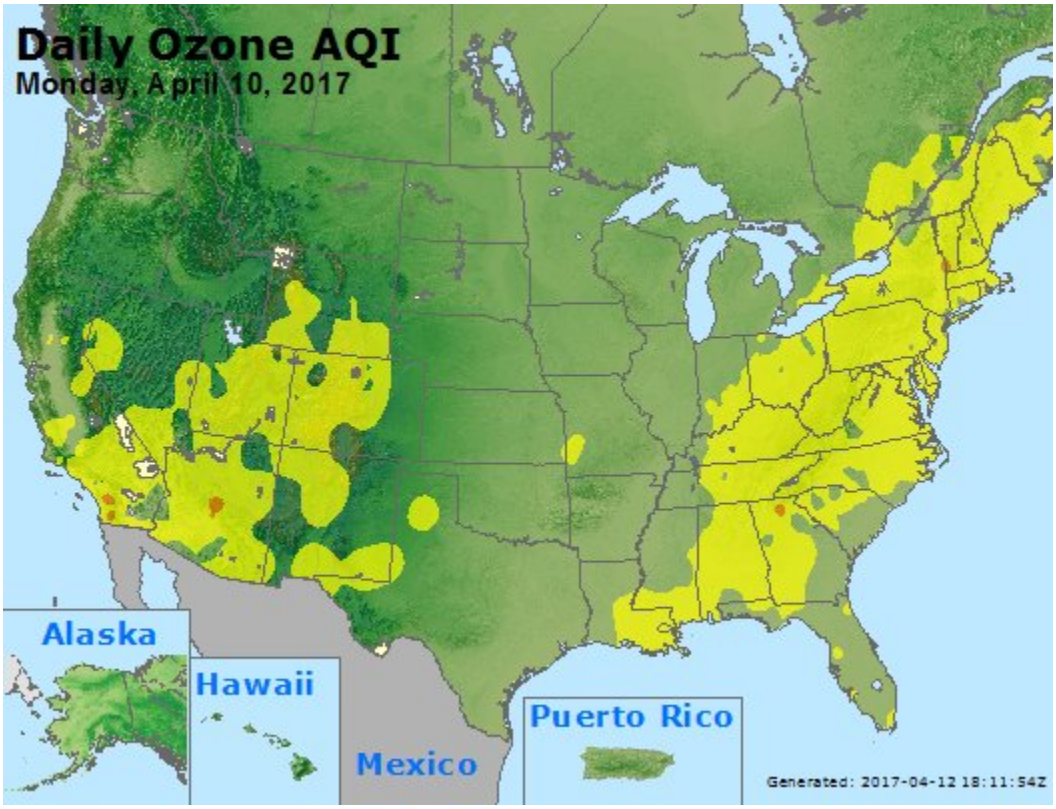


**Figure 5. Ozone Air Quality Index for the Mid-Atlantic and Northeast Regions on April 10, 2017**




## 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.