## Ozone National Ambient Air Quality Standard Health Exceedances on May 29 2018

### Exceedance Locations and Levels

On Tuesday, May 29, 2018, there were four (4) exceedances 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. Maximum 8-Hour Average Ozone Concentrations in New Jersey on May 29, 2018**

| STATION | Daily Maximum 8-Hr Average (ppb) |
|---|---|
| Ancora State Hospital | 30 |
| Bayonne | 72 |
| Brigantine | 24 |
| Camden Spruce St | 47 |
| Chester | 66 |
| Clarksboro | 40 |
| Colliers Mills | 53 |
| Columbia | 43 |
| Flemington | 57 |
| Leonia | 74 |
| Millville | 20 |
| Monmouth University | 37 |
| Newark Firehouse | 74 |
| Ramapo | 75 |
| Rider University | 58 |
| Rutgers University | 69 |
| Washington Crossing* | No Data |

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

From the out-of-state stations within New Jersey's ozone non-attainment areas, there was one (1) exceedance of the ozone NAAQS. See Table 2.

**Table 2: Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey's Ozone Non-Attainment Areas on May 29, 2018**

| STATE | STATION | Daily Maximum 8-Hr Average (ppb) |
|---|---|---|
| CT | Danbury | 61 |
| CT | Greenwich | 70 |
| CT | Madison-Beach Road | 54 |
| CT | Middletown-CVH-Shed | 60 |

| | | |
|---|---|---|
| CT | New Haven | 53 |
| CT | Stratford | 66 |
| CT | Westport | 66 |
| DE | BCSP (New Castle Co.) | 28 |
| DE | BELLFNT2 (New Castle Co.) | 34 |
| DE | KILLENS (Kent Co.) | 23 |
| DE | LEWES (Sussex Co.) | 29 |
| DE | LUMS 2 (New Castle Co.) | 26 |
| DE | MLK (New Castle Co.) | 32 |
| DE | SEAFORD (Sussex Co.) | 37 |
| MD | Fair Hill | 35 |
| NY | Babylon | 46 |
| NY | Bronx - IS52 | 60 |
| NY | CCNY | 68 |
| NY | Holtsville | 51 |
| NY | Pfizer Lab | 64 |
| NY | Queens | 54 |
| NY | Riverhead | 61 |
| NY | Rockland Cty | 58 |
| NY | White Plains | 74 |
| NY | Susan Wagner | No Data |
| PA | BRIS (Bucks Co.) | No Data |
| PA | CHES (Delaware Co.) | 32 |
| PA | NEWG (Chester Co.) | 34 |
| PA | NORR (Montgomery Co.) | 55 |
| PA | LAB (Philadelphia Co.) | No Data |
| PA | NEA (Philadelphia Co.) | 62 |
| PA | NEW (Philadelphia Co.) | 49 |

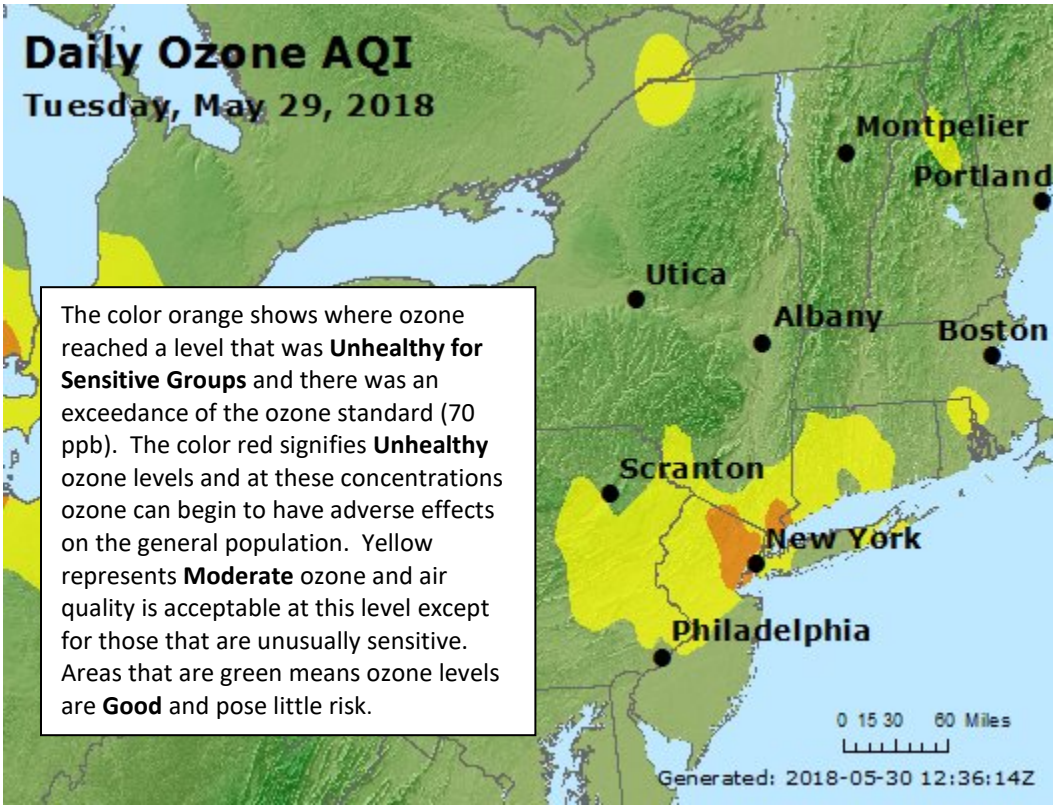
The number of days in 2018 on which exceedances of the ozone NAAQS were recorded for all the states is summarized in Table 3. Figure 1 shows graphically the region's ozone concentrations on May 29, 2018.

**Table 3: Number of Days Ozone NAAQS was Exceeded in NJ's Non-Attainment Areas in 2018**

| STATE | # of Days NAAQS was Exceeded<br>January 1 – May 29, 2018<br>NAAQS = 70 ppb |
|---|---|
| Connecticut | 4 |
| Delaware | 2 |
| Maryland | 2 |
| New Jersey | 4 |

| | |
|---|---|
| New York | 4 |
| Pennsylvania | 3 |

**Figure 1. Ozone Air Quality Index for May 29, 2018**




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**

A ridge of high pressure was noted over our region on May 29th as we were between two areas of low pressure. A weak cold front to our north pushed southeast across New York and New England throughout the day while a secondary area of low pressure lingered south of the region, over the Mid-Atlantic. Available moisture associated with these weather features allowed for early morning low-level clouds and fog throughout much of the nonattainment area. These clouds lifted mid- to late-morning in the Hudson Valley and in central/northern New Jersey allowing for the sun to emerge. Abundant afternoon sunshine allowed for temperatures to rise into the upper 80s while winds remained light and variable.

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

Figures 2, 3, and 4 show the back trajectories starting at different wind heights for the monitored exceedance on May 29, 2018. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Five (5) monitoring stations with an 8-hr ozone exceedance were used to run back trajectories. The selected sites and the maximum 8-hr ozone level recorded are listed in Table 4 below:

**Table 4. Monitoring Stations with 8-hr Ozone Exceedances that Were Selected to Run 48-hr Back Trajectories**

| STATE | STATION | Daily Maximum 8-Hr Average (ppb) |
|---|---|---|
| NJ | Bayonne | 72 |
| NJ | Leonia | 74 |
| NJ | Newark Firehouse | 74 |
| NJ | Ramapo | 75 |
| NY | White Plains | 74 |

On the day preceding the ozone event, backward trajectories at the low-level (Figure 2) originated in Rhode Island and traveled southwest over the Long Island Sound, Long Island, and the Atlantic following on the heels of a cold front that was pushing southward. Winds at the low level then made a sharp turn northward for the New Jersey coastline and looped back around crossing through the I-95 corridor and the Northern New Jersey/NYC metropolitan area before reaching their destination on May 29$^{th}$. Trajectories at the surface remained at the surface for the duration of their path. Backward trajectories at the mid and upper level (Figures 3 & 4) followed similar transport pathways. Originating in Ontario, mid and upper level trajectories traveled southeastward and crossed through southern Ontario where moderate and isolated occurrences of USG air quality were observed the day before. Mid and upper level trajectories then passed through central New York and the NYC metropolitan area before reaching their endpoints. Winds at the mid and upper level experienced some mixing down to lower levels but in general remained aloft for the duration of their path. Figure 5 shows ozone air quality index values recorded on May 28$^{th}$.

**Figure 2. 48-hour Back Trajectories for May 29, 2018 at 10 meters**

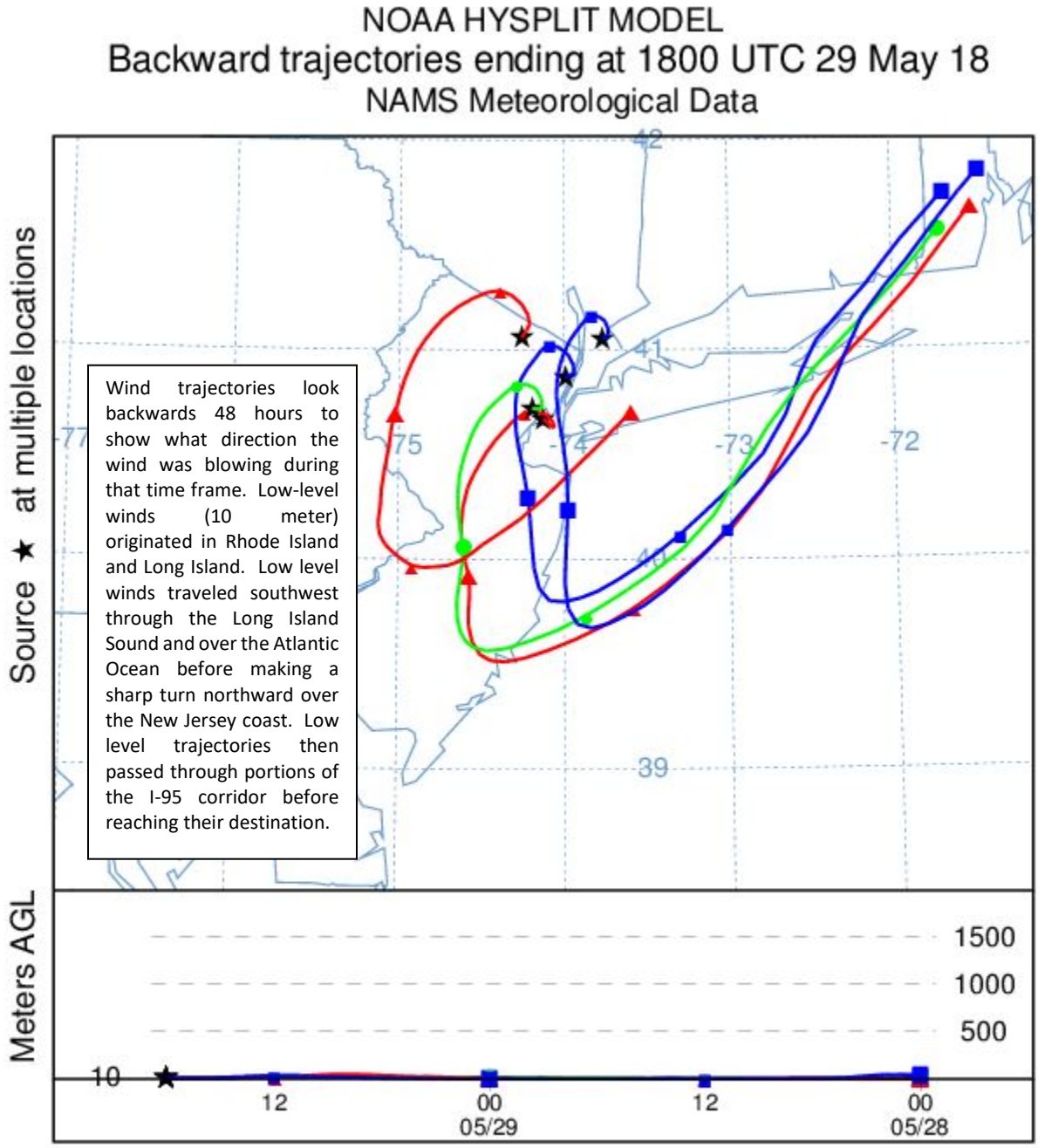


**Figure 3. 48-hour Back Trajectories for May 29, 2018 at 500 meters**

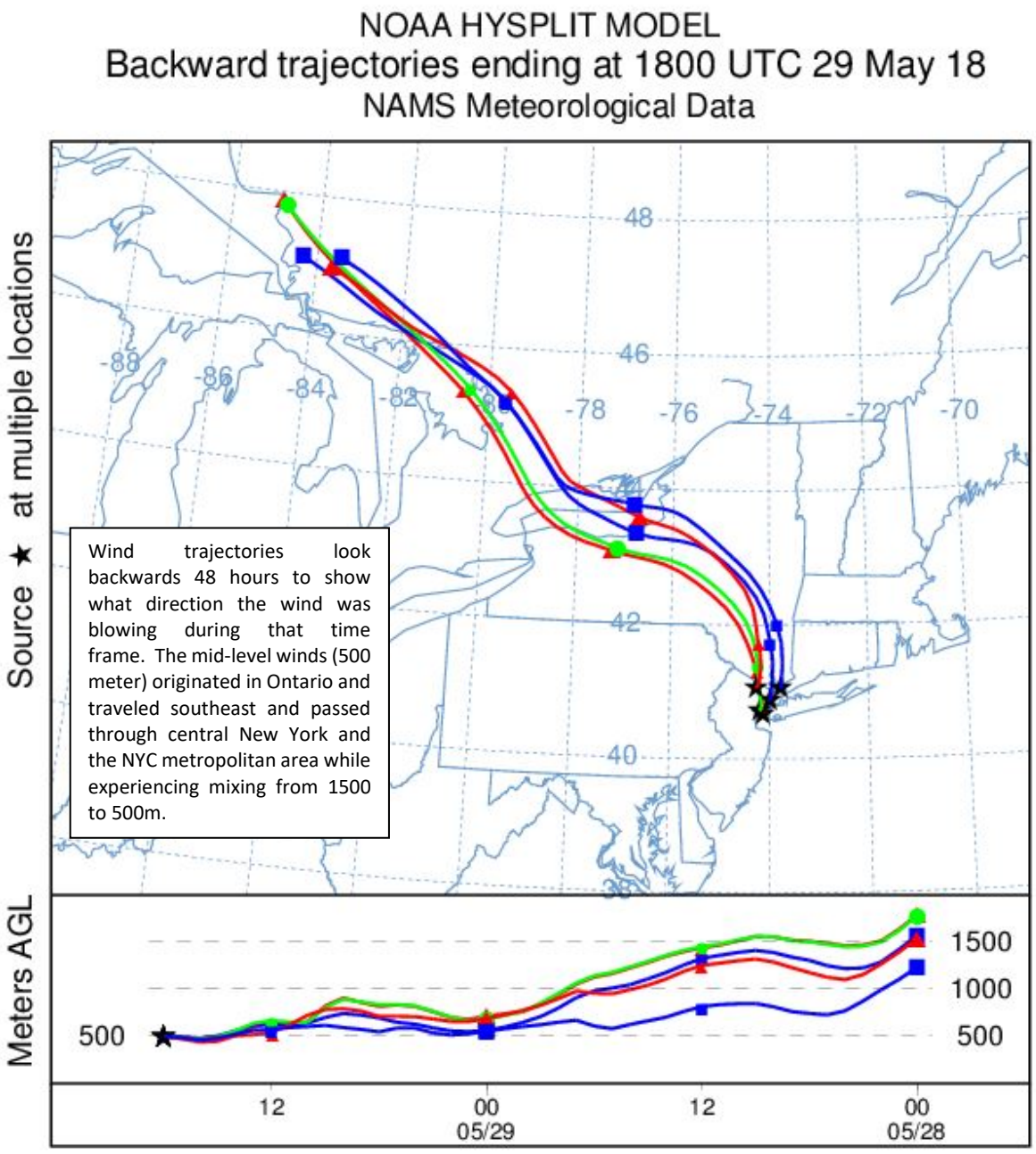


**Figure 4. 48-hour Back Trajectories for May 29, 2018 at 1500 meters**

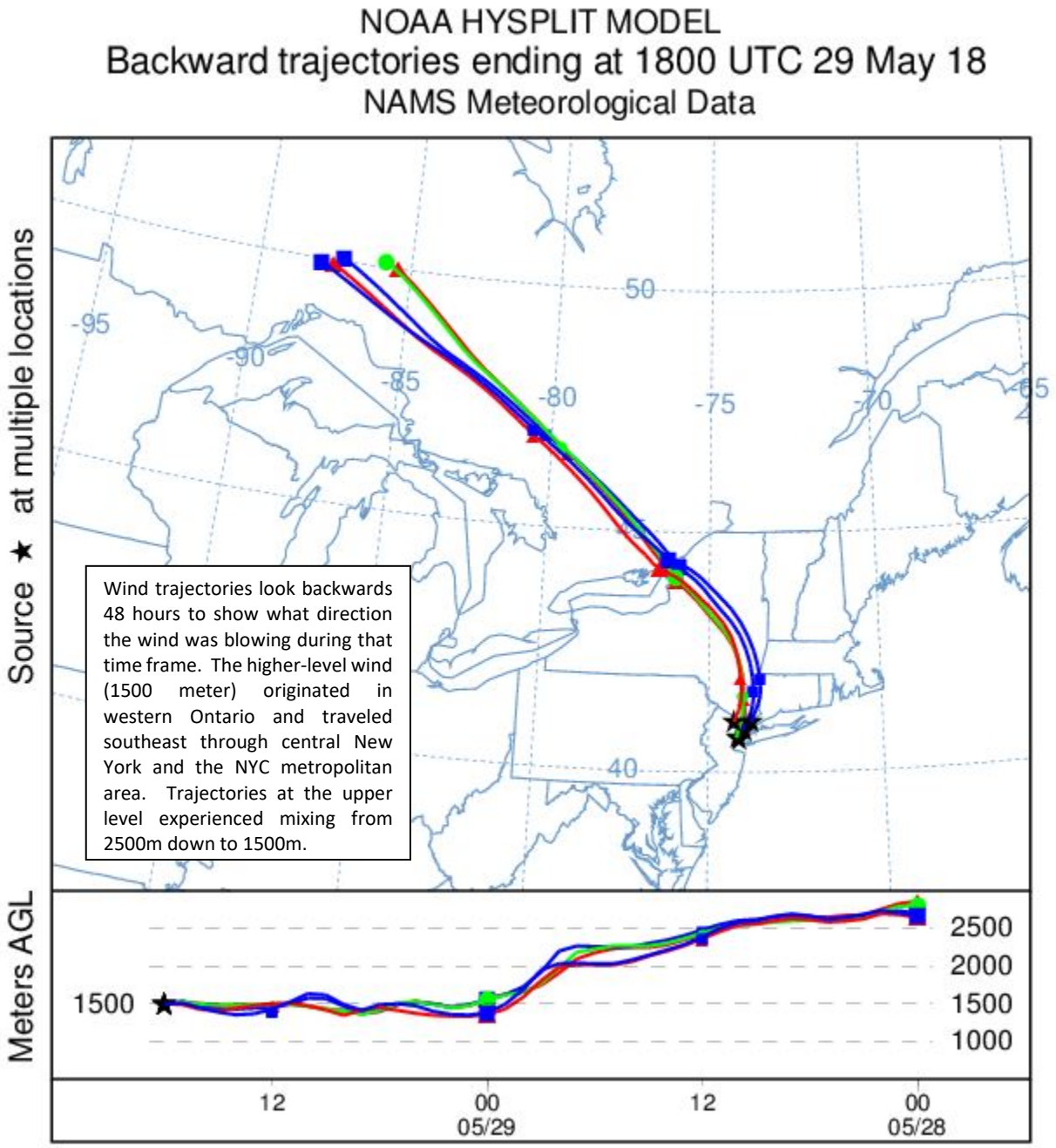
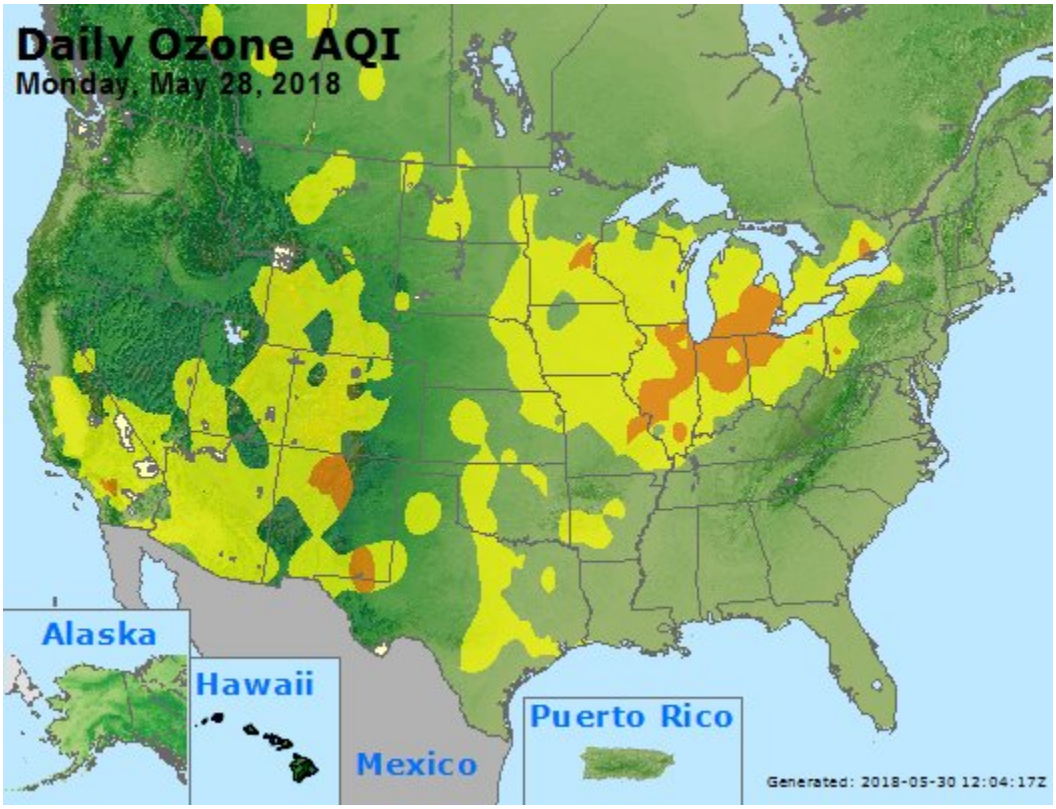


**Figure 5. Ozone Air Quality Index for the United States on May 28, 2018**




**How is Ozone Created?**

Ground-level ozone is an air pollutant known to cause a number of 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**

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.