Ozone National Ambient Air Quality Standard Health Exceedances on July 18, 2016

Exceedance Locations and Levels

On Monday, July 18, 2016, there were no exceedances in New Jersey of the new 8-hour average ozone NAAQS of 70 ppb that became effective in December 2015. The highest 1-hour average ozone concentration recorded on July 18, 2016 in New Jersey was 68 ppb at the Rutgers University station, which is below the 1-hour ozone NAAQS of 120 ppb.

The number of days in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey remains at fifteen (15). By the 18th 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 six (6) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Monday, July 18, 2016 (see Table 1):

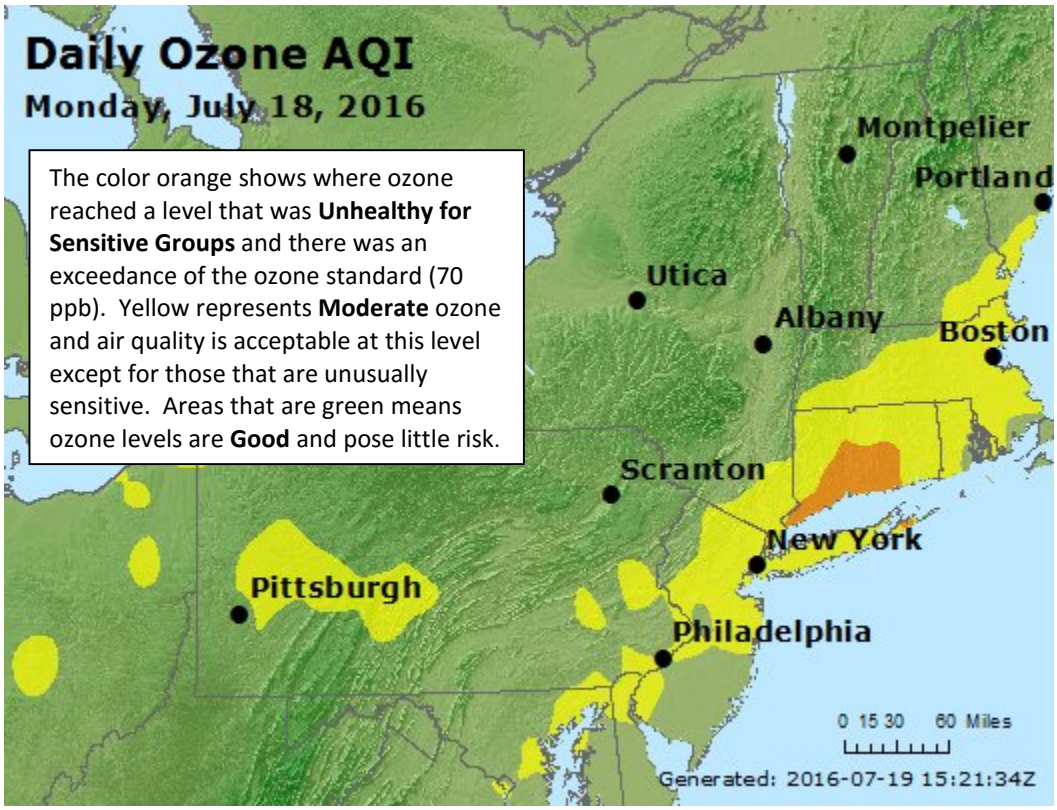
Table 1: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on July 18, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Greenwich	73
CT	Madison-Beach Road	82
CT	Middletown	84
CT	New Haven	75
CT	Stratford	83
CT	Westport	80

The highest 1-hour average ozone concentration recorded was 114 ppb at the Madison-Beach Road station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Monday marks the 17th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in Connecticut. The number of days for New York remains at thirteen (13), eight (8) days for Pennsylvania, five (5) days for Delaware, and four (4) days for Maryland.

Figure 1. Ozone Air Quality Index for July 18, 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 Connecticut showed temperatures reached into the 90°F's, while skies were mostly sunny. High pressure was centered over the southeastern United States as a cold front approached from the west, resulting in southwest winds into Connecticut. 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 18, 2016. The figures illustrates where the winds came from during the 48 hours preceding the high ozone event. Three (3) monitoring stations were chosen to run back trajectories, based on the 8-hour ozone concentrations recorded and their location. The selected sites and the maximum 8-hr ozone levels recorded are listed in Table 2 below.

Table 2. 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	84
CT	Stratford	83
CT	Madison Beach Road	82

The low level wind (10 meter) shown in Figure 2 traveled northeast across Delaware, New Jersey, and the Long Island Sound, picking up pollution generated by cars, trucks, and industry that later mixed with local emissions in Connecticut. The back trajectories for the 500 meter (Figure 3) and 1500 meter (Figure 4) winds illustrate similar transport pathways. Winds traveled across the Ohio River Valley, Pennsylvania, northern New Jersey, and New York City, picking up emissions from motor vehicles, industry, and power plants, and transporting them into Connecticut.

Portions of the Long Island Sound and New York City experienced high ozone on July 17, 2016, the day before this exceedance event occurred, and had exceedances of the 8-hour ozone standard at several monitors. Figure 5 illustrates where those exceedances occurred across the region. The low, mid, and higher level winds all passed through this area, picking up the dirty air that was already in place from the day before, and transporting that pollution to Connecticut. The combination of a dirty air mass in place over the Long Island Sound and the long range transport of pollution generated by a variety of mobile and stationary sources caused the high ozone experienced in Connecticut on July 18, 2016. This is the second day in a row that there have been ozone exceedances in the state.

Figure 2. 48-hour Back Trajectories for July 18, 2016 at 10 meters

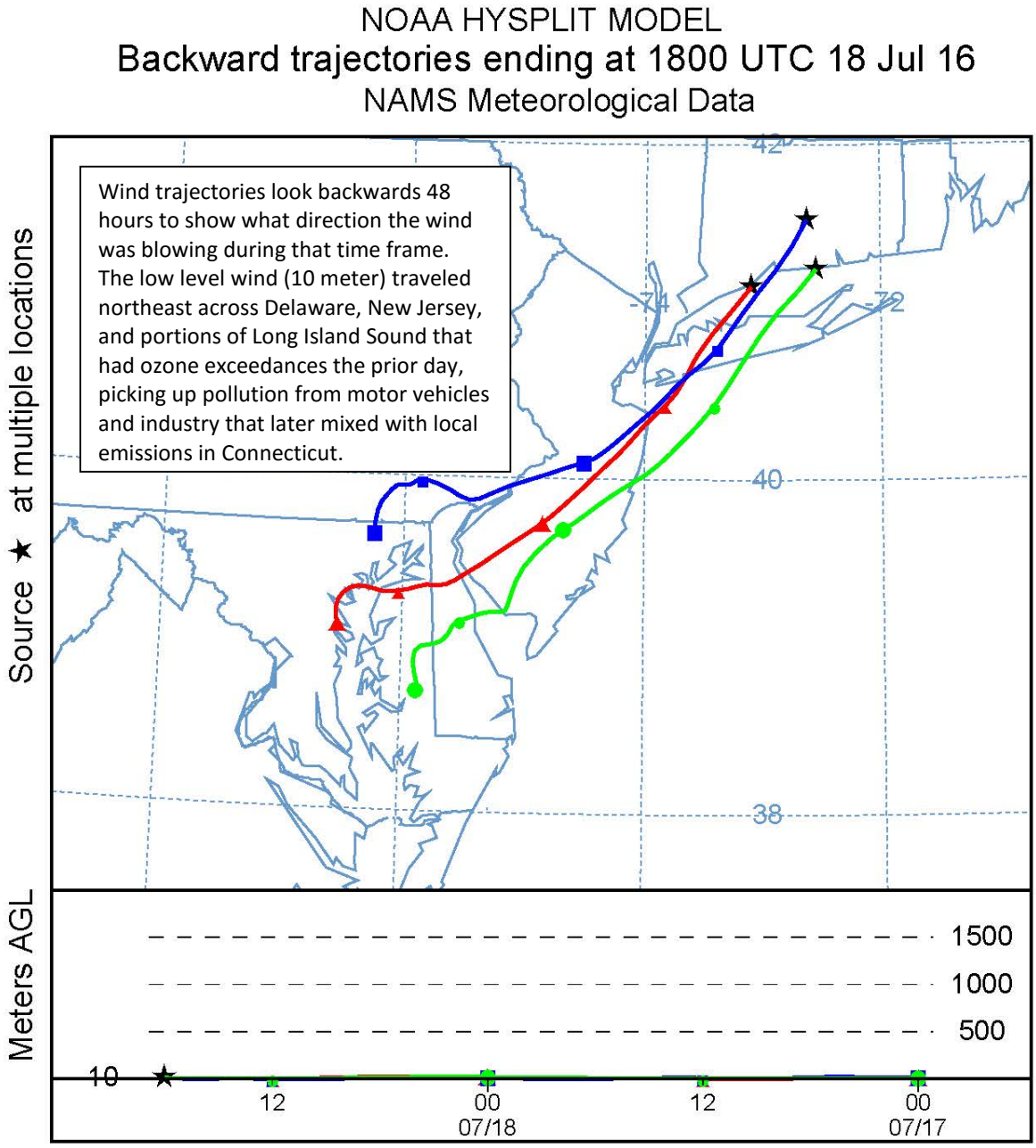


Figure 3. 48-hour Back Trajectories for July 18, 2016 at 500 meters

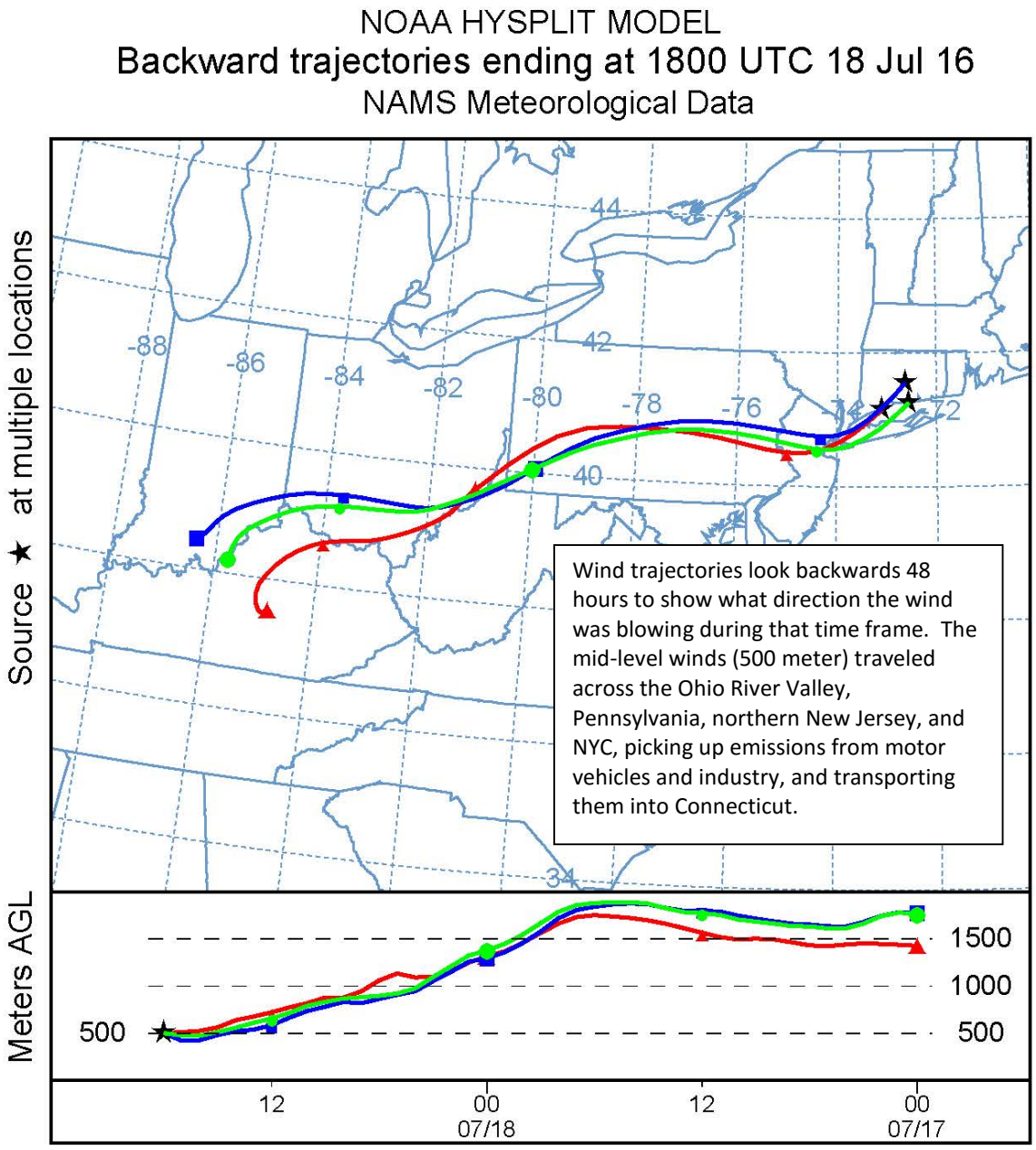


Figure 4. 48-hour Back Trajectories for July 18, 2016 at 1500 meters

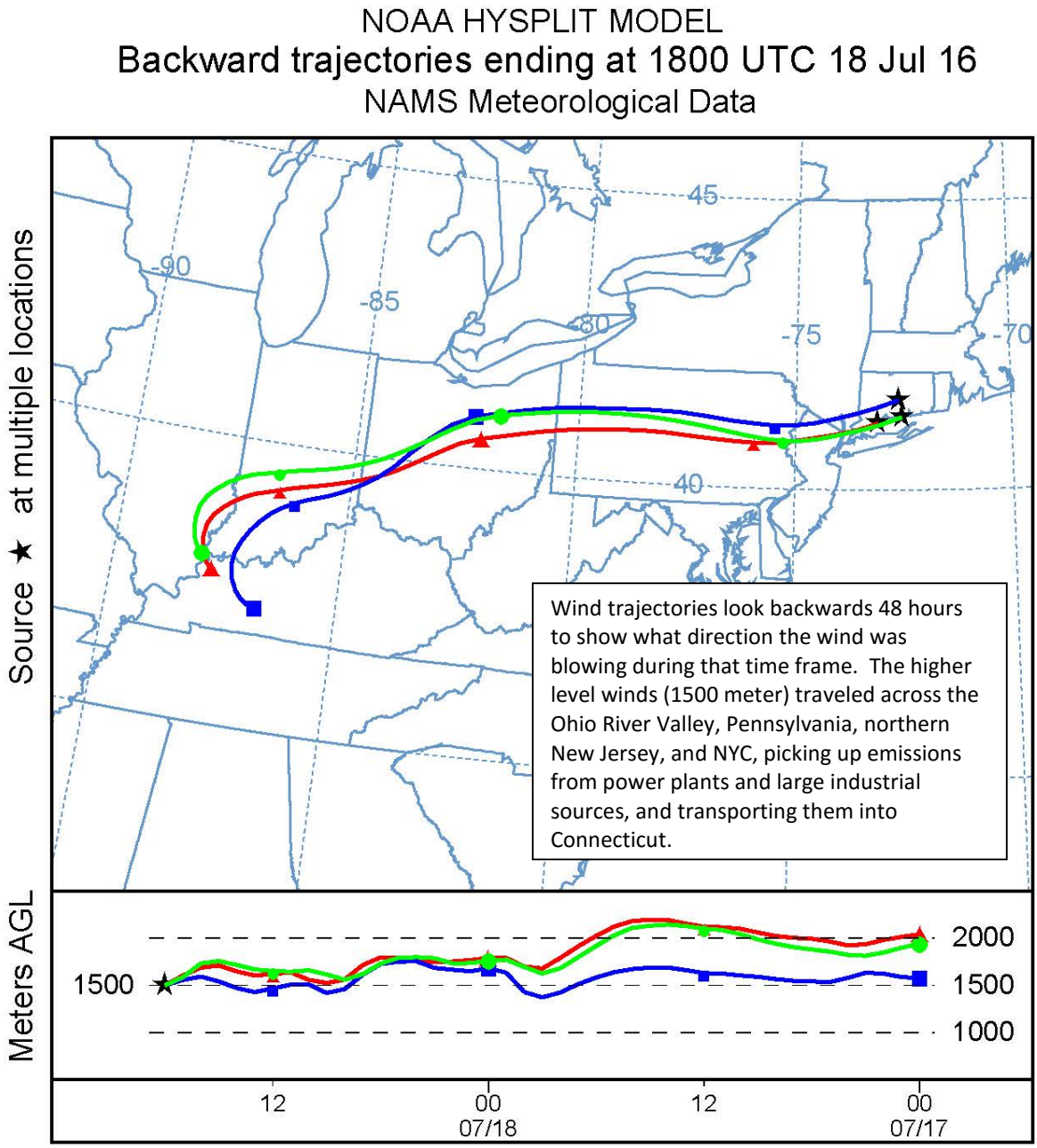
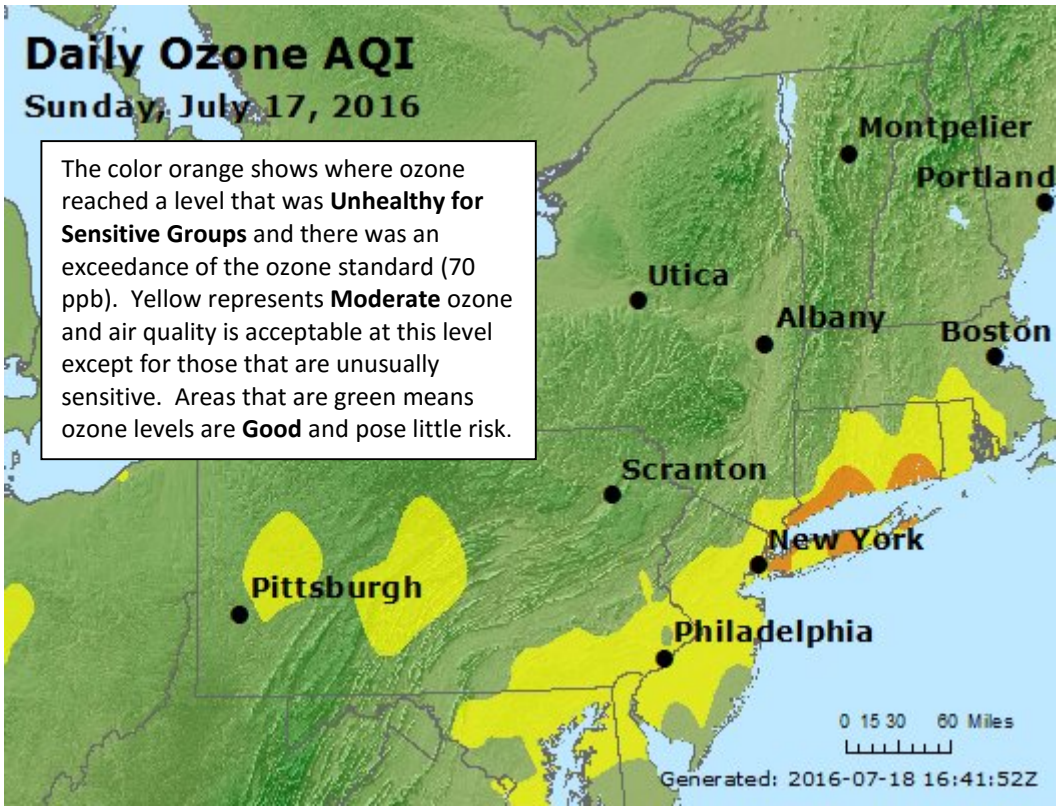


Figure 5. Ozone Air Quality Index for the Northeast Region on July 17, 2016



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.