Ozone National Ambient Air Quality Standard Health Exceedances on August 31, 2016

Exceedance Locations and Levels

On Wednesday, August 31, 2016, there was one (1) exceedance in New Jersey of the new 8-hour average ozone NAAQS of 70 ppb that became effective in December 2015: Camden Spruce Street station with a concentration of 72 ppb.

The highest 1-hour average ozone concentration recorded on August 27, 2016, in New Jersey was 82 ppb at the Rutgers University, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 23rd day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 31st of August in 2015, there were a total of thirteen (13) 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 neighboring states, there were seven (7) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Wednesday, August 31, 2016 (see Table 1):

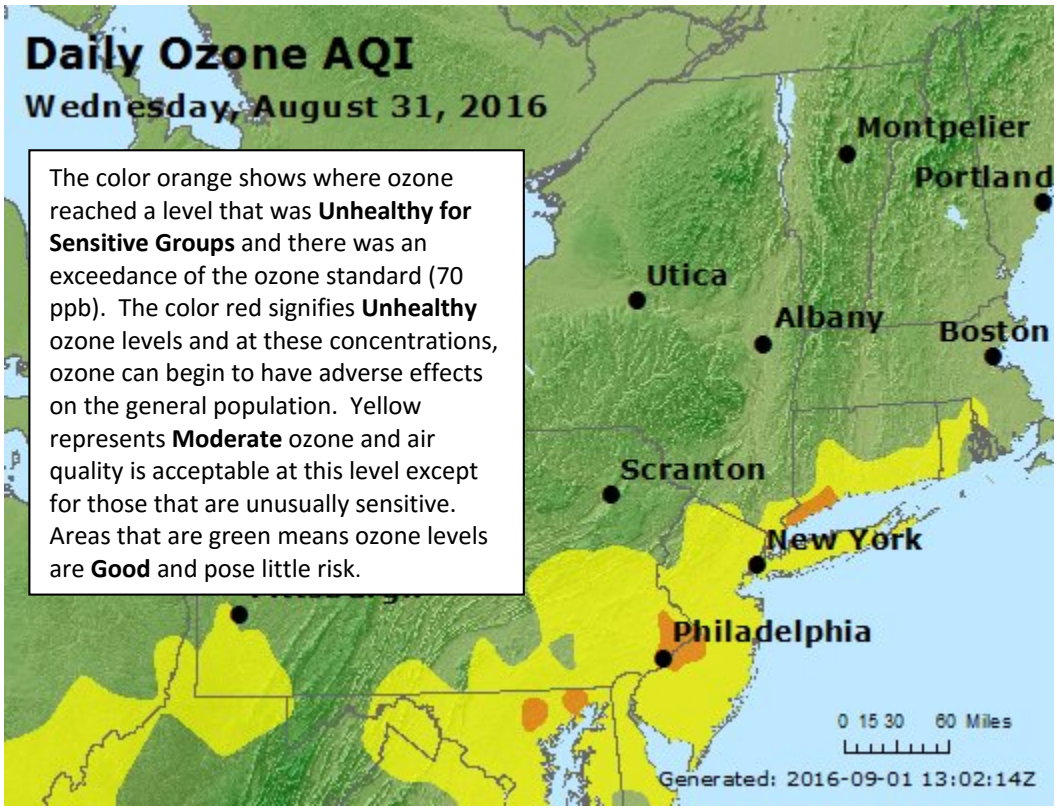
Table 1: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on August 24, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Greenwich	76
CT	Stratford	75
CT	Westport	76
PA	BRIS (Bucks Co.)	80
PA	LAB (Philadelphia Co.)	73
PA	NEA (Philadelphia Co.)	80
PA	NEW (Philadelphia Co.)	76

The highest 1-hour average ozone concentration recorded was 96 ppb at the Stratford station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Wednesday marks the 24th day in 2016 on which an exceedance of the new 8-hour ozone NAAQS of 70 ppb was recorded in Connecticut, and the 11th day in Pennsylvania. The number of days remains at eighteen (18) for New York, eight (8) for Delaware, and seven (7) for Maryland.

Figure 1. Ozone Air Quality Index for August 31, 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 approximately 90°F, while winds were from the southwest with a cold front approaching the area. Locations farthest to the south and east were last to receive clouds and showers associated with the front, allowing enough sunlight to permeate these areas and drive ground level ozone formation. Southwest winds, along with warm temperatures and adequate sunshine, 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 August 31, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Four (4) 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 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	Greenwich	76
CT	Stratford	75
NJ	Camden Spruce Street	72
PA	BRIS (Bucks Co.)	80

The low level wind (Figure 2) followed two separate paths, depending on what monitoring site it was traveling to. The back trajectories for the exceedance sites in Connecticut and New Jersey originated offshore and then shifted northeast up the I-95 corridor, picking up air contaminant emissions from cars, trucks, and industry. The back trajectory for the exceedance site in Pennsylvania traveled south along the New Jersey-Pennsylvania border and then recirculated back around over I-95. Recirculating winds allowed pollution that was picked up the prior day to accumulate and later mix with local emissions along the I-95 corridor and by the exceedance monitor.

The mid-level wind (Figure 3) also followed two separate paths. The back trajectories for the Connecticut exceedance monitors traveled south and then shifted northeast, transporting emissions picked up along the I-95 corridor and the Philadelphia and New York City metropolitan areas, where there is a high volume of mobile and industrial sources. The back trajectories for the New Jersey and Pennsylvania exceedance monitors traveled west across Delaware and Baltimore before shifting northeast and picking up pollution along I-95.

The higher level wind (Figure 4) traveled across portions of New York and Pennsylvania, including the urban areas of Philadelphia and New York City, bringing emissions from large industrial sources and power plants. The higher level winds, in combination with the low and mid-level winds, allowed air pollution from a variety of mobile and stationary sources to be transported into the areas of New Jersey, Pennsylvania, and Connecticut that experienced high ozone on August 31, 2016.

Figure 2. 48-hour Back Trajectories for August 31, 2016 at 10 meters

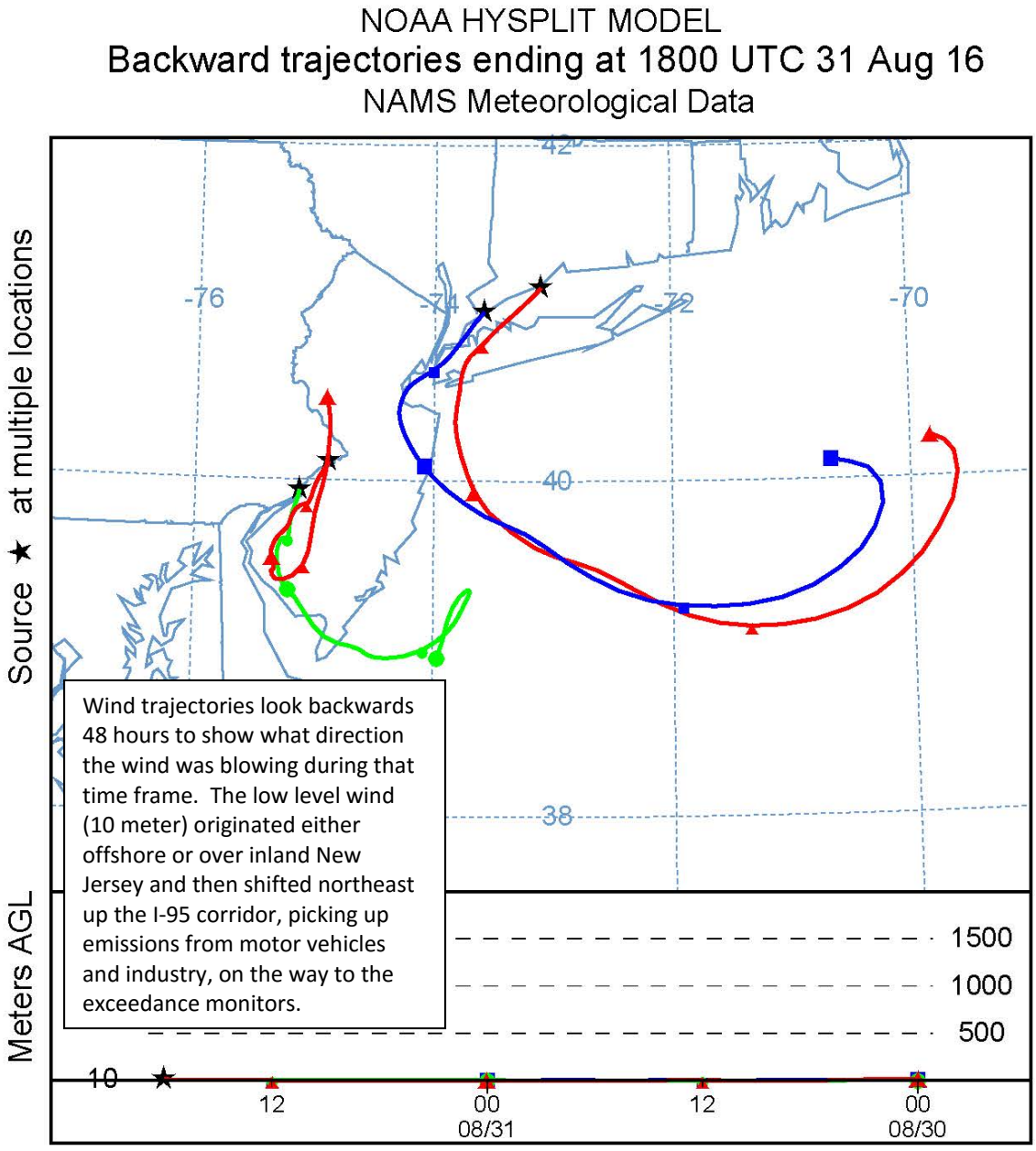


Figure 3. 48-hour Back Trajectories for August 31, 2016 at 500 meters

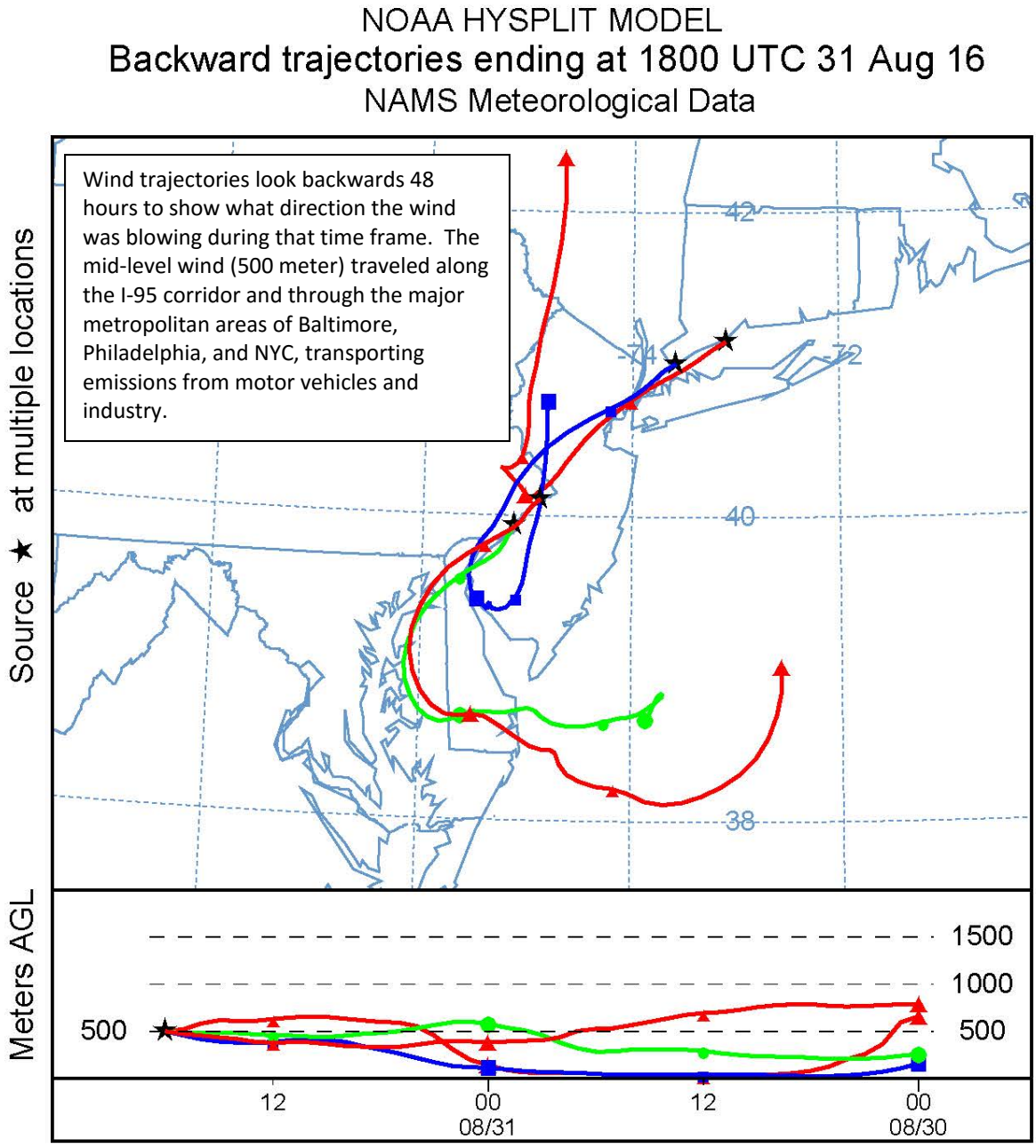
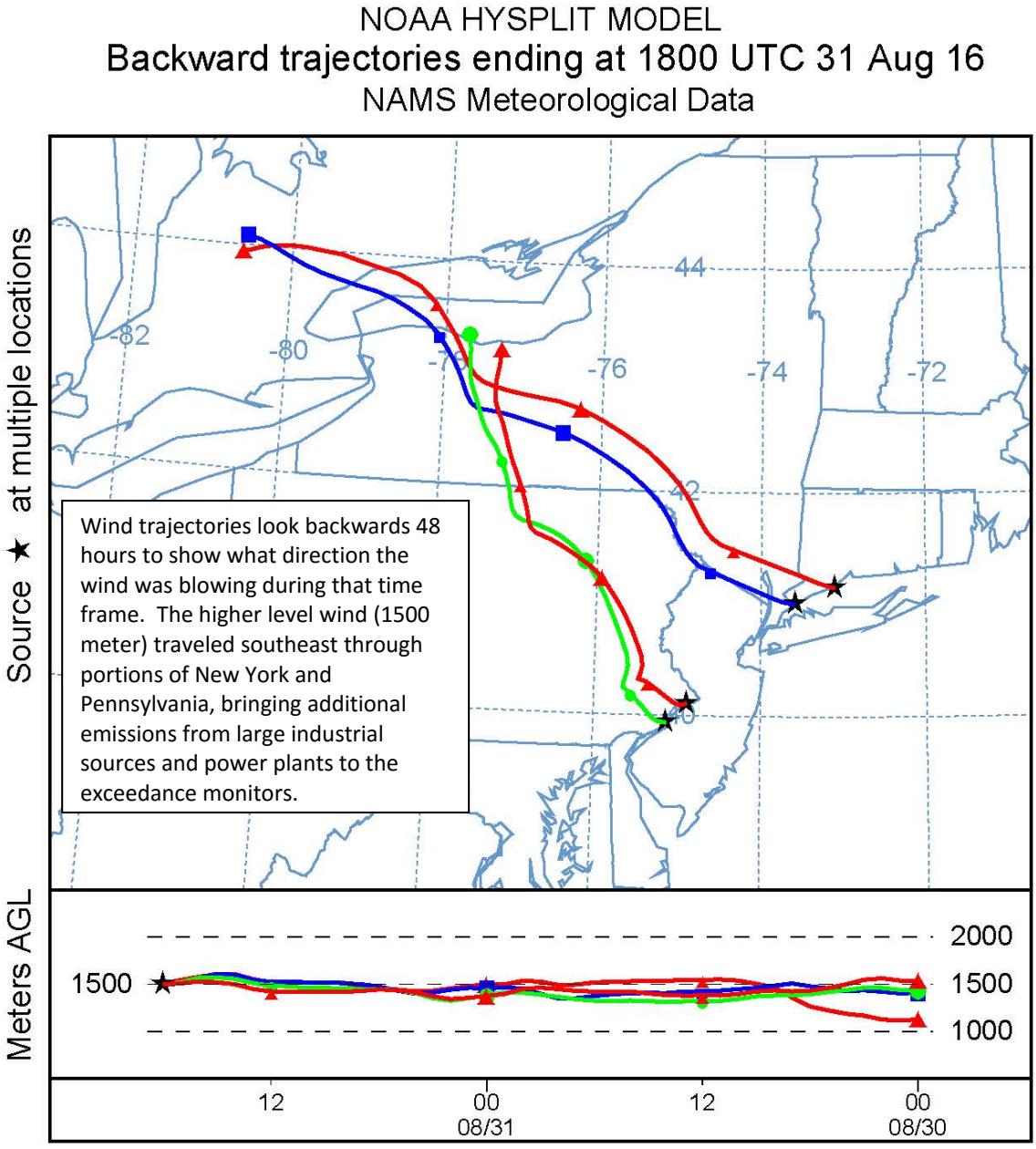


Figure 4. 48-hour Back Trajectories for August 31, 2016 at 1500 meters



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.