Ozone National Ambient Air Quality Standard Health Exceedances on July 21, 2016

Exceedance Locations and Levels

On Thursday, July 21, 2016, there were three (3) 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 21, 2016

STATION	Daily Maximum 8-Hr Average (ppb)
Leonia	71
Rider University	74
Rutgers University	74

The highest 1-hour average ozone concentration recorded on July 21, 2016 in New Jersey was 91 ppb at the Rutgers University station, which is below the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the 16th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 21st 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 ten (10) exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Thursday, July 21, 2016 (see Table 2):

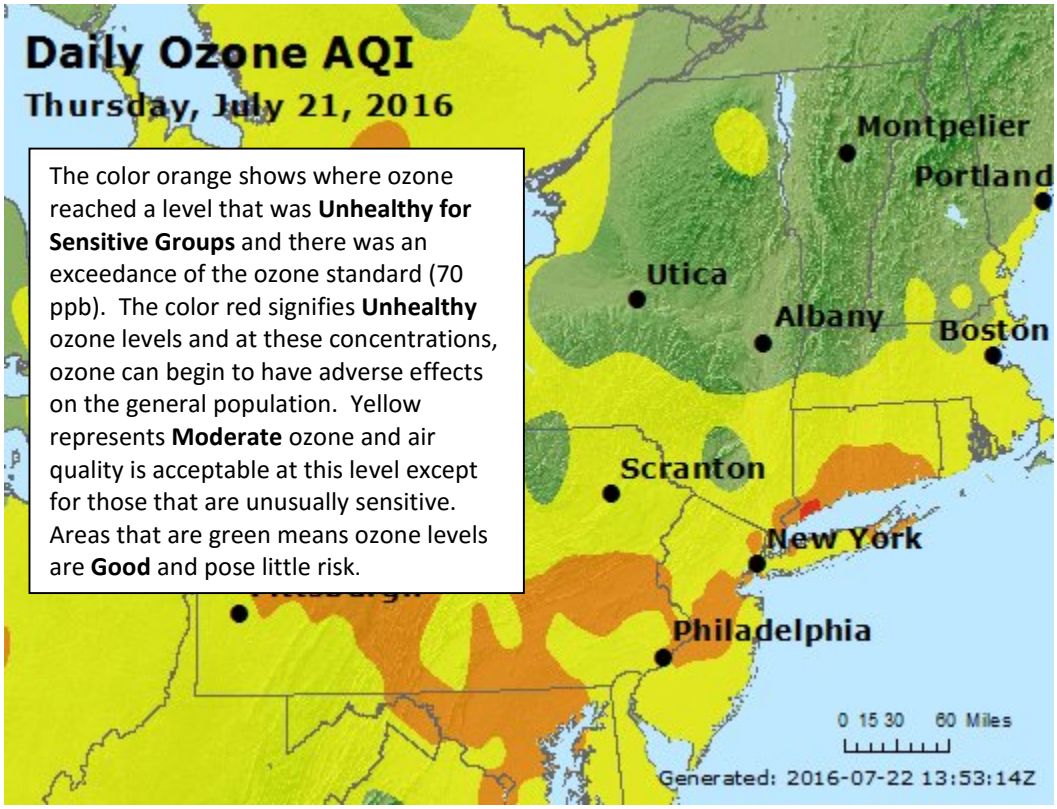
Table 2: Ozone NAAQS Exceedances at Other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on July 21, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Greenwich	85
CT	Madison-Beach Road	74
CT	Middletown	78
CT	New Haven	80
CT	Stratford	81
CT	Westport	87
NY	Susan Wagner	77
PA	BRIS (Bucks Co.)	78
PA	NEA (Philadelphia Co.)	81
PA	NEW (Philadelphia Co.)	75

The highest 1-hour average ozone concentration recorded was 107 ppb at the Westport station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the 18th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in Connecticut, fourteen (14) days for New York, and nine (9) days for Pennsylvania. The number of days for Delaware remains at five (5), and four (4) days for Maryland.

Figure 1. Ozone Air Quality Index for July 21, 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. 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 21, 2016. The figures illustrates where the winds came from during the 48 hours preceding the high ozone event. Eight (8) monitoring stations were chosen to run back trajectories, based on the 8-hour ozone concentrations recorded and their location. It is important to note that all locations that had exceedances on July 21, 2016 were positioned along the I-95 corridor. 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	Westport	87
CT	Greenwich	85
NJ	Rider University	74
NJ	Rutgers University	74
NJ	Leonia	71
NY	Susan Wagner	77
PA	BRIS (Bucks Co.)	81
PA	NEA (Philadelphia Co.)	78

The low level wind (Figure 2) traveled around New Jersey's southern edge and then shifted northeast and up the I-95 corridor to the two (2) exceedance monitors in southeast Pennsylvania. Winds also originated out of New York and traveled south through Pennsylvania before also shifting northeast and moving up along the I-95 corridor to the six (6) additional exceedance monitors. 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.

The mid-level wind (Figure 3) recirculated along the I-95 corridor or just north of the major interstate highway in Pennsylvania, before shifting northeast towards the exceedance monitors. Recirculating winds allowed polluted air picked up from the previous day to accumulate and then mix 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 southeast across portions of New York, Pennsylvania, 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 in Pennsylvania, New Jersey, New York, and Connecticut on July 21, 2016.

Figure 2. 48-hour Back Trajectories for July 21, 2016 at 10 meters

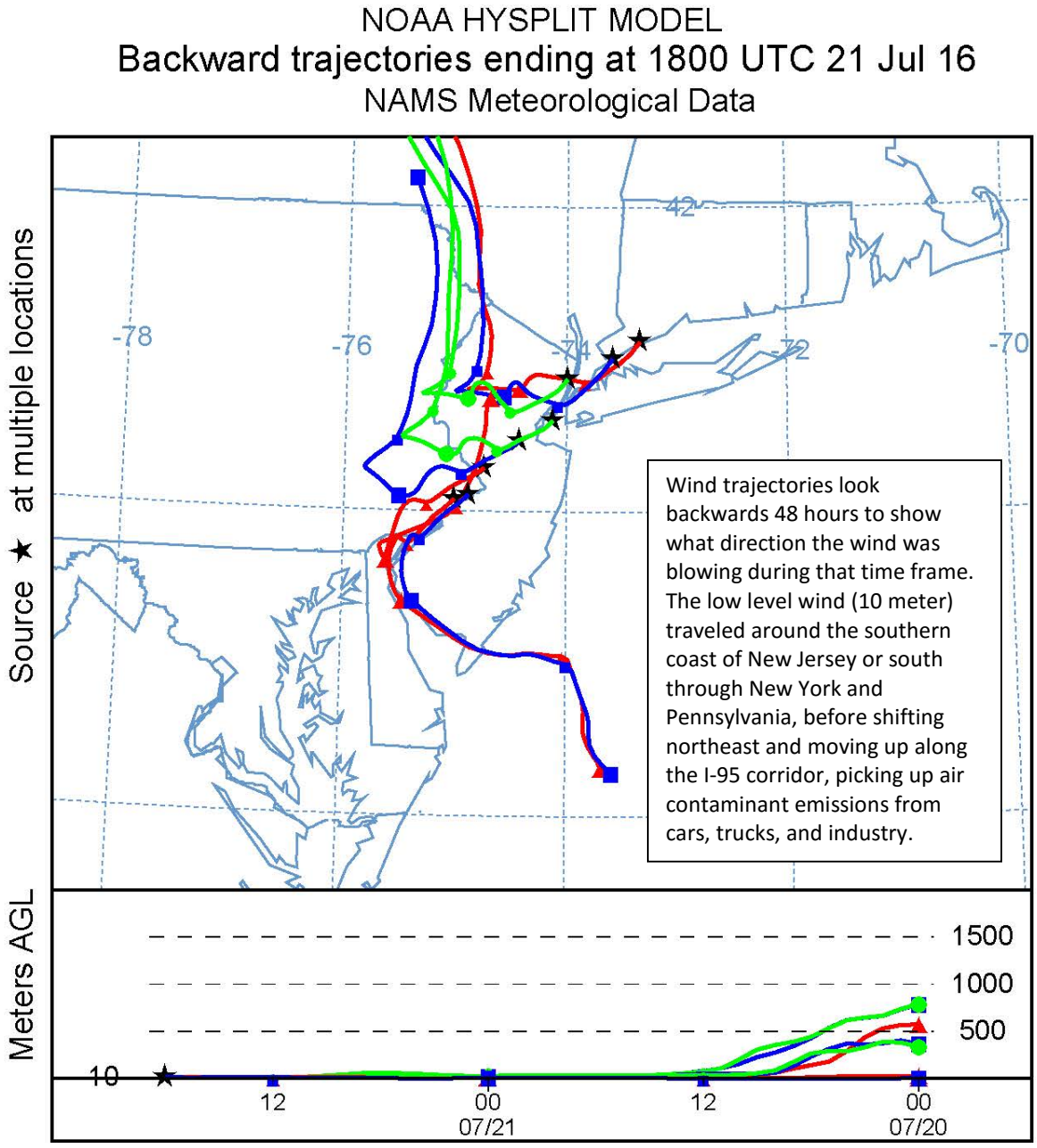


Figure 3. 48-hour Back Trajectories for July 21, 2016 at 500 meters

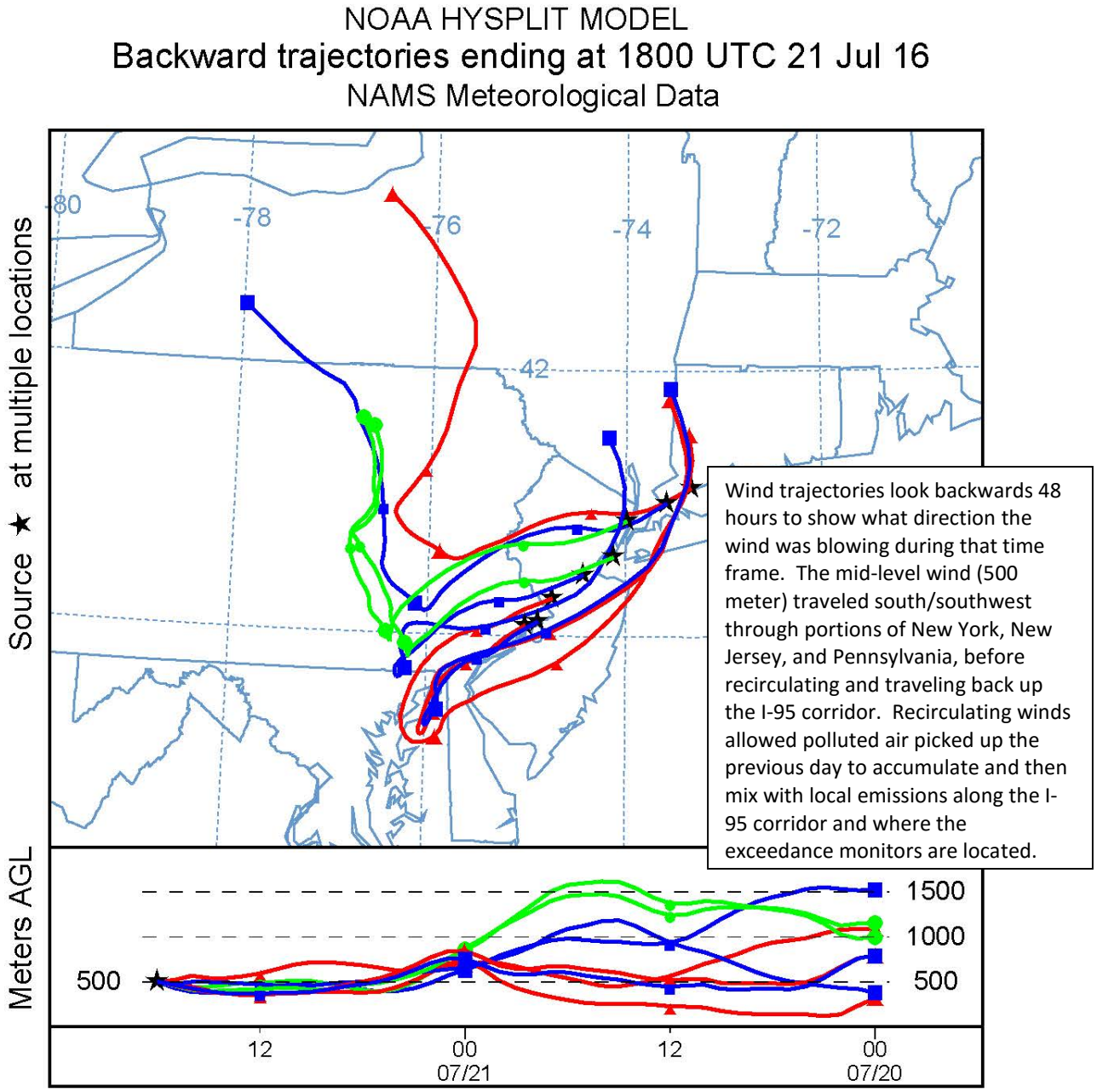
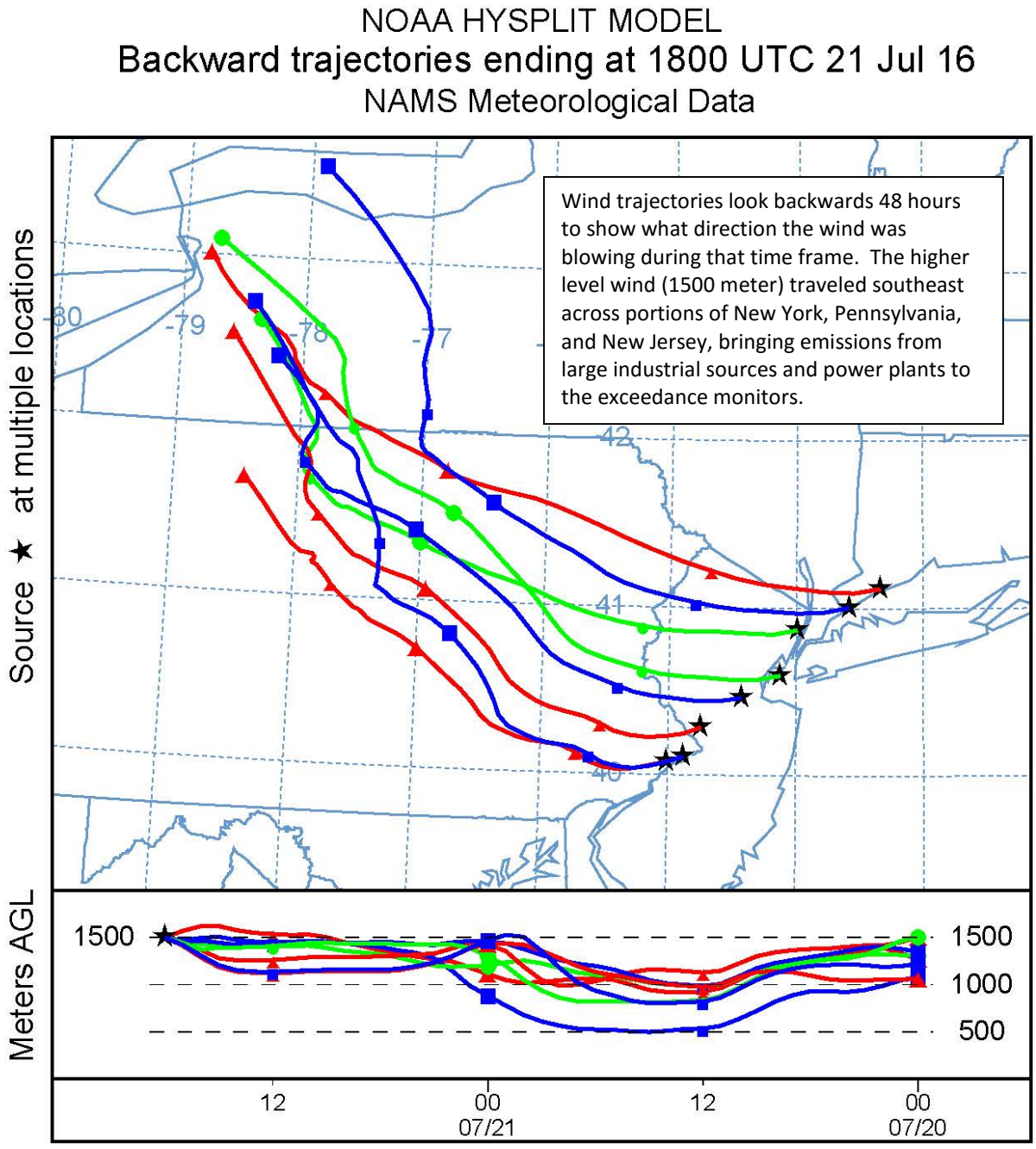


Figure 4. 48-hour Back Trajectories for July 21, 2016 at 1500 meters



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.