Ozone National Ambient Air Quality Standard Health Exceedances on June 30, 2017

Exceedance Locations and Levels

On Friday, June 30, 2017, there was one (1) exceedance in New Jersey of the 8-hour average ozone National Ambient Air Quality Standard (NAAQS) of 70 ppb that became effective in December 2015 (See Table 1):

Table 1: Ozone NAAQS Exceedances in New Jersey on June 30, 2017

STATION	Daily Maximum 8-Hr Average (ppb)
Leonia	79

One (1) 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 June 30, 2017, in New Jersey was 104 ppb at Leonia, which is below the 1-hour ozone NAAQS of 120 ppb.

Friday marks the 9th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey. By the 30th of June in 2016, there were twelve (12) days on which ozone exceedances were measured in New Jersey (based on the 70 ppb NAAQS of 2015), and there were five (5) days by this same date in 2015 (based on the former 75 ppb NAAQS of 2008) (See Table 2).

Table 2: New Jersey Exceedance Count

	# of Days NAAQS was Exceeded January 1 - June 30, 2017 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - June 30, 2016 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - June 30, 2015 NAAQS = 75 ppb
New Jersey	9	12	5

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 nonattainment areas. From this group of stations in the neighboring states, there were two (2) exceedances of the 70 ppb ozone NAAQS of 2015 recorded on Friday, June 30, 2017 (See Table 3):

Table 3: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on June 30, 2017

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	74
NY	White Plains	71

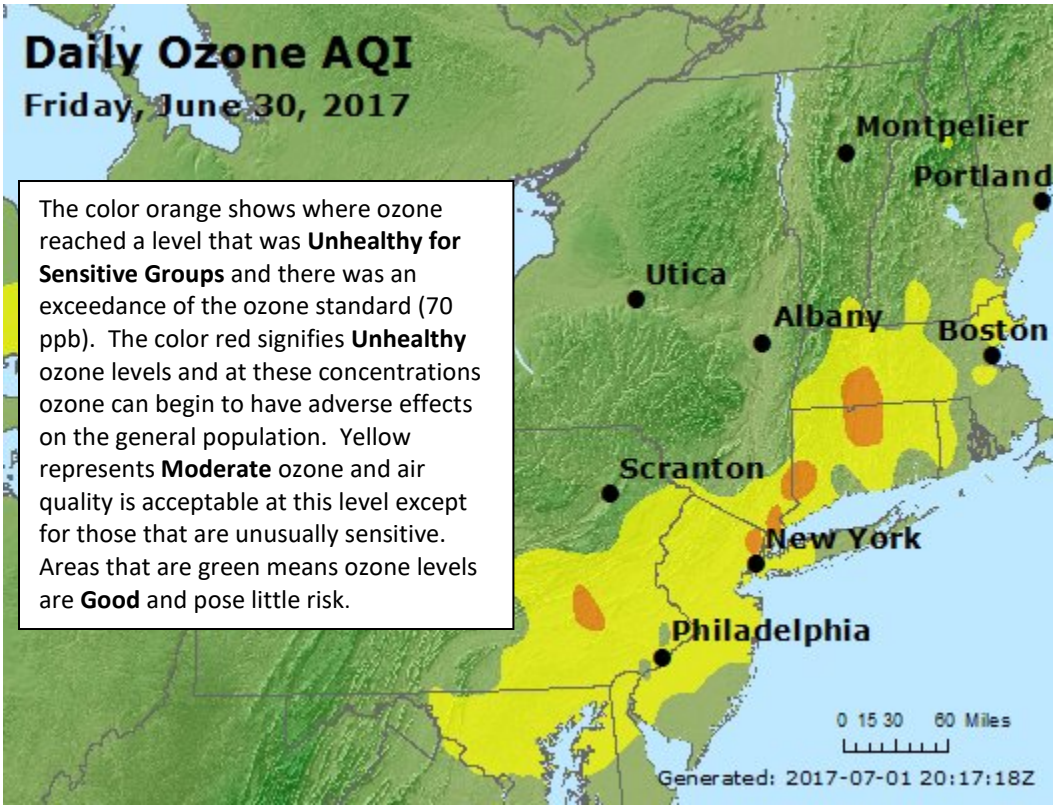
No station exceeded the 75 ppb ozone NAAQS of 2008, and none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 104 ppb at the Danbury station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Friday marks the 10th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Connecticut and the 8th day for New York. The number of days for Maryland and Pennsylvania remains at seven (7), and five (5) days for Delaware (See Table 4). Figure 1 shows graphically the region's ozone concentrations on June 30, 2017

Table 4: Number of Ozone Exceedances by State

STATE	# of Days NAAQS was Exceeded January 1 - June 30, 2017 NAAQS = 70 ppb
Connecticut	10
Delaware	5
Maryland	7
New Jersey	9
New York	8
Pennsylvania	7

Figure 1. Ozone Air Quality Index for June 30, 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 partly sunny skies with scattered late afternoon showers and thunderstorms, temperatures reaching near 90 degrees, and winds generally from the southerly direction. A frontal boundary associated with a broad low pressure system extended across northern New England as a high pressure system remained anchored off the eastern sea board. These two features allowed for a strong southerly flow across much of the region and more sunshine closer to the coast. In addition, a surface trough was noted just west of New Jersey extending from western New York southward into the Mid-Atlantic. This trough not only enhanced afternoon showers and thunderstorms but also allowed polluted air aloft, at the mid-levels, to mix down closer to the surface throughout portions of New Jersey's nonattainment area. All of these features mentioned above are commonly seen in 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 June 30, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Three (3) 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 5 below:

Table 5. 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	Danbury	74
NJ	Leonia	79
NY	White Plains	71

Surface level back trajectories (Figure 2) show that elevated ozone at the monitored locations originated off the coast of Virginia. Winds recirculated off shore before traveling northward along coastal Maryland, Delaware and New Jersey toward its endpoint. The winds remained at the surface during the 48hour time, collecting and transporting locally generated emissions into the region. Mid-level back trajectories (Figure 3) originated along the southeastern United States and traveled northward through North Carolina as well as the metropolitan areas of Washington DC, Baltimore, Wilmington, and Philadelphia before reaching its endpoint. Finally, upper level back trajectories (Figure 4) originated further south over Georgia/Alabama. Winds traveled west/northwest toward Tennessee before a turn more north and northeast through the Ohio River Valley and Pennsylvania before arriving to its destination. Figures 5 and 5a below show graphically national ozone concentrations on June 28th and 29th that contributed to exceedances on June 30, 2017.

Figure 2. 48-hour Back Trajectories for June 30, 2017 at 10 meters

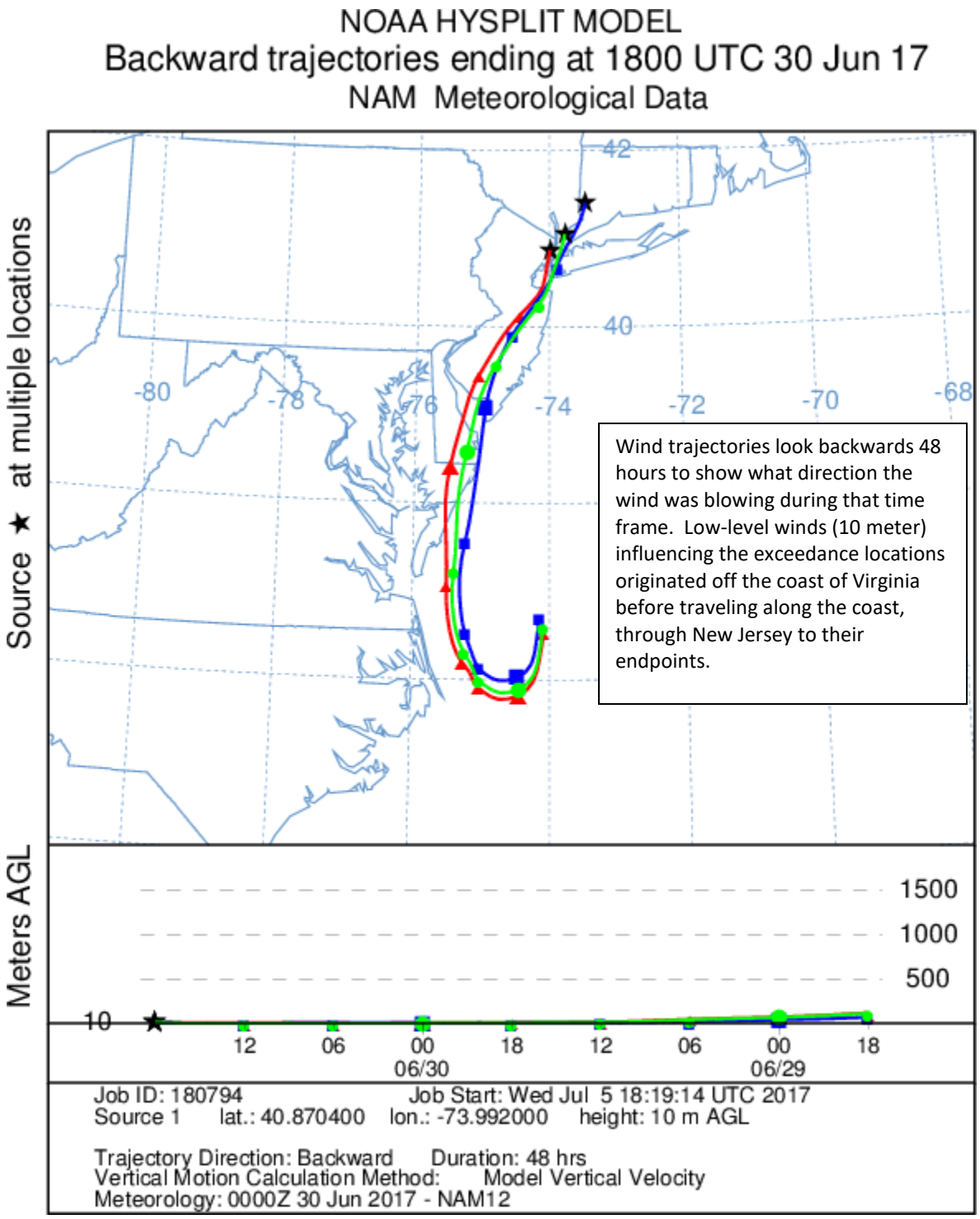


Figure 3. 48-hour Back Trajectories for June 30, 2017 at 500 meters

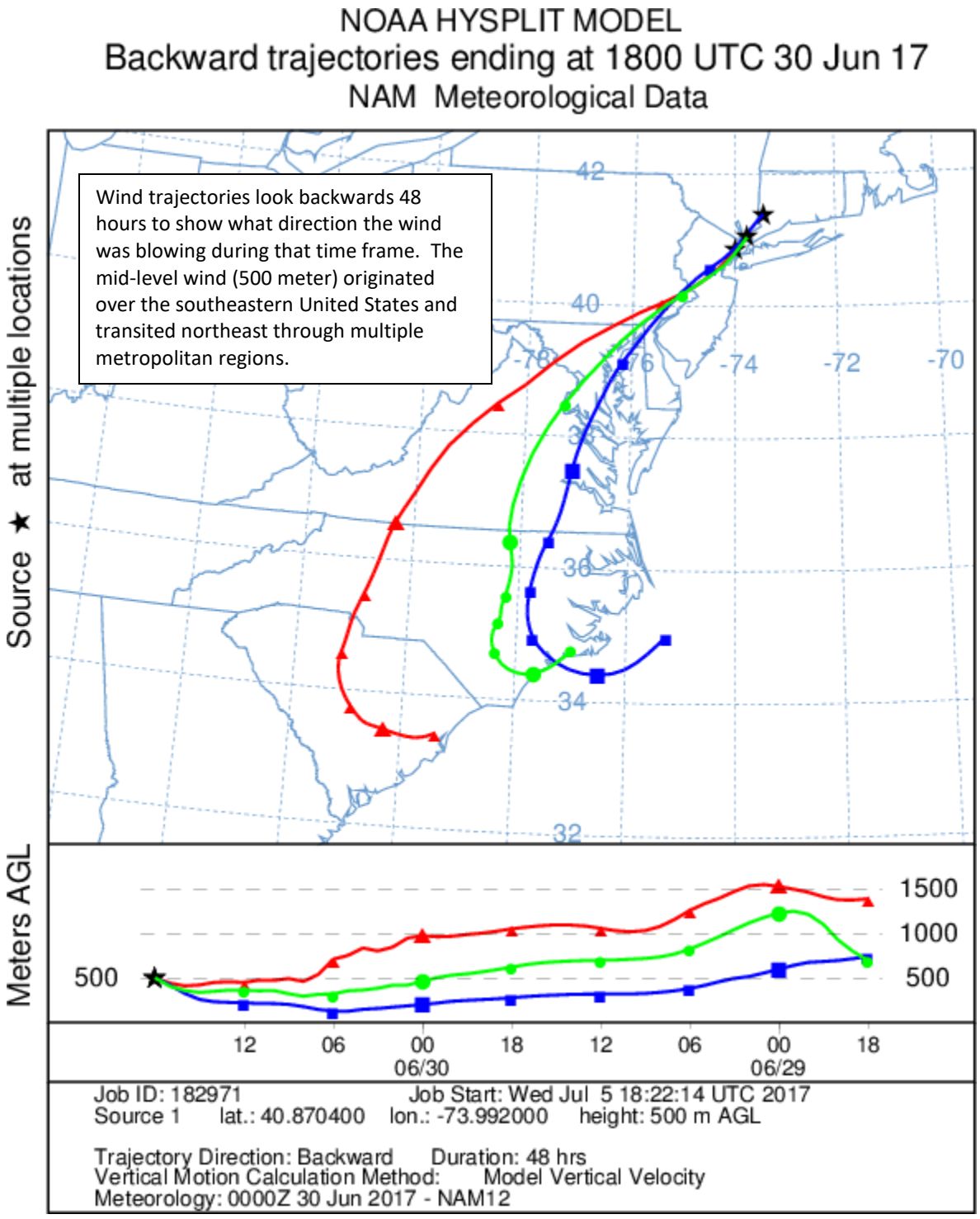


Figure 4. 48-hour Back Trajectories for June 30, 2017 at 1500 meters

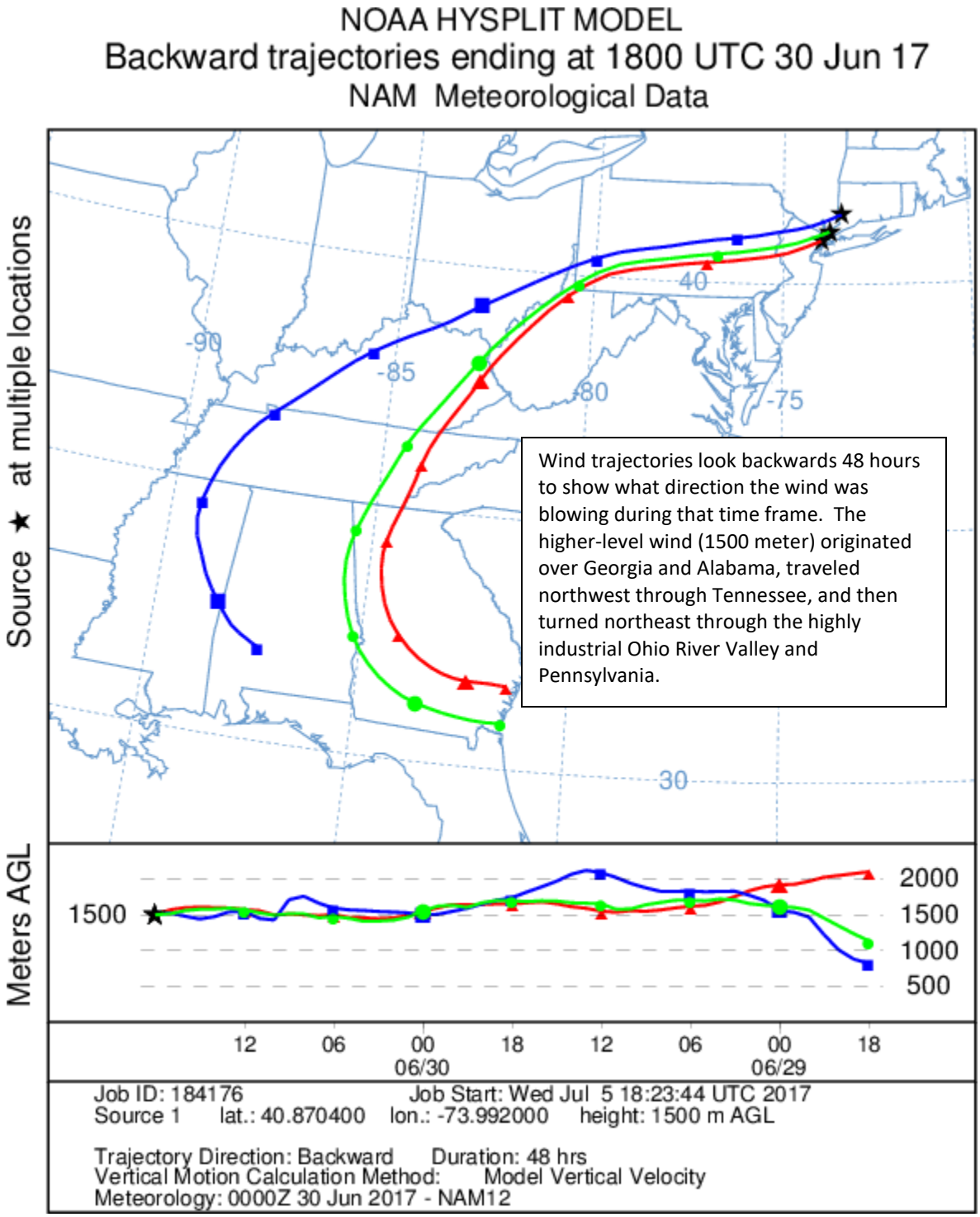


Figure 5. Ozone Air Quality Index for the United States on June 28, 2017

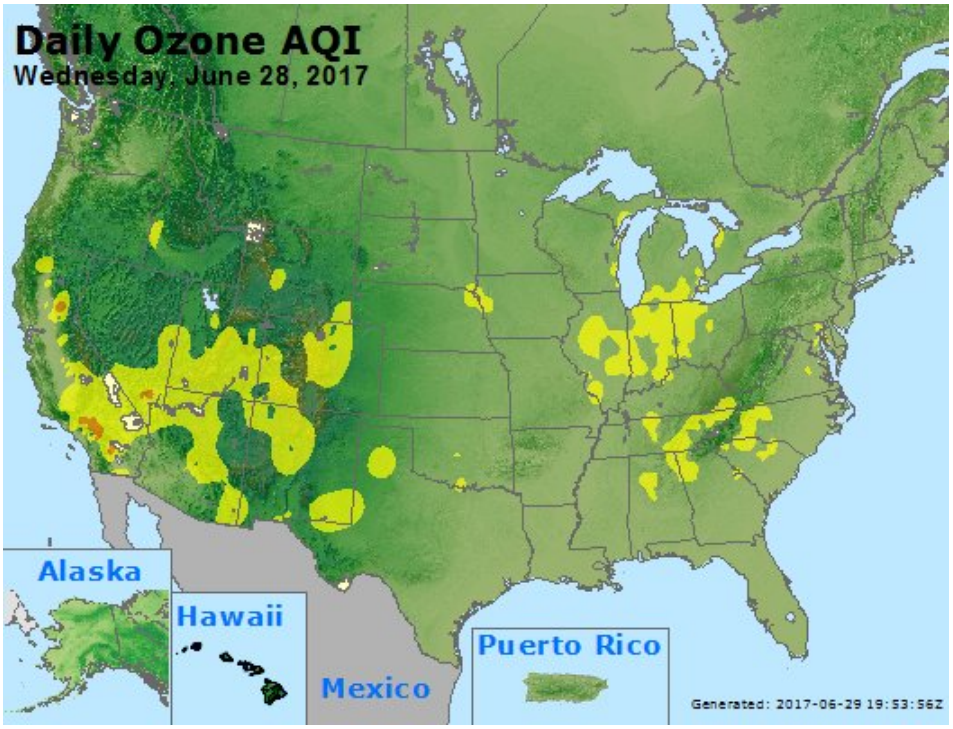
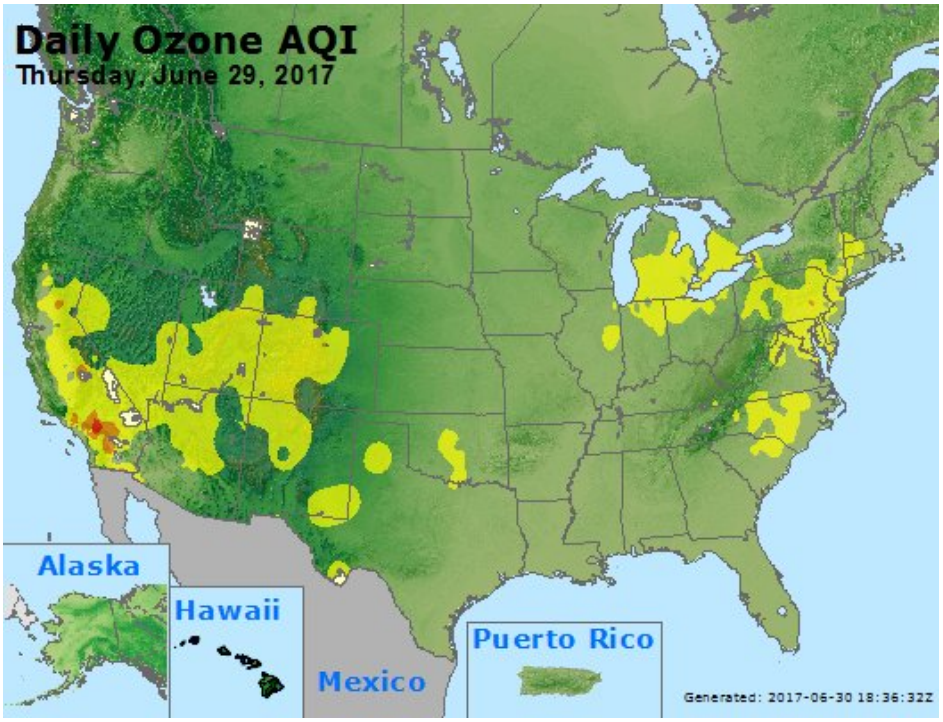


Figure 5a. Ozone Air Quality Index for the United States on June 29, 2017



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.