Ozone National Ambient Air Quality Standard Health Exceedances on July 11, 2017

Exceedance Locations and Levels

On Tuesday, July 11, 2017, there were no exceedances in New Jersey of the 8-hour average ozone National Ambient Air Quality Standard (NAAQS) of 70 ppb that became effective in December 2015.

No New Jersey 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 on July 11, 2017, in New Jersey was 82 ppb at the Colliers Mills station, which is below the 1-hour ozone NAAQS of 120 ppb.

The number of days in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in New Jersey remains at nine (9). By the 11th of July in 2016, there were fourteen (14) days on which ozone exceedances were measured in New Jersey (based on the 70 ppb NAAQS of 2015), and there were seven (7) days by this same date in 2015 (based on the former 75 ppb NAAQS of 2008). (See Table 1).

Table 1: New Jersey Exceedance Count

	# of Days NAAQS was Exceeded January 1 - July 11, 2017 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - July 11, 2016 NAAQS = 70 ppb	# of Days NAAQS was Exceeded January 1 - July 11, 2015 NAAQS = 75 ppb
New Jersey	9	14	7

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 was one (1) exceedance of the 70 ppb ozone NAAQS of 2015 recorded on Tuesday, July 11, 2017. (See Table 2):

Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on July 11, 2017

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Madison-Beach Road	74

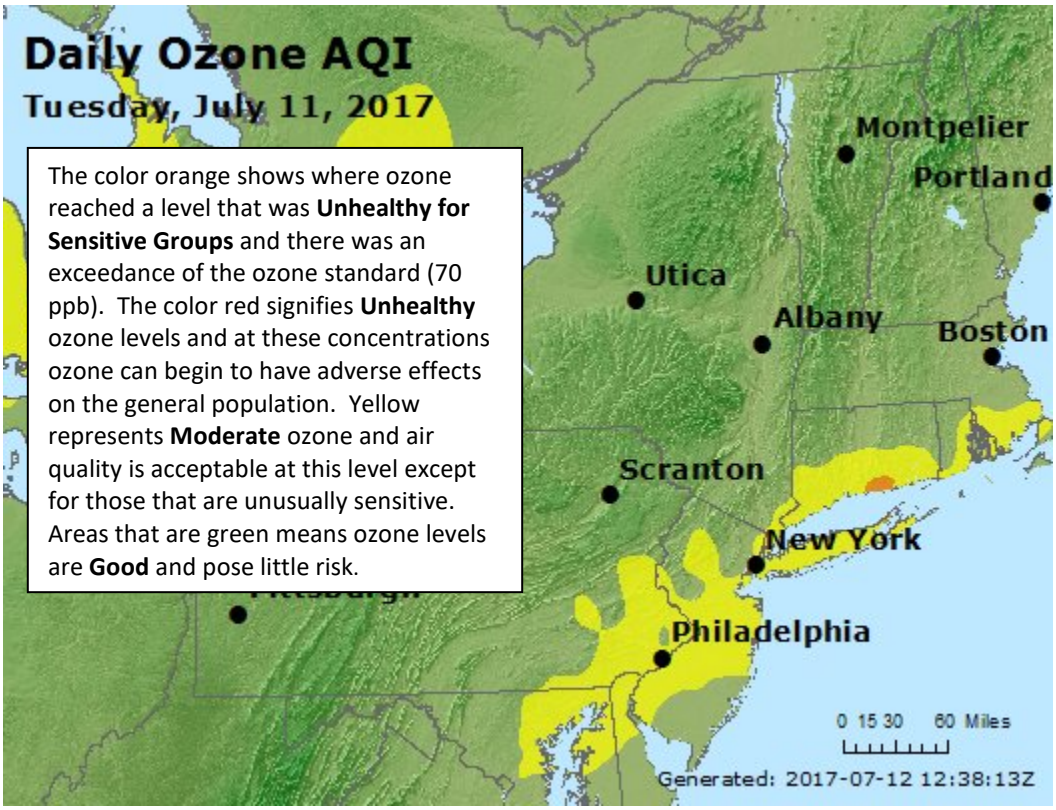
No station exceeded the 75 ppb ozone NAAQS of 2008, and none exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 87 ppb at the Madison-Beach Road station in Connecticut, which is below the 1-hour ozone NAAQS of 120 ppb.

Tuesday marks the 13th day in 2017 on which exceedances of the 70 ppb ozone NAAQS of 2015 were recorded in Connecticut. The number of days for New York remains at eight (8), with seven (7) days for Maryland and Pennsylvania, and five (5) days for Delaware (shown Table 3). Figure 1 shows graphically the region's ozone concentrations on July 11, 2017.

Table 3: Number of Ozone Exceedances by State

STATE	# of Days NAAQS was Exceeded January 1 - July 11, 2017 NAAQS = 70 ppb
Connecticut	13
Delaware	5
Maryland	7
New Jersey	9
New York	8
Pennsylvania	7

Figure 1. Ozone Air Quality Index for July 11, 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 showed scattered clouds, calm winds, and temperatures reaching the mid-80s occurred throughout the day in Madison, CT. A stationary frontal boundary was stalled over the Ohio River Valley and a high-pressure system over the south was flooding the region with light west-southwesterly winds, hot temperatures, and high humidity. Throughout the afternoon hours on July 11, the stationary front progressed southward over Connecticut. This boundary provided a mechanism to bring any polluted air aloft down to the surface and enhance ozone levels near the affected monitor. The weather conditions mentioned above are all factors commonly seen in a typical 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 July 11, 2017. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. One (1) monitoring station with an 8-hr ozone exceedance was chosen to run back trajectories. The selected site and the maximum 8-hr ozone level recorded is listed in Table 4 below:

Table 4. 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	Madison-Beach Road	74

Surface winds (Figure 2) originated over the Atlantic Ocean, south of Connecticut off the coast of North Carolina. Winds at the surface then passed through the Long Island Sound which is frequently recognized as having high ozone levels due to the interaction of the land sea interface before landing at its endpoint in Madison, CT. Mid and upper level winds followed similar transport pathways traveling from locations west-southwest of Connecticut. Mid-level winds (Figure 3) originated in the Mid-West and traveled through the heavily industrialized states of Illinois, Indiana, Ohio, and Pennsylvania. Trajectories at the mid-level then traveled through northern New Jersey, New York City, and urban locations of Connecticut while descending from 1000m to 500m. The upper-level winds (Figure 4) also originated in the Mid-West and gradually rose to higher elevation of 1500m throughout its path. Upper level winds tracked eastward through the Ohio River Valley, Pennsylvania and New York before arriving at its endpoint in Connecticut. The mid and upper level winds also brought in some polluted air from areas to the west which had isolated regions of elevated ozone levels the day before on July 10, 2017 (shown Figure 5).

Figure 2. 48-hour Back Trajectories for July 11, 2017 at 10 meters

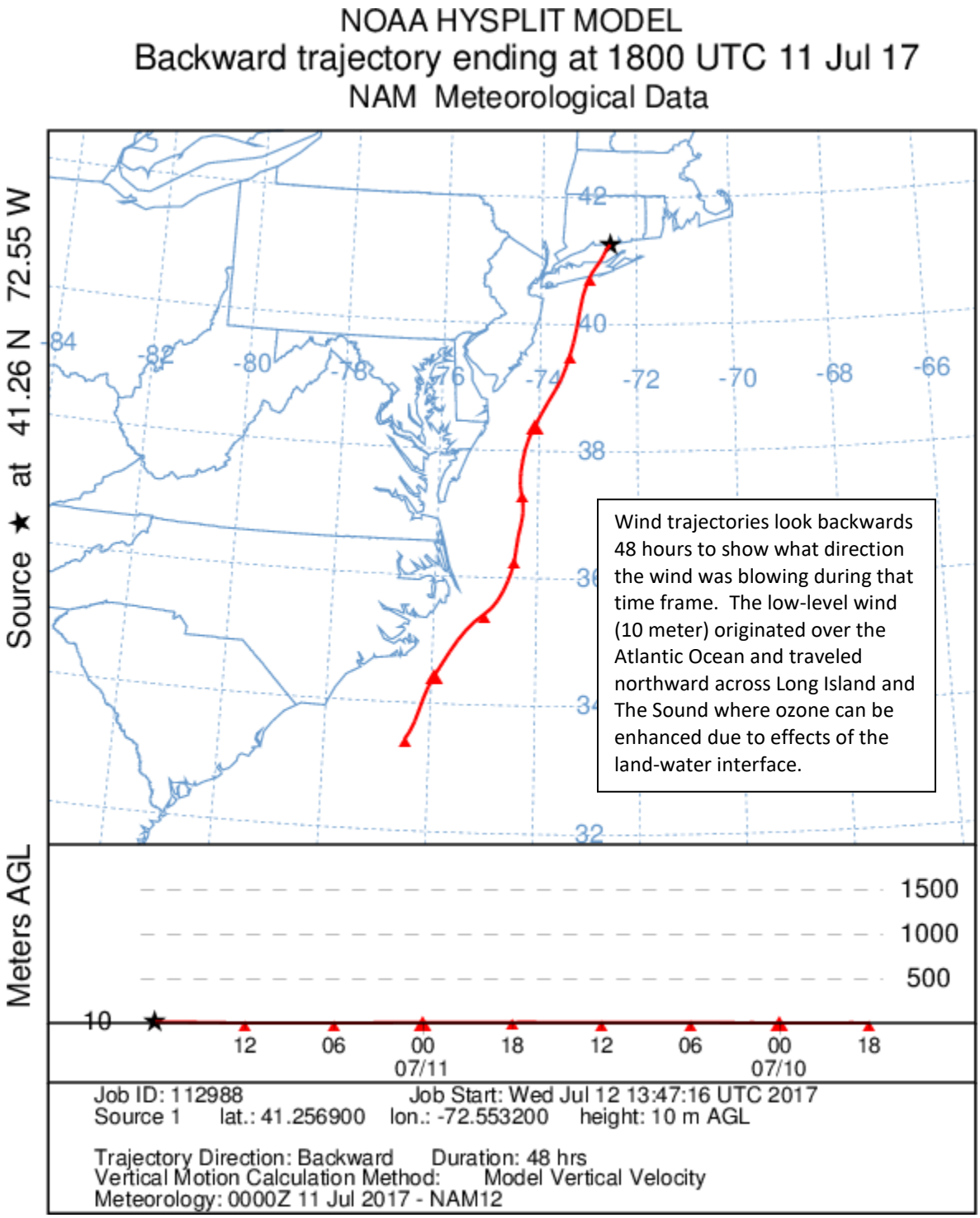


Figure 3. 48-hour Back Trajectories for July 11, 2017 at 500 meters

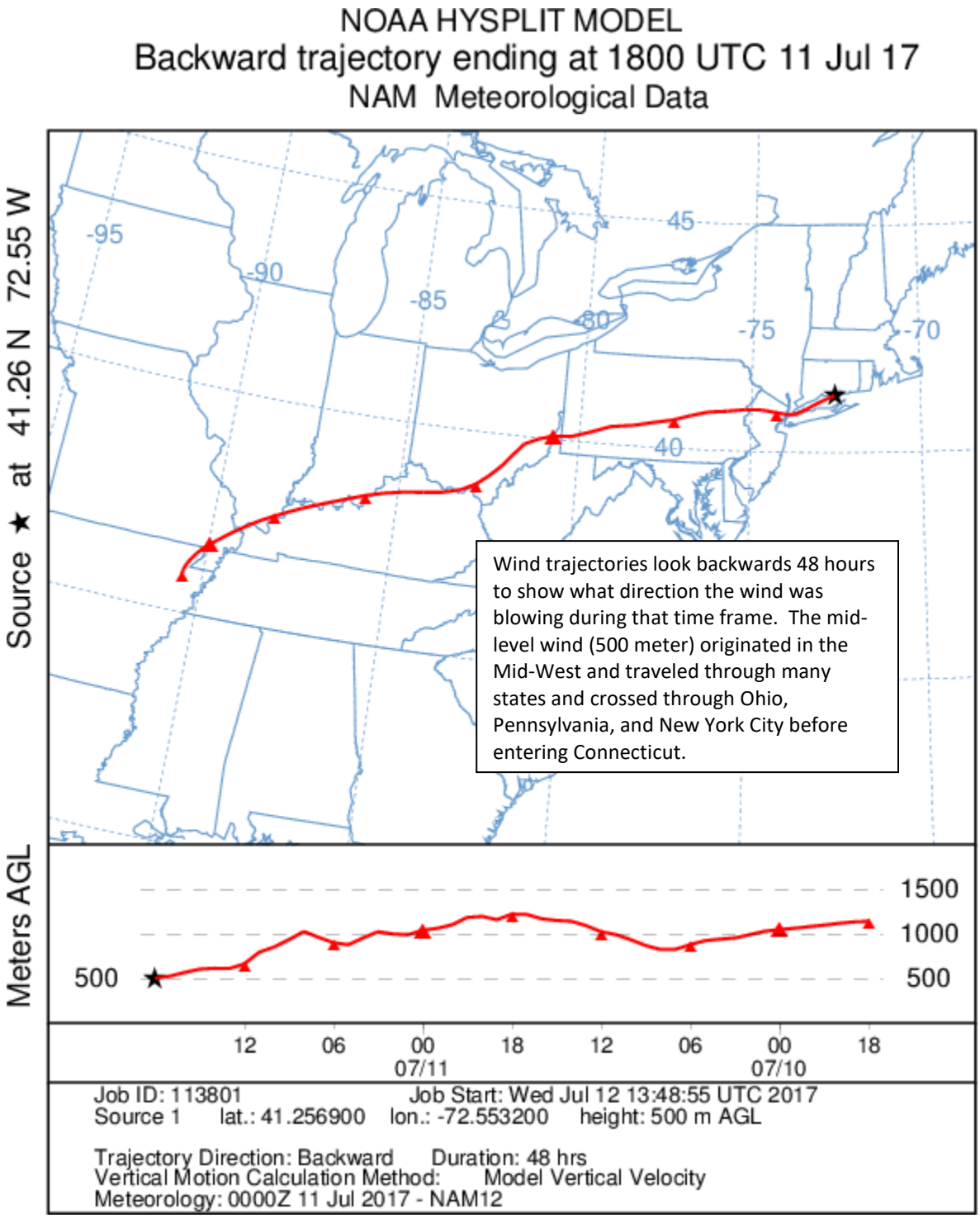


Figure 4. 48-hour Back Trajectories for July 11, 2017 at 1500 meters

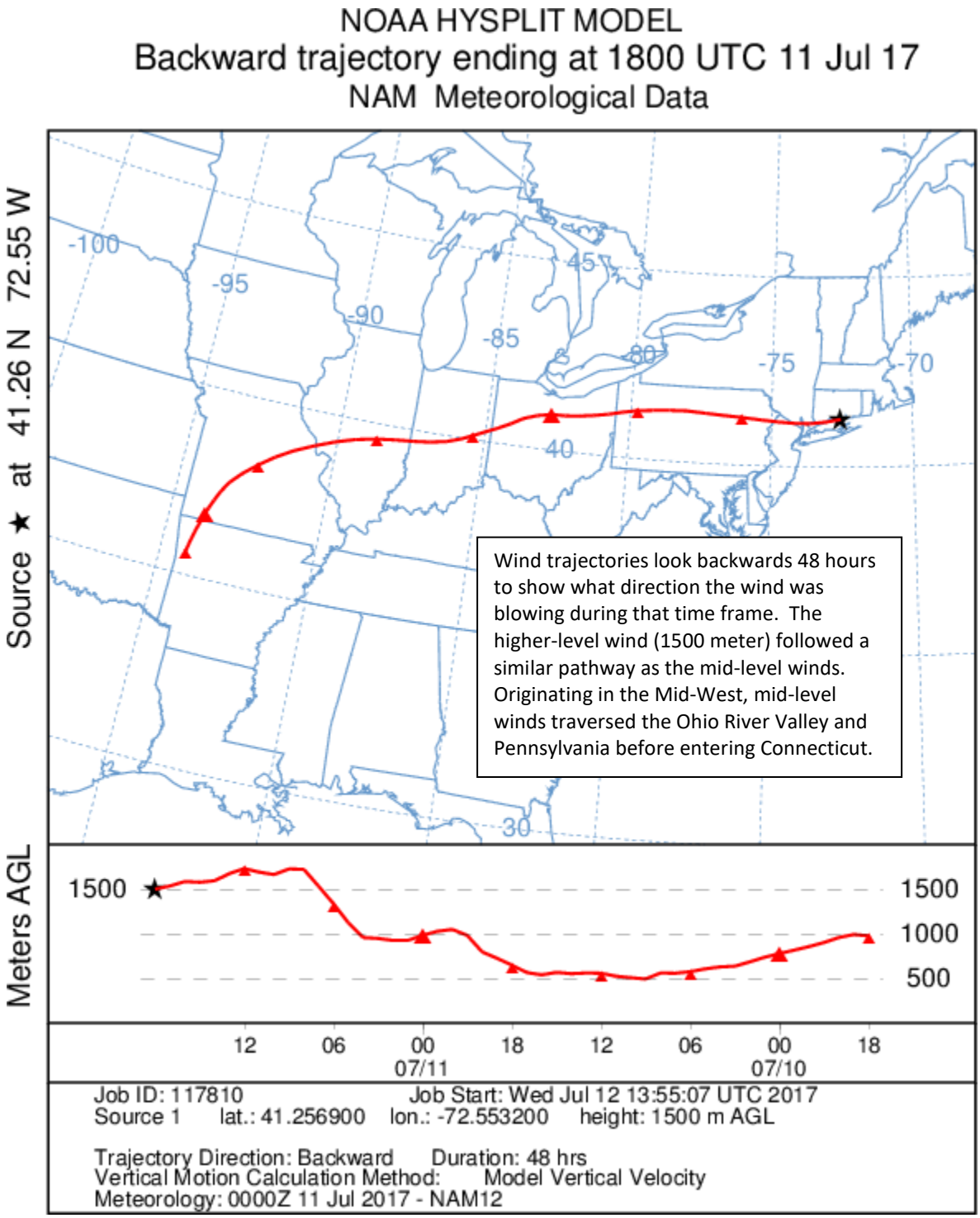
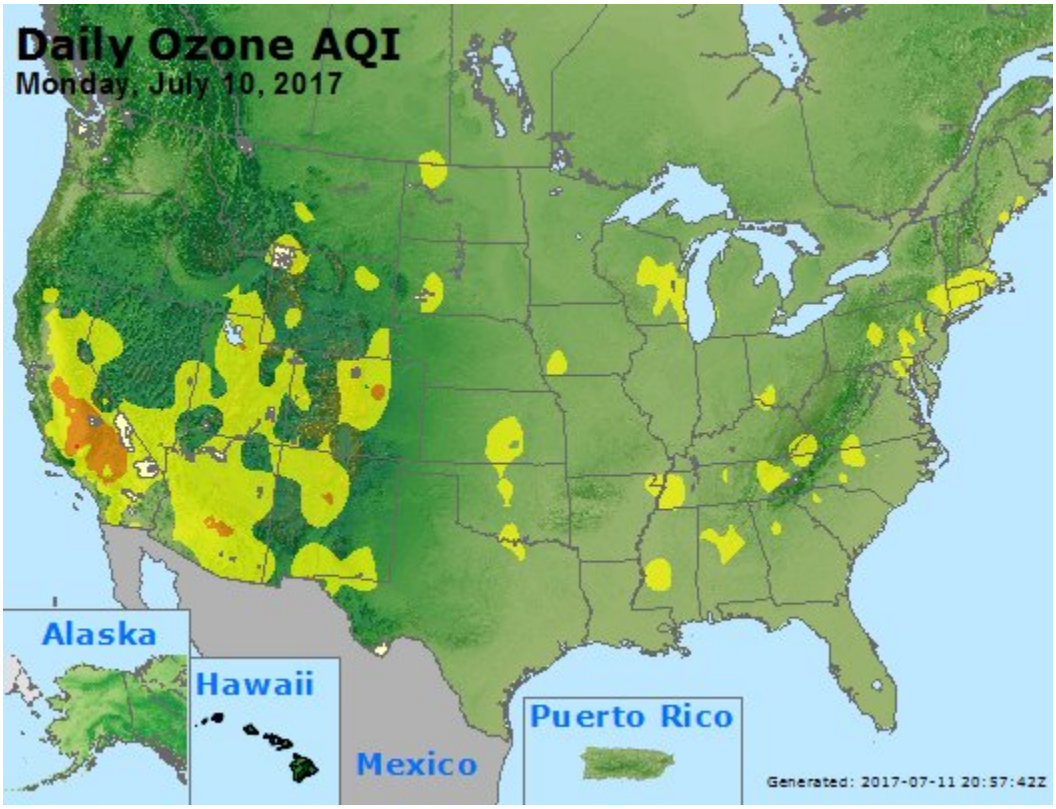


Figure 5. Ozone Air Quality Index for the United States on July 10, 2017



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 the state of 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 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.