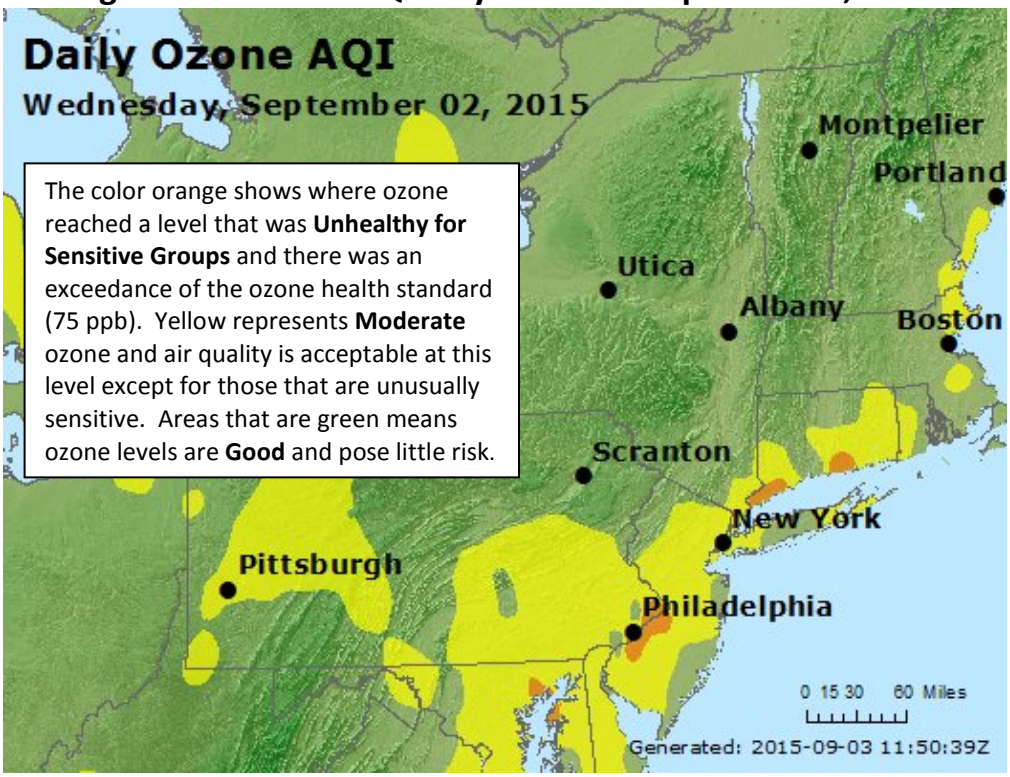
Ozone National Ambient Air Quality Health Standard Exceedances on September 2, 2015

Exceedances Locations and Levels

On Wednesday, September 2, 2015, exceedances of the 8-hour average National Ambient Air Quality Standard (NAAQS) for ozone (75 ppb) were recorded at two (2) New Jersey stations: Camden Spruce Street station with a concentration of 78 ppb and Clarksboro station with a concentration of 77 ppb. The highest 1-hour average ozone concentration recorded on September 2, 2015 in New Jersey was 94 ppb at the Leonia station, which is below the 1-hour NAAQS of 120 ppb. This is the fifteenth (15^{th}) day there was an exceedance of the 8-hour ozone NAAQS in 2015 for New Jersey. By this time in 2014, there were 3 days on which an ozone exceedance was measured in New Jersey, and there were 9 days in 2013.

There is a group of monitoring stations in designated counties of 5 states, New York, Connecticut, Pennsylvania, Delaware, and Maryland, which are included in New Jersey's ozone non-attainment areas. From this group of stations in the other neighboring states, there were five (5) exceedances of the 8-hour ozone NAAQS recorded on Wednesday, September 2, 2015: Bristol, PA with a concentration of 82 ppb, Philadelphia (NEA), PA with a concentration of 82 ppb, Greenwich, CT with a concentration of 78 ppb, Madison-Beach Road, CT with a concentration of 78 ppb, and Westport, CT with a concentration of 78 ppb. The highest 1-hour average ozone concentration recorded was 105 ppb at the Madison-Beach Road station in Connecticut.

Figure 1. Ozone Air Quality Index for September 2, 2015



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 ranged from the high 80s ^{o} F into the low 90s^{o} F with stagnating conditions. Winds were light and variable with a high pressure ridge approaching the area. Skies were mostly sunny. Sufficient sunlight, combined with warmer temperatures and light variable winds are all features commonly seen with an ozone episode.

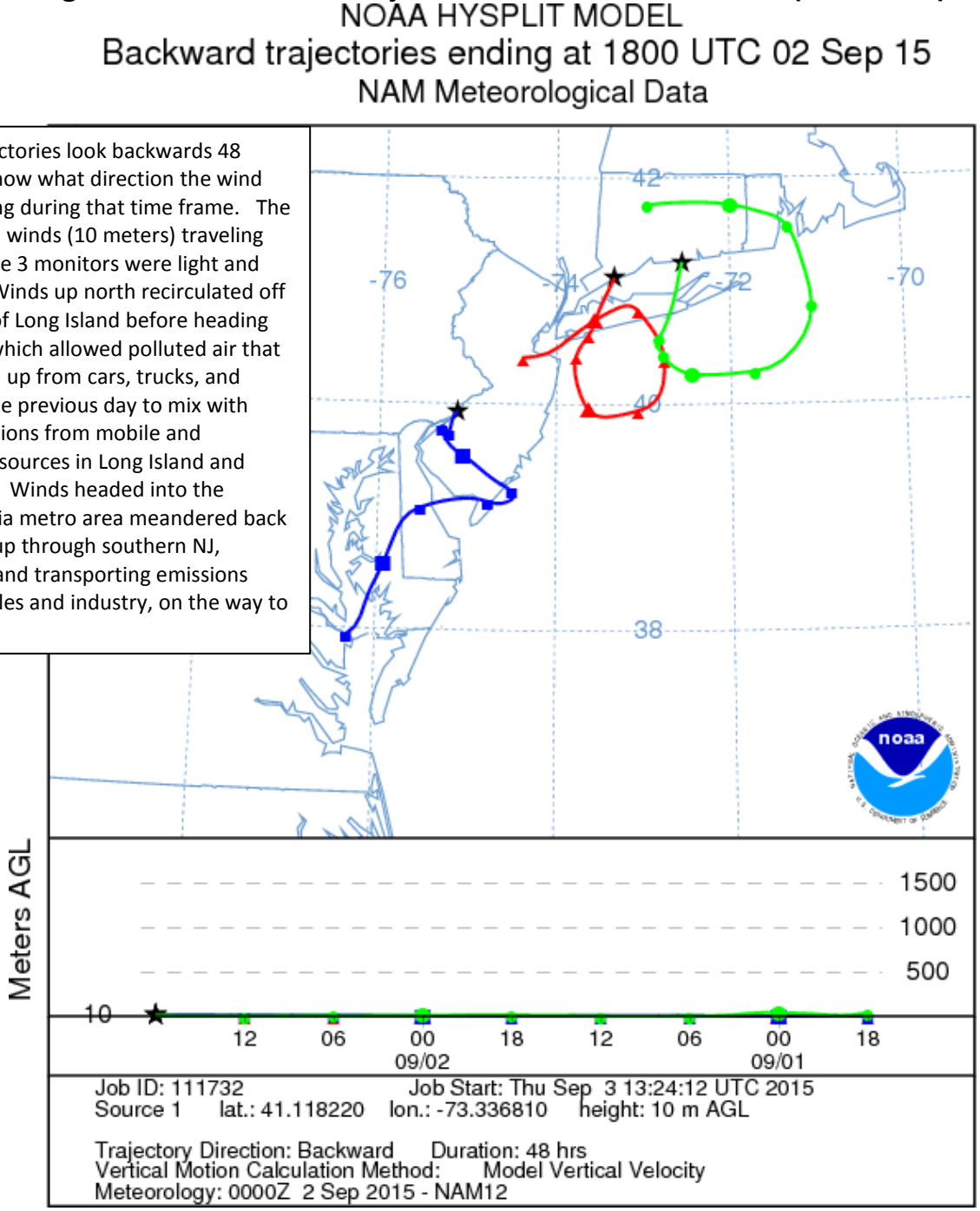
Where Did the Air Pollution that Caused Ozone Come From?

Figures 2 and 3 show the back trajectories for 3 selected monitored exceedances (Westport, CT; Madison Beach Rd., CT; and Camden Spruce Street, NJ) for September 2. These sites were selected because they were representative of the three regions (southwestern Connecticut, central coast Connecticut, and the Philadelphia metropolitan area) where ozone exceedances occurred. Figure 2 shows where the low level winds came from during the 48 hours preceding the high ozone levels at monitor locations. Light and variable winds were evident at all 3 monitors. Up north, winds recirculated just off the Long Island coast before heading up to the areas of coastal Connecticut where exceedances occurred. Recirculating winds allowed polluted air from the previous day to mix with local emissions from cars, trucks, and industry in Long Island and Connecticut. Winds headed up towards the Philadelphia metropolitan area were slow moving and meandered back and forth through southern New Jersey, collecting emissions from motor vehicles and industry, and transporting them up to the Camden monitor.

Figure 3 illustrates that higher level winds (500 meters) were also light and recirculating. Winds traveled up along the I-95 corridor towards the monitoring stations in New Jersey and Connecticut, bringing with them pollution from mobile sources and industry that was picked up the previous day, plus local emissions from cars, trucks, and industry released the day of the exceedances. Recirculating winds at both the 10 meter and 500 meter heights allowed pollution from a variety of mobile and stationary sources to accumulate and then be transported into the regions of Connecticut and the Philadelphia metropolitan area that experienced high ozone on September 2.

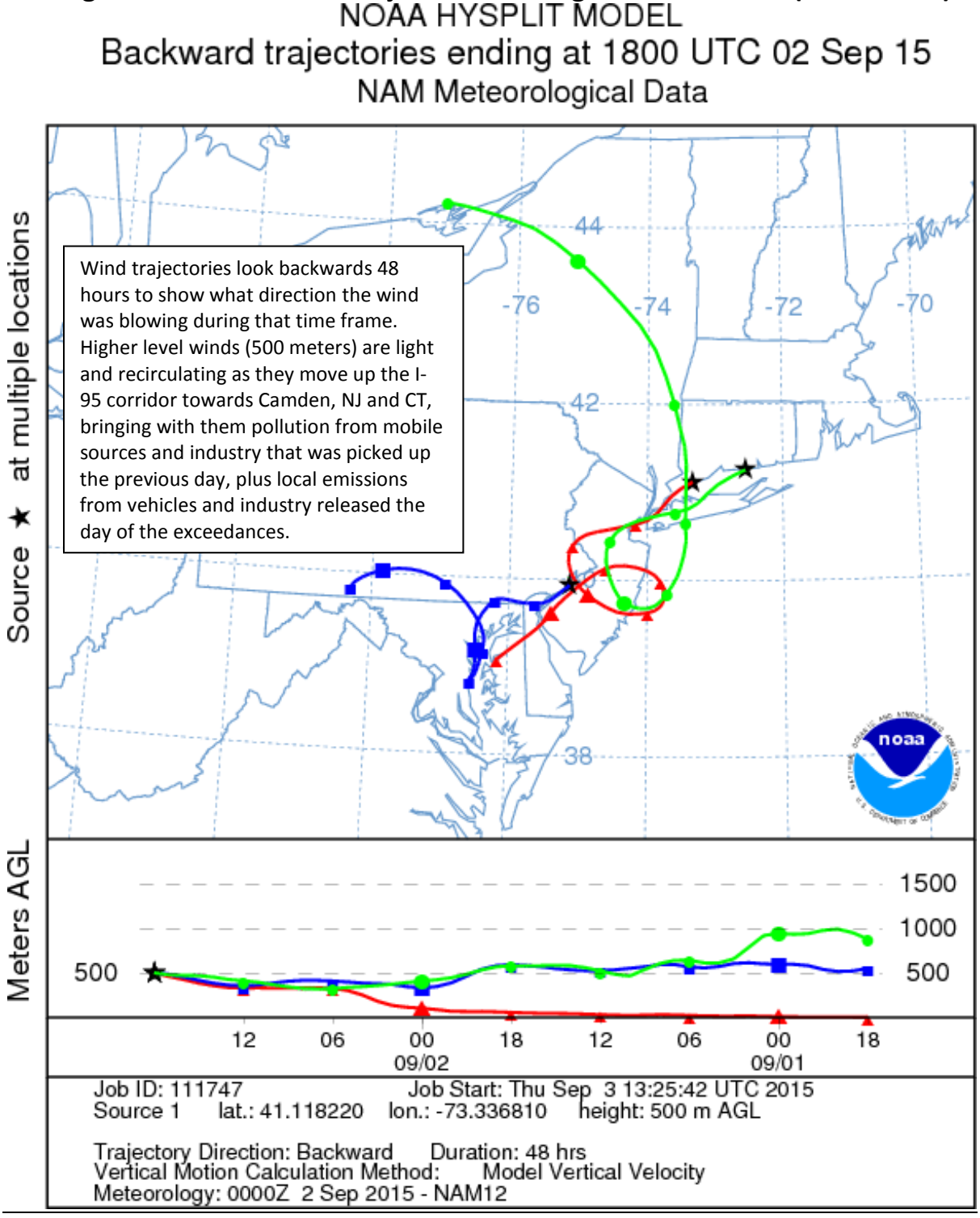
The ozone exceedances on September 2, 2015 are part of a multi-day ozone event that is being driven by a hot and stagnant air mass over the area. Wednesday, September 2 marks the second day in a row that an Air Quality Alert has been issued for the state of New Jersey. This high ozone event is forecast to continue a third day and then finally end as a weak cold front pushes through and brings a cleaner and cooler air mass to the area.

Figure 2. 48-hour Back Trajectories for Low Level Winds (10 meters)



Wind trajectories look backwards 48 hours to show what direction the wind was blowing during that time frame. The lower level winds (10 meters) traveling towards the 3 monitors were light and variable. Winds up north recirculated off the coast of Long Island before heading up to CT, which allowed polluted air that was picked up from cars, trucks, and industry the previous day to mix with local emissions from mobile and stationary sources in Long Island and coastal CT. Winds headed into the Philadelphia metro area meandered back and forth up through southern NJ, collecting and transporting emissions from vehicles and industry, on the way to Camden.

Figure 3. 48-hour Back Trajectories for Higher Level Winds (500 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.