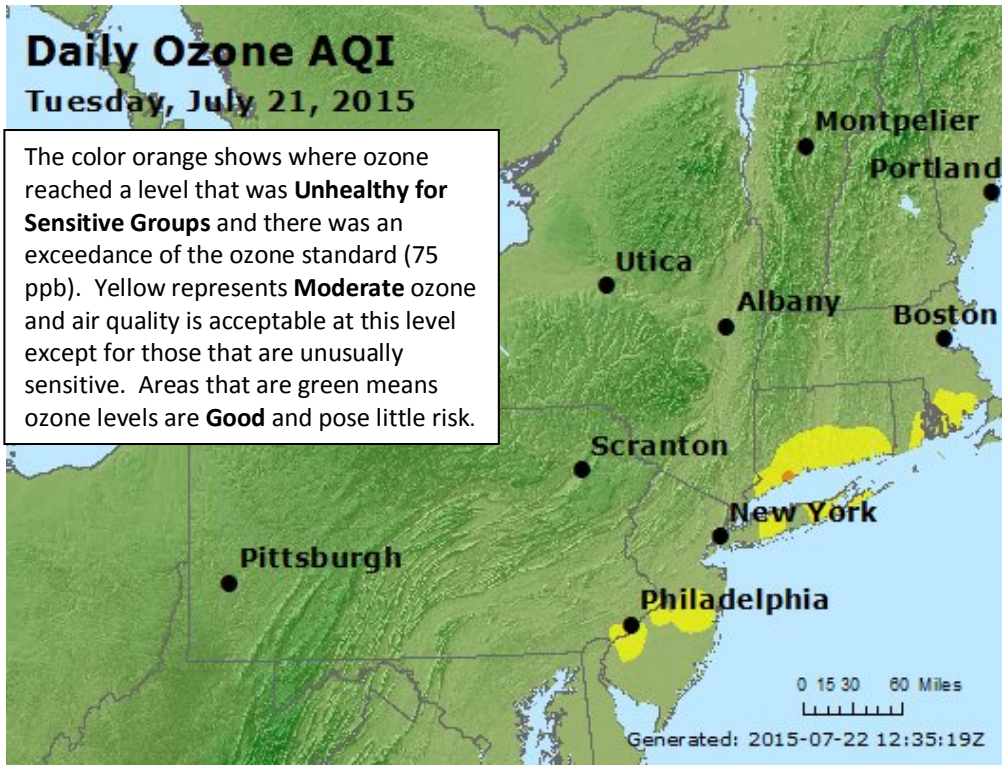
Ozone National Ambient Air Quality Standard Health Exceedance on July 21, 2015

Exceedances Locations and Levels

On Tuesday, July 21, 2015, an exceedance of the 8-hour average 75 ppb NAAQS for ozone was recorded at one (1) station: Stratford, CT with a concentration of 76 ppb. The highest 1-hour average ozone concentration recorded on July 21, 2015 was 102 ppb, also at Stratford, which is below the 1-hour NAAQS of 120 ppb. The Stratford site was the only ozone exceedance in the 5 states that make up the Air Quality Control Region that includes New Jersey. The highest 8-hour average ozone concentration recorded in New Jersey was 64 ppb at the Clarksboro monitoring station. The highest 1-hour average ozone concentration recorded in New Jersey was 83 ppb, also at the Clarksboro station. Figure 1 shows the ozone AQI across the region for July 21, 2015.

Figure 1. Ozone Air Quality Index for July 21, 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

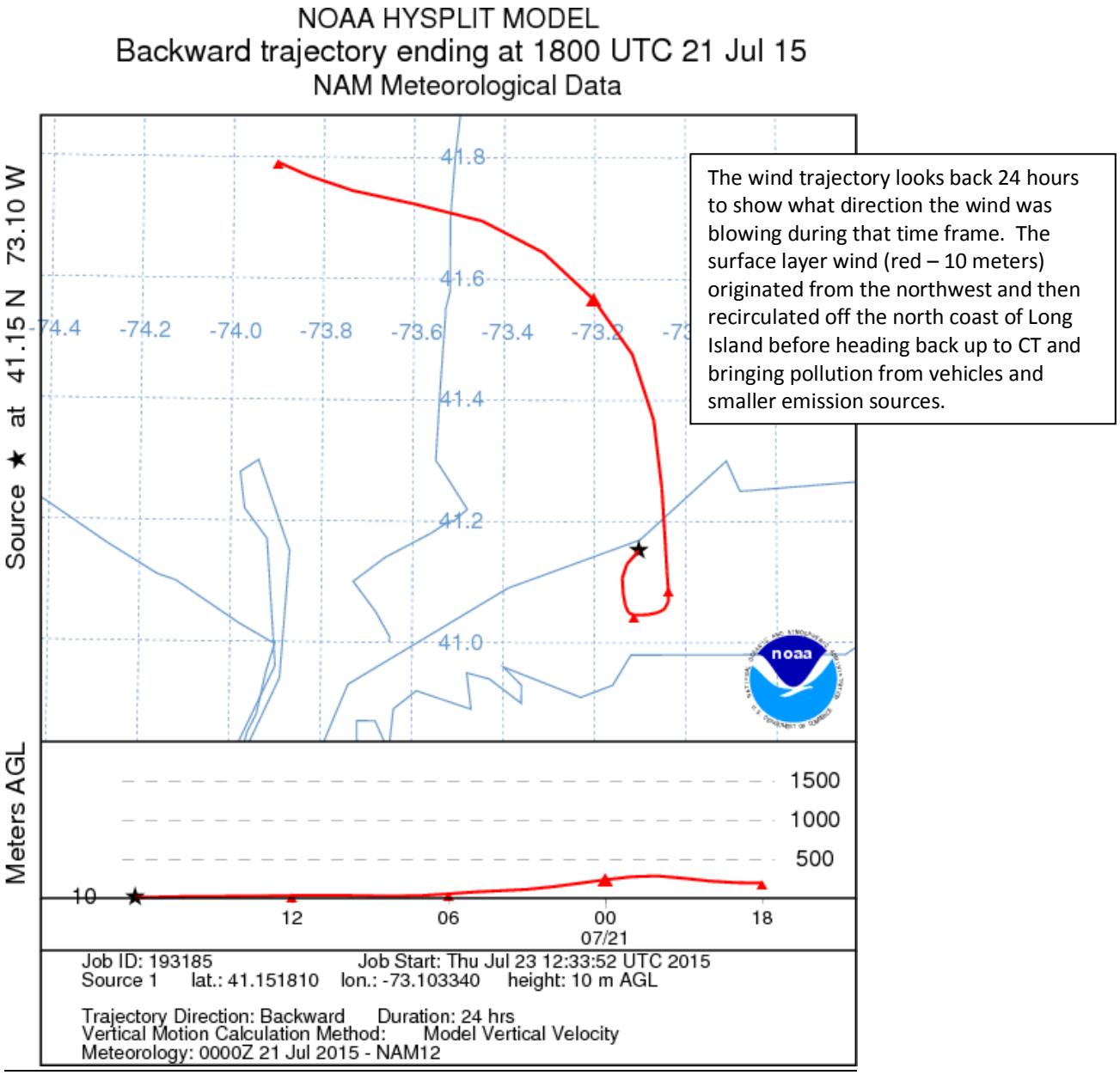
Weather

Meteorological data from Sikorsky Memorial Airport in Stratford, CT shows temperatures reached 88^{o} F while winds were light and variable. Skies were mostly sunny. Sufficient sunlight, combined with warmer temperatures, are features commonly seen with an ozone exceedance. Cloud cover was more substantial over New Jersey with a frontal boundary approaching and likely explains why there were no exceedances in the Garden State.

Where Did the Air Pollution that Caused Ozone Come From?

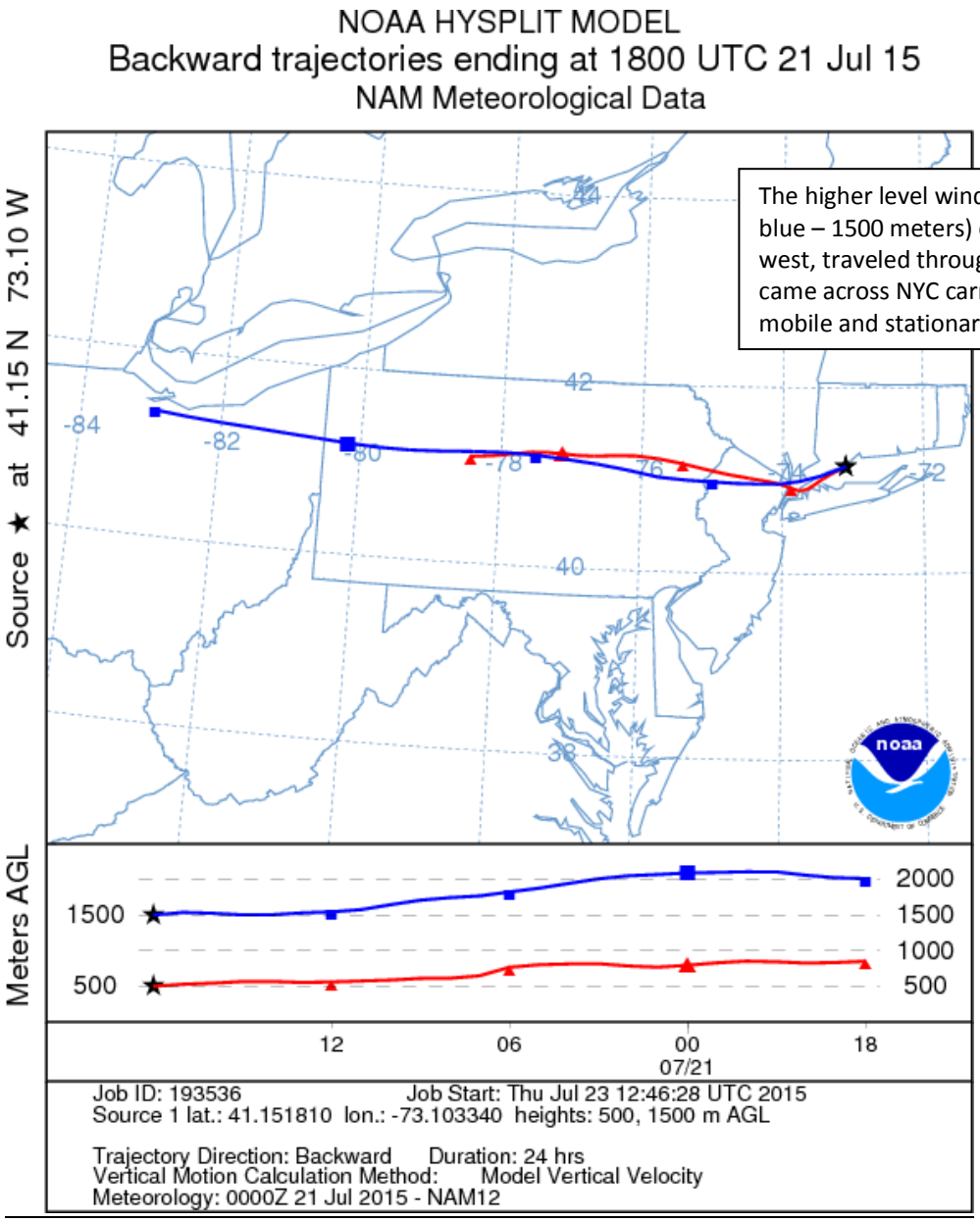
Figures 2 and 3 illustrate the back trajectories for the monitored exceedance for July 21. Figure 2 shows that surface level winds originated from the northwest, dipped down through Connecticut, and then recirculated just off the coast of Long Island before heading back towards Connecticut. Recirculating winds allowed polluted air from the previous day to mix with local emissions from cars, trucks, and industry in southern Connecticut. The higher level winds in Figure 3 came from the west, crossed through central PA, and then traveled over NYC, bringing additional pollution from urban sources and distant power plants. The combination of these winds caused air pollution from a variety of mobile and stationary sources to be transported into the area of southern CT that experienced high ozone on July 21.

Figure 2. 24-hour Back Trajectory at 10 meters



The wind trajectory looks back 24 hours to show what direction the wind was blowing during that time frame. The surface layer wind (red – 10 meters) originated from the northwest and then recirculated off the north coast of Long Island before heading back up to CT and bringing pollution from vehicles and smaller emission sources.

Figure 3. 24-hour Back Trajectories at 500 and 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.