GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

NAAQS Exceedance Reports

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Georgia EPD - Air Protection Branch

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EXCEEDANCE vs. VIOLATION

- **"Exceedance" of the NAAQS**
  - **$PM_{2.5}$ ➔** 24-hour measurement > 35 μg/m^3
  - **Ozone ➔** 8-hour measurement > 70 ppb
  - **SO_2 ➔** 1-hour measurement > 75 ppb
  - **Pb ➔** 24-hour measurement > 0.15 μg/m^3
- **"Violation" of the NAAQS**
  - **$PM_{2.5}$ ➔** Annual arithmetic mean, averaged over 3 years > 12.0 μg/m^3
  - **$PM_{2.5}$ ➔** 98th percentile of 24-hour daily average, averaged over 3 years > 35 μg/m^3
  - **Ozone ➔** Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years > 70 ppb
  - **SO_2 ➔** 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years > 75 ppb
  - **Pb ➔** Rolling 3-month average > 0.15 μg/m^3

EXCEEDANCE REPORTS

- GA EPD writes detailed reports for <u>every</u> exceedance of the NAAQS (O_3, $PM_{2.5}$, SO_2, Pb).
  - INITIAL REPORT
    - Must be completed within 2 business days after the exceedance.
    - In 2016, Ozone (30), $PM_{2.5}$ (9), SO_2 (3), and Lead (4).
    - In 2017, Ozone (10), $PM_{2.5}$ (2), SO_2 (0), and Lead (1).
  - FINAL REPORT
    - Submitted after all relevant information has been collected. This could be days, weeks, or months…
- Reports include discussions on meteorology, emissions, and air quality.

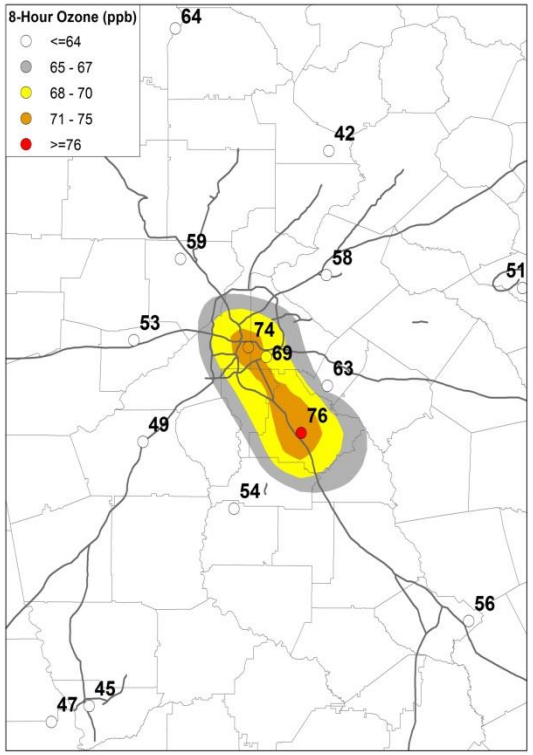
PURPOSE

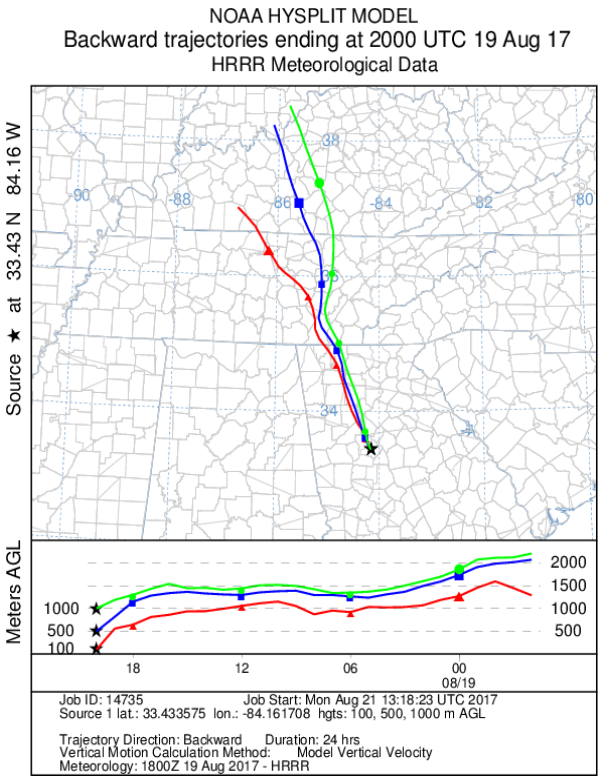
- Previously, there was no set process for investigating the cause of the exceedance, or determining the impact of the exceedance on our design values.
- These exceedance reports are used to better understand the complex conditions leading to exceedances and to help develop effective emission control strategies (if warranted) to prevent future exceedances.
- In the case of wildfire impacts, these reports can be used as the basis of our Exceptional Event demonstrations.

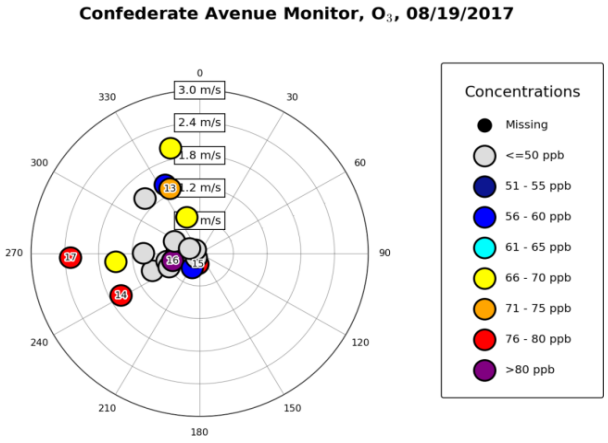
COLLABORATION

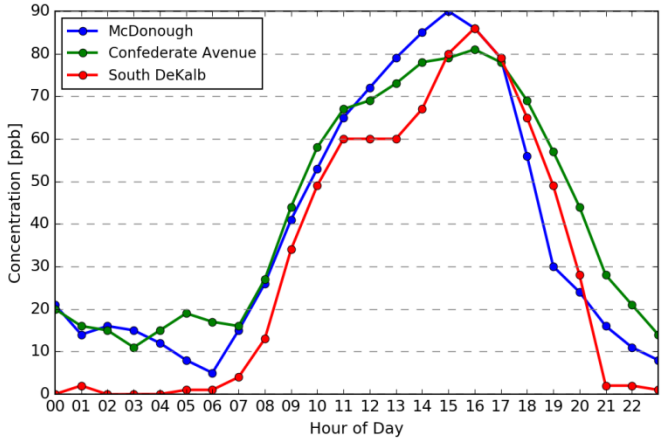
- Planning & Support Program
  - Creates emission maps and graphs, runs HYSPLIT and other models, and puts the reports together
- Ambient Monitoring Program
  - Confirms the exceedance and provides the air monitoring and meteorological information
- Stationary Source Compliance Program and EPD District Offices
  - Provides information on industrial facilities in the area
- Georgia Forestry Commission
  - Provides information on prescribed fires and wildfires

ATLANTA OZONE – AUGUST 19, 2017

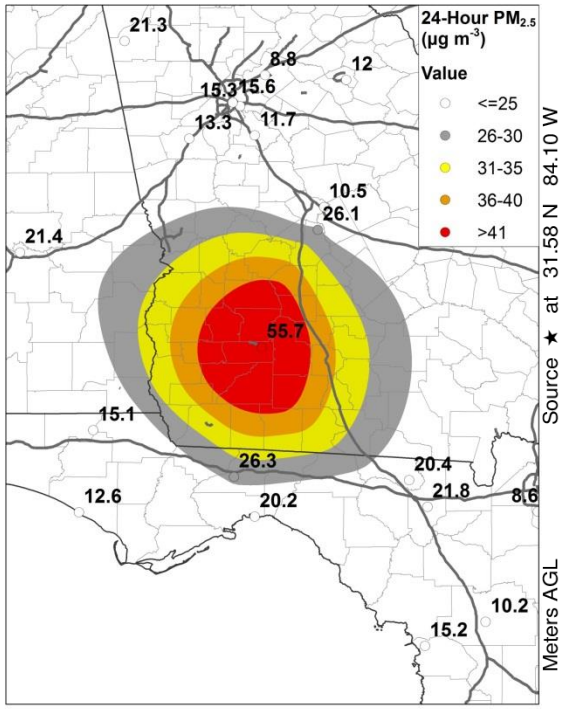


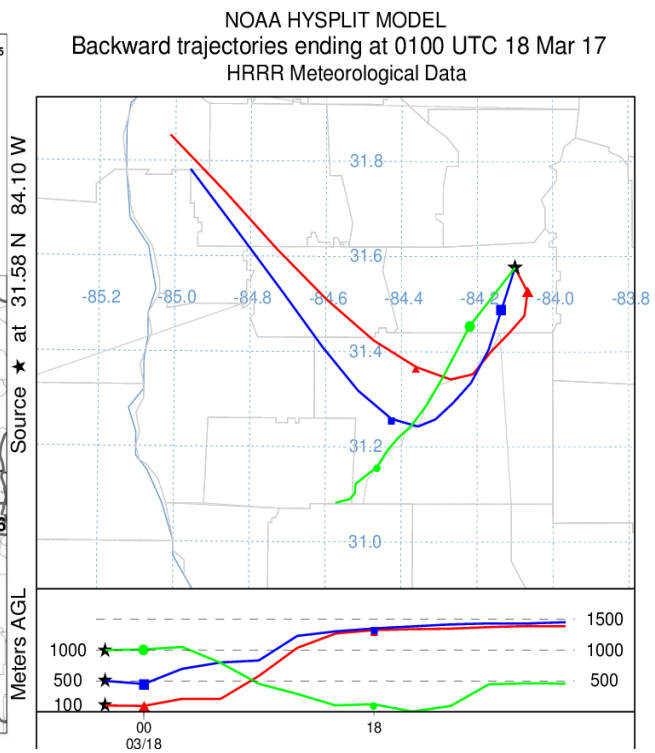


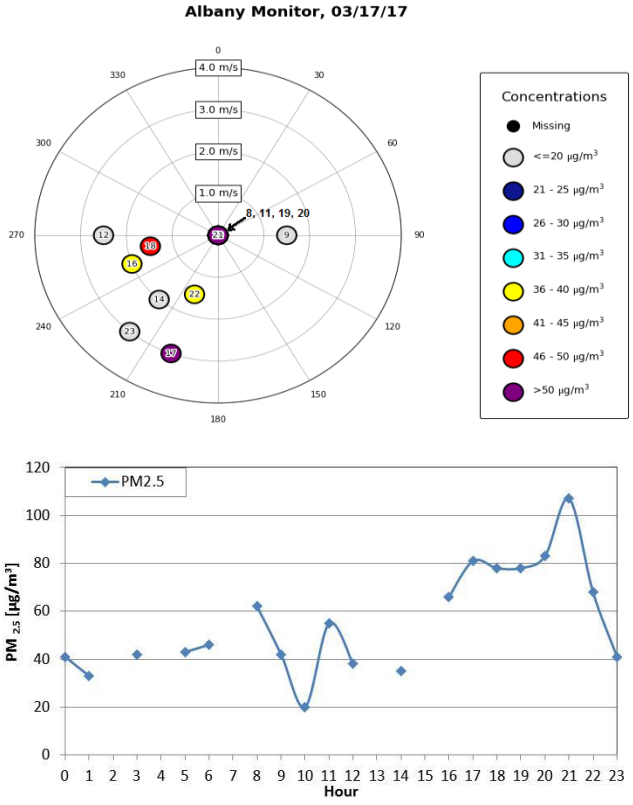




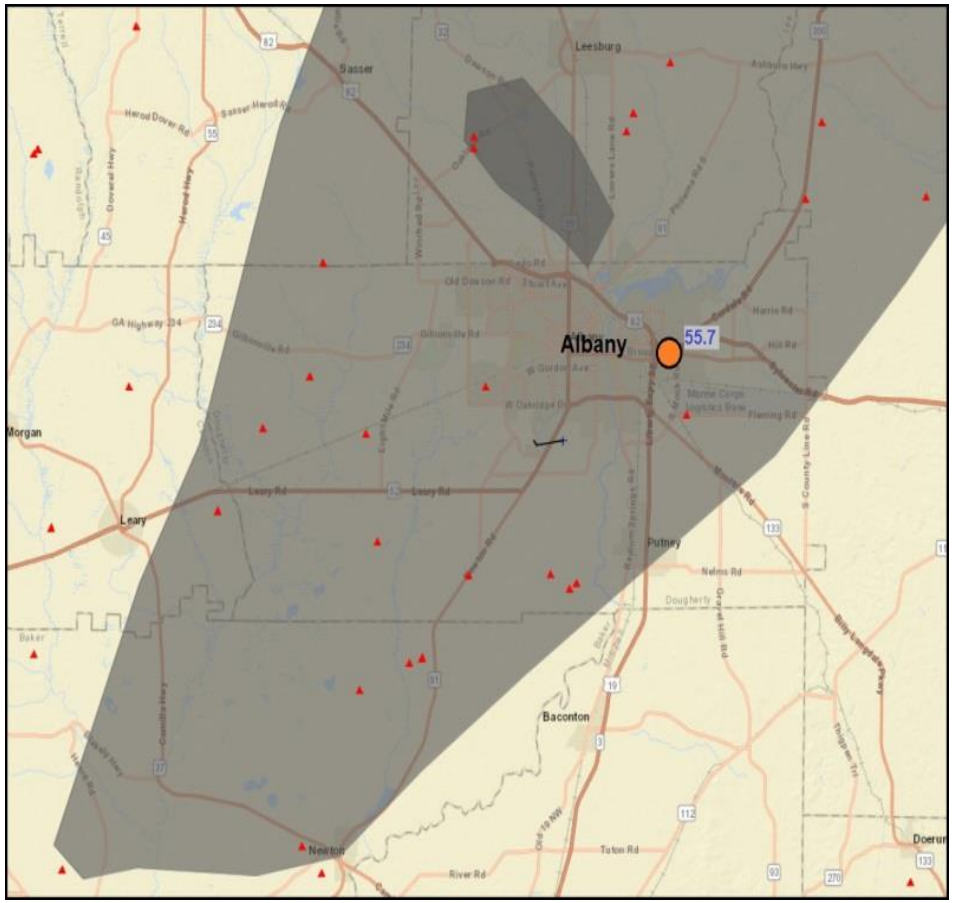
ALBANY $PM_{2.5}$ - MARCH 17, 2017

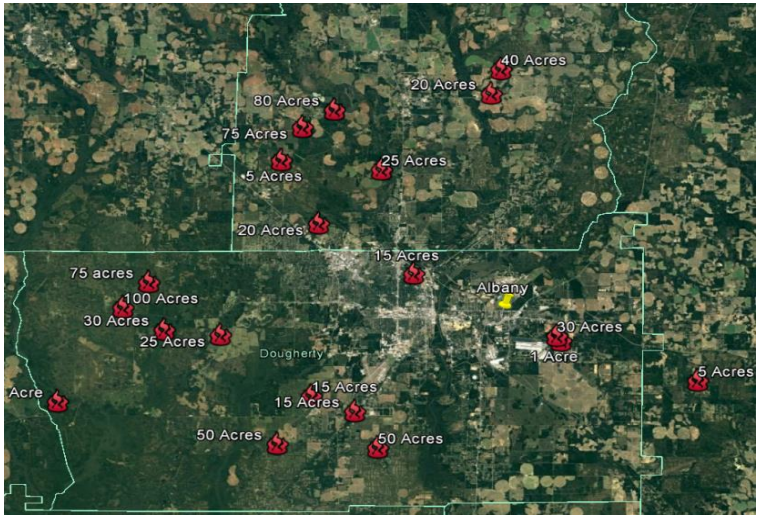




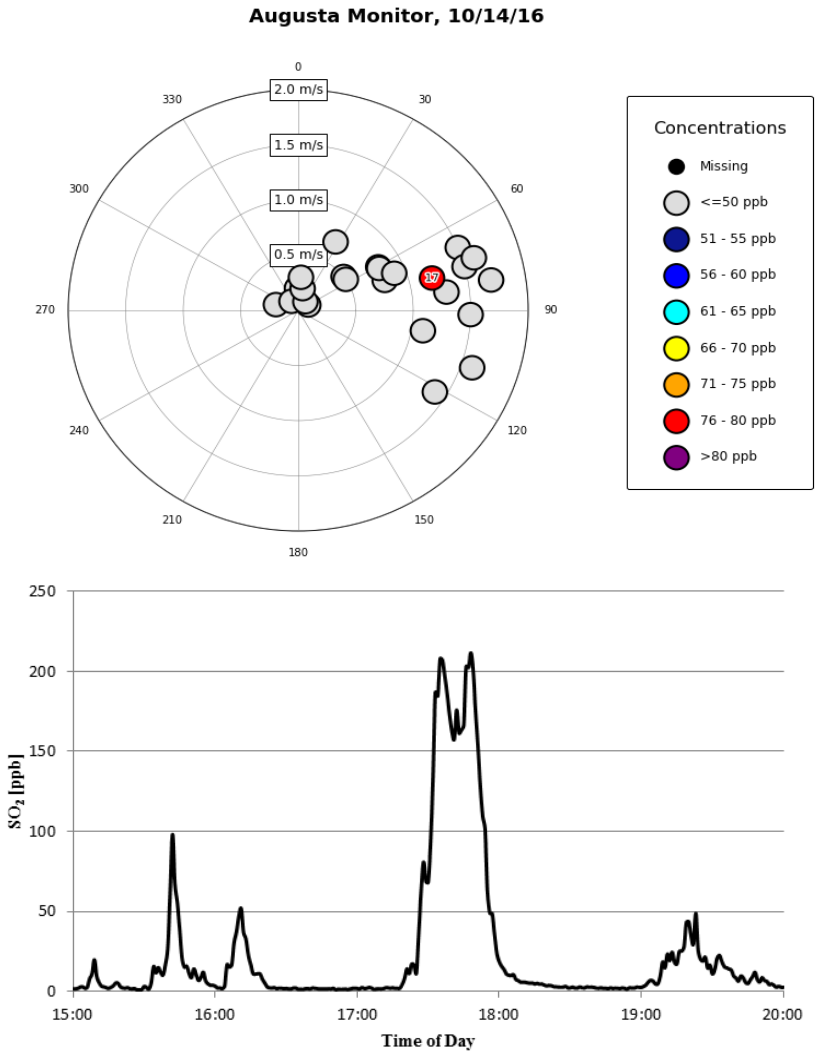


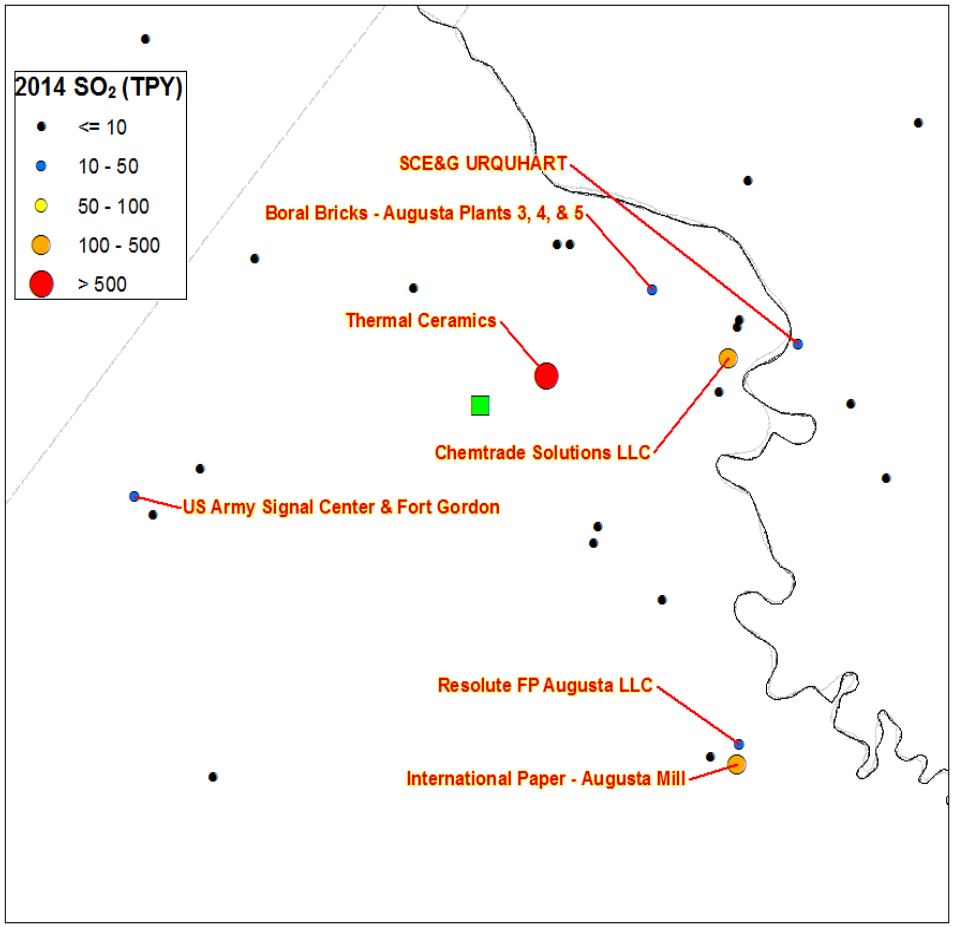
ALBANY $PM_{2.5}$ - MARCH 17, 2017



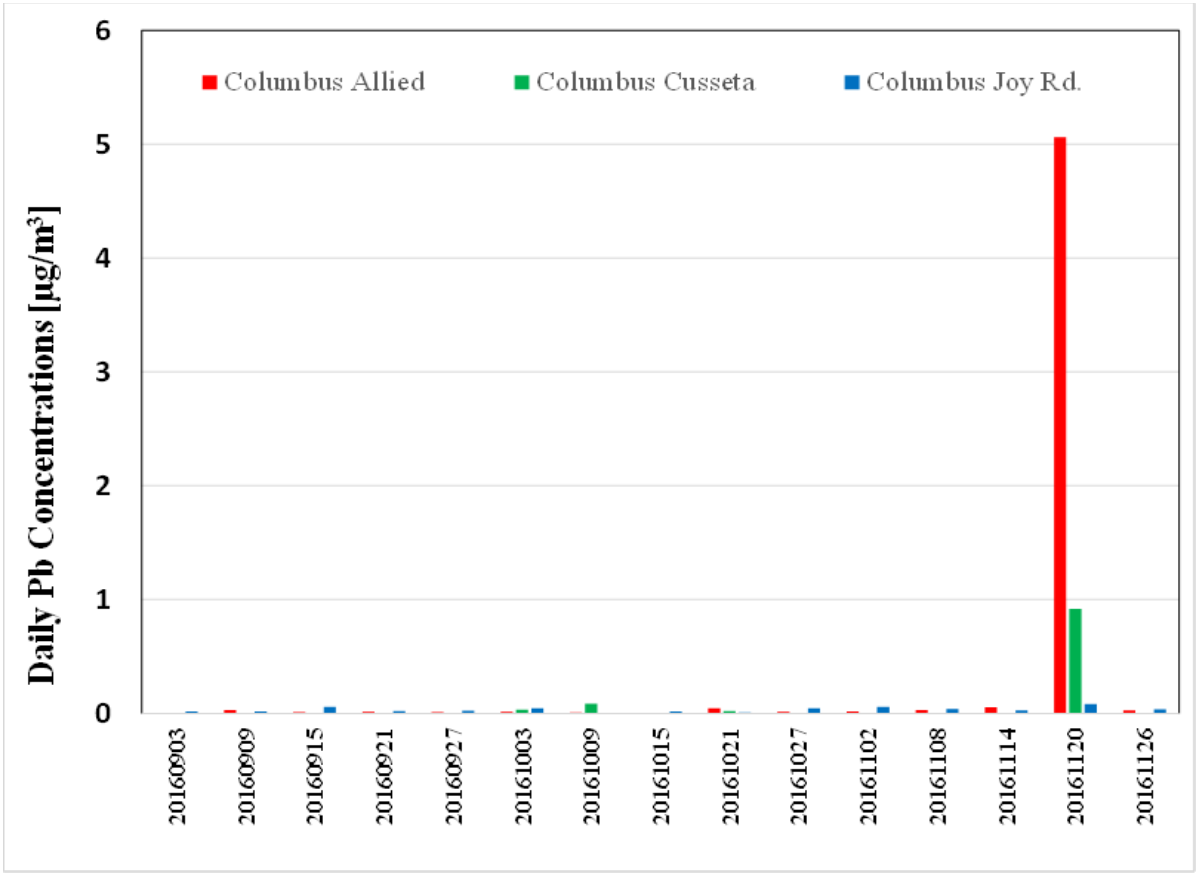


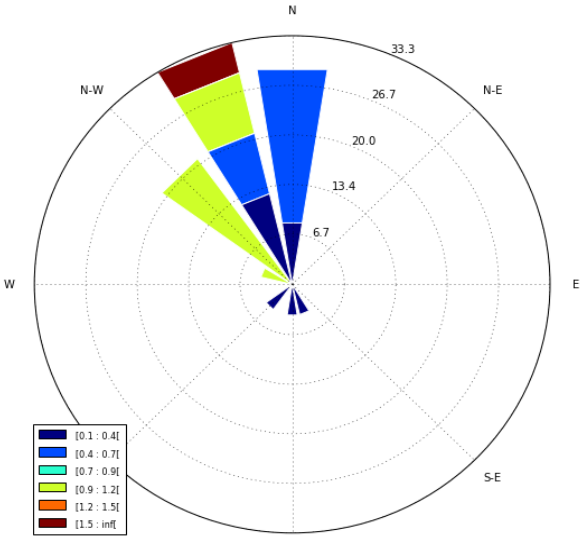
AUGUSTA SO_2 – OCTOBER 14, 2016

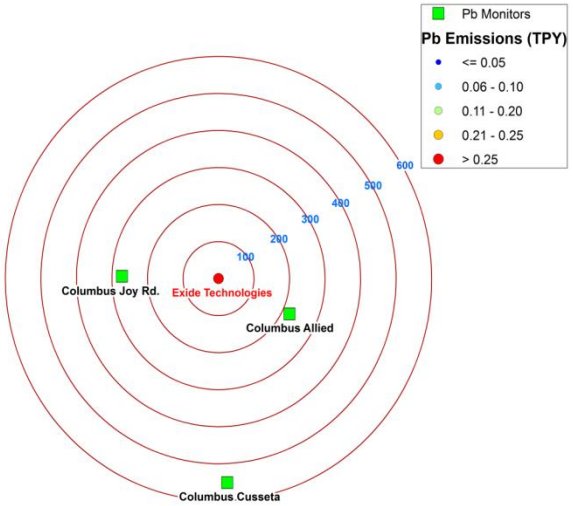




COLUMBUS Pb – NOVEMBER 20, 2016







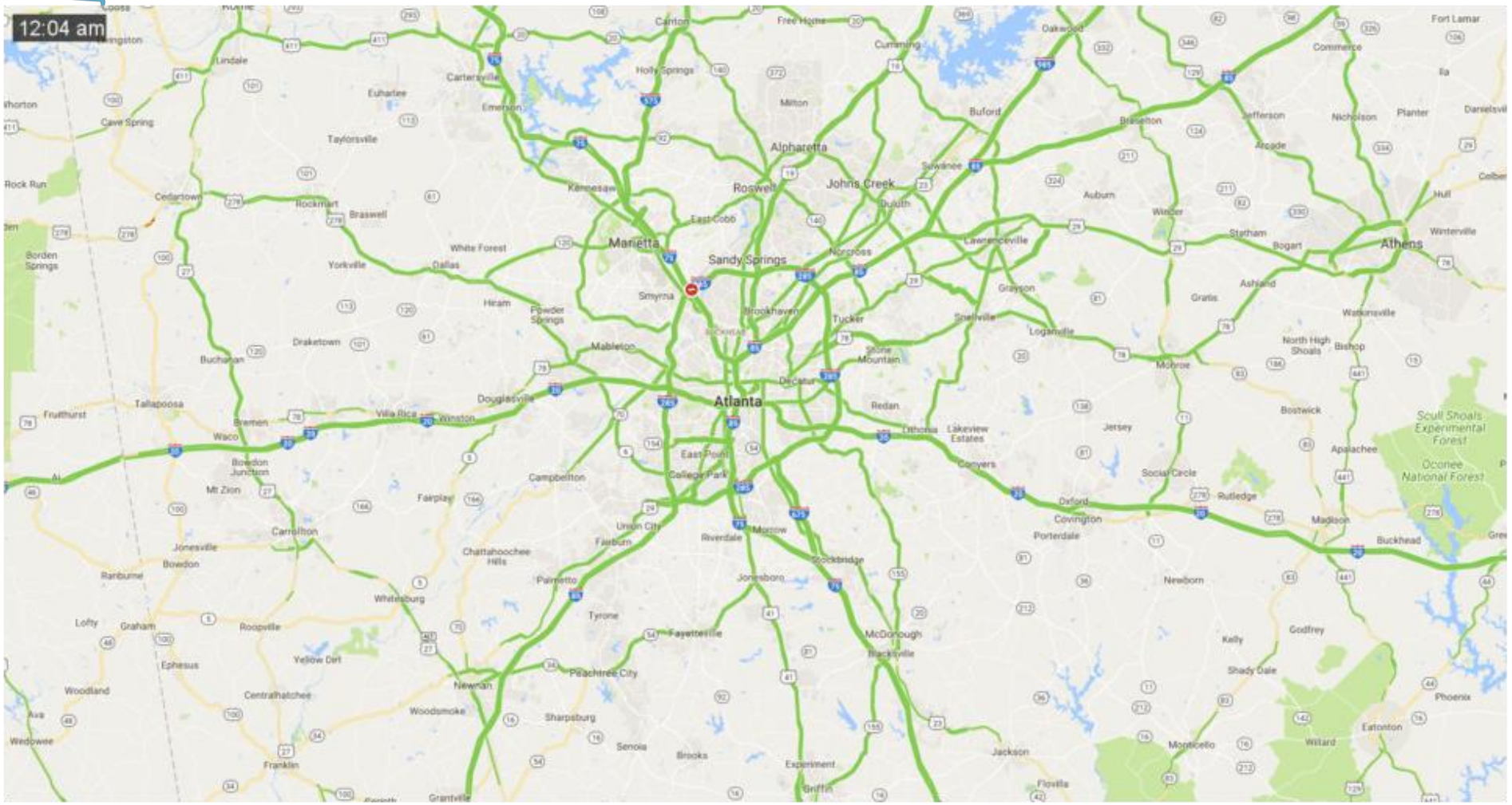
FINAL OZONE EXCEEDANCE REPORT

- Trend analysis of ozone concentrations and meteorological conditions in Atlanta during 1990-2016
- Multiple Linear Regression (MLR) analysis
- Classification and Regression Tree (CART) analysis
- HYSPLIT back trajectory
- Detailed analysis of VOC and NOx precursor measurements

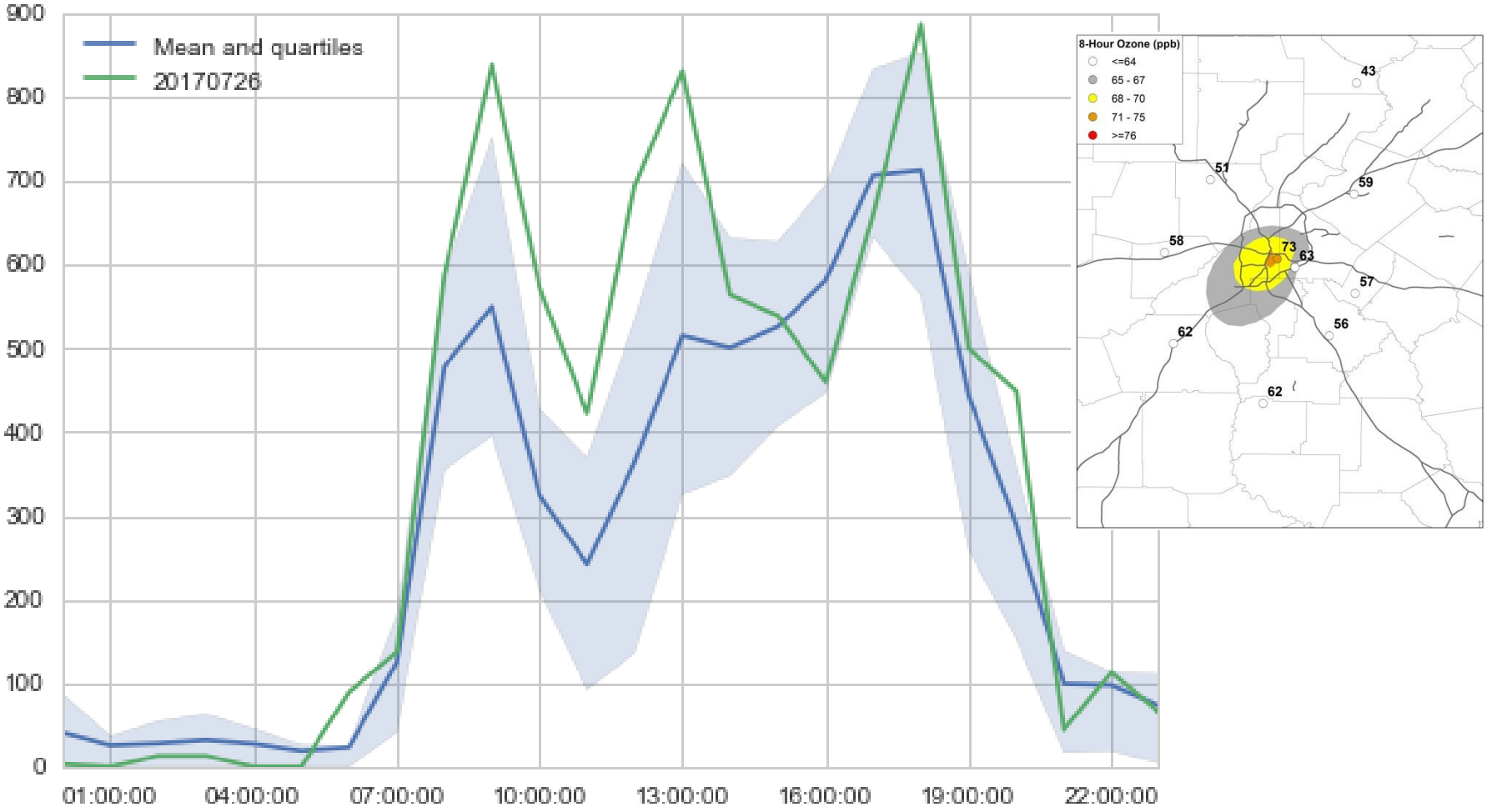
OZONE CONTRIBUTION SUMMARY

- Low relative humidity (PM), high daily maximum air temperature, low cloud coverage, low wind speed
- High ozone on previous days
- NOx emissions, mainly from on-road mobile sources
- VOC emissions, mainly from biogenic sources in the summer months with additional contributions from local on-road mobile sources in the evening and morning hours
- Local transport of ozone and precursor emissions from the Atlanta urban core to monitors outside the urban core.
- Many of the ozone exceedances were local events rather than regional events.

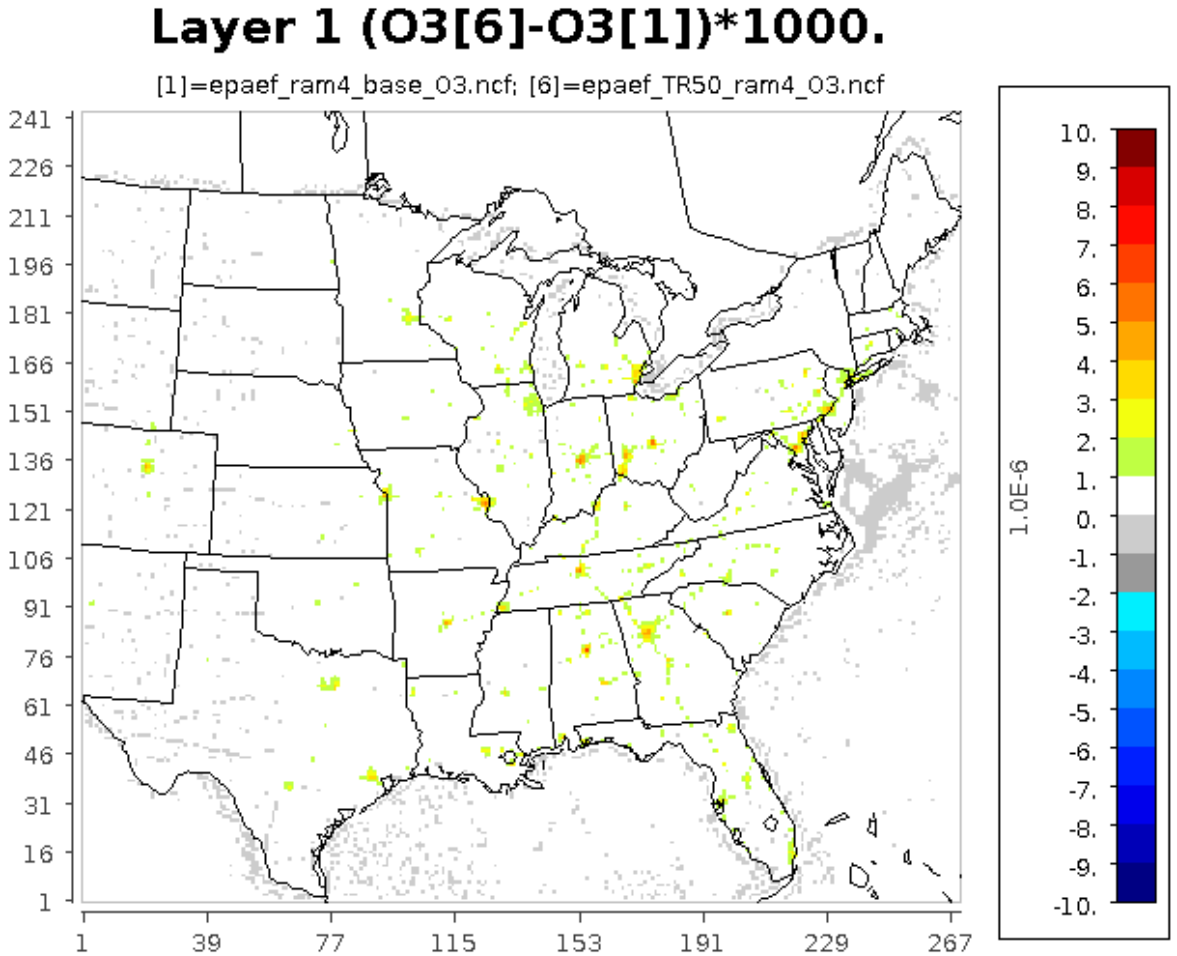
GOOGLE TRAFFIC MAP ON JULY 26



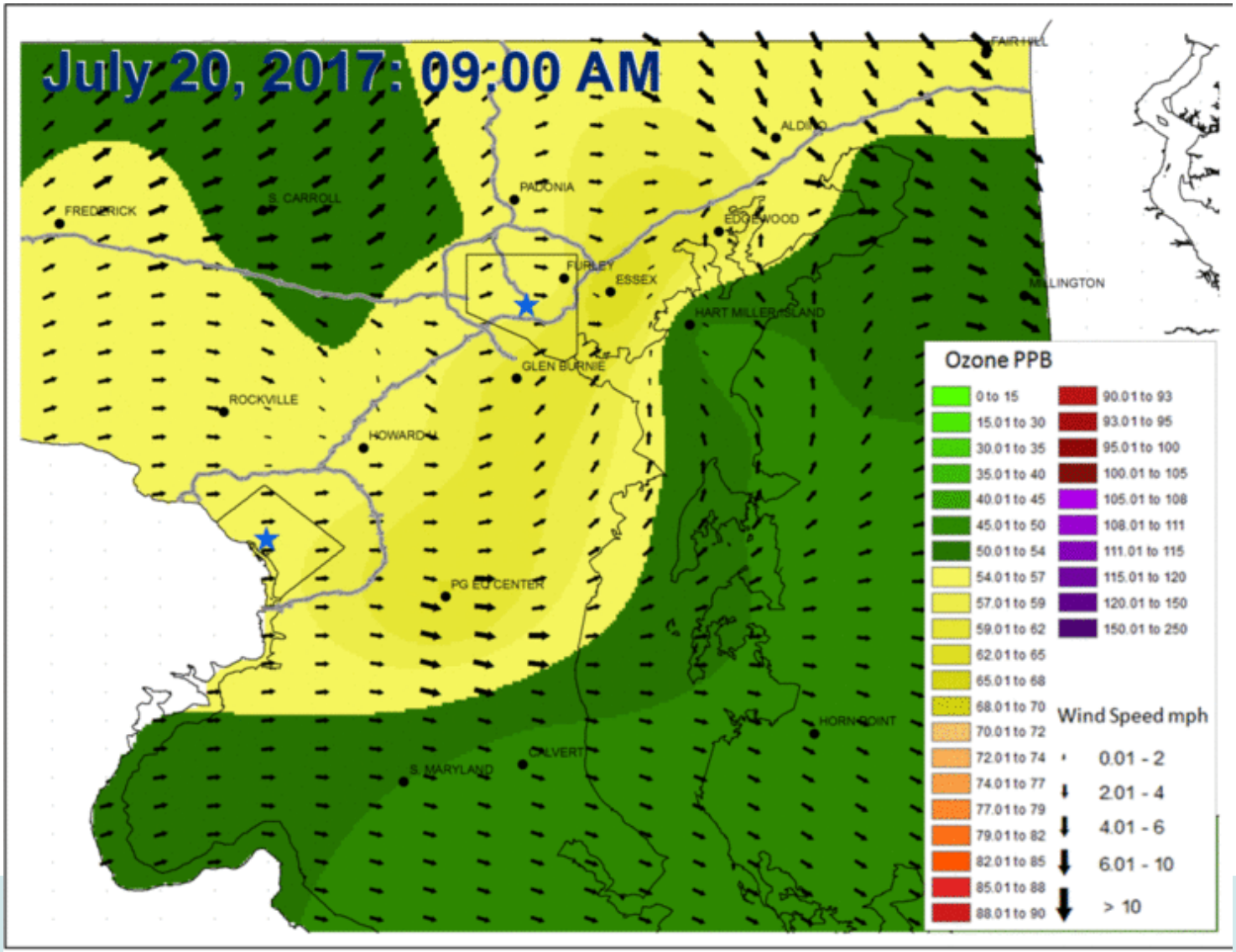
GOOGLE TRAFFIC COUNTS ON JULY 26



50% REDUCTION ON-ROAD NOx



BALTIMORE OZONE EXAMPLE



NOTE: This animation provided by James Boyle (Maryland Department of the Environment)

IMPROVED EFFICIENCY

- When the exceedance reports were initiated in 2015, it took 2-3 days to complete an initial exceedance report.
  - Staff needed time to develop new processes and collaborations, and to learn about the many unique situations that lead to NAAQS exceedances.
- After automating many of the processes and developing SOPs and templates, we became much more efficient and reduced the time down to 2-3 hours per initial exceedance report.

TRANSFERABLE

- EPD's Air Protection Branch uses existing staff, existing monitoring data and data analysis, and existing modeling tools to develop the exceedance reports.
  - We have three staff fully trained to develop the exceedance reports and they rotate responsibility for preparing the reports.
- Other air pollution control agencies could easily adopt this practice without additional funds or staffing.
- Our SOP and example exceedance reports (both initial and final) are available for other air pollution control agencies to use as templates.

CONTACT INFORMATION

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