



CASE STUDY: Impacts of Prescribed Fires on Air Quality in Georgia

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NAAQS Exceedance vs. NAAQS Violation

- National Ambient Air Quality Standards (NAAQS)
- “Exceedance” of the NAAQS
 - 24-hour $\text{PM}_{2.5}$ measurement $> 35 \mu\text{g}/\text{m}^3$
- “Violation” of the NAAQS
 - Annual arithmetic mean, averaged over 3 years $> 12.0 \mu\text{g}/\text{m}^3$
 - 98th percentile of 24-hour daily average, averaged over 3 years $> 35 \mu\text{g}/\text{m}^3$



Recent PM2.5 NAAQS Exceedances in Georgia

- ☐ March 8, 2019 – Atlanta ($39 \mu\text{g}/\text{m}^3$) – Prescribed
- ☐ March 20, 2019 – Macon ($36 \mu\text{g}/\text{m}^3$) – Prescribed
- March 20, 2019 – Warner Robins ($37 \mu\text{g}/\text{m}^3$) – Prescribed
- March 21, 2019 – Macon ($52 \mu\text{g}/\text{m}^3$) – Prescribed
- March 21, 2019 – Warner Robbins ($61 \mu\text{g}/\text{m}^3$) – Prescribed
- ☐ March 22, 2019 – Albany ($38 \mu\text{g}/\text{m}^3$) – Prescribed
- ☐ December 5, 2019 – Sandersville ($39 \mu\text{g}/\text{m}^3$) – Prescribed

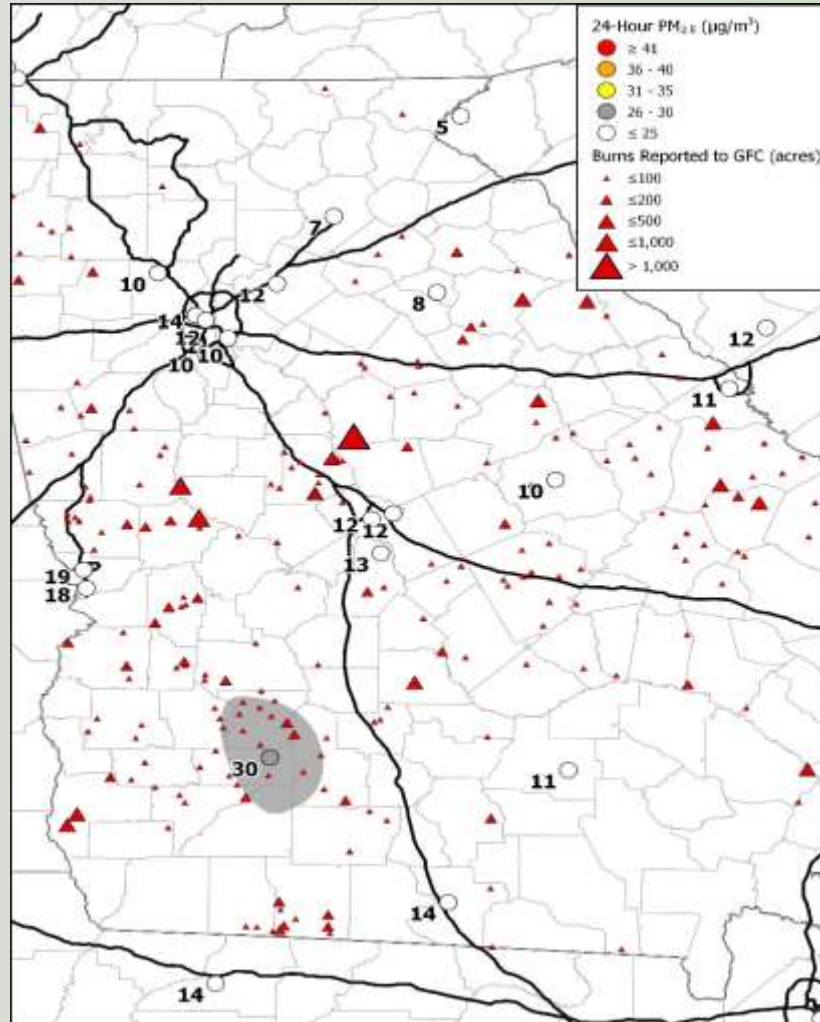


Atlanta

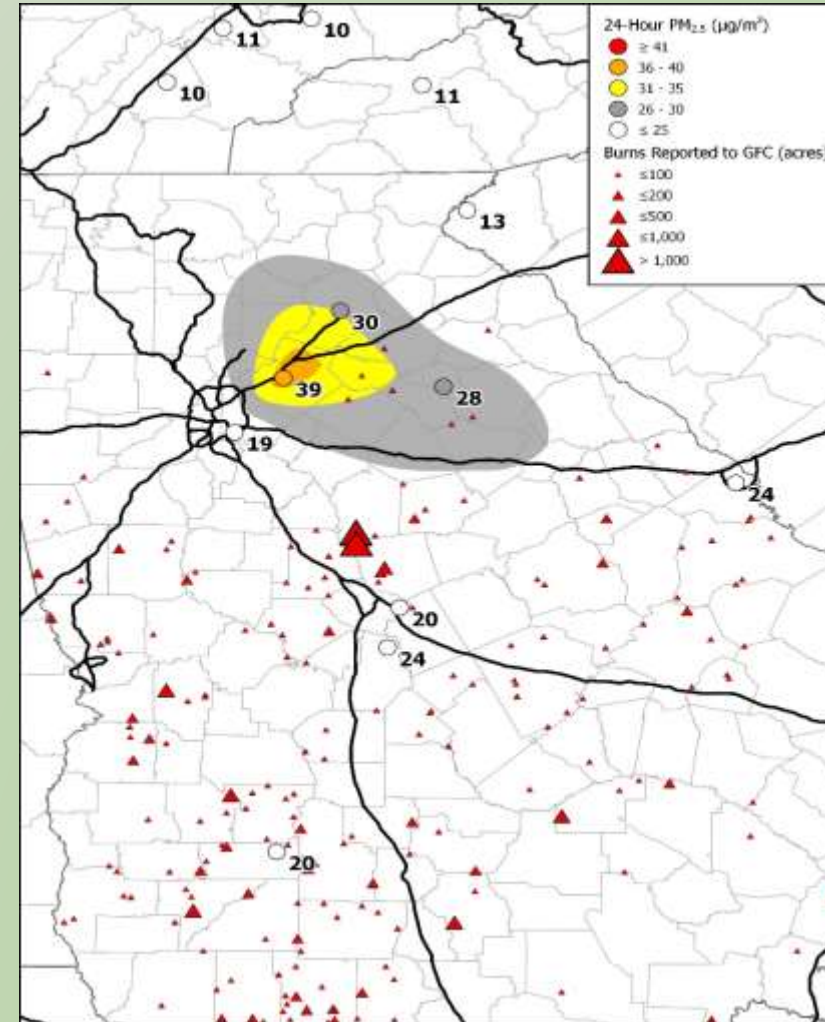
March 8, 2019



Ozone and GFC Fire Acres: March 7-8, 2019



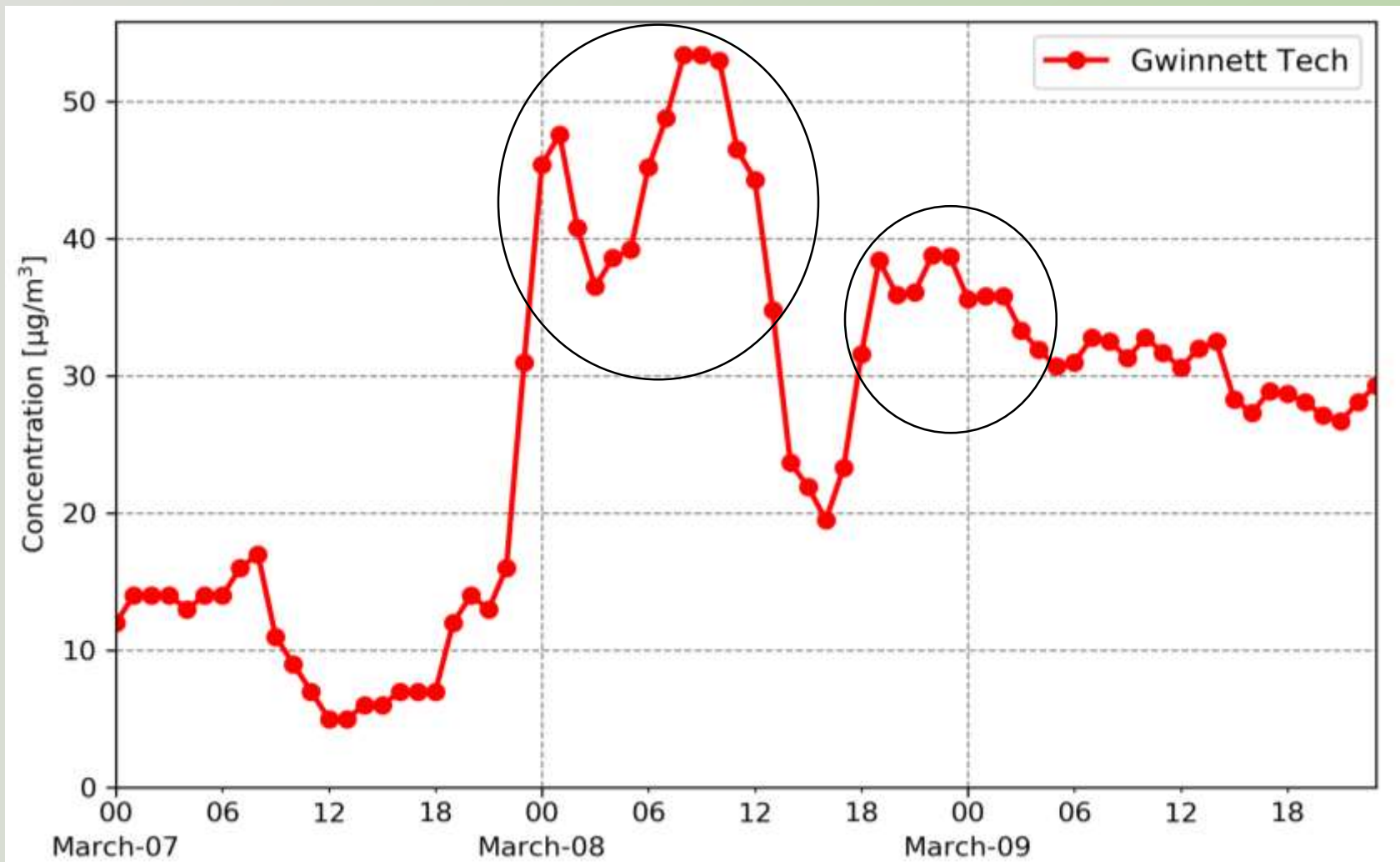
March 7, 2019



March 8, 2019

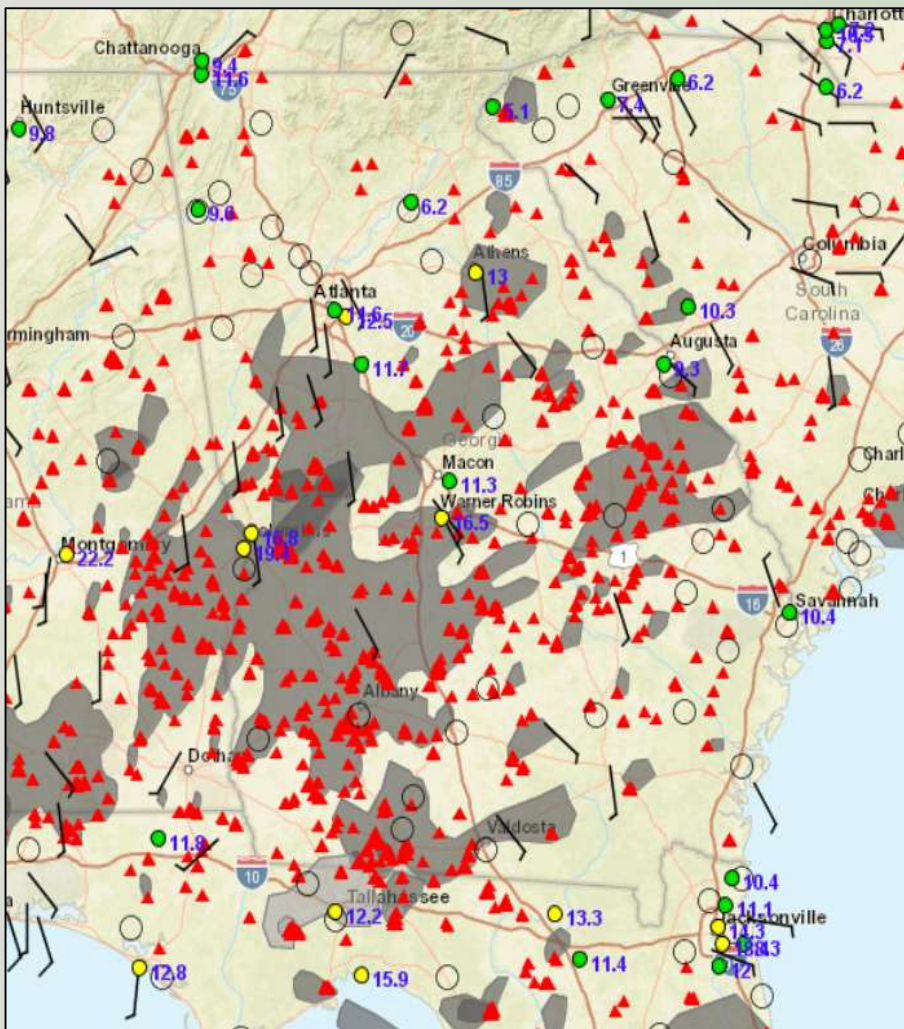


Hourly Ozone Time Series: March 7-9, 2019

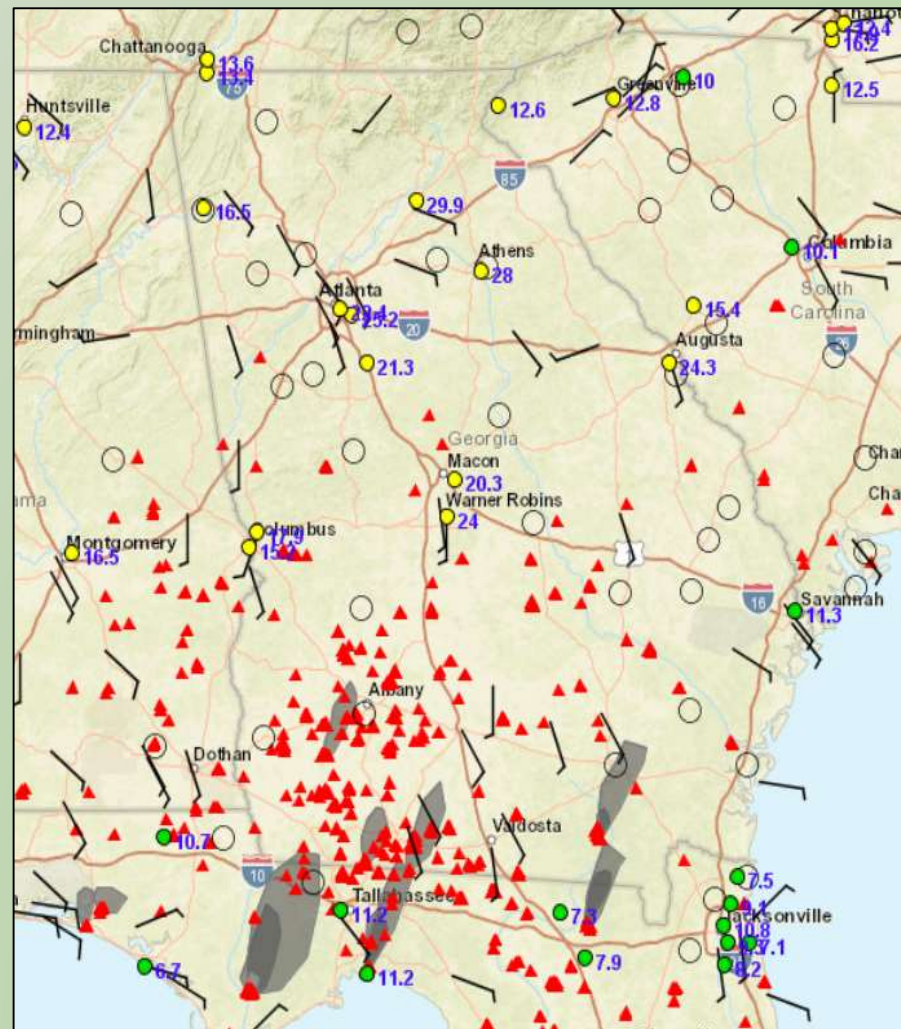




NOAA HMS Smoke Plumes: March 7-8, 2019



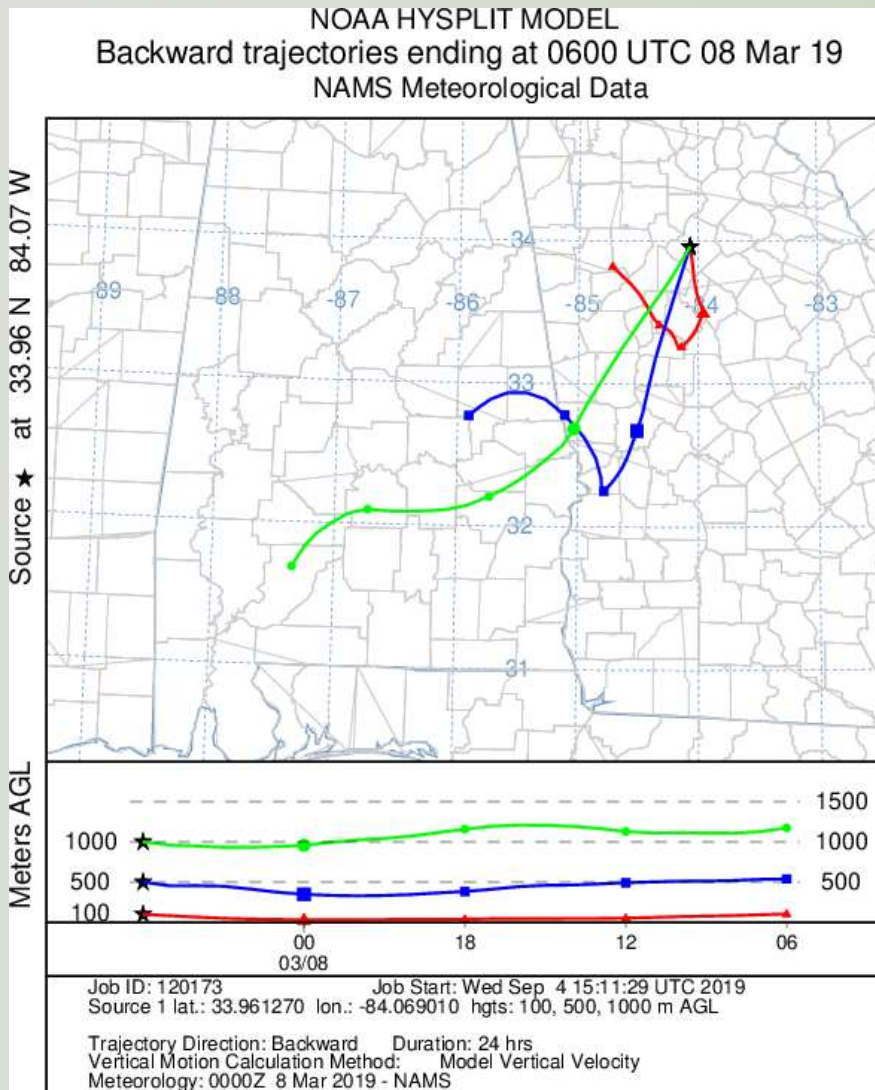
March 7, 2019



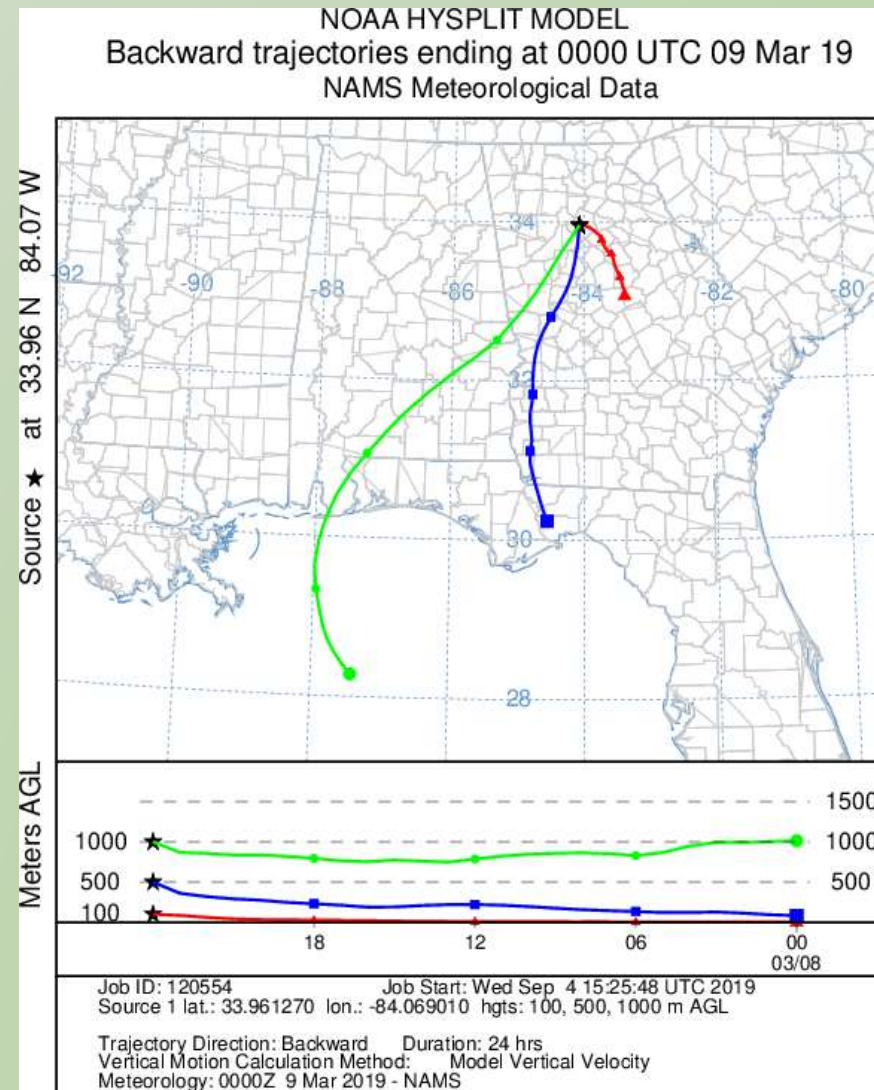
March 8, 2019



HYSPLIT Back Trajectories: March 8, 2019



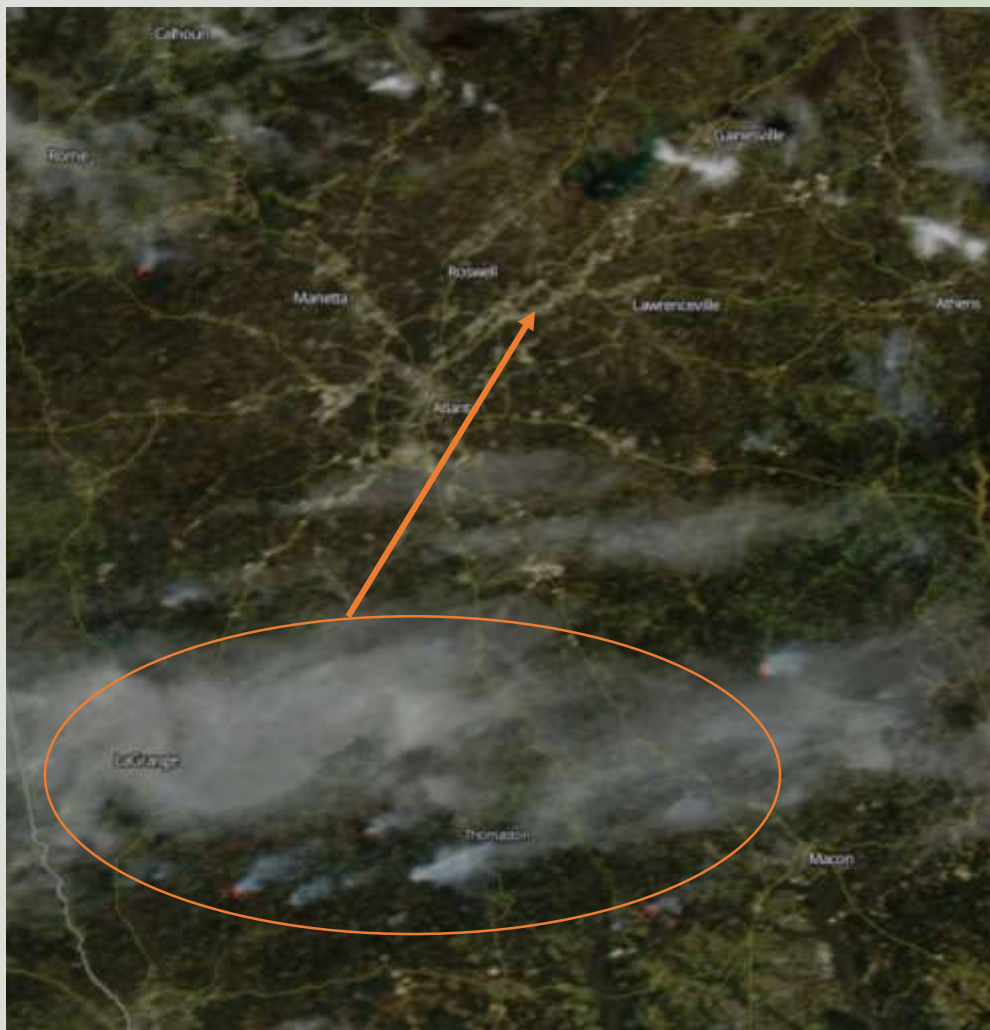
March 8, 2019 at 1:00 AM



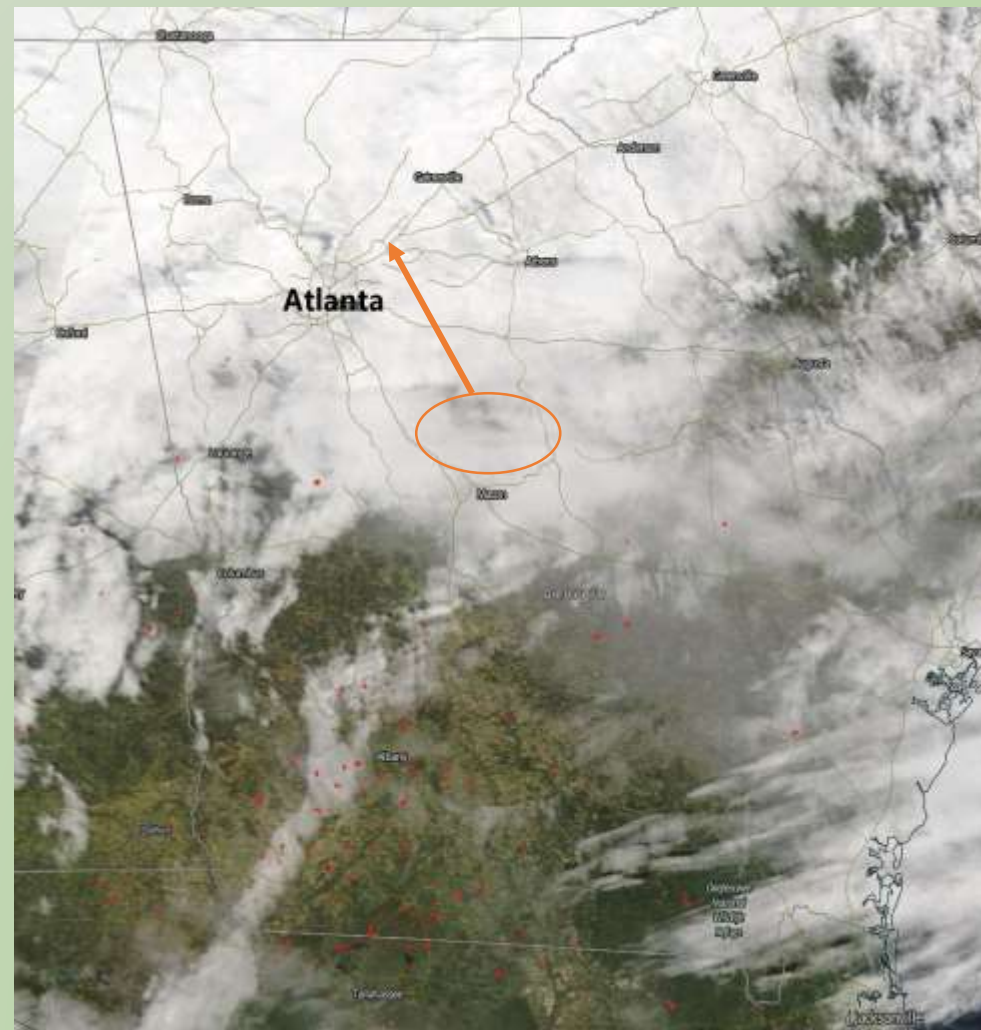
March 8, 2019 at 7:00 PM



NASA Satellite Images: March 7-8, 2019



March 7, 2019 at 1:30 PM



March 8, 2019 at 10:30 AM

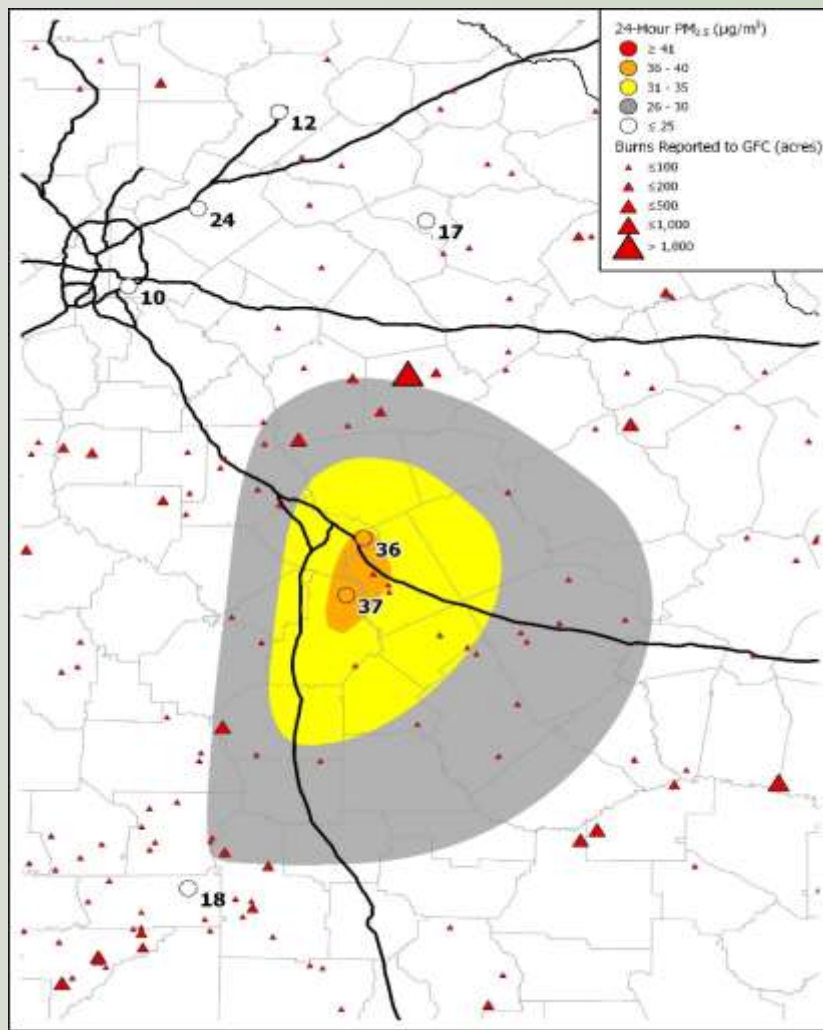


Macon & Warner Robins

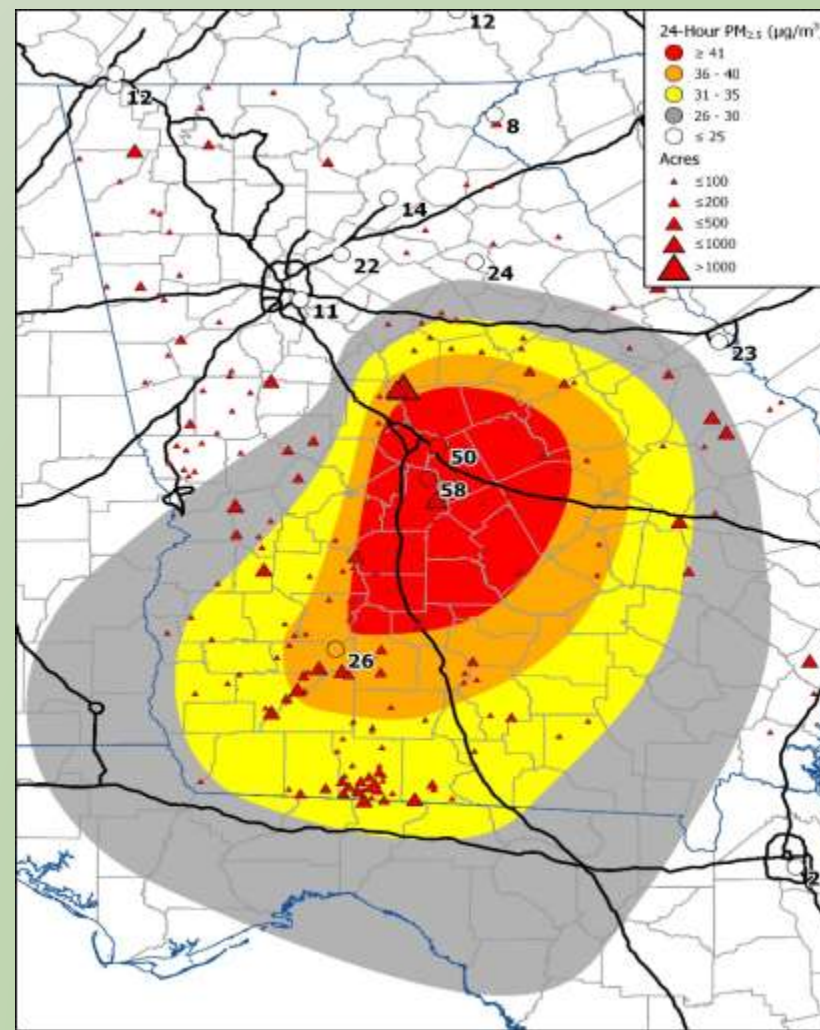
March 20-21, 2019



Ozone and GFC Fire Acres: March 20-21, 2019



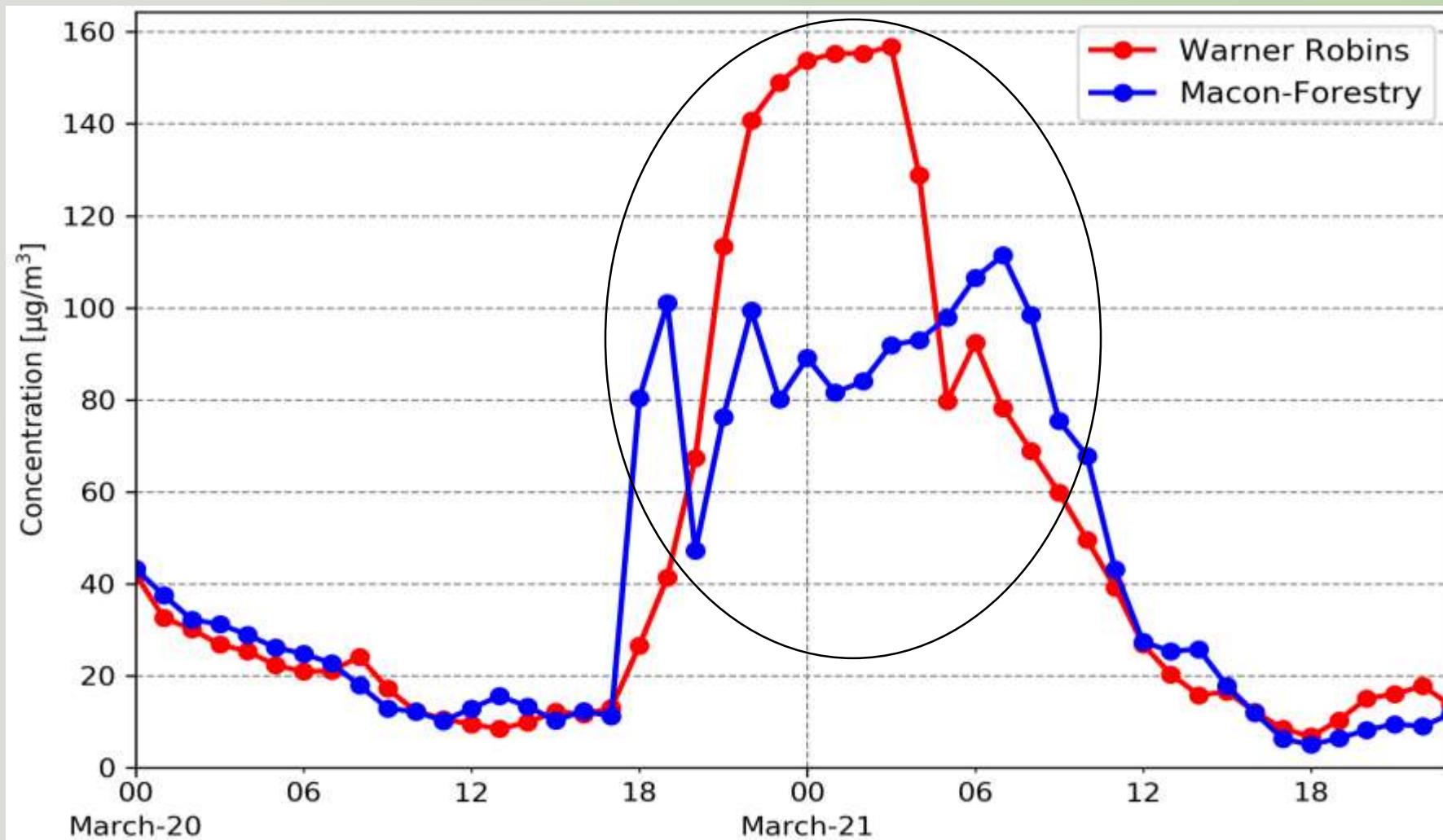
March 20, 2019



March 21, 2019

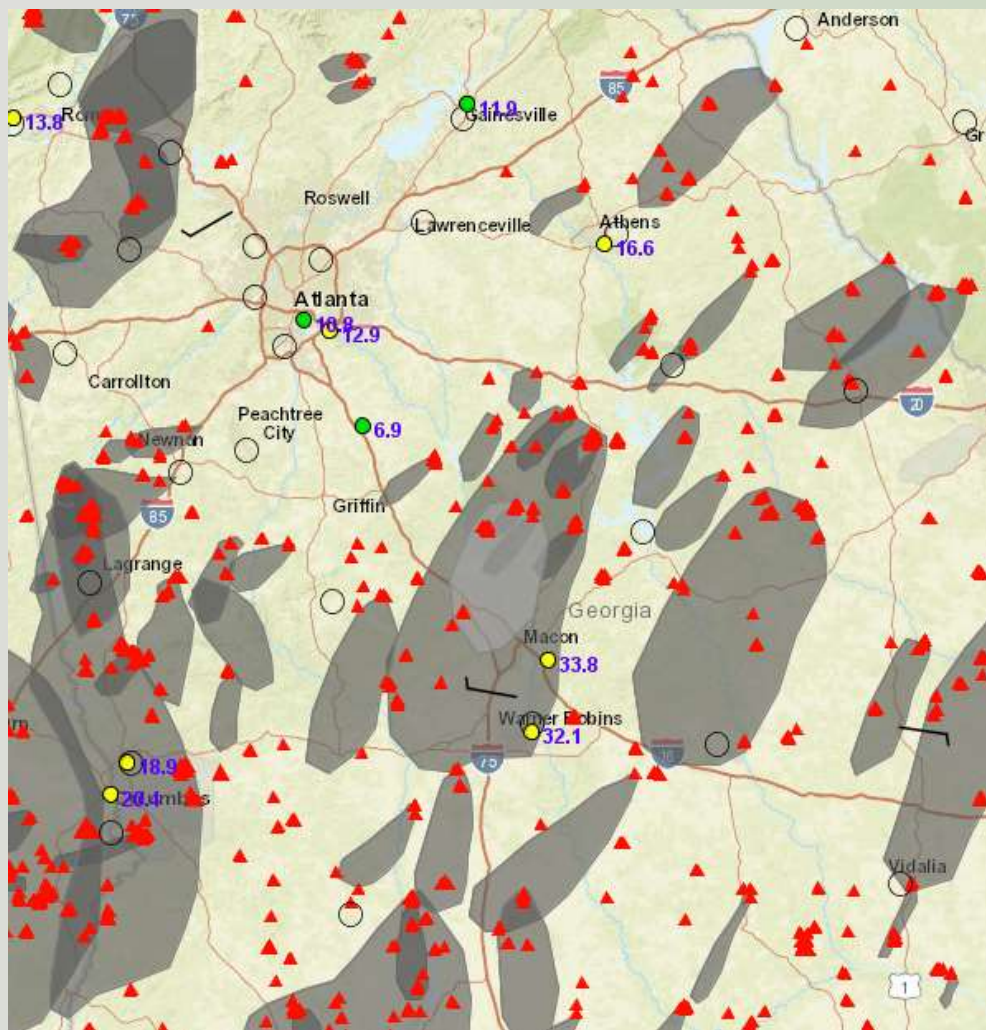


Hourly Ozone Time Series: March 20-21, 2019

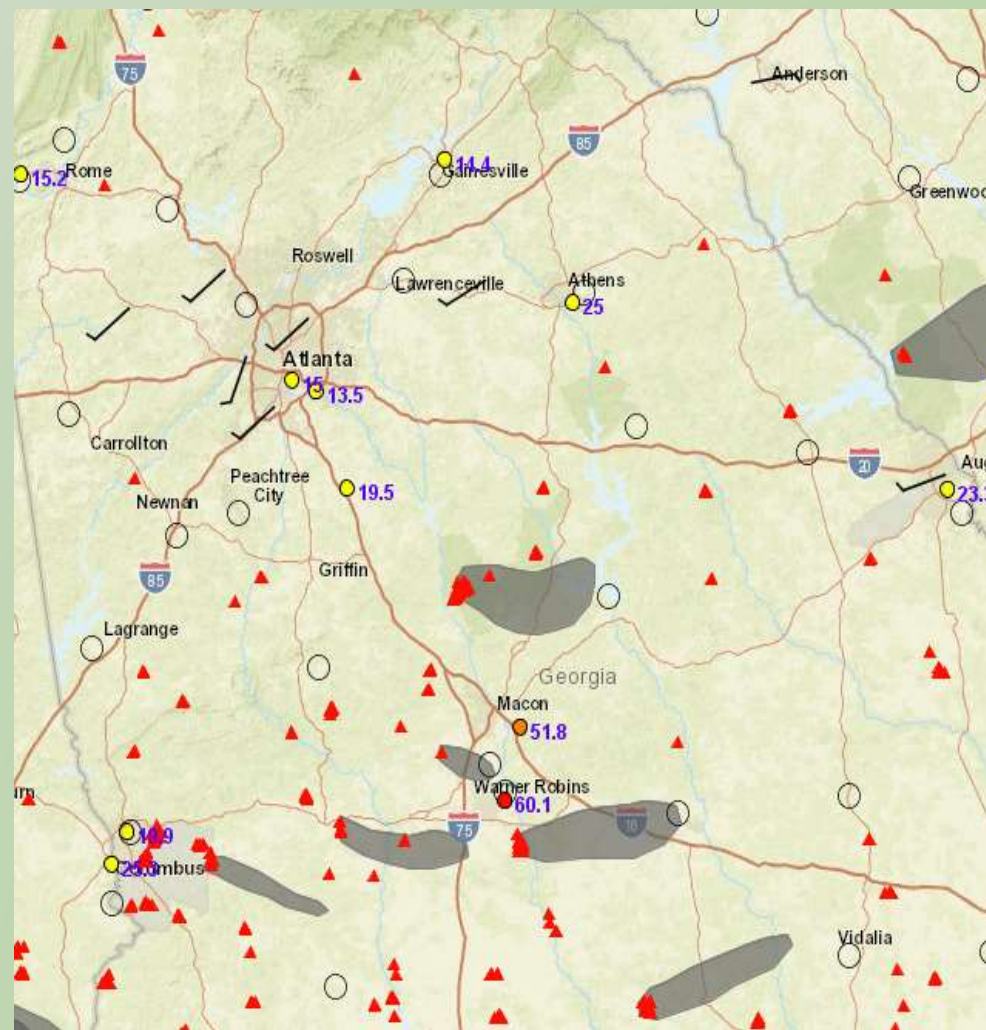




NOAA HMS Smoke Plumes: March 20-21, 2019



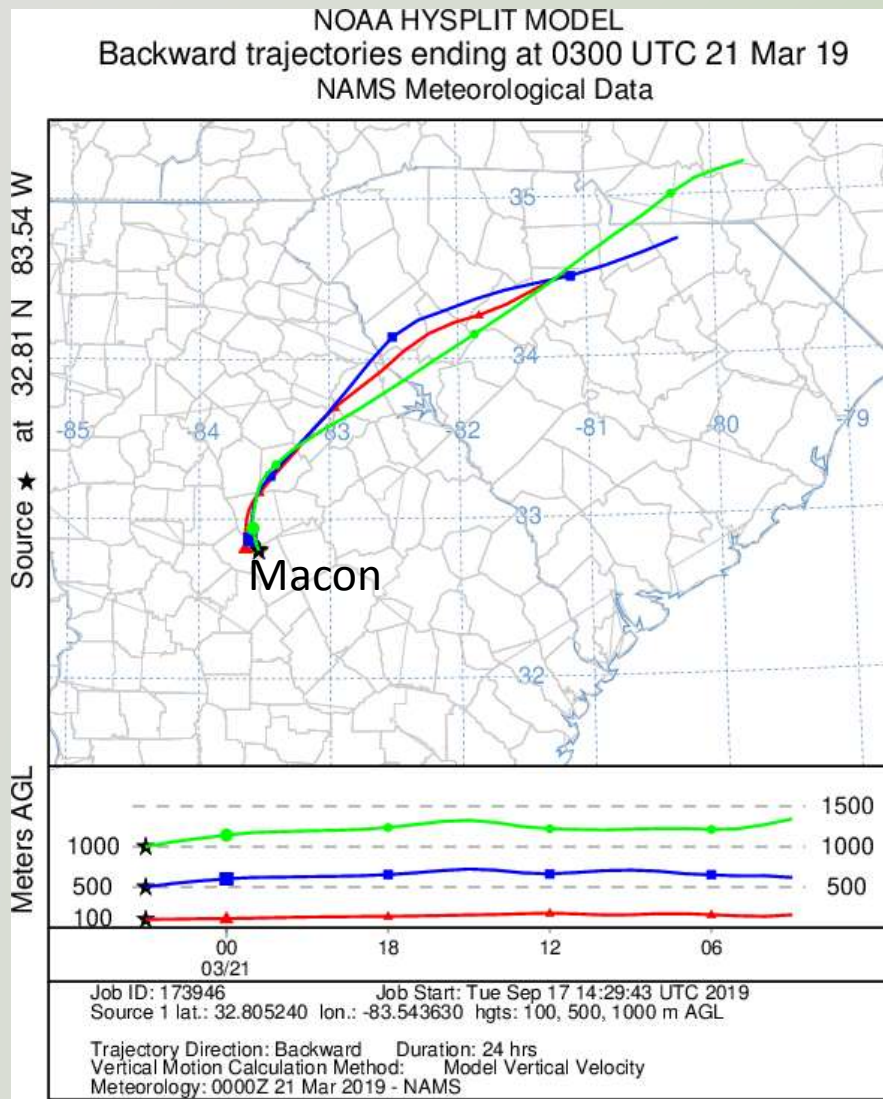
March 20, 2019



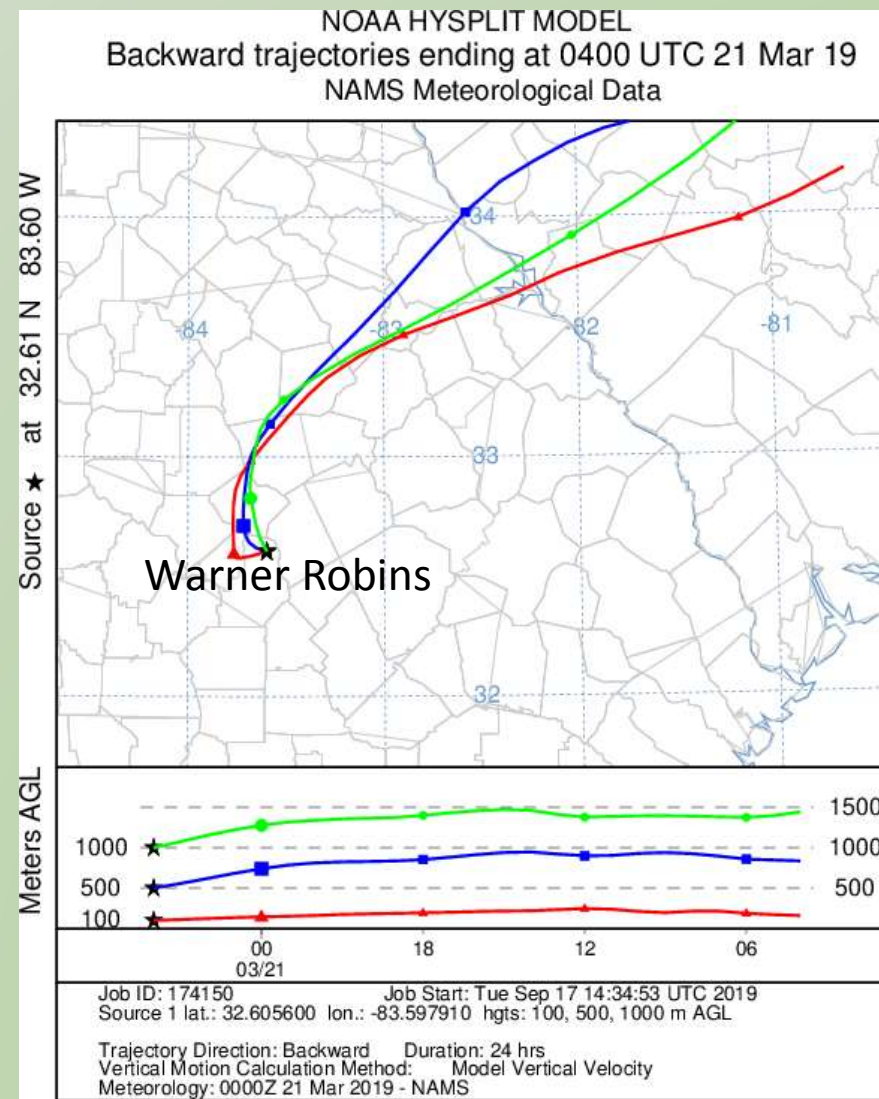
March 21, 2019



HYSPLIT Back Trajectories: March 20, 2019



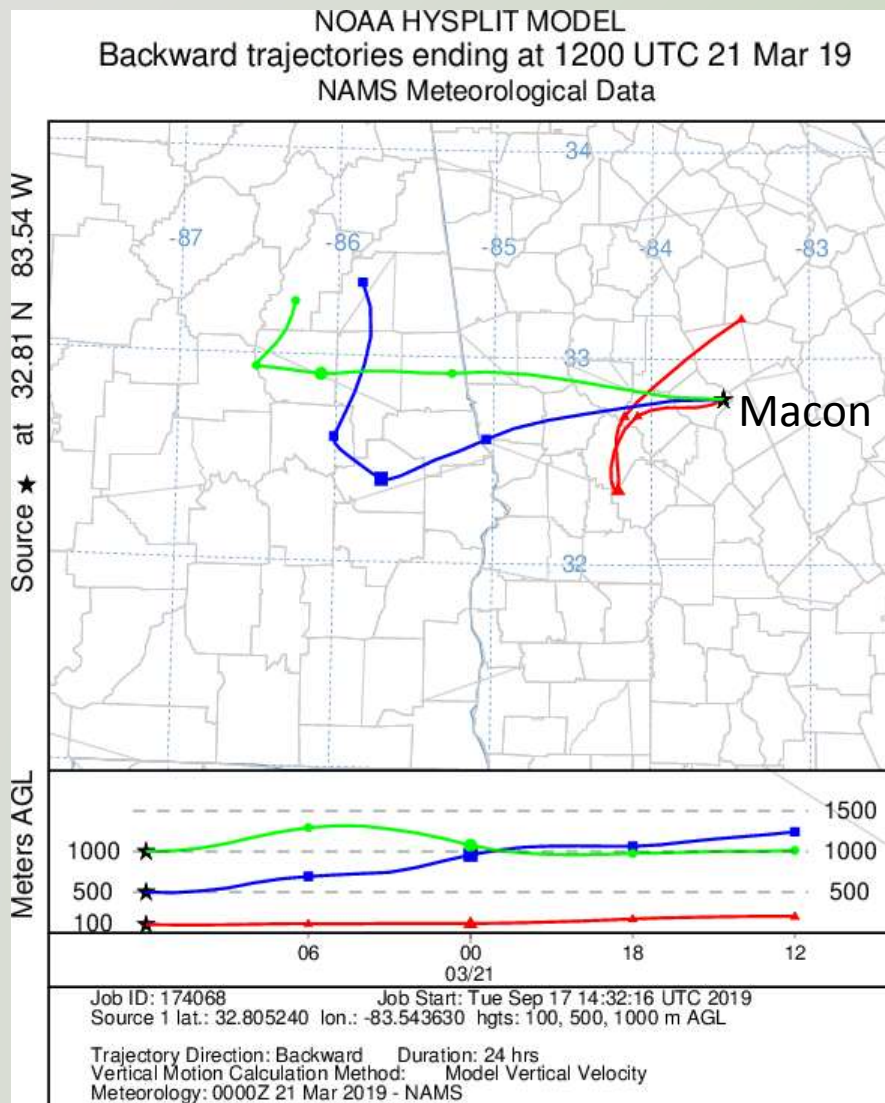
March 20, 2019 at 10:00 PM



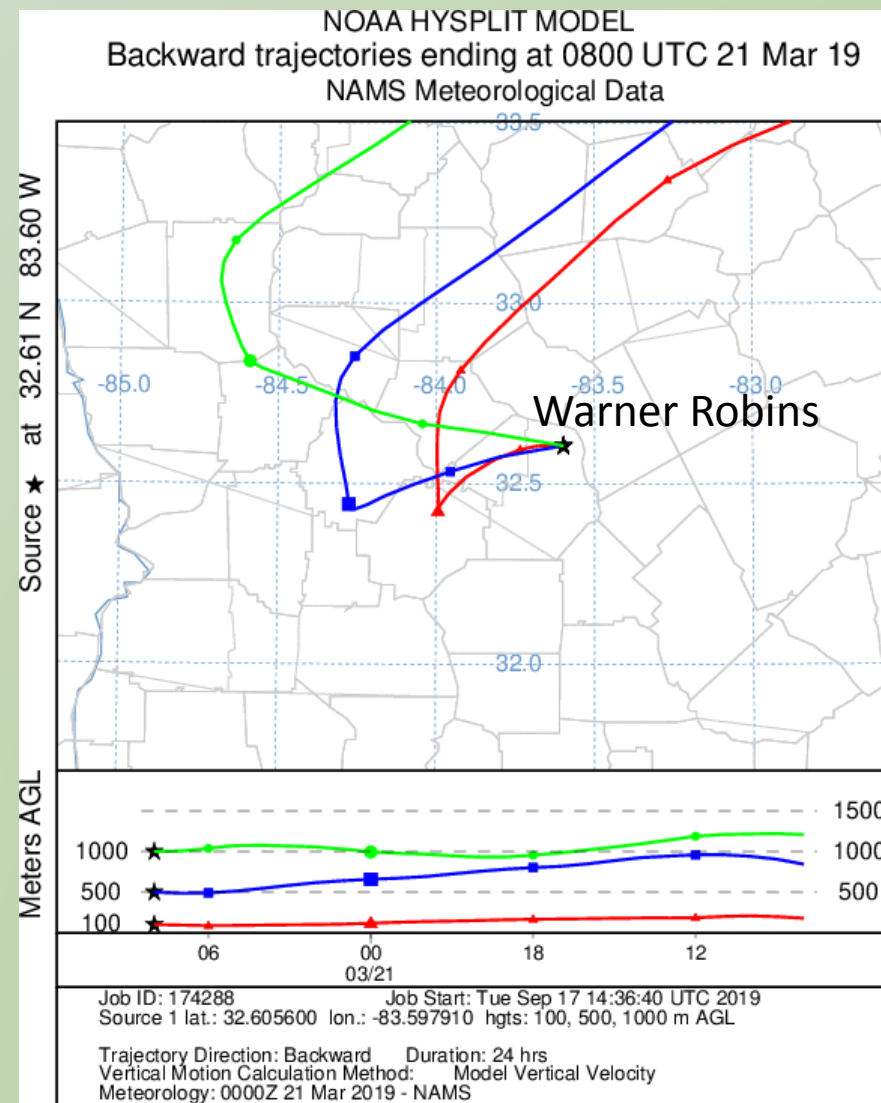
March 20, 2019 at 11:00 PM



HYSPLIT Back Trajectories: March 21, 2019



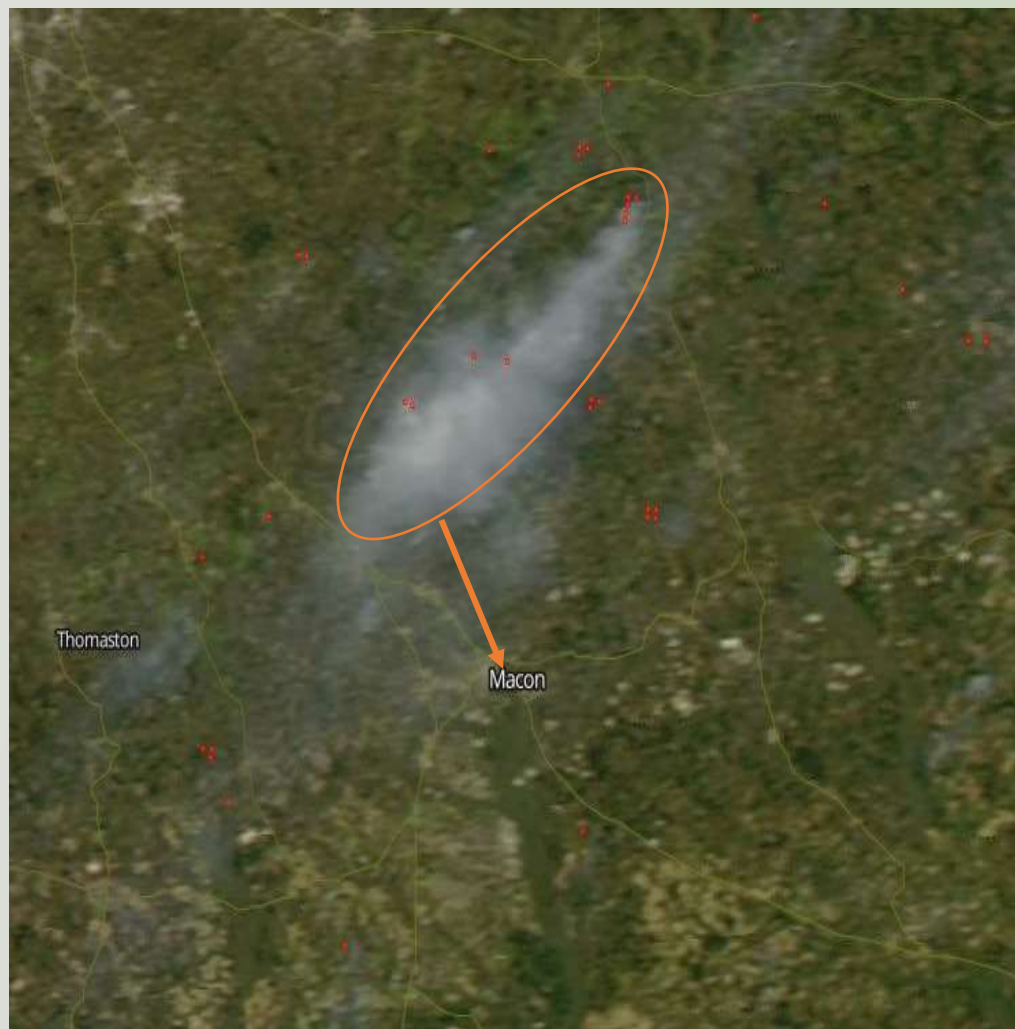
March 21, 2019 at 7:00 AM



March 21, 2019 at 3:00 AM



NASA Satellite Images: March 20-21, 2019



March 20, 2019 at 1:30 PM



March 21, 2019 at 10:30 AM

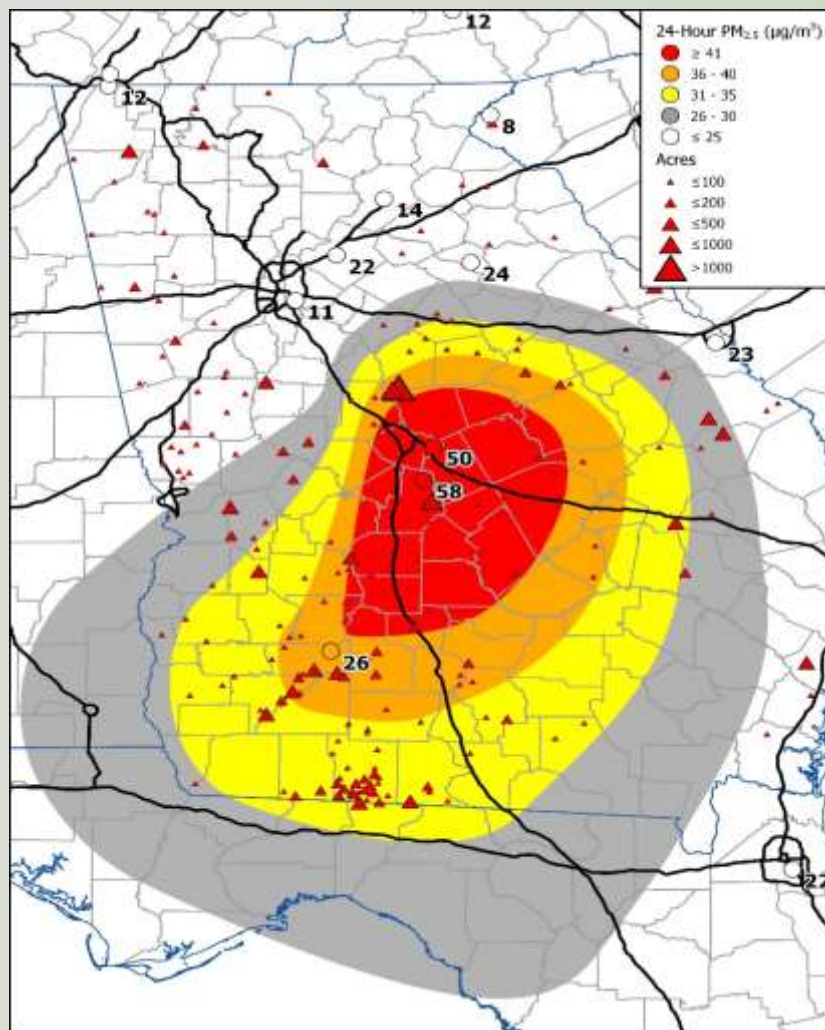


Albany

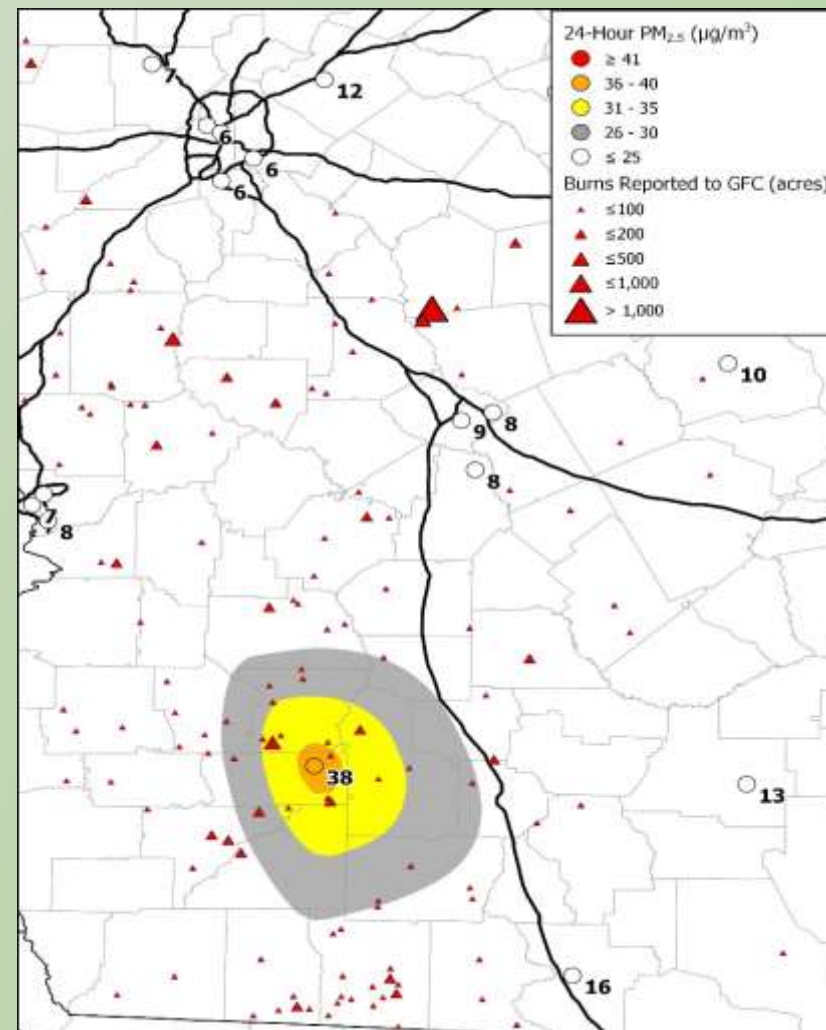
March 22, 2019



Ozone and GFC Fire Acres: March 21-22, 2019



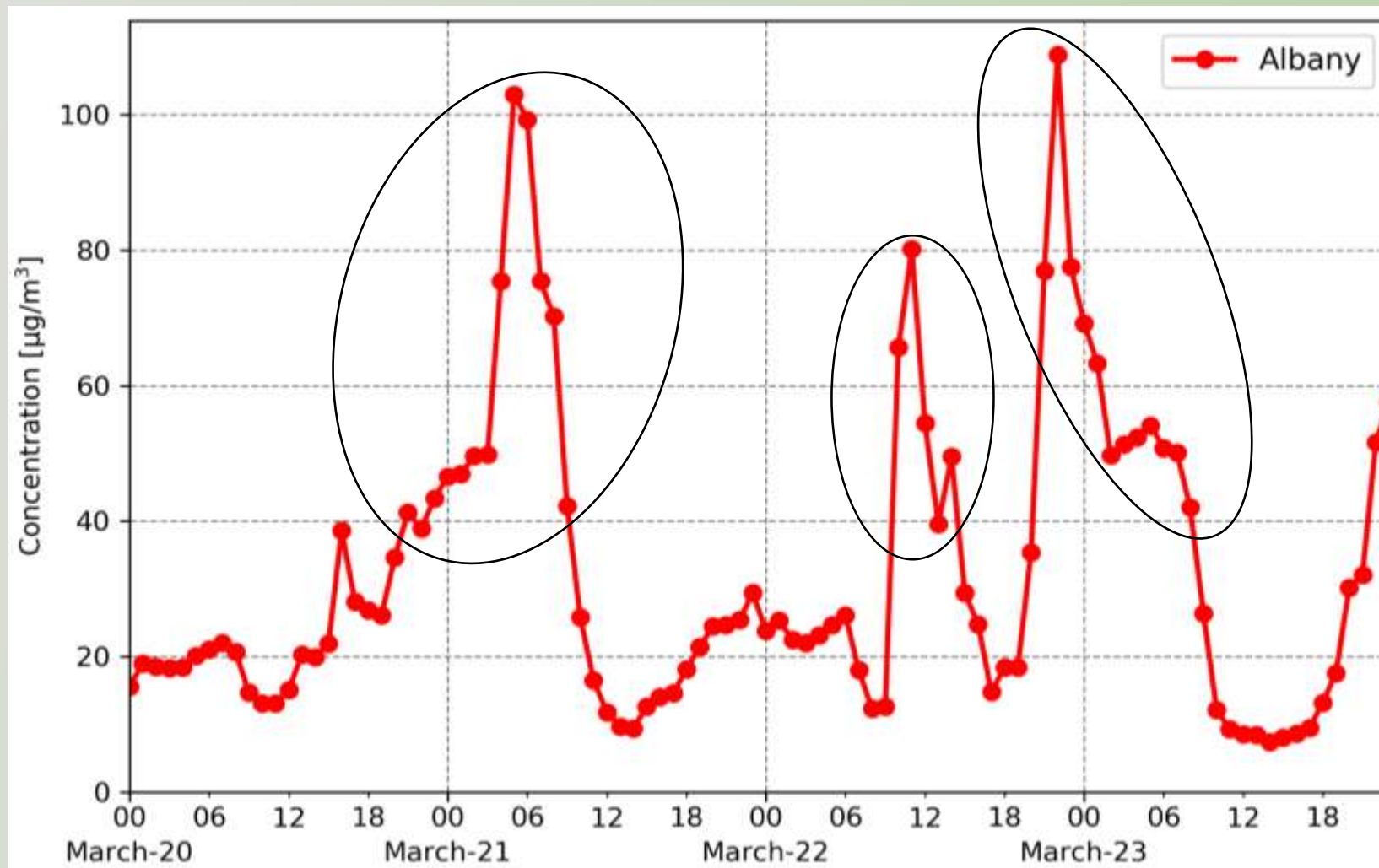
March 21, 2019



March 22, 2019

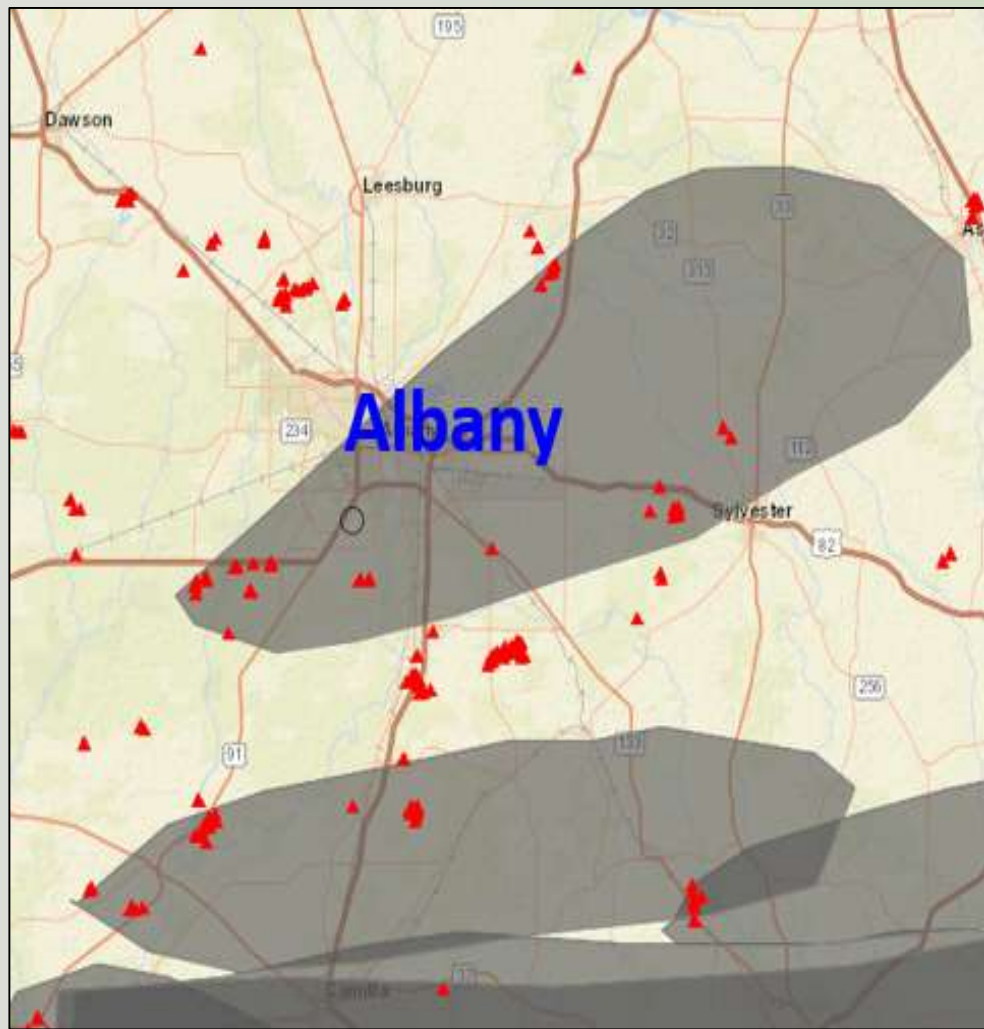


Hourly Ozone Time Series: March 20-23, 2019

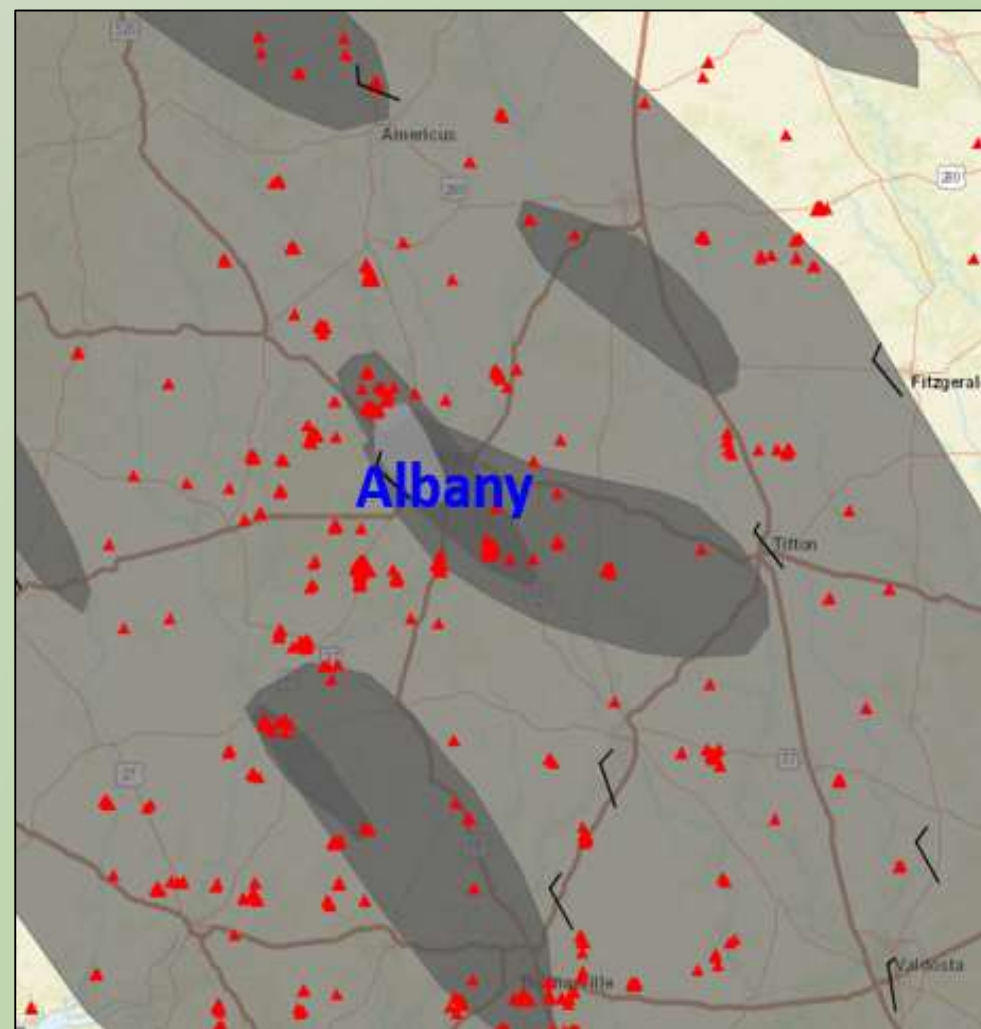




NOAA HMS Smoke Plumes: March 21-22, 2019



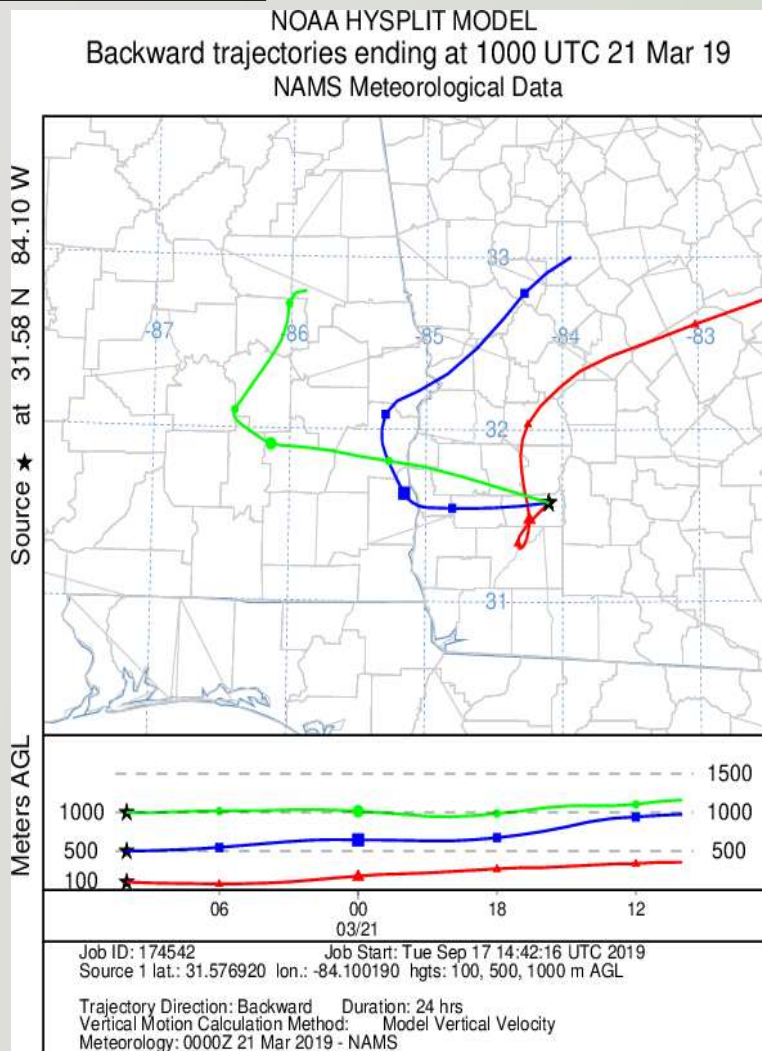
March 21, 2019



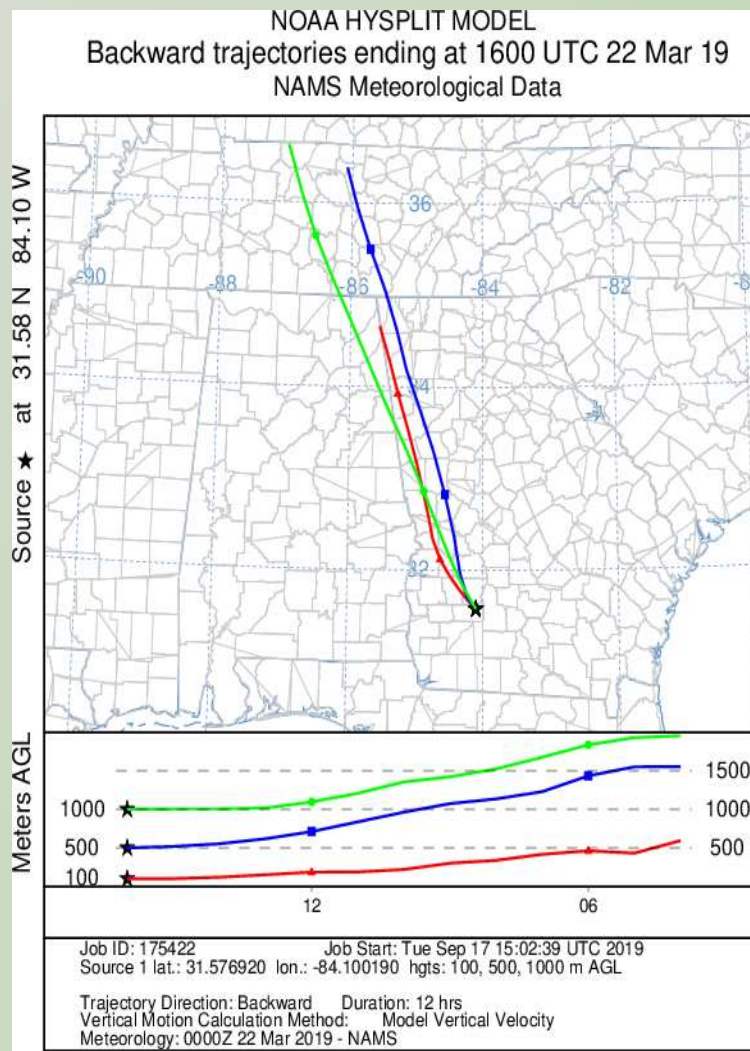
March 22, 2019



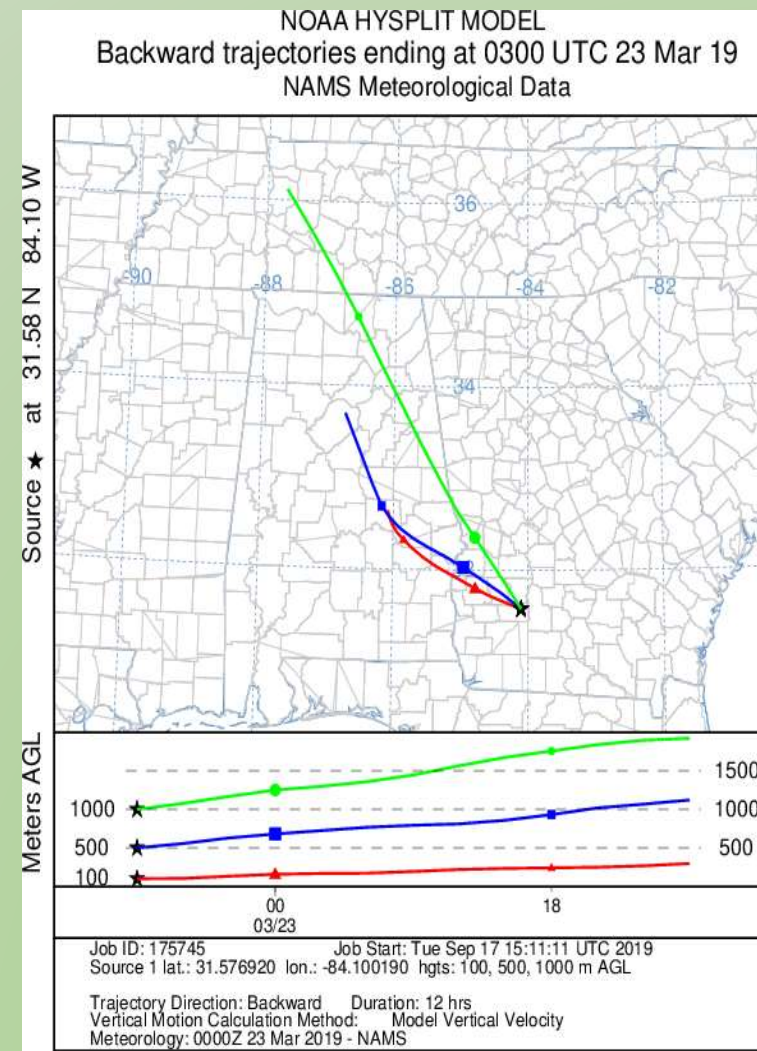
HYSPLIT Back Trajectories: March 21-22, 2019



March 21, 2019 at 5:00 AM



March 22, 2019 at 11:00 AM



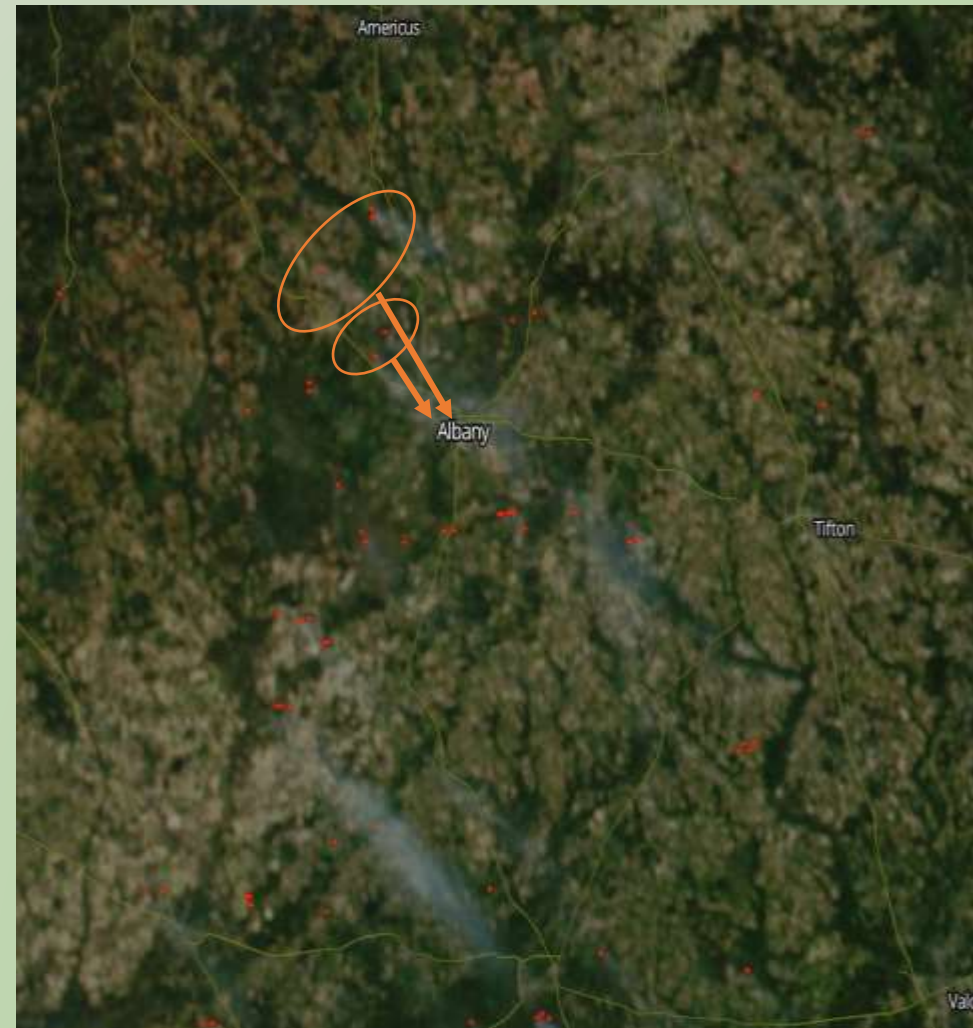
March 22, 2019 at 10:00 PM



NASA Satellite Images: March 21-22, 2019



March 21, 2019 at 10:30 AM



March 22, 2019 at 1:30 PM

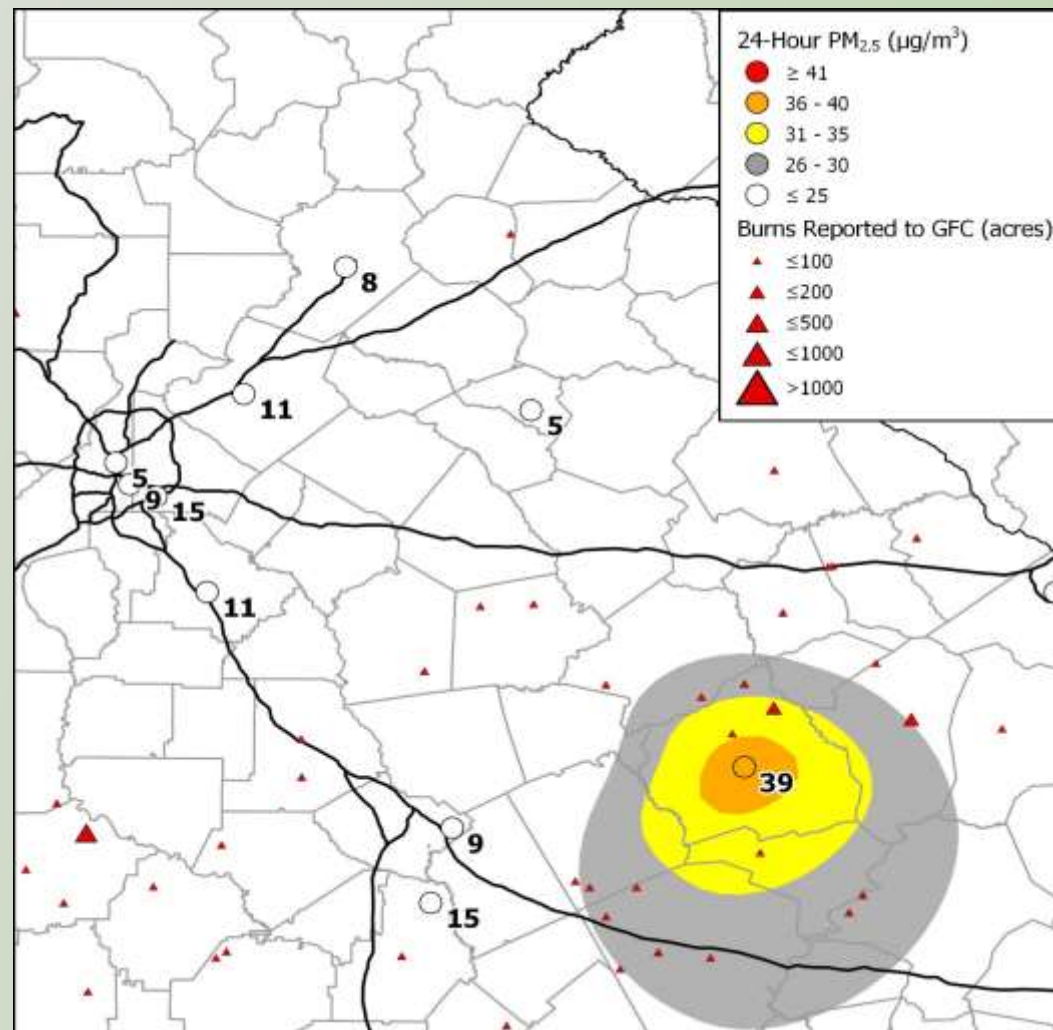


Sandersville

December 5, 2019



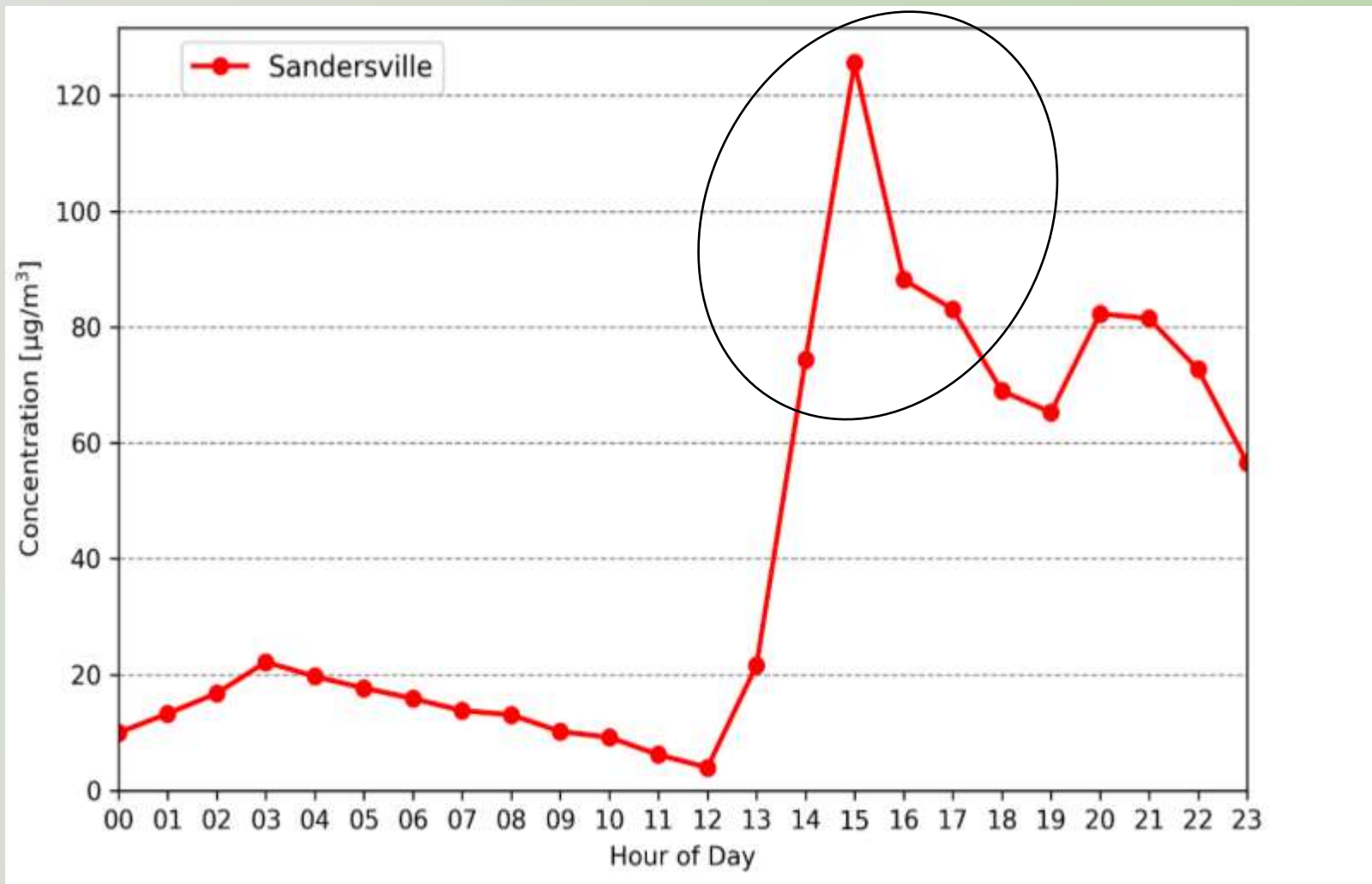
Ozone and GFC Fire Acres: December 5, 2019



December 5, 2019

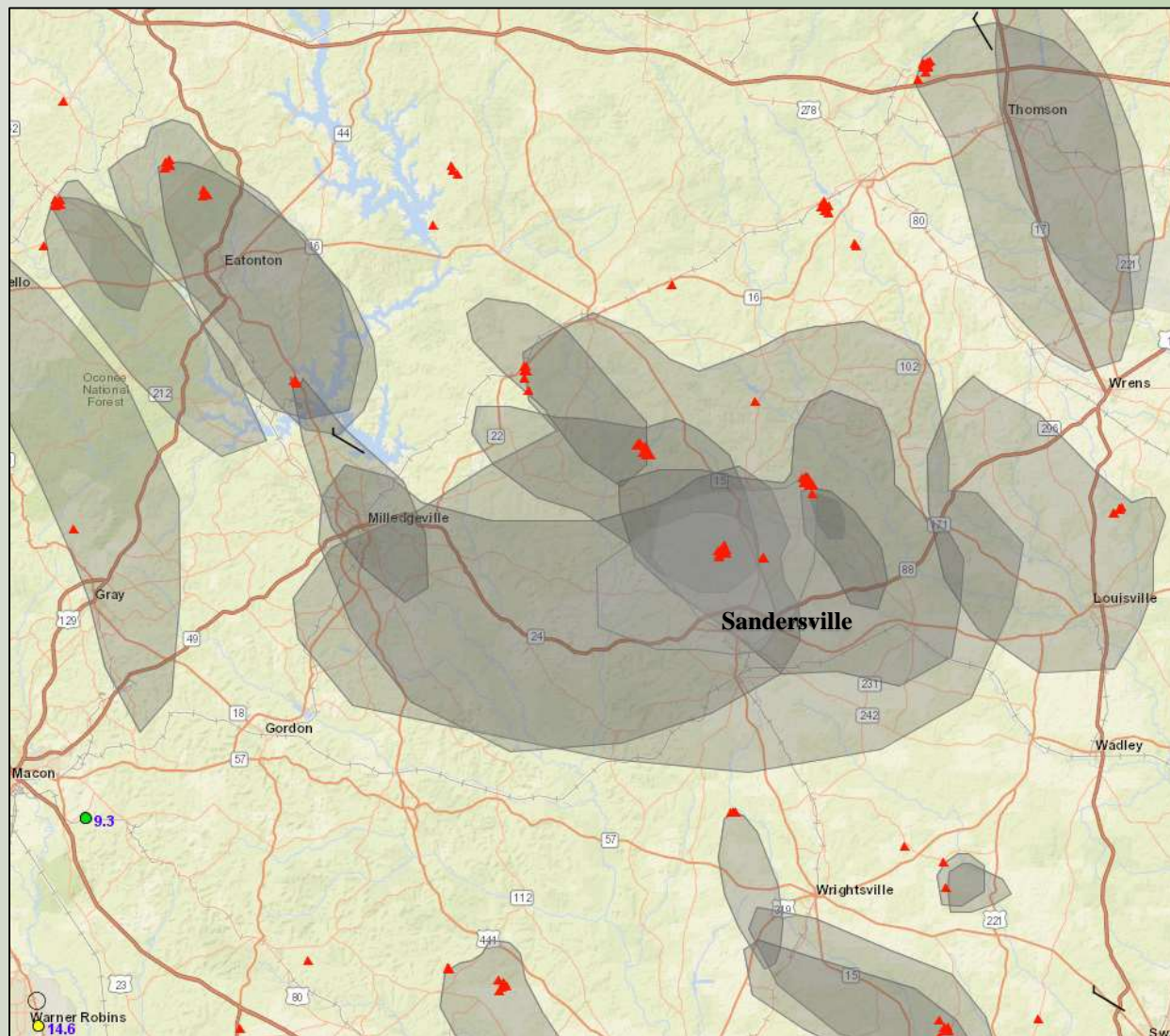


Hourly Ozone Time Series: December 5, 2019





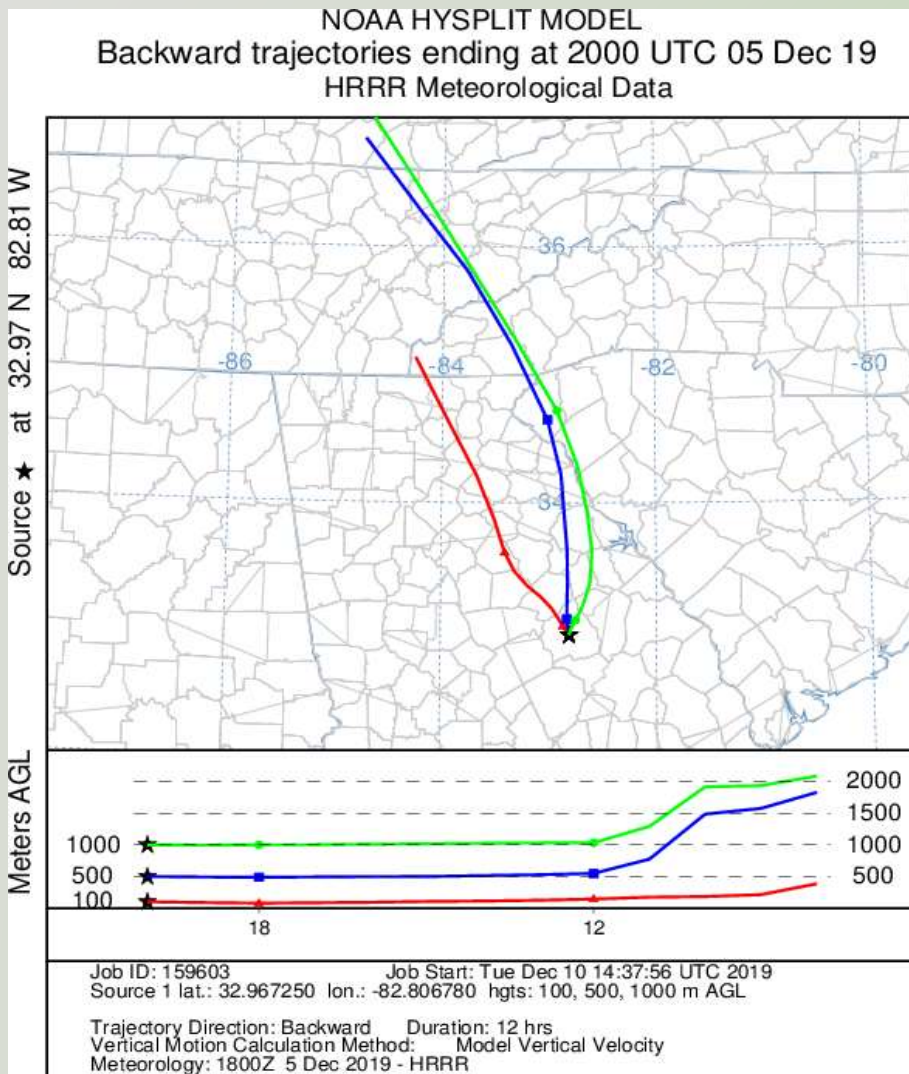
NOAA HMS Smoke Plumes: December 5, 2019



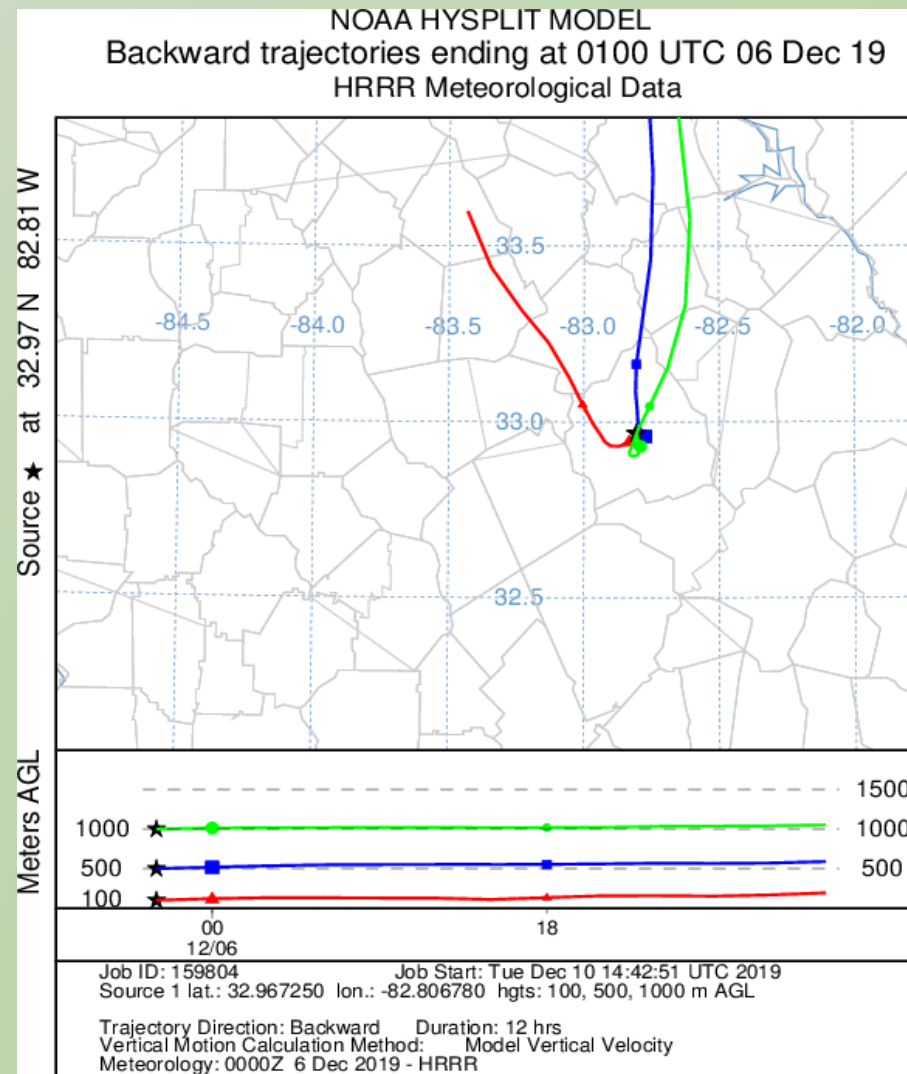
March 21, 2019



HYSPLIT Back Trajectories: December 5, 2019



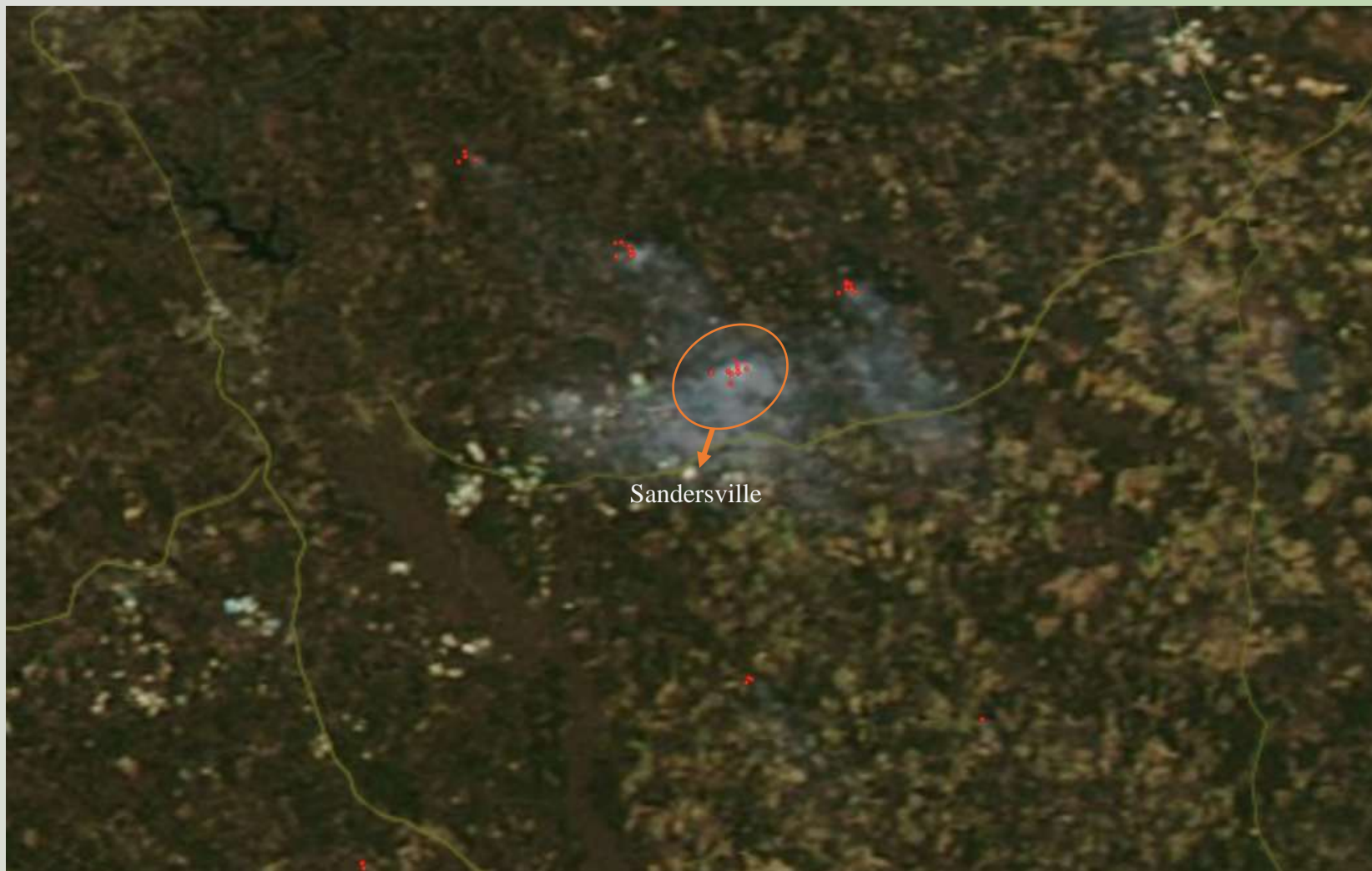
December 5, 2019 at 3:00 PM



December 5, 2019 at 8:00 PM



NASA Satellite Images: December 5, 2019



December 5, 2019 at 1:30 PM



Summary

- Prescribed fires contribute to PM_{2.5} exceedances, but have not caused any violations of the PM_{2.5} NAAQS in Georgia.
- Prescribed fires can impact air quality on the day of the burn as well as the days following the burn.
- EPA may propose a new, lower PM_{2.5} NAAQS in 2020.
- Good smoke management practices will become even more important to avoid future exceedances and violations if the PM_{2.5} NAAQS is lowered.