

Georgia



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

August 19, 2008

The Honorable Sonny Perdue
Governor of Georgia
203 State Capitol
Atlanta, Georgia 30334

Dear Governor Perdue:

As you are aware, reducing fine particle pollution ($PM_{2.5}$) represents one of the most significant challenges to improving air quality in our nation today. Health studies link these tiny particles – about $1/30^{th}$ the diameter of a human hair – to serious human health problems, including aggravated asthma, increased respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and even premature death in people with heart and lung disease. Fine particle pollution can remain suspended in the air for long periods of time and create public health problems far away from emission sources. Reducing levels of $PM_{2.5}$ is an important part of our nation's commitment to clean, healthy air.

We have reviewed the May 23, 2008, letter from Dr. Carol A. Couch, Director of the Georgia Environmental Protection Division (EPD), submitting Georgia's recommendations on air quality designations for the 2006 24-hour $PM_{2.5}$ standards. We have also reviewed the technical information submitted to support Georgia's recommendations and have enclosed the results of our review of Georgia's requests for consideration of data under the Exceptional Events rule for the Albany and Atlanta areas. In accordance with the Clean Air Act, I write to inform you that the U.S. Environmental Protection Agency (EPA) agrees that all areas in your state are attaining the 2006 24-hour $PM_{2.5}$ standards at this time. In the near future, EPA will publish a notice in the Federal Register to solicit public comments on our intended designation decisions. We intend to make final designation decisions for the 2006 24-Hour $PM_{2.5}$ standards by December 18, 2008.

EPA has taken steps to reduce fine particle pollution across the country, such as implementing the Clean Diesel Program to dramatically reduce emissions from highway, nonroad and stationary diesel engines. In addition to on-going initiatives, state programs to attain the 1997 $PM_{2.5}$ standards will also help to reduce unhealthy levels of fine particulate matter.

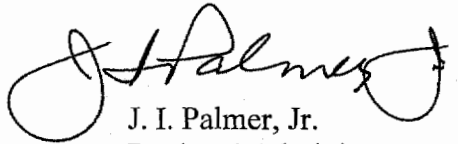
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I appreciate the leadership and attention provided by you and the management and staff of EPD in protecting air quality. If you have any questions, please do not hesitate to contact me at (404) 562-8357. We look forward to continuing to work with you and EPD officials in implementing the PM_{2.5} standards.

Sincerely,

A handwritten signature in dark ink, appearing to read "J. I. Palmer, Jr.", with a large, stylized initial "J" and a trailing flourish.

J. I. Palmer, Jr.
Regional Administrator

Enclosure

cc: Carol A. Couch, Ph.D., Director, EPD

PM_{2.5} Exceptional Events Technical Support Document

U.S. Environmental Protection Agency Region 4

State of Georgia: Atlanta-Sandy Springs-Marietta, GA and
Albany, GA Metropolitan Statistical Areas

2007

Introduction

This document provides U.S. Environmental Protection Agency (EPA) Region 4 rationale for concurrence or non-concurrence with exceptional event flags on the 24-hr average PM_{2.5} concentrations recorded at various Air Quality System (AQS) sites within the Georgia Department of Natural Resources Environmental Protection Division (EPD) Ambient Air Monitoring Network. The exceptional event flags that EPA Region 4 has concurred with will be excluded from use in determinations of exceedances and National Ambient Air Quality Standards (NAAQS) violations.

According to 40 CFR 50.1(j):

“Exceptional event means an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include stagnation of air masses or meteorological inversions, a meteorological event involving high temperatures or lack of precipitation, or air pollution relating to source noncompliance.”

§50.14(b)(2) also states:

“EPA shall exclude data from use in determinations of exceedances and NAAQS violations where a State demonstrates to EPA's satisfaction that emissions from fireworks displays caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Such data will be treated in the same manner as exceptional events under this rule, provided a State demonstrates that such use of fireworks is significantly integral to traditional national, ethnic, or other cultural events including, but not limited to July Fourth celebrations which satisfy the requirements of this section.”

Finally, §50.14(c)(3)(iii) states:

“The demonstration to justify data exclusion shall provide evidence that:

- (A) The event satisfies the criteria set forth in 40 CFR 50.1(j);*
- (B) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;*
- (C) The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and*
- (D) There would have been no exceedance or violation but for the event.*

Each PM_{2.5} 24-hr average concentration requested for exclusion was first evaluated against these criteria using a two-step analysis. This analysis was designed to compare the requested value to historical values observed at the site and determine whether any exceedances could have been caused by the claimed event.

Step 1: Monthly Average Comparison

Using 24-hr PM_{2.5} data from AQS for 2004-2007, a comparison three-year monthly average was calculated. The three-year monthly average concentration was calculated excluding data from the year in which the data in question was collected. For example, a requested value in May

2006 was compared to the average of all the samples collected at the site during May 2004, May 2005, and May 2007. If the three-year average was greater than the annual PM_{2.5} NAAQS (15.0 µg/m³) and the requested value was less than the 24-hr PM_{2.5} NAAQS (35 µg/m³), then EPA concurrence was not given to the requested value. This is because in EPA's judgment there is insufficient evidence that "there would have been no exceedance or violation but for the event" as required by §50.14(c)(3)(iii)(D) because the normally expected concentration at the site (the three-year monthly mean concentration) is in excess of the NAAQS.

Step 2: Monthly 84th Percentile Comparison

Using 24-hr PM_{2.5} data from AQS for 2004-2007, a comparison three-year upper 84th percentile was calculated for the month in which the requested value was collected. The three-year monthly 84th percentile was calculated excluding data from the year in which the data in question was collected. For example, a requested value in May 2006 was compared to the upper 84th percentile calculated from all the samples collected at the site during May 2004, May 2005, and May 2007. The calculated three-year monthly upper 84th percentile was considered to represent the range of normally expected high values at that site due to normal local and background sources. If the requested value was below the calculated three-year monthly upper 84th percentile, EPA concurrence was not given to the requested value. This is because in EPA's judgment that there is insufficient evidence to demonstrate that the NAAQS exceedance was caused by the claimed event as required by §50.14(c)(3)(iii)(D) and not by normal local and background sources at the site.

If a requested value did not meet the requirements described in one or more of the above steps and the State did not submit compelling evidence to demonstrate that the event satisfied the exceptional event criteria, then EPA concurrence was not given to the exceptional event flag on the requested value. The values that did meet all of the conditions described above were then evaluated against the requirements of §50.14(c)(3)(iii). A summary of the approval or disapproval of all flagged data can be found in Appendix A.

Summary of Maps and Graphs Used

A variety of maps and graphs were used in this document. Unless otherwise noted, these products were obtained from the DATAFED Data Views Catalog, which can be accessed at http://datafedwiki.wustl.edu/index.php/Data_Views_Catalog. This includes maps using data from AQS, the National Aeronautics and Space Administration (NASA), and the Navy Aerosol Analysis and Prediction System (NAAPS). Also, unless otherwise noted, all ambient air monitoring data used in this analysis was obtained from the EPA AQS database. A summary of AQS site and parameter codes used in this document can be found in Appendix B.

The following discussion will demonstrate that the 24-hr average PM_{2.5} concentrations observed at various Georgia Environmental Protection Division network monitoring sites on the following dates meet or fail to meet the criteria laid out in the Exceptional Events Rule, §50.14.

EXCEEDANCE EVENT: Prescribed Burning

Exceedance Date:	2/28/2007
MSA:	Atlanta-Sandy Springs-Marietta, GA
Event Description:	Transport of smoke from prescribed burning southeast of Atlanta.

Table 1: Site-specific information used in analysis, concentrations in $\mu\text{g}/\text{m}^3$

AQS ID	Date	Observed Concentration	Monthly Average	84 th Percentile	95 th Percentile	EPA Concurrence
13-121-0032-1	2/28/2007	29.7	13.9	18.4	22.7	NO

Detailed Discussion of Evidence

A) Event Description

Documentation submitted by the Georgia EPD claims that smoke from prescribed burning southeast of Metro Atlanta caused NAAQS exceedances at the site listed above. According to §50.14(b)(3):

“EPA shall exclude data from use in determinations of exceedances and NAAQS violations, where a State demonstrates to EPA's satisfaction that emissions from prescribed fires caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section provided that such emissions are from prescribed fires that EPA determines meets the definition in §50.1(j), **and provided that the State has certified to EPA that it has adopted and is implementing a Smoke Management Program or the State has ensured that the burner employed basic smoke management practices.** If an exceptional event occurs using the basic smoke management practices approach, the State must undertake a review of its approach to ensure public health is being protected and must include consideration of development of a SMP.”

Georgia EPD did not submit documentation that a Smoke Management Program or basic smoke management practices were employed during this event. Therefore, the event does not meet the requirements of the exceptional events rule for exclusion of data from NAAQS calculations. EPA concurrence was not given to this exceptional event flag.

EXCEEDANCE EVENT: Georgia / Florida Wildfires

Exceedance Dates:	5/12/07, 5/22/07, 5/27/07, 5/31/07
MSA:	Atlanta-Sandy Springs-Marietta, GA
Event Description:	Transport of smoke from wildfires in Southern Georgia and northern Florida.

Table 1: Site-specific information used in analysis, concentrations in $\mu\text{g}/\text{m}^3$

AQS ID	Date	Observed Concentration	Monthly Average	84 th Percentile	95 th Percentile	EPA Concurrence
13-121-0048-1	5/12/2007	35	N/A	N/A	N/A	NO
13-089-0002-1	5/22/2007	50.6	16.1	23.3	25.8	YES
13-089-2001-1	5/22/2007	79.8	15.3	21.3	24.4	YES
13-115-0005-1	5/22/2007	36.7	18.1	24.0	30.6	YES
13-121-0032-1	5/22/2007	64.5	16.1	23.8	26.2	YES
13-063-0091-1	5/27/2007	44.8	16.6	23.8	26.2	YES
13-067-0003-1	5/27/2007	77.6	16.3	23.4	27.8	YES
13-067-0004-1	5/27/2007	70.8	16.2	23.5	27.1	YES
13-089-2001-1	5/27/2007	43.4	15.3	21.3	24.4	YES
13-121-0048-1	5/27/2007	60.8	N/A	N/A	N/A	YES
13-089-0002-1	5/31/2007	35.1	16.1	23.3	25.8	NO
13-089-2001-1	5/31/2007	37.9	15.3	21.3	24.4	YES
13-121-0032-1	5/31/2007	38.8	16.1	23.8	26.2	YES

Detailed Discussion of Evidence

A) Event Description

Documentation submitted by the Georgia EPD claims that smoke from wildfires in Georgia and Florida caused NAAQS exceedances at the sites listed above. All of the requested values passed both steps of the initial two-step analysis, with exception of the values collected at the Georgia Tech site (AQS ID: 13-121-0048) for which historical data was not available and no initial two-step analysis could be performed.

The Bugaboo Scrub Fire (Figure 1a) was a wildfire that occurred from April to June in 2007 and ultimately became the largest fire in recent history of both Georgia and Florida. The Bugaboo, which was not actually named until it had burned for nearly a month, started in the Okefenokee Swamp, most of which is located in Georgia. It was previously known as the Sweat Farm Road Fire, which merged with the Big Turnaround Complex fire (Figure 1b). Due to the amount of acreage consumed from these wildfires, copious smoke impacted sites around Region 4 from May through the first week of June, in many cases causing very large increases in the 24 hour $\text{PM}_{2.5}$ mass.

Figure 2 shows an image taken by the National Oceanic and Atmospheric Administration's (NOAA) Geostationary Satellite Server (GOES). This image, taken on May 22, 2007, shows a large plume of smoke from the wildfires impacting the Atlanta area.

B) Causal Relationship Between the Event and Air Quality

PM_{2.5} speciation data was collected at the South DeKalb site (AQS ID 13-089-0002) on a 1 in 3 day sampling schedule. Because of this schedule, speciation data was not collected on some of the days with claimed smoke impact, particularly May 22 and 31. In order to obtain a more complete picture of the air quality during this period, data from the Southern Company Southeastern Aerosol Research and Characterization (SEARCH) Study was used. Information about the SEARCH study can be found at:

<http://www.atmospheric-research.com/studies/SEARCH/index.html>.

A map of the location of the Jefferson Street SEARCH site, as well as the impacted GA EPD monitoring sites, is shown in Figure 3. Figures 4a and 4b show PM_{2.5} sulfate and organic carbon concentrations collected at the Jefferson St. and South DeKalb sites during May and June, 2007. Elevated levels of organic carbon were observed on May 22, 27, and 31, indicating impact from smoke. Also, sulfate levels were not observed to be above normal concentrations on any of these days suggesting that the observed elevated PM_{2.5} levels were not due to local stationary and mobile sources.

In order to more accurately assess the possible impact of smoke on this day, wind trajectories were analyzed for each of the requested days. Figure 5 illustrates backward wind trajectories that passed through southern Georgia and northern Florida on May 12, 22, 27, and 31. The figure confirms air transport from the claimed source region to the Atlanta area on May 22, 27, and 31, but does not show significant transport from the source region on May 12. Figure 6 shows the atmospheric aerosol concentrations observed by the National Aeronautics and Space Administration (NASA) Ozone Monitoring Instrument (OMI) satellite. These images confirm high aerosol concentrations in the claimed source region of southern Georgia and northern Florida.

The wildfires and their impact on air quality were also well documented by *The Atlanta Journal-Constitution* and other local news sources. Several news articles and photographs from these days were submitted to EPA by the Georgia EPD.

C) Comparison to Historical Levels

In order to further assess the impacts of the Georgia and Florida fires, the values in question were compared to historical levels observed at each site. Table 1 shows that all of the values that passed both steps of the initial two-step analysis are significantly greater than the 95th percentile calculated from data collected during the month of May for 2004-2006. This is good evidence that the data were influenced by an exceptional event. Figure 7 shows the spatially averaged 24-hr average PM_{2.5} concentrations observed on each of the days in question. Figures 8 and 9 show the excess PM_{2.5} concentrations observed above the 84th and 95th percentiles, respectively, on each of the days. These maps show 24-hr average PM_{2.5} concentrations above the normal range of values observed in the Atlanta area during the month of May in the past.

A scatter plot of all of the 24-hr average PM_{2.5} concentrations collected during 2004-2007 is shown in Figure 10. The concentrations observed during the month of May are shown in red.

This figure demonstrates that many concentrations recorded during May 2007 far exceeded the normal range of values observed in the Atlanta area.

D) Demonstration of No Exceedance “But For” the Event

In order to quantify the impacts of the fire on observed PM_{2.5} concentrations, speciation data collected at the Jefferson St. SEARCH site and the South DeKalb site during May and June, 2007 were used to approximate the organic mass increment of the observed PM_{2.5} mass that was caused by the wildfires. The organic mass increment was calculated using the following equation, adapted from Turpin and Lim (2001).

$$OMI = (OC_{observed} - OC_{average}) \times 2.0 \quad (Eq. 2)$$

Where OMI is the organic mass increment due to smoke from the wildfire, OC_{observed} is the observed organic carbon mass, and OC_{average} is the average organic carbon mass observed at the site during the month of May for 2004-2006. A multiplier of 2.0 is used to approximate the total PM_{2.5} mass associated with smoke from wildfires (Turpin and Lim 2001). The OMI values calculated for the Jefferson St. and South DeKalb sites during May and June, 2007 are shown in Figures 11a and 11b, respectively.

In order to approximate the PM_{2.5} concentration that would have been observed but for the fire, the OMI was subtracted from the observed 24-hr average PM_{2.5} concentration. This procedure was then repeated for each day that PM_{2.5} speciation data was collected during May and June, 2007 to compare impacts of smoke on different days. The results of this analysis are shown in Figure 12a and 12b. Figure 12a illustrates the smoke impacts at the Jefferson St. SEARCH site, and Figure 12b shows the smoke impacts at the South DeKalb site. These figures show the relationship between the observed PM_{2.5} concentrations at each site and the calculated “adjusted PM_{2.5} mass” (Observed PM_{2.5} – OMI) that approximates the PM_{2.5} concentrations that would have been observed but for the smoke impact. The graph demonstrates that without the PM_{2.5} mass emitted by the fire on May 22, 27, and 31, 2007, the 24-hr average PM_{2.5} concentration would have been below the 24-hr PM_{2.5} NAAQS of 35 µg/m³, and thus that there would have been no exceedance but for the wildfire.

Since the values collected at the Jefferson St. site on each of the requested days met all of the requirements for exclusion from NAAQS calculations under the exceptional events rule, and since all of the requested values are in excess of the historical 95th percentile levels for the respective site (corroborating impact from an exceptional event), it can be assumed that all of the requested values were similarly impacted by the wildfires, even though speciation data was not collected at these sites (except for the South DeKalb site on 5/27). The overall body of evidence indicates that there would have been no NAAQS exceedances of the 24-hr PM_{2.5} standard during this period but for the wildfires.

EPA concurrence was given to all of the values requested on May 22, 27, and 31, 2007 except the concentration of 35.1 µg/m³ observed at the South DeKalb site on May 31 2007. Concurrence was not given to this value because by NAAQS rounding conventions, it is not an exceedance of the 24-hr PM_{2.5} standard of 35 µg/m³. This means that in order for this value to be excluded from NAAQS calculations, it must be demonstrated that there would have been no exceedance of the annual PM_{2.5} NAAQS (15.0 µg/m³) but for the event. PM_{2.5} speciation data

was not collected at the South DeKalb site on May 31, but the data collected at the Jefferson St. SEARCH site does not show that the adjusted PM_{2.5} level excluding the OMI from the fires would have been below the annual NAAQS of 15.0 µg/m³ in the Atlanta area on this day (see Figure 12a, adjusted PM_{2.5} mass at the Jefferson St site on May 31 was 21.3 µg/m³).

EPA concurrence was also not given to the flagged concentration of 35 µg/m³ collected at the Georgia Tech site (AQS ID: 13-121-0048) on May 12th. This measurement was not an exceedance of the 24-hr PM_{2.5} standard of 35 µg/m³, which means that in order for this value to be excluded from NAAQS calculations, it must be demonstrated that there would have been no exceedance of the annual PM_{2.5} NAAQS (15.0 µg/m³) but for the event. Figures 11a and 11b do not show significant values for the OMI on this day, suggesting that this exceedance of the annual NAAQS was likely caused by other sources and not by smoke from the wildfires. Also, the documentation submitted by Georgia EPD did not demonstrate a clear causal relationship between the measured concentration and the event, and did not demonstrate that there would have been no exceedance or violation but for the event.

Figure 1a: Big Turnaround fire April 29, 2007 Blaine Eckberg, USFWS



Figure 1b: Georgia Forestry Commission - Aerial View of Sweat Farm Road Fire on April 28, 2007.



Figure 2: NOAA GOES satellite image, May 22, 2007.

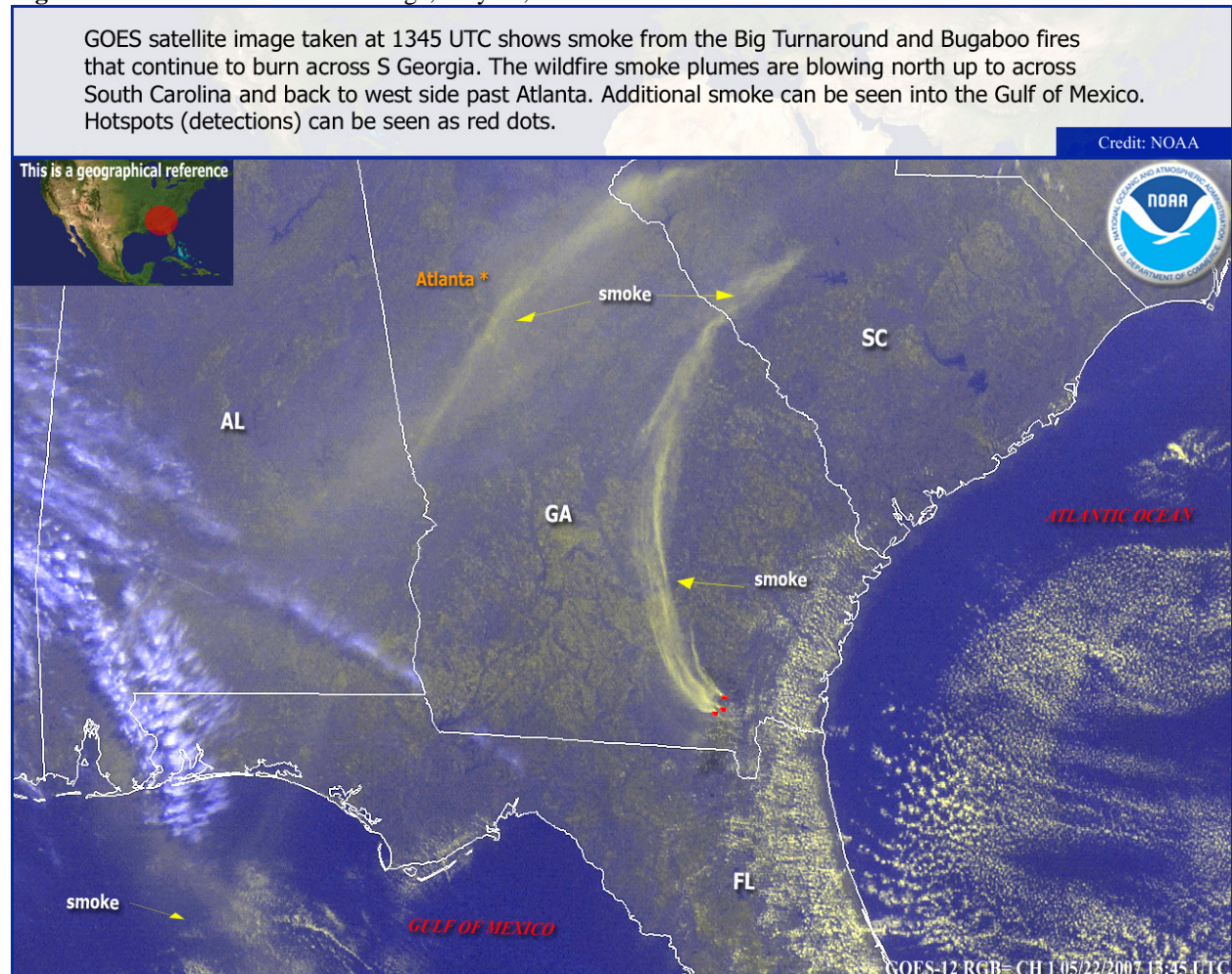


Figure 3: Map of PM_{2.5} monitoring sites in the Atlanta area.

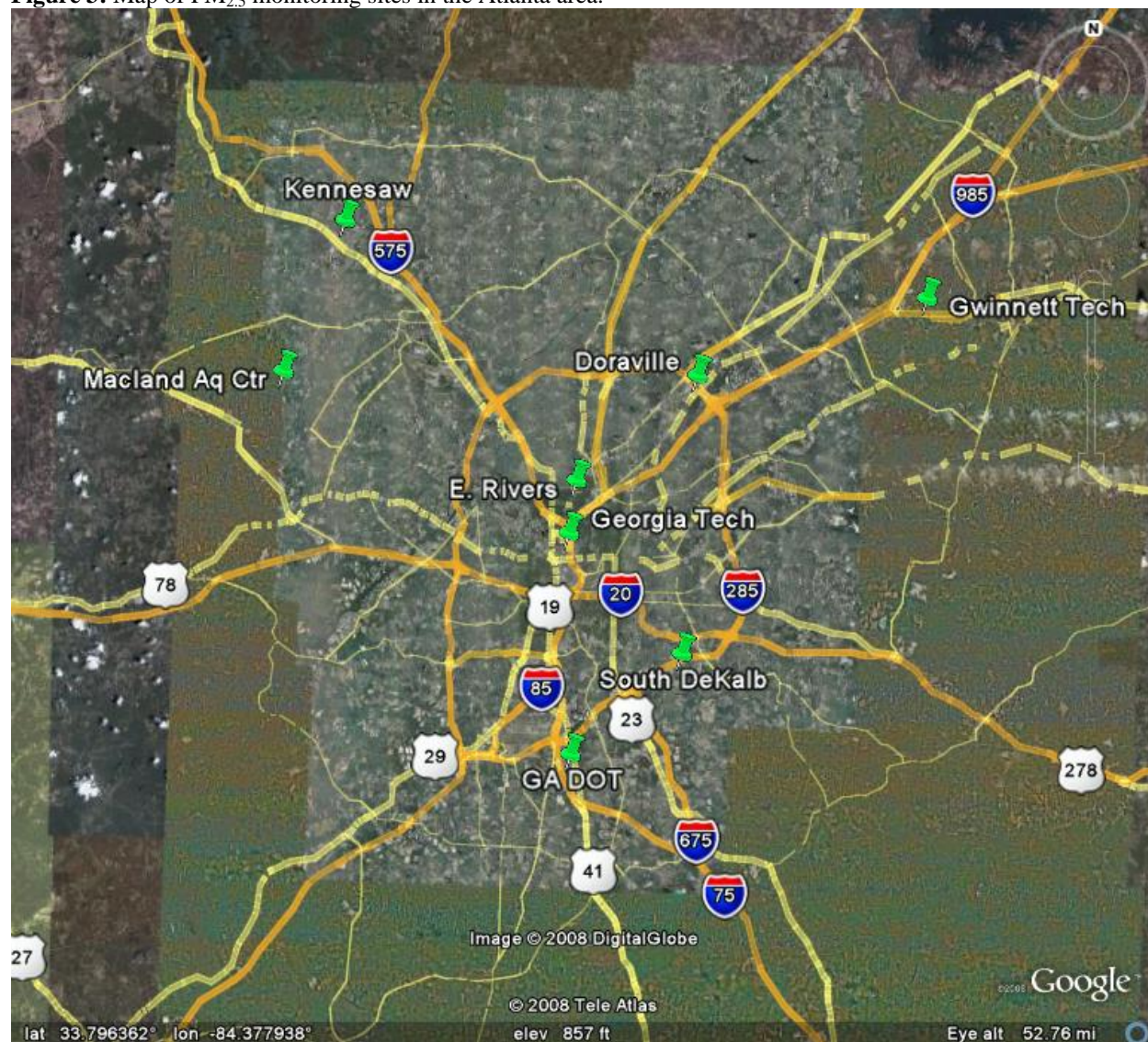


Figure 4a: Jefferson St. PM_{2.5} Organic Carbon and PM_{2.5} Sulfate compared to total PM_{2.5} mass, May –June, 2007.

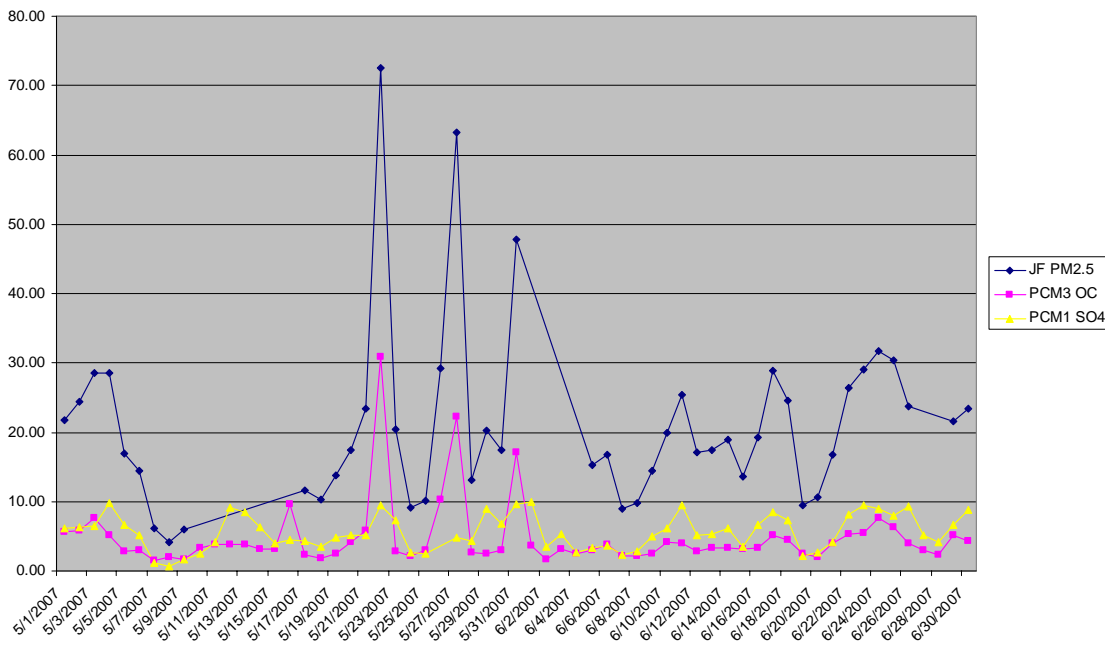


Figure 4b: South DeKalb PM_{2.5} Organic Carbon and PM_{2.5} Sulfate compared to total PM_{2.5} mass, May –June, 2007.

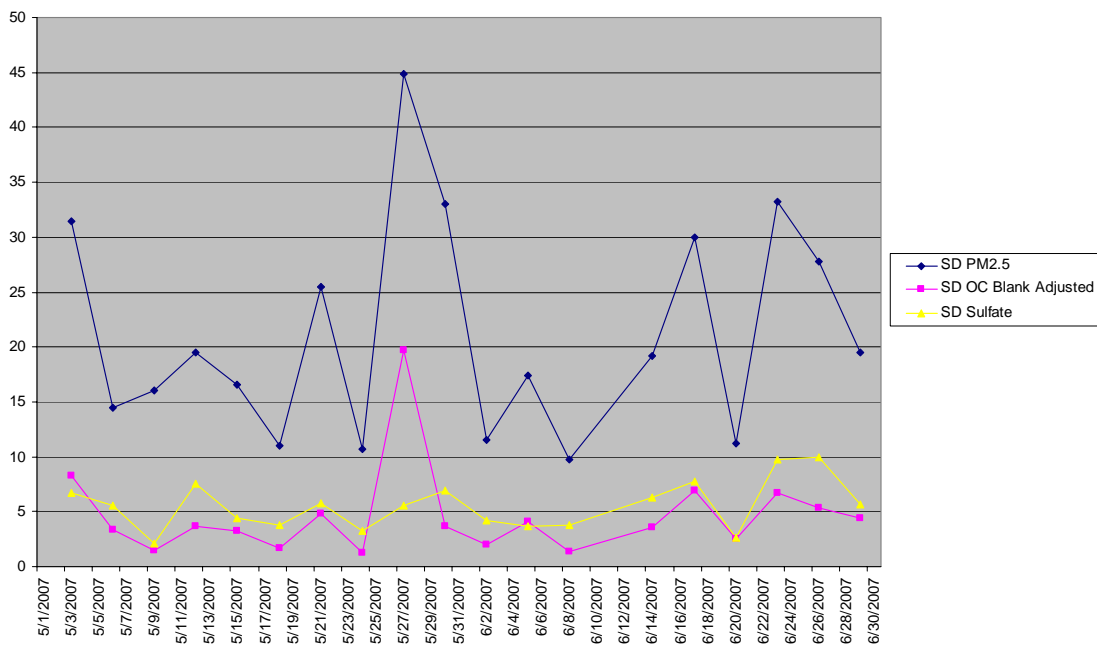


Figure 5: Backward wind trajectories passing through claimed source region, May 22, 27, and 31, 2007.

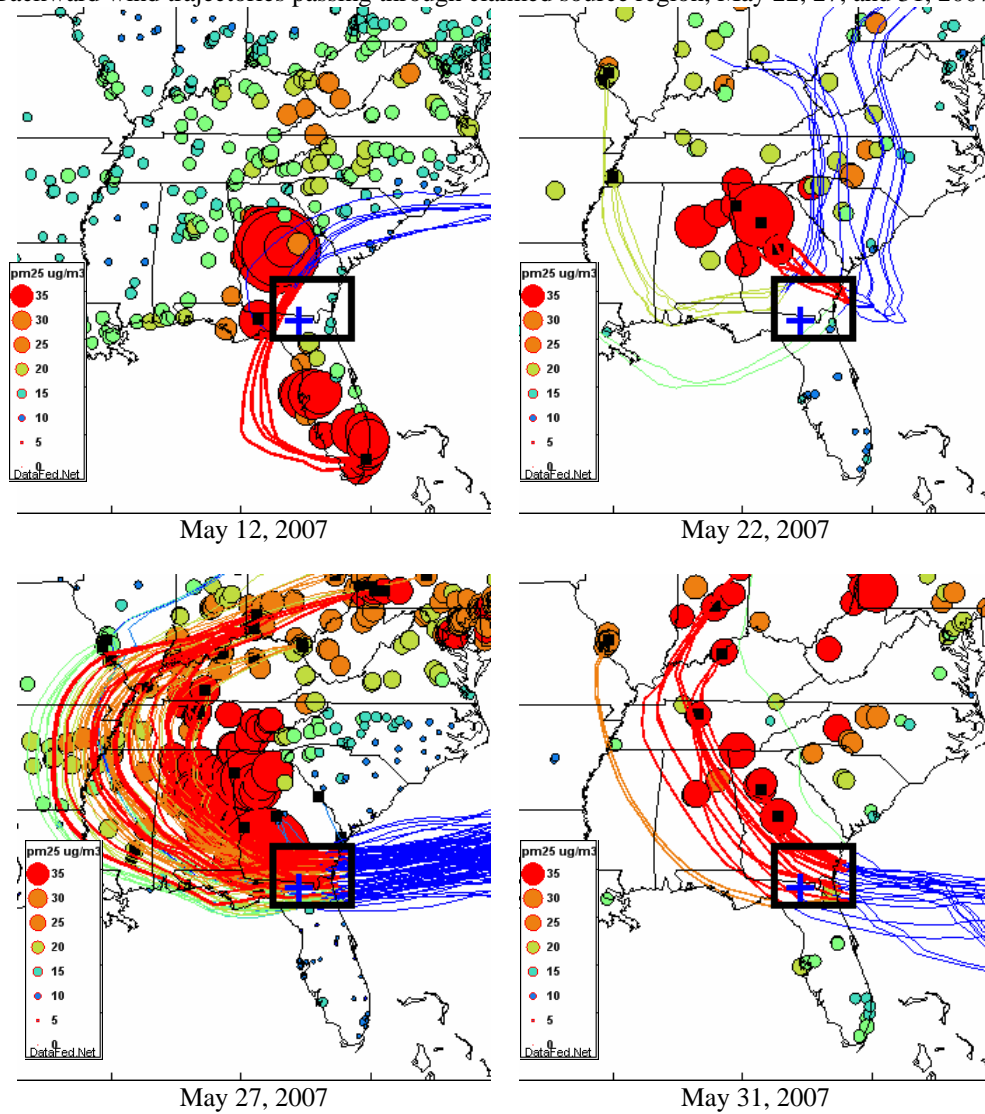


Figure 6: NASA OMI satellite aerosol index, May 22, 27, and 31, 2007.

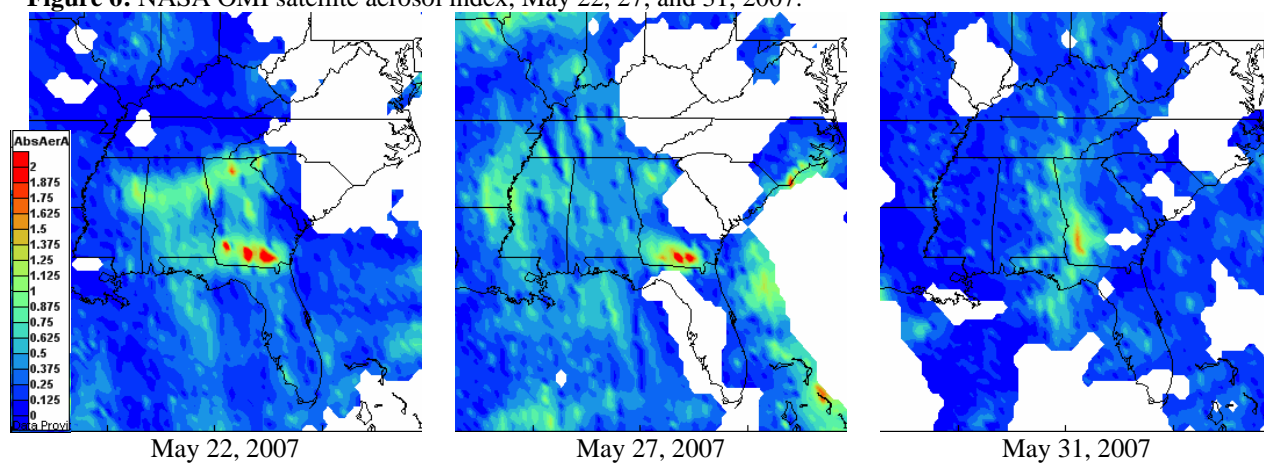


Figure 7: Spatially averaged observed PM_{2.5} concentrations, May 22, 27, and 31, 2007.

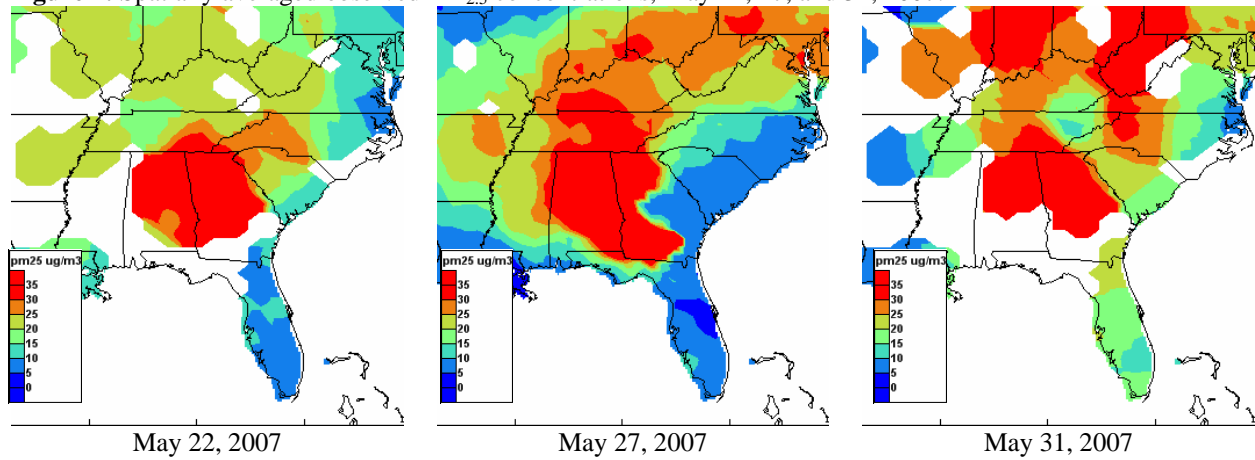


Figure 8: Spatially averaged excess PM_{2.5} concentrations above the 84th percentile, May 22, 27, and 31, 2007.

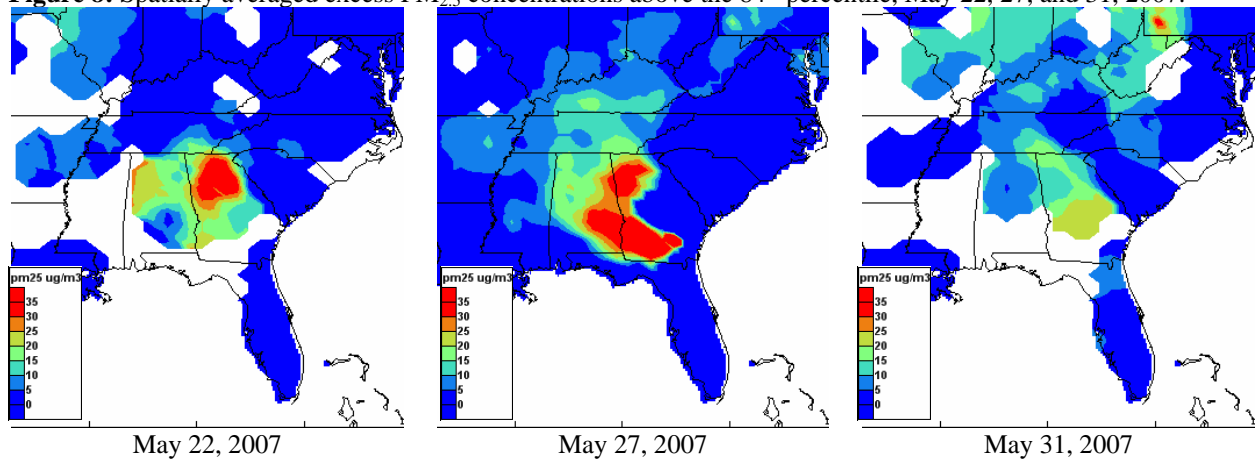


Figure 9: Spatially averaged excess PM_{2.5} concentrations above the 95th percentile, May 22, 27, and 31, 2007.

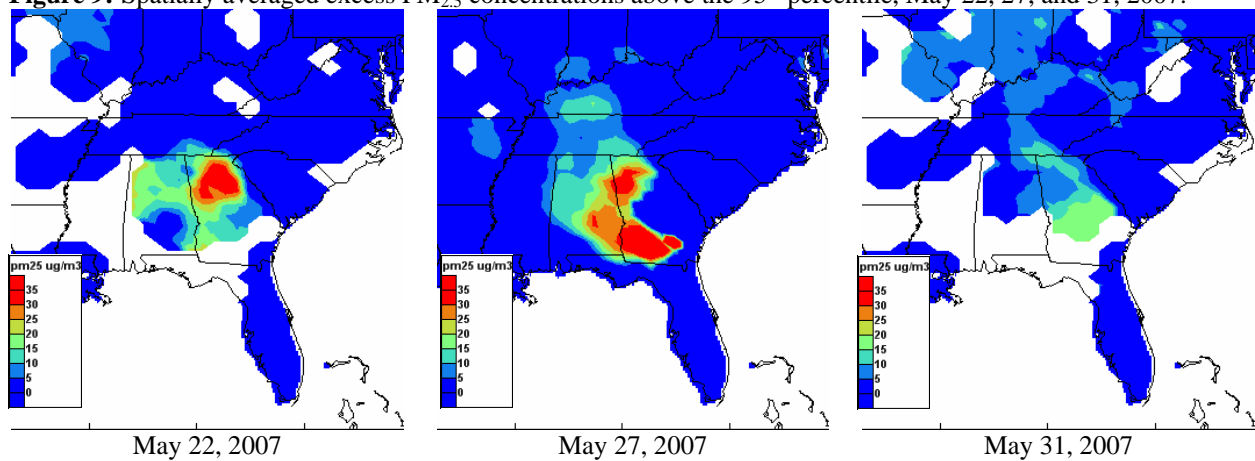


Figure 10: Scatter plot of all 24-hr average PM_{2.5} concentrations recorded in the Atlanta area during 2004-2007. Values collected during the month of May are shown in red.

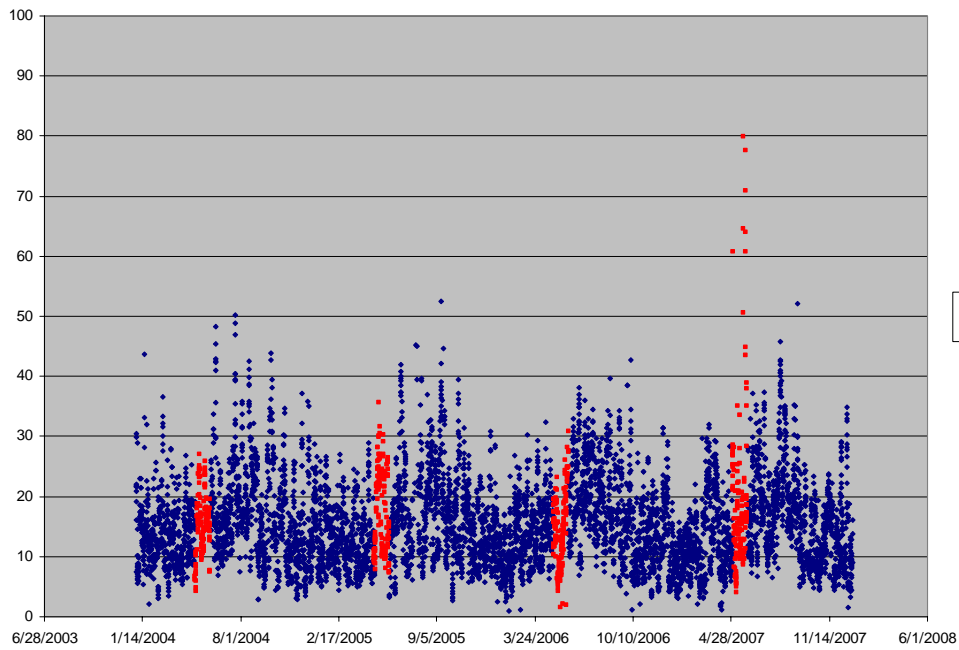


Figure 11a: Observed PM_{2.5} concentrations and calculated organic mass increment, Jefferson St. site, May – June, 2007.

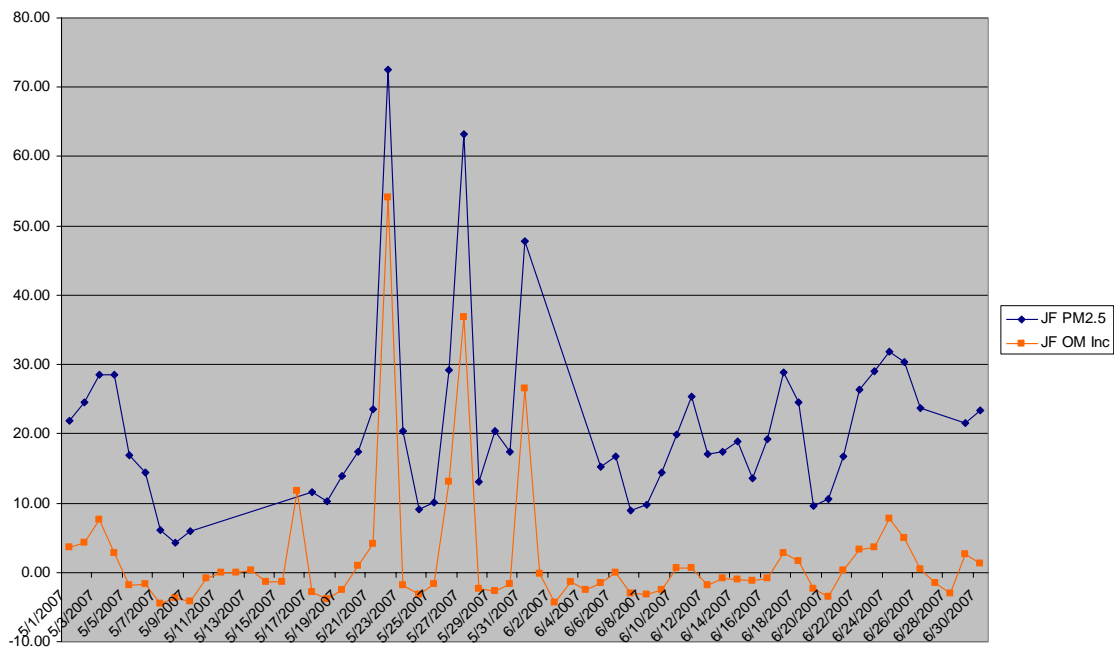


Figure 11b: Observed PM_{2.5} concentrations and calculated organic mass increment, South DeKalb site, May – June, 2007.

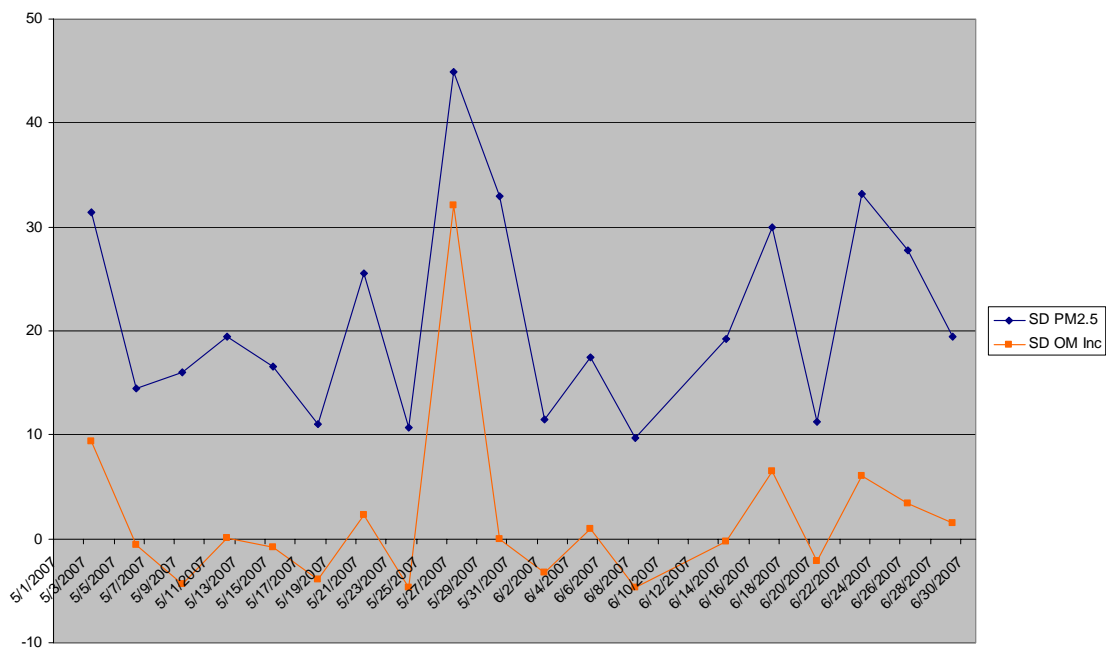


Figure 12a Observed $PM_{2.5}$ concentrations and adjusted $PM_{2.5}$ concentrations “but for” the fires, calculated by subtracting the organic mass increment from the observed $PM_{2.5}$ concentration, Jefferson St. site, May – June, 2007.

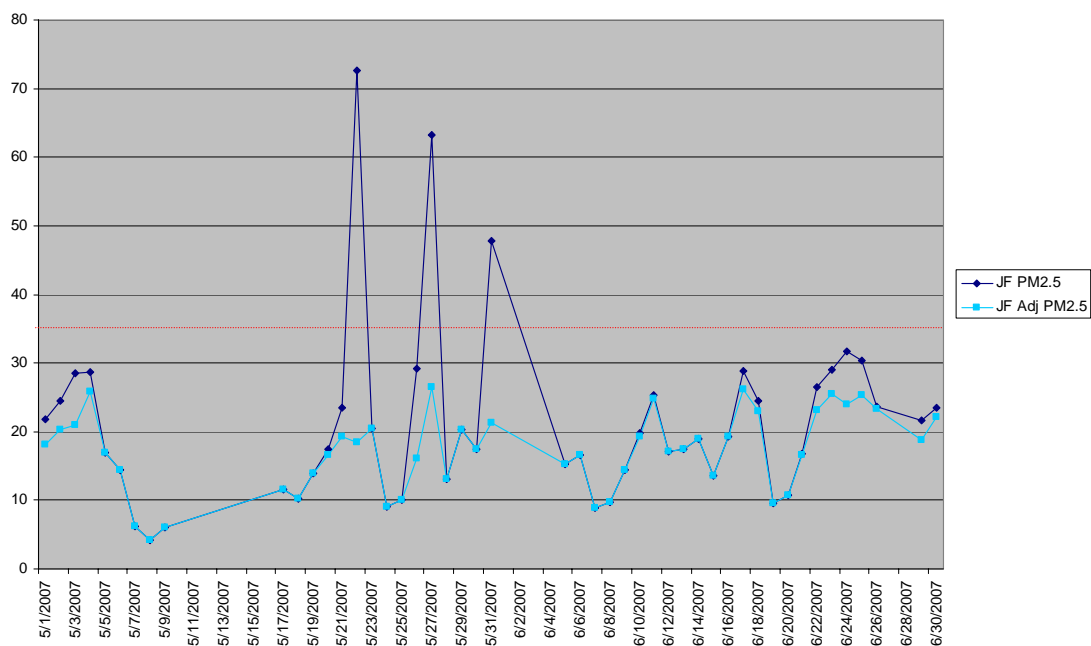
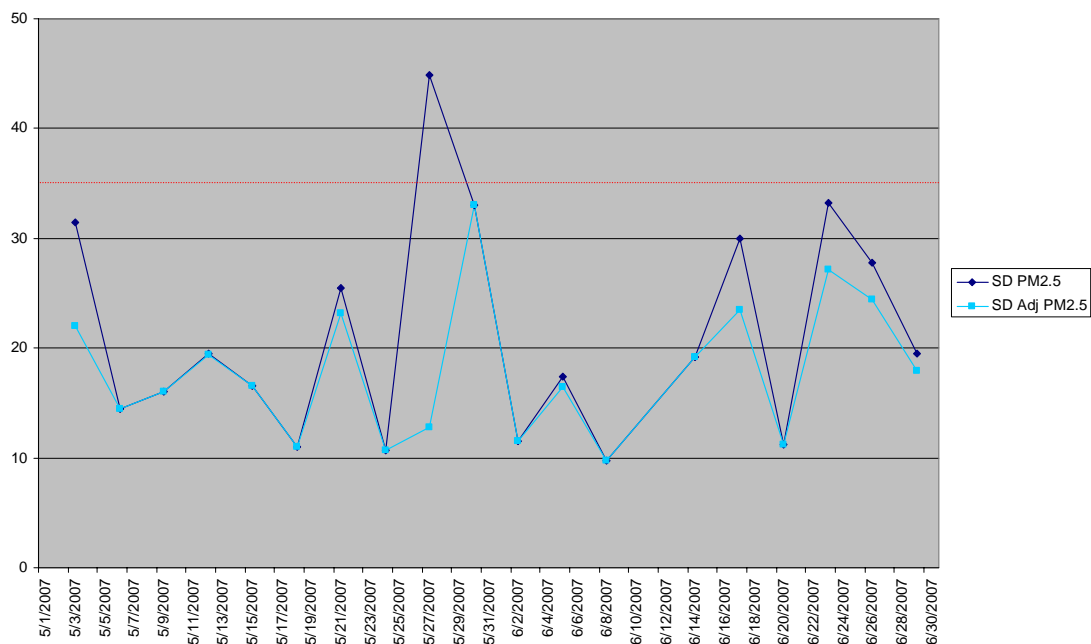


Figure 12b: Observed $PM_{2.5}$ concentrations and adjusted $PM_{2.5}$ concentrations “but for” the fires, calculated by subtracting the organic mass increment from the observed $PM_{2.5}$ concentration, South DeKalb site, May – June, 2007.



EXCEEDANCE EVENT: Georgia / Florida Wildfires

Exceedance Dates:	5/12/07, 5/22/07, 5/27/07, 5/31/07
MSA:	Albany, GA
Event Description:	Transport of smoke from wildfires in Southern Georgia and northern Florida.

Table 2: Site-specific information used in analysis, concentrations in $\mu\text{g}/\text{m}^3$

AQS ID	Date	Observed Concentration	Monthly Average	84 th Percentile	95 th Percentile	EPA Concurrence
13-095-0007-1	5/3/2007	34.6	15.1	21.8	25.0	NO ¹
13-095-0007-1	5/27/2007	112.7	15.1	21.8	25.0	YES

Notes: ¹Three-year monthly average above $15.0\mu\text{g}/\text{m}^3$

Detailed Discussion of Evidence

A) Event Description

Documentation submitted by the Georgia EPD claims that smoke from wildfires in Georgia and Florida caused NAAQS exceedances at the sites listed above. The only requested value that passed both steps of the initial two-step analysis was the concentration of $112.7\mu\text{g}/\text{m}^3$ collected on May 27, 2007. EPA concurrence was not given to the flagged value collected on May 3, 2007 because it is not an exceedance of the 24-hr PM_{2.5} standard, and the average concentration observed at the site during the month of May in 2004-2006 was greater than the annual PM_{2.5} standard of $15.0\mu\text{g}/\text{m}^3$. Also, the documentation submitted by the Georgia EPD did not demonstrate a clear causal relationship between the measured concentration and the event, and did not demonstrate that there would have been no exceedance or violation but for the event on May 3, 2007.

Documentation submitted by the Georgia EPD claims that smoke from the Bugaboo Scrub and Sweat Farm fires (see Figures 1a and 1b) caused an exceedance of the 24-hr PM_{2.5} NAAQS at the Albany site (AQS ID: 13-095-0007) on May 27, 2007. Due to the amount of acreage consumed from these wildfires, copious smoke impacted sites around Region 4 from May through the first week of June, in many cases causing very large increases in the 24 hour PM_{2.5} mass.

B) Causal Relationship Between the Event and Air Quality

PM_{2.5} speciation data was not collected in the Albany area during this time period. Backward wind trajectories passing through the claimed source region in southern Georgia and northern Florida are shown in Figure 13. High aerosol particulate concentrations can be seen in the source region on May 27, 2007 in Figure 6. The trajectories in Figure 13 strongly support smoke impacts in the Albany area from the fires.

C) Comparison to Background Levels

In order to further assess the impacts of the Georgia and Florida fires, the value in question was compared to historical levels observed at each site. Table 2 shows that the 24-hr average PM_{2.5} concentration observed on May 27 (112.7 $\mu\text{g}/\text{m}^3$) was 87.7 $\mu\text{g}/\text{m}^3$ greater than the 95th percentile concentration observed at the site during the month of May in 2004-2006. This indicates that air quality was influenced by an exceptional event. The PM_{2.5} concentrations observed in the region can be seen in Figure 7. The spatially averaged excess concentrations above the 84th and 95th percentiles on May 27 are shown in Figures 8 and 9 respectively. Again, these maps indicate that PM_{2.5} concentrations in the Albany area far exceeded the normally expected range of concentrations for the month of May.

A scatter plot of all of the 24-hr average PM_{2.5} concentrations collected at the Albany site during 2004-2007 is shown in Figure 14. The concentrations observed during the month of May are shown in red. This figure demonstrates that the value in question is greatly above the normally expected range of values at this site.

D) Demonstration of No Exceedance “But For” the Event

Since no PM_{2.5} speciation data was collected in the Albany area, an organic mass apportionment was not possible. The magnitude of the observed concentration compared to historical levels at the site, however, combined with wind trajectories that support the transport of smoke into the Albany area, are sufficient evidence that there would have been no exceedance of the 24-hr standard but for the event. EPA concurrence was given to the exceptional event flag on the May 27, 2007 concentration.

Figure 13: Backward wind trajectories passing through claimed source region, May 27, 2007.

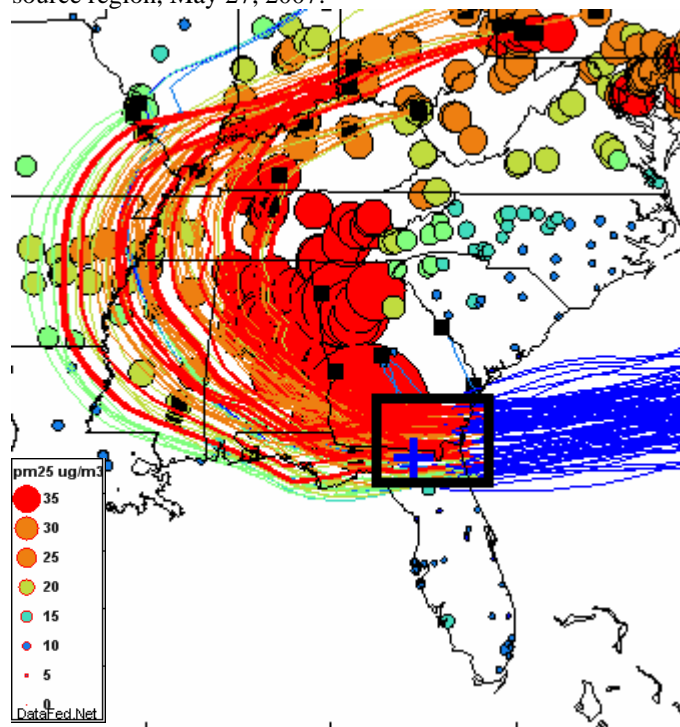
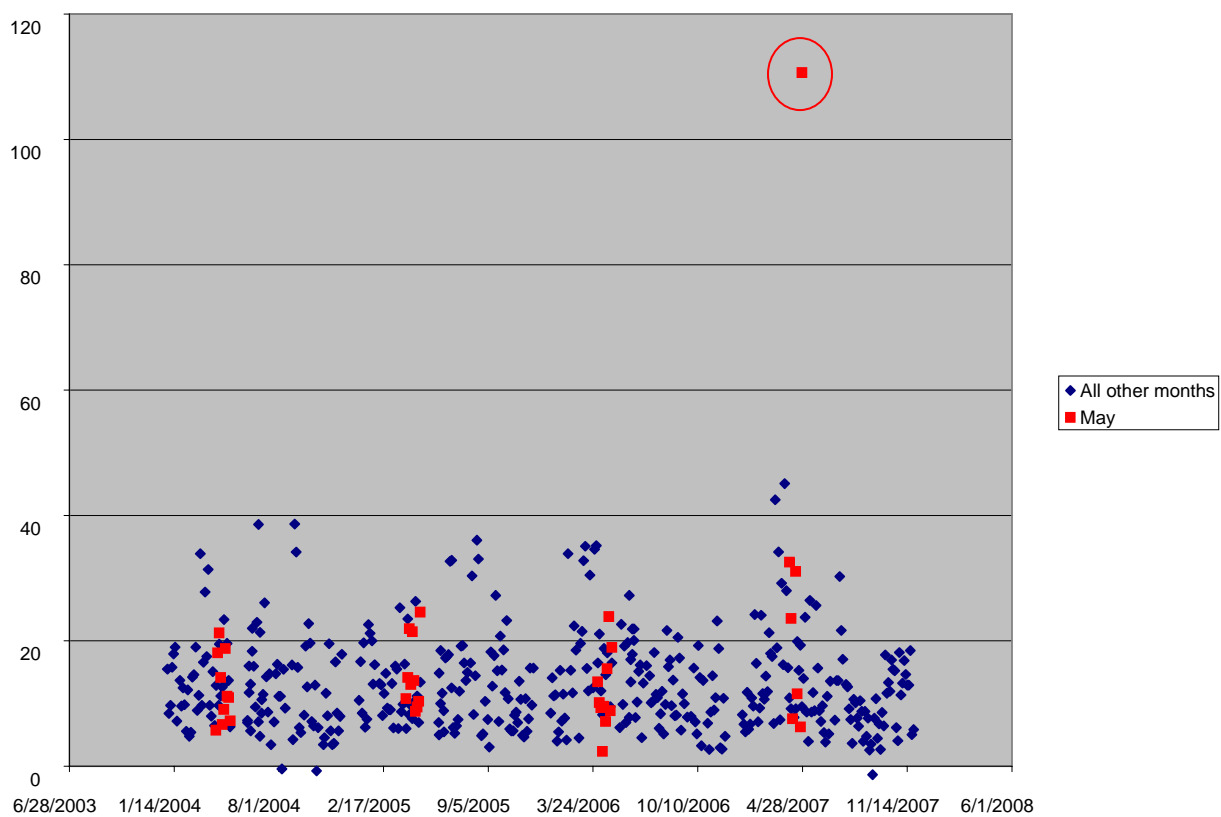


Figure 14: Scatter plot of all 24-hr average PM_{2.5} concentrations recorded at the Albany site during 2004-2007. Values collected during the month of May are shown in red.



References

Turpin, B.J., Lim, H.J., 2001. Species Contributions to $PM_{2.5}$ Mass Concentrations: Revisiting common Assumptions for Estimating Organic Mass; *Aerosol Science and Technology*. Volume 35, Pages 602-610.

Appendix A

Summary of All Flagged Data

AQS ID	Date	Value	Monthly Avg	84th Perc	95th Perc	µg Over 95th	Approved?	Event
13-121-0032-1	2/28/2007	29.7	13.9	18.4	22.7	7.0	NO	Prescribed Burning
13-095-0007-1	5/3/2007	34.6	15.1	21.8	25.0	9.6	NO	GA FL Fires
13-121-0048-1	5/12/2007	35	N/A	N/A	N/A	N/A	NO	GA FL Fires
13-089-0002-1	5/22/2007	50.6	16.1	23.3	25.8	24.8	YES	GA FL Fires
13-089-2001-1	5/22/2007	79.8	15.3	21.3	24.4	55.4	YES	GA FL Fires
13-115-0005-1	5/22/2007	36.7	18.1	24.0	30.6	6.1	YES	GA FL Fires
13-121-0032-1	5/22/2007	64.5	16.1	23.8	26.2	38.4	YES	GA FL Fires
13-063-0091-1	5/27/2007	44.8	16.6	23.8	26.2	18.6	YES	GA FL Fires
13-067-0003-1	5/27/2007	77.6	16.3	23.4	27.8	49.8	YES	GA FL Fires
13-067-0004-1	5/27/2007	70.8	16.2	23.5	27.1	43.8	YES	GA FL Fires
13-089-2001-1	5/27/2007	43.4	15.3	21.3	24.4	19.0	YES	GA FL Fires
13-121-0048-1	5/27/2007	60.8	N/A	N/A	N/A	N/A	YES	GA FL Fires
13-095-0007-1	5/27/2007	112.7	15.1	21.8	25.0	87.7	YES	GA FL Fires
13-089-0002-1	5/31/2007	35.1	16.1	23.3	25.8	9.3	NO	GA FL Fires
13-089-2001-1	5/31/2007	37.9	15.3	21.3	24.4	13.5	YES	GA FL Fires
13-121-0032-1	5/31/2007	38.8	16.1	23.8	26.2	12.7	YES	GA FL Fires

Appendix B

AQS and SEARCH Site and Parameter Codes

AQS Site ID	Site Name	Address	Latitude	Longitude
13-063-0091-1	Georgia DOT	25 Kennedy Dr	+33.609722	-84.391111
13-067-0003-1	Kennesaw	GA National Guard, McCollum Pkwy	+34.015346	-84.607484
13-067-0004-1	Macland Aquatic Center	Macland Aquatic Center, Powder Springs	+33.899182	-84.661589
13-089-0002-1	South DeKalb	2390 Wildcat Rd	+33.688007	-84.290325
13-089-2001-1	Doraville Health Ctr	3760 Park St	+33.901251	-84.279989
13-089-2001-2	Doraville Health Ctr	3760 Park St	+33.901251	-84.279989
13-095-0007	Albany	Turner Elem. School, Albany	+31.576917	-84.100194
13-121-0032-1	E. Rivers School	8 Peachtree Battle Ave NW	+33.819424	-84.389791
13-121-0032-2	E. Rivers School	8 Peachtree Battle Ave NW	+33.819424	-84.389791
13-121-0048-1	Georgia Tech	Ford ES&T Bldg, 311 Ferst St	+33.779189	-84.395843

AQS Parameter Code	Description
88101	PM _{2.5} - Local Conditions (Federal Reference Method)
88502	PM _{2.5} Speciation Sampler Total Mass
88301	Ammonium Ion PM _{2.5} (Local Conditions)
88305	Organic Carbon, Unadjusted PM _{2.5} (Local Conditions)
88307	Elemental Carbon PM _{2.5} (Local Conditions)
88403	Sulfate PM _{2.5} (Local Conditions)

SEARCH Parameter	Description
PCM1 SO ₄	Blank corrected PM _{2.5} sulfate concentrations from channel 1 of the Particulate Composition Monitor (PCM)
PCM3 OC	Blank corrected PM _{2.5} organic carbon concentrations from channel 3 of the Particulate Composition Monitor (PCM)
FRM Mass	24-hr average PM _{2.5} concentration collected by Federal Reference Method