

# **EPA's Supersites Program and the Eastern Supersites Program July 2001 Intensive Monitoring**

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## **EPA's PM Supersites Program**

The "Supersites" program is a set of special studies extending beyond the national regulatory networks for particulate matter (PM) to elucidate source-receptor relationships and atmospheric processes in support of State Implementation Plans (SIPs). The program consists of regional programs in 8 air sheds representing a spectrum of PM problems across the country. In addition to supporting SIPs, the program will 1) accelerate the testing of advanced sampling methods to replace current technologies, 2) provide advanced measurements<sup>1</sup> that simultaneously support PM<sub>2.5</sub> and ozone SIPs, 3) foster collaborative partnerships across the research and regulatory monitoring communities, and 4) provide additional information useful in upcoming health risk assessments of PM and its components. Spurred by the recommendations of the National Academy of Sciences committee on PM Research, EPA staff further developed the mission of the Supersites program to address priority health and exposure related research needs identified by the committee through a coordinated monitoring/ coordinated science planning effort.

The "Supersites" program is an integrated measurement approach that combines a mix of intensive or advanced measurements at a central location combined with other monitoring sites. It should not be understood solely as a single site making research grade measurements. The regulatory monitoring program provides a wealth of continuous gaseous data for criteria pollutants (ozone, nitrogen oxides, carbon monoxide, and sulfur dioxide), ozone precursor data through the Photochemical Assessment Measurements Stations (PAMS), and PM<sub>2.5</sub> mass and chemically resolved data valuable for SIP planning and science objectives. The Supersites Program provides enhanced chemical, temporal, and size-resolved data not captured by a regulatory monitoring program where comparison with the NAAQS generally is the primary data objective.

The Supersites Program has objectives in three major areas :

*1) SIPs....support development of State Implementation Plans (SIP's) through improved understanding of source-receptor relationships leading to improved design, implementation, and tracking of control strategy effectiveness in the overall PM program;*

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<sup>1</sup> Atmospheric species that are involved in the formation, maintenance and removal of both ozone and PM<sub>2.5</sub>; examples include nitric acid, nitrogen dioxide, peroxides and peroxy radicals.

*2) health effects and exposure.....development of monitoring data and samples to support health and exposure studies to reduce uncertainty in National Ambient Air Quality Standards setting and to enable improved health risk assessments; and*

*3)methods testing.... comparison and evaluation of emerging sampling methods with routine techniques to enable a smooth transition to advanced methods.*

### **Eastern Supersites Program (EPS01)**

The ESP01 began early in 2000 as an effort to coordinate an intensive monitoring in July 2001 among the three PM Supersites projects (New York, Pittsburgh, and Baltimore) located in the eastern portion of the US. Over the next year others expressed interest in participating in the program, which lead to active solicitation by EPA for participation from other air quality studies and programs in ESP01. Currently over 30 groups are involved in ESP01 (see Attached table). The primary objective of the program is:

#### **Development of a regional air quality database to support --**

Data Analysis for transport, boundary conditions, and understanding better aloft chemistry and dynamics.

Regional And Sub-Continental Scale Eulerian Modeling

Observationally Based Models

Provide Outer Domain for Neighborhood Scale Modeling.

The intensive monitoring program will occur from June 30, 2001 at 0000 hrs to July 29, 2001 at 2400 hrs. A majority of the programs have either changed their sampling schedule to coincide with this effort and/or enhanced the measurements to be obtained. An extensive set of gas, PM, PM precursor, photochemical, visibility, and meteorological measurements comprise the program. Figure 1 outlines the study domain. Augmenting the ground-based study in the vertical dimension are 4 aircraft (U. MD, LADCO, and TNRCC) and an extensive network of Radar Profilers (NOAA FSL). The NOAA FSL data are of particular importance for understanding transport within and above the boundary layer, a major issue in the eastern half of the US.

An effort has been made to coordinate common measurements among the programs to help ensure modelers and data analysts will be working with uniform databases. EPA's intent is to centralize all air quality and meteorological data in one location within several relational databases to allow for easy access to all or part of the data.

The primary contact for ESP01 coordination is  
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## *Studies Coordinating with ESP01 to Date*

### Southeast US --

1. Houston Supersites,
2. TVA PM2.5 Partnership,
3. Fall Line Air Quality Study,
4. Assessment of Spatial Aerosol Composition in Atlanta,
5. SEARCH
6. ARIES
7. Brenton Air Quality Study (3 Radar Profilers + surface)
8. MMS Off Shore Study (2 Radar Profilers + Surface)
9. TNRCC

### Studies in the Upper Midwest

- DOE Studies in Western PA and the Upper Ohio River Valley
10. Lawrenceville (Urban Pittsburgh, PA) - Upper Ohio River Valley Project
  11. Holbrook (Rural Southwest PA) - Upper Ohio River Valley Project
  12. Steubenville, OH (Urban) - Steubenville Comprehensive Air Monitoring Project
  13. NETL (Suburban Pittsburgh, PA) - NETL Office of Science and Technology (In house) monitoring facility
  14. North Birmingham, AL (Urban) - Southern Fine Particulate Monitoring Project.

- Other Studies in the Upper Midwest
15. Lake Michigan Air Directors (2 aircraft)
  16. St. Louis Supersites
  17. Pittsburgh Supersites

### Mid Atlantic:

18. Baltimore Supersites
19. NE-OPS ( Philadelphia with Aircraft and LIDAR)
20. March-Atlantic -- Ft Mead

### Northeast:

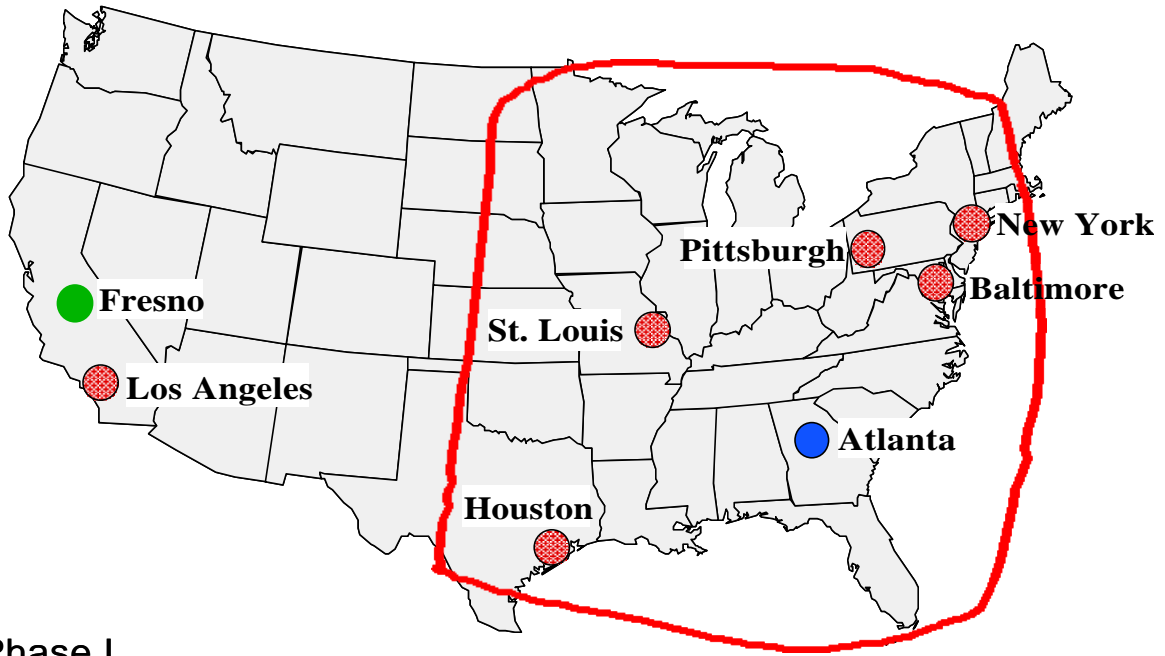
21. NY Supersites
22. New Hampshire Study (4 sites)
23. Boston PM Center
24. Toronto, Canada
25. NY PM Center (Thurston)

### North Central:

26. LADCO: Lake Michigan area with two aircraft and existing surface

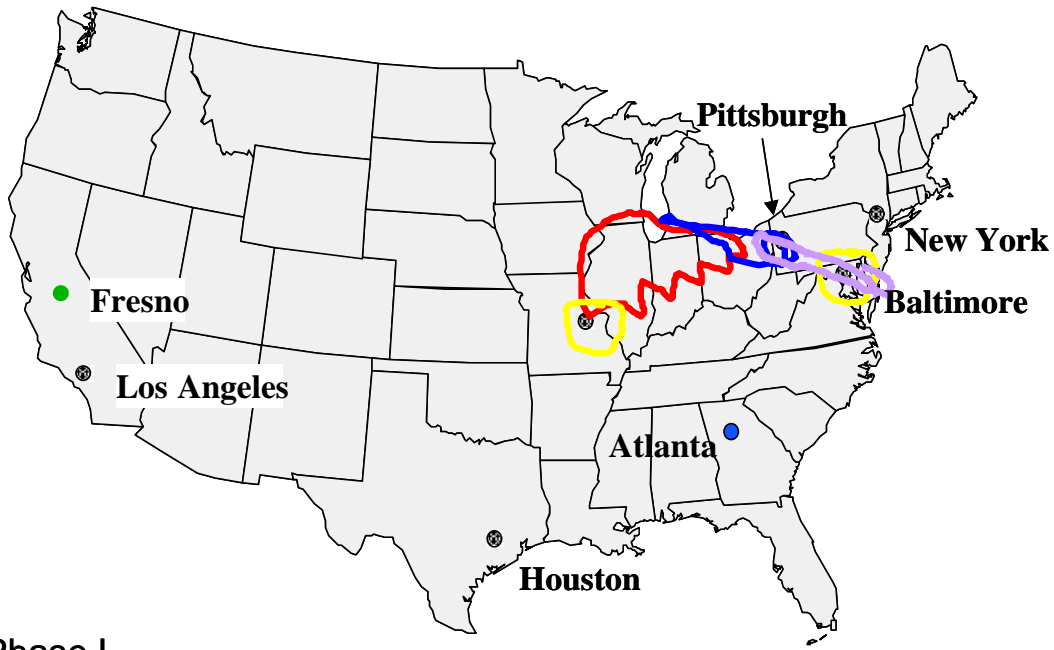
### National

27. NOAA - Demonstration Division Profiler Program
28. EPA PM2.5 National FRM Network
29. EPA PM2.5 National Chemical Speciation Network
30. NPS/EPA PM2.5/PM10 IMPROVE Network
31. EPA CASTNet Network
32. EPA PAMS Network



- Phase I
- Phase II
- Both Phases

ESP01 General Study



- Phase I
- Phase II
- Both Phases

— U MD Plane Flight Path

General Aircraft Flight Plans