

1999 Atlanta Supersite Data in the NARSTO Archive

The 1999 Atlanta Supersites Project was conducted during August 1999 in Atlanta, Georgia. This 4-week intensive study (August 3 to September 1, 1999) brought together over 150 scientists and technicians making a variety of measurements using advanced state-of-the-science systems, such as the particle mass spectrometers, semi-continuous species specific PM methods, and discrete chemical speciation samplers for mass and the major chemical components of mass. The study was coordinated by the Southern Oxidants Study (SOS) in collaboration with numerous universities and agencies that comprise SOS as well as several on-going air quality research programs occurring in Atlanta at the time of this study. The Atlanta Supersites Project was located at the existing SEARCH/ARIES site on Jefferson St. in NW Atlanta, GA. The primary objective of the Atlanta Supersites Project was to evaluate and compare advanced measurement methods for particulate matter mass and its components. Methods included filter/denuder based time-integrated or discrete samplers, a variety of semi-continuous methods measuring mass, its major components (sulfate, nitrate, ammonium, organic carbon, elemental carbon, trace elements) and gas phase precursors, and for the first time ever, a comparison among particle mass spectrometers, four in total. These data were complemented by meteorological data as well as gas phase criteria pollutant measurements and other supplemental data, such as particle physical properties, VOC, oxygenated VOC, and NO_y. The primary and supplemental data also were used to better understand the formation and accumulation of PM in Atlanta and to better understand source-receptor relationships.

The comprehensive database developed as a result of this study is available publicly through the NARSTO web site. This long-term archival and public distribution of NARSTO validated electronic data and data products are located at the NARSTO Permanent Data Archive (PDA) operated by the NASA Langley Research Center Distributed Active Archive Center (DAAC). The Langley DAAC provides no-cost ordering and FTP retrieval of NARSTO project data at [URL: http://eosweb.larc.nasa.gov/PRODOCS/narsto/table_narsto.html](http://eosweb.larc.nasa.gov/PRODOCS/narsto/table_narsto.html). Information about the archiving process is available at the NARSTO Quality System Science Center (QSSC) at [URL: http://cdiac.esd.ornl.gov/programs/NARSTO/narsto.html](http://cdiac.esd.ornl.gov/programs/NARSTO/narsto.html). Atlanta Supersites project data files are stored in the NARSTO Data Exchange Standard (DES) format. Data Exchange Standard files are self-documenting, with the essential information contained in the same file as the data. These files are easily read by spreadsheets and relatively easy to create with spreadsheets software. They are saved as ASCII comma-separated value (.csv) files. Data Exchange Standard files are composed of key phrases, metadata tables and data tables. Metadata is information about the content, quality, condition and additional characteristics of the data. Typical metadata tables includes a station information table, a measurement method information table, a lookup table where codes appearing in data tables are cross-referenced with descriptions, and a measurement data table that contains the actual data. The measurement data table besides presenting the actual data, it provides information about the when and where of the collection of measurement of each value, define any missing value, and provides references to definitions of standard and/or nonstandard flags as well as any project specific quality codes. Therefore, A DES file contains header information about the contents of the file and the data originator, metadata entries that identify sites, flags, units, and sampling and analysis methods, and a main data table of measurement results. The DES file can be directly imported into an Excel spreadsheet or other software. Project documentation about the data collection is associated with the data set in the PDA.

When the DES file has been filled in with metadata and data, a copy is saved in ASCII CSV (comma-separated values) format. The ASCII file is the final storage format for the archive. The ASCII file is submitted to the Quality Assurance Center (QAC), currently it is part of the NARSTO QSSC, where the file is run through a set of quality assurance tests. The QAC provides the results of the QA tests (and sometimes statistical summaries and time series plots) to the data originator. The data originator reviews the reports, makes corrections as needed, and resubmits the file to the QAC. After a final check, the ASCII file becomes the master copy of the data and is placed in the archive.

As of this writing (November, 2002), 38 Atlanta supersite files, involving 969,469 measurements, have been produced and submitted to the QAC for QA/QC. All of these 38 files have been accepted for

permanent storage at the NARSTO archive. A description of the 38 files that includes principal investigator, principal investigator's affiliation, status, instrumentation used and type of measurements follows:

Karsten Baumann (3 files)

Georgia Institute of Technology

Accepted for permanent storage

- PCM: Multi-channel denuder filter pack system for PM_{2.5} mass, ions, organic carbon (OC), elemental carbon (EC), and gaseous ammonia, nitric and light organic acids, and sulfur dioxide.
- Met and criteria gases (atmospheric pressure, ambient temperature, relative humidity, wind speed and wind direction, global and UV radiation, NO, NO_y, O₃, CO, SO₂).

Purmendu Dasgupta (4 files)

Texas Tech University

Accepted for permanent storage

- Automated IC with continuous parallel plate denuder collection and analysis system for acid gases
- Automated IC with non-water collection system for sulfate, nitrate, nitrite, chloride, and oxalate
- Semi-continuous HCHO and H₂O₂ (gas)

Piet Jongejan and J. Slanina (2 files)

Netherlands Energy Research Foundation

Accepted for permanent storage

- SJAC: Steam jet aerosol collector for chloride, nitrate, sulfate and ammonium ion and automated IC for on-line analysis.
- Rotating wet denuder for collection of HCl, HONO, HNO₃, SO₂ and NH₃ and automated IC for on-line analysis.

Rodney Weber and Yin-Nan Lee (1 file)

Georgia Institute of Technology and Brookhaven National Laboratory

Accepted for permanent storage

- CPCIC: CNC-based collection for aerosol ion chromatography for chloride, nitrate, sulfate ammonium ion, sodium, potassium, and calcium.

Susanne Hering (1 file)

Aerosol Dynamics, Inc.

Accepted for permanent storage

- ICVC: Integrated collection and vaporization cell for automated nitrate, sulfate and particulate carbon

Petros Koutrakis and George Allen (3 files)

Harvard School of Public Health

Accepted for permanent storage

- CAMMS: pressure drop mass measurement for PM_{2.5}
- HEADS for gaseous ammonia, particle acidity and sulfate
- Aethalometer for black carbon soot.

Michael Bergin (2 files)

Georgia Institute of Technology

Accepted for permanent storage

- Aerosol optical depth, spectral radiometer, sun photometers, RH-controlled TEOM.
- UV radiation measurements

Ted Russell (1 file)

Georgia Institute of Technology

Accepted for permanent storage

- TEOM: tapered element oscillating microbalance for particle mass, with RH control.

Paul Solomon (9 files)

Environmental Protection Agency

Accepted for permanent storage

- 4 types of Speciation Samplers: Andersen, Met One, URG, and VAPS for PM2.5 mass, ions, trace elements, OC/EC
- FRM PM2.5 samplers with Teflon filters for mass and trace elements
- FRM PM2.5 sampler with quartz filter for OC/EC
- Auto Dichotomous sampler with electron microscopy and XRF analysis of fine and coarse PM.

Dennis Savioe (3 files)

University of Miami

Accepted for permanent storage

- MOUDI for ions and trace elements
- MOUDI for OC,EC
- MOUDI for organic speciation
- MOUDI for mass, heavy molecular weight organic compounds

Eric Edgerton (1 file)

Atmospheric Research and Analysis, Inc.

Accepted for permanent storage

- PCM particle composition monitor for PM2.5 mass, trace elements, water-soluble metals, ions, OC/EC.
- Automated catalytic reduction system for ammonium, nitrate, and sulfate. Commercial (R&P) for OC/EC.

Barbara Turpin (1 file)

Rutgers University

Accepted for permanent storage

- In-situ carbon analyzer for organic and elemental carbon

Peter McMurry (4 files)

University of Minnesota

Accepted for permanent storage

- TDMA measurements of water uptake
- DMA-APM measurements of particle density
- DMPS 3: Particle size distributions 3 nm-3 um

Hal Maring (1 file)

University Miami

Accepted for permanent storage

TSI nephelometer for particle light scattering at three wavelengths

Rod Zika (1 file)

University of Miami

Accepted for permanent storage

- On-line GC for volatile organics and oxygenates

Roger Tanner (1 file)

TVA Environmental Research Center

Accepted for permanent storage

- Particle Concentrator Speciation Sampler BYU Design-Ions and OC/EC data