NARSTO EPA_SS_FRESNO BAM Particulate Mass Concentration Data

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1. Data Set Description:

This data set contains measurements taken from two Beta Attenuation Monitors (BAM) operated at the Fresno Supersite. The PM10 BAM has been operating from December 4, 1999 to present and the PM2.5 BAM has been operating from December 16, 1999 to present. One BAM samples through an impactor size-selective inlet to collect particles with aerodynamic diameters less than 10µm at a flow rate of 16.7 liters/min. The other BAM samples through a cyclone size-selective inlet to collect particles with aerodynamic diameters less than 2.5µm at a flow rate of 16.7 liters/min. Each BAM reports data for one hour.

The MetOne Beta Attenuation Mass Monitor (BAM) measures the attenuation of a beam of beta particles (electrons) generated by a 14C source that is transmitted through an aerosol sample collected on a glass fiber filter tape. Before sample collection, the beta attenuation is measured through a clean part of the tape to obtain a baseline. A sample is collected on the same location on the tape. After sample collection, the beta attenuation is measured through the exposed part of the tape. The net attenuation is proportional to the amount of mass collected on the filter. A mass flow controller controls the flow rate during sample collection at a flow rate of approximately 16.7 l/min. The mass concentration of the collected aerosol is determined from the net attenuation, the sample air flow, the sample time, and the attenuation coefficient for the instrument.

The **Fresno Supersite** is one of several Supersites that was established in urban areas within the United States by the U.S. Environmental Protection Agency (EPA) to better understand the measurement, sources, and health effects of suspended particulate matter (PM). The site is located at 3425 First St., approximately 1 km north of the downtown commercial district. First Street is a four-lane artery with moderate traffic levels. Commercial establishments, office buildings, churches, and schools are located north and south of the monitor. Medium-density single-family homes and some apartments are located in the blocks to the east and west of First Street. The Fresno Supersite began operation in May of 1999 and continues today.

The U.S. EPA Particulate Matter (PM) Supersites Program was an ambient air monitoring research program from 1999-2004 designed to provide information of value to the atmospheric sciences, and human health and exposure research communities. Eight geographically diverse projects were chosen to specifically address these EPA research priorities: (1) to characterize PM, its constituents, precursors, co-pollutants, atmospheric transport, and its source categories that affect the PM in any region; (2) to address the research questions and scientific uncertainties about PM source-receptor and exposure-health effects relationships; and (3) to compare and evaluate different methods of characterizing PM including testing new and emerging measurement methods. Data collected by these projects are publicly available at the NARSTO Permanent Data Archive, NASA Langley DAAC. Data users should acknowledge the U.S. EPA Particulate Matter (PM) Supersites Program and the project investigator(s) listed below.

More information can be found in the Quality Assurance Project Plan (PDF).

The data set should be cited as follows:
Watson, John G. and Judith C. Chow. 2006. NARSTO EPA_SS_Fresno BAM Particulate Mass Concentration Data. Available on-line via NARSTO Data and Informaton at the Atmospheric Science Data Center at NASA Langley Research Center, Hampton, Virginia, U.S.A.

2. Sample Data Record/Data Format:

Data files are in the NARSTO Data Exchange Standard (DES) format that is described in detail on the NARSTO Quality Systems Science Center (QSSC) web site. The files follow a tabular layout and are stored as ASCII comma-separated values files (.csv). The DES does not rely on row position to identify specific information, but uses a tag to describe the information contained in the row. The DES is a self-documenting format with three main sections: the header contains information about the contents of the file and the data originator; the middle section contains metadata tables that describe/define sites, flags, and other codified fields; and the final section is the main data table that contains key sampling and analysis information and the data values. Descriptions of the standardized metadata fields are also available on the QSSC web site.

Quality Control Level

The Quality Control (QC) Level is a number that indicates the overall quality of the data in the main table of the DES formatted files. The *QUALITY CONTROL LEVEL key phrase is located in the first few rows of the DES formatted data file. A short description of the QC level appears in parentheses after the number. As data usage and analyses progress, the Principal Investigator can upgrade the data to a higher QC level than originally submitted. The QC level and effective date for each data file are included in the following table.

Time-Series Plots

Time-series plots are included for all of the numeric variables in each of the data files. These plots are useful for screening for outliers and visualization of values less than the detection limit and values with other quality flags. Please note that some but not all of the plots were visually examined for possible outliers and other issues. Links to the plots for each data file are included in the following table.

Data File	QC Level (Efffective Date)	Links to Time-Series Plots (PDF)
NARSTO_EPA_SS_FRESNO_BAM10_1HR_19991204_19991231_V1.csv	1 (20060830)	View 19991204_19991231
NARSTO_EPA_SS_FRESNO_BAM10_1HR_20000101_20001231_V1.csv	1 (20060830)	View 20000101_20001231
NARSTO_EPA_SS_FRESNO_BAM10_1HR_20010101_20011231_V1.csv	1 (20060830)	View 20010101_20011231
NARSTO_EPA_SS_FRESNO_BAM10_1HR_20020101_20021231_V1.csv	1 (20060830)	View 20020101_20021231
NARSTO_EPA_SS_FRESNO_BAM10_1HR_20030101_20031231_V1.csv	1 (20060830)	View 20030101_20031231
NARSTO_EPA_SS_FRESNO_BAM25_1HR_19991216_19991231_V1.csv	1 (20060830)	View 19991216_19991231
NARSTO_EPA_SS_FRESNO_BAM25_1HR_20000101_20001231_V1.csv	1 (20060830)	View 20000101_20001231
NARSTO_EPA_SS_FRESNO_BAM25_1HR_20010101_20011231_V1.csv	1 (20060830)	View 20010101_20011231
NARSTO_EPA_SS_FRESNO_BAM25_1HR_20020101_20021231_V1.csv	1 (20060830)	View 20020101_20021231
NARSTO_EPA_SS_FRESNO_BAM25_1HR_20030101_20031231_V1.csv	1 (20060830)	View 20030101_20031231

Data Quality Notes

For all BAM data files: A minor study flag issue exists in all of the BAM files. In the "Study standard flags" look-up table, study flags are specified with a length of Char 4. One of the flags (dPimp) has a length of Char 5. This is not an issue in the data table, where the "Flag--study" has been specified with length of Char 24.

For the BAM10 data files: Please note that the BAM10 files have a mismatch in the formats used in the column for "PM10: mass variable". The specified format is Decimal 8.2, but the measured values are integers with no explicit decimal point (e.g., 56). Similarly, the missing value code (-99999) is a six-digit integer (including sign) with no explicit decimal point.

3. References:

- Watson, J.G.; Chow, J.C. A wintertime PM2.5 episode at the Fresno, CA, Supersite; Atmos. Environ. 2002, 36(3), 465-475.
- Watson, J.G.; Chow, J.C.; Bowen, J.L.; Lowenthal, D.H.; Hering, S.V.; Ouchida, P.; Oslund, W. Air quality measurements from the Fresno supersite; JAWMA 2000, 50(8), 1321-1334.
- Watson, J.G.; Chow, J.C. Comparison and evaluation of in-situ and filter carbon measurements at the Fresno Supersite; J. Geophys. Res. 2002, 107(D21), ICC 3-1-ICC 3-15, doi: 10.1029/2001JD000573.
- Watson, J.G.; Chow, J.C.; Hering, S.V.; Fitz, D.R. Final report for Phase I of Fresno supersite measurements; prepared for Cooperative Institute for Atmospheric Sciences and Terrestrial Applications, Las Vegas, NV, by Desert Research Institute: Reno, NV,

2002.

- Watson, J.G.; Chow, J.C.; Lowenthal, D.H.; Stolzenburg, M.R.; Kreisberg, N.M.; Hering, S.V. Particle size relationships at the Fresno supersite; JAWMA 2002, 52(7), 822-827.
- Watson, J.G.; Chow, J.C.; Fitz, D.R. Quality assurance project plan - Fresno Supersite (Revision 0); prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, by Desert Research Institute: Reno, NV, 2000.
- Watson, J.G.; Chow, J.C. Zone of representation for the Fresno, CA supersite; JAWMA 2002, in preparation.

4. Contact Information:

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Data Center:

The User and Data Services Office at the Langley Atmospheric Science Data Center is involved throughout the system to monitor the quality of data on ingest, to ensure prompt replies to user questions, to verify media orders prior to filling them, and to ensure that the needs of the users are being met.

If you have a problem finding what you need, trouble accessing the system, or need an answer to a question concerning the data or how to obtain data, please contact the User and Data Services staff.

Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov
URL: http://eosweb.larc.nasa.gov

5. Acknowledgement:

When data from the Langley Atmospheric Science Data Center are used in a publication, we request the following acknowledgment be included: "These data were obtained from the NASA Langley Research Center Atmospheric Science Data Center".

The Langley Data Center requests a reprint of any published papers or reports or a brief description of other uses (e.g., posters, oral presentations, etc.) of data that we have distributed. This will help us determine the use of data that we distribute, which is helpful in optimizing product development. It also helps us to keep our product-related references current.

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