NARSTO EPA_SS_FRESNO Particle-bound Polycyclic Aromatic Compound Data

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1. Data Set Description:

This data set contains measurements of particle-bound polycyclic aromatic compounds (PAC) from a Photoelectric Aerosol Sensor (PAS) monitor that has been operated at the Fresno supersite from September 30, 1999 to December 31, 2006. The ambient sample is measured continuously and averaged for five minute periods. The sample inlet is a tube with an inverted funnel to protect the inlet from rain but has no specified particle size separation.

The EcoChem Photoelectric Aerosol Sensor (PAS 2000) uses the principle of photoionization to measure particle-bound polycyclic aromatic compounds/hydrocarbons (PAH). The sampled air stream and particles are exposed to radiation at 220 nm from a pulsed excimer lamp. Radiation at this wavelength ionizes PAH-coated aerosols but not gas molecules or non-carbon aerosols. The resulting free electrons are removed from the air stream and the positively charged particles are collected on a filter inside an electrometer where the charge is measured. The resulting electric current is proportional to the concentration of the total particle-bound PAH in the sample with no specification of which PAHs are present. The low volatility of the various PAHs reduces the amount of gaseous PAH in the sample and ensures that the sample is particle-bound PAH. The sample flow rate is measured with a mass flow meter and is controlled by a variable speed motor that maintains a constant mass flow of 2.0 l/min referenced to standard temperature and pressure conditions of 0 °C and 1 atm. Data units for the PAC are currently reported in femptoAmps, as a reliable conversion has not yet been established.

Publishing history:

The PAC data set was originally published in 2003, with data from September 30, 1999 through September 30, 2003. The data provider later replaced these files with similar files containing the same data but with minor differences in metadata and study flags.

The data provider also sent additional files extending the data from October 1, 2003 through December 31, 2006.

The QSSC is republishing this data set in June 2008. The replacement files are now Version 2 (V2) files. The additional 2003-2006 (V1) files are added, and plots are also now added for all of the files.

The V2 files have these minor differences from the original V1 files:
- Study flagging conventions have been revised; and
- Organization and Network names have been updated.

The data values themselves were not changed.

The last replacement file, NARSTO_EPA_SS_FRESNO_PAH-5MIN_20030701_20031231_V2.csv, contains three months of additional data compared to the file it replaces (NARSTO_EPA_SS_FRESNO_PAH-5MIN_20030701_20030930_V1.csv).

The addition of the 2003 to 2006 data completes data reporting for this data set.

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.

TheU.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. 2003. NARSTO EPA_SS_FRESNO Particle-bound Polycyclic Aromatic Compound 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 File 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 (http://cdiac.esd.ornl.gov/programs/NARSTO/]. 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.

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.

Data File Names	Links to Time-Series Plots of Reported Variables (PDF)
NARSTO_EPA_SS_FRESNO_PAH-5MIN_19990930_19991231_V2.csv	View 19990930_19991231_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20000101_20000630_V2.csv	View 20000101_20000630_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20000701_20001231_V2.csv	View 20000701_20001231_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20010101_20010630_V2.csv	View 20010101_20010630_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20010701_20011231_V2.csv	View 20010701_20011231_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20020101_20020630_V2.csv	View 20020101_20020630_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20020701_20021231_V2.csv	View 20020701_20021231_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20030101_20030630_V2.csv	View 20030101_20030630_V2
NARSTO_EPA_SS_FRESNO_PAH-5MIN_20030701_20031231_V2.csv	View 20030701_20031231_V2
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20040101_20040630_V1.csv	View 20040101_20040630_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20040701_20040930_V1.csv	View 20040701_20040930_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20041001_20041231_V1.	View 20041001_20041231_V1

csv	
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20050101_20050630_V1.csv	View 20050101_20050630_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20050701_20051231_V1.csv	View 20050701_20051231_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20060101_20060331_V1.csv	View 20060101_20060331_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20060401_20060630_V1.csv	View 20060401_20060630_V1
NARSTO_EPA_SS_FRESNO_PAH_5MIN_20060701_20061231_V1.csv	View 20060701_20061231_V1

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.

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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
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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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