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1. Data Set Description:

The main mission for the National Research Council - Institute for Aerospace Research (NRC-IAR) Convair 580 was to map the particle spatial distribution in the valley through remote sensing, and to provide critical meteorological data, particle number size distribution and O₃ profiles. Only the latter set of measurements are being archived at this time.

The flights followed mostly meridional and two approximately east-west tracks at 4800 m over the valley for remote sensing using two LIDARs (Strapp and Chevrier, 2001). Spirals from 150-6000 m, for vertical profiles of O₃, particle number size distribution, and meteorological parameters, were conducted at the model western boundary at 49° 20' N and 123° 45' W, at the model southern boundary of 48° 25' N and 123° W, as well as during takeoff and landing. A typical flight covered the valley in eight meridional legs, approximately equally spaced, with three of them directly over the ground sites Slocan Park (SP), Langley Ecole Lochiel (LEL), and Sumas Eagle Ridge (SER). East-west flight tracks were flown north and south of the Fraser River, covering most of the urban centers of the valley to probe the urban-suburban-rural gradient, with additional E-W tracks over the north shore lakes to help understand the valley flow situation.

The remote sensing was based on aerosol backscattering using upward- and downward-looking LIDARs at the 1064 nm wavelength with a depolarization channel (Strawbridge and Snyder, 2004a). The profiles were obtained during aircraft spirals, specifically located at the western and southern boundaries of the domains of air quality models UAM/V and Model 3/CMAQ, and were intended as the input as boundary conditions for further modeling. The Convair mission flights covered an area with boundaries roughly corresponding to the model domain of Model 3/CMAQ application to the region, with the eastern boundary at 121° 52' 30" W and the western boundary at 123° 50' 13" W, and extended from 48° 30' N to 49° 30' N over the mountain tops.

On August 26th and 29th, night missions were flown from approximately 9 p.m. to 2 a.m. the next morning, primarily to map the nighttime movement of the urban plume in the main and secondary valleys (Strawbridge and Snyder, 2004b). The ground site overflights provided an assessment of the vertical thermal structure and the extent of particle spatial distribution over the sites.

The **Pacific 2001 Air Quality Study** was conducted from 1 August to 31 September, 2001 in the Lower Fraser Valley (LFV), British Columbia, Canada. The study consisted of individual research projects organized to address several issues on ambient particulate matter and ozone that are important to policy makers. The ground sampling sites during the study were (1) Cassiar Tunnel, (2) Slocan Park, (3) Langley Ecole Lochiel, (4) Sumas Eagle Ridge, and (5) Golden Ears Provincial Park and aloft measurements were taken from a Convair 580 and a Cessna 188. Selected measurement data have been compiled for each site and aircraft and are archived as site-specific data sets.

A special issue of Atmospheric Environment [Vol. 38(34), Nov 2004] describes specific study objectives (Li, 2004) and presents a series of results papers from the field study.

The data set should be cited as follows:

Li, Shao-Meng. 2004. NARSTO PAC2001 NRC-IAR Convair 580 Particle Count, Ozone, Meteorological Data. Available on-line via [NARSTO Data and Information](#) 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](#). 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.

Data File Name Syntax:

Pacific 2000 data file names are comprised of nine sections, defined as follows:

Model file name: **NARSTO_PAC2001_SLPK_JRB_MET_TOWER_200108D75_V1.csv**

1. Archive project: **NARSTO**
2. Study acronym: **PAC2001**
3. Site ID / Aircraft ID: **4-character abbreviation**

Study site and aircraft abbreviations

Abbreviation	Site Name
BNDDB	Boundary Bay
CSRT	Cassier Tunnel
GEPP	Golden Ears Provincial Park
LNEL	Langley Ecole Lochiel
LPHS	Langley Poppy High School
SLPK	Slocan Park
SLPS	Slope Study
SMMT	Sumas Mountain
CSNA	CFS Cessna 188
CNVR	NRC-IAR Convair 580

4. Principal Investigator ID: **Initials (3 characters)**

Principal Investigator's initials and affiliation

Initials	Name	Affiliation
AMM	Anne Marie Macdonald	Environment Canada
ANL	Anna Lise Norman	University of Calgary
C-M	Cris Mihele	Environment Canada
DKW	Danny Wang	Environment Canada
FAF	Frank Froude	Environment Canada
GVRD	Greater Vancouver Regional District	Greater Vancouver Regional District
HAB	H. A. Weibe	Environment Canada
J-R	Jochen Rudolph	York University
JRB	Jeff Brook	Environment Canada
JWB	Jan Bottenheim	Environment Canada
KGA	Kurt Anlauf	Environment Canada
LAG	Lisa Graham	Environment Canada
M-M	Mike Mozurkewich	York University
M-S	Mahiba Shoeib	Environment Canada
PCB	Peter Brickell	Environment Canada
R-M	Robert McLaren	York University
S-L	Shoa-meng Li	Environment Canada
S-P	Sara Pryor	University of Indiana
S-S	Sangeeta Sharma	Environment Canada
WOR	Douglas Worsnop	Aerodyne Research Inc.



5. Measurement activity: **General measurement type**

6. Instrument name or analysis method: **General analysis method**

7. Sampling date with sampling days or flight number:

- **For Ground-based measurements:** The first date in the data file (YYYYMMDD), followed by the letter "D" and the total number of sampling days.
 - Examples:
 - 20010801D1 (starting August 1, 2001, total of 1 day)
 - 20010815D61 (starting August 15, 2001, total of 61 days)
- **For Aircraft measurements:** The first date in the data file (YYYYMMDD), followed by the letter "F" and the flight number for the date.
 - Examples:
 - 20010815F1 (first flight on August 15, 2001)
 - 20010815F2 (second flight on August 15, 2001)

8. Archive data file version number: The file version number starts at "**V1**". The version number is incremented if the archive data file is replaced.

9. Suffix: **.csv** (comma separated values)

Archived Data Files

File Name	Browse Plot (PDF)
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-01_PR-01_20010814_V1.csv	View FL-01 PR-01 20010814
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-01_PR-02_20010814_V1.csv	View FL-01 PR-02 20010814
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-01_PR-03_20010814_V1.csv	View FL-01 PR-03 20010814
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-01_PR-04_20010814_V1.csv	View FL-01 PR-04 20010814
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-02_PR-01_20010815_V1.csv	View FL-02 PR-01 20010815
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-02_PR-02_20010815_V1.csv	View FL-02 PR-02 20010815
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-02_PR-03_20010815_V1.csv	View FL-02 PR-03 20010815
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-02_PR-04_20010815_V1.csv	View FL-02 PR-04 20010815
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-03_PR-01_20010820_V1.csv	View FL-03 PR-01 20010820
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-03_PR-02_20010820_V1.csv	View FL-03 PR-02 20010820
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-03_PR-03_20010820_V1.csv	View FL-03 PR-03 20010820
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-03_PR-04_20010820_V1.csv	View FL-03 PR-04 20010820
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-04_PR-01_20010825_V1.csv	View FL-04 PR-01 20010825
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-04_PR-02_20010825_V1.csv	View FL-04 PR-02 20010825
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-04_PR-03_20010825_V1.csv	View FL-04 PR-03 20010825
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-04_PR-04_20010825_V1.csv	View FL-04 PR-04 20010825
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-05_PR-01_20010826_V1.csv	View FL-05 PR-01 20010826
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-05_PR-02_20010826_V1.csv	View FL-05 PR-02 20010826
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-05_PR-03_20010826_V1.csv	View FL-05 PR-03 20010826
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-05_PR-04_20010826_V1.csv	View FL-05 PR-04 20010826



NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-06_PR-01_20010826_V1.csv	View FL-06_PR-01_20010826
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-06_PR-02_20010827_V1.csv	View FL-06_PR-02_20010827
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-06_PR-03_20010827_V1.csv	View FL-06_PR-03_20010827
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-06_PR-04_20010827_V1.csv	View FL-06_PR-04_20010827
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-07_PR-01_20010829_V1.csv	View FL-07_PR-01_20010829
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-07_PR-02_20010829_V1.csv	View FL-07_PR-02_20010829
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-08_PR-01_20010829_V1.csv	View FL-08_PR-01_20010829
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-08_PR-02_20010830_V1.csv	View FL-08_PR-02_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-08_PR-03_20010830_V1.csv	View FL-08_PR-03_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-08_PR-04_20010830_V1.csv	View FL-08_PR-04_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-09_PR-01_20010830_V1.csv	View FL-09_PR-01_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-09_PR-02_20010830_V1.csv	View FL-09_PR-02_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-09_PR-03_20010830_V1.csv	View FL-09_PR-03_20010830
NARSTO_PAC2001_CONV_SML_PART-CNT+O3_FL-09_PR-04_20010830_V1.csv	View FL-09_PR-04_20010830

3. References:

- Strapp, J., and W.T. Chevrier, Pacific 2001 flight plan report, 26p, June 2001.
- Strawbridge, K., Snyder, B., 2004a. Planetary boundary layer height determination during Pacific 2001 using the advantage of a scanning lidar instrument. Atmospheric Environment, 38(34), pp. 5861-5871.
- Strawbridge, K., Snyder, B., 2004b. Daytime and nighttime aircraft lidar measurements showing evidence of particulate matter transport into the northern valleys of the Lower Fraser Valley, BC. Atmospheric Environment, 38(34), pp. 5873-5886.
- Li, Shao-Meng. 2004. A concerted effort to understand the ambient particulate matter in the Lower Fraser Valley: the Pacific 2001 Air Quality Study. Atmospheric Environment, Volume, 38(34), pp. 5719-5731. (Pacific 2001 Special Issue)

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.

Please contact us at support-asdc@earthdata.nasa.gov for instructions on mailing reprints.

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