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Saskatchewan Forest Fire Control Centre Surface Meteorological Data

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Saskatchewan Forest Fire Control Centre Surface Meteorological Data

Barry Funk, Richard Strub

Summary

The Saskatchewan Forest Fire Control Centre (SFFCC) provided surface meteorological data to BOREAS from its archive. This data set contains hourly surface meteorological data from 18 of the meteorological stations located across Saskatchewan. Included in these data are parameters of date, time, temperature, relative humidity, wind direction, wind speed, and precipitation. Temporally, the data cover the period of May through September of 1994 and 1995. The data are provided in comma-delimited ASCII files, and are classified as AFM-Staff data.

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1. Data Set Overview

1.1 Data Set Identification

Saskatchewan Forest Fire Control Centre Surface Meteorological Data

1.2 Data Set Introduction

These data contain hourly reports from 18 surface meteorological stations across Saskatchewan, Canada. Included in these data are parameters of date, time, temperature, relative humidity, wind direction, wind speed, and precipitation.

1.3 Objective/Purpose

For the BOREal Ecosystem-Atmosphere Study (BOREAS), the Saskatchewan Forest Fire Control Centre (SFFCC) meteorological data, along with the other climate information, were obtained in order to provide spatially and temporally extensive information over the region. The SFFCC monitoring sites were established to provide hourly weather reports, input to the operational program of forecasts and warnings, input to operational weather prediction models, and climate data.

1.4 Summary of Parameters

Parameters include date, time, temperature, relative humidity, wind direction, wind speed, and precipitation.

1.5 Discussion

These data were compiled by SFFCC from observations at remote automatic weather stations.

1.6 Related Data Sets

BOREAS AFM-07 SRC Surface Meteorological and Radiation Data
BOREAS AES MARS II Surface Meteorological Data
BOREAS AES READAC Surface Meteorological Data
BOREAS AES Five-Day Averaged Surface Meteorological and Upper Air Data
AES Canadian Hourly and Daily Surface Meteorological Data

2. Investigator(s)

2.1 Investigator(s) Name and Title

G. Barrie Atkinson BOREAS AES Project Scientist

2.2 Title of Investigation

BOREAS Staff Science Meteorological Data Acquisition Program

2.3 Contact Information

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3. Theory of Measurements

BOREAS staff does not have any detailed information on how the original full resolution measurements were made at the various SFFCC stations. The best source of information for this would be SFFCC. Due to turnover and staff changes at SFFCC, there is not a single point of contact for these data at this time.

4. Equipment

4.1 Sensor/Instrument Description

BOREAS staff does not have specific descriptions of the various types of instruments used by SFFCC to collect the data. Users are encouraged to contact SFFCC.

4.1.1 Collection Environment

The data were collected continuously in all types of weather.

4.1.2 Source/Platform

None given.

4.1.3 Source/Platform Mission Objectives

None given.

4.1.4 Key Variables

The parameters are date, time, temperature, relative humidity, wind direction, wind speed, and precipitation.

4.1.5 Principles of Operation

None given.

4.1.6 Sensor/Instrument Measurement Geometry

These data were compiled by SFFCC from observations at remote automatic weather stations.

4.1.7 Manufacturer of Sensor/Instrument

None given.

4.2 Calibration

4.2.1 Specifications

None given.

4.2.1.1 Tolerance

None given.

4.2.2 Frequency of Calibration

None given.

4.2.3 Other Calibration Information

None given.

5. Data Acquisition Methods

These data were compiled by SFFCC from observations at remote automatic weather stations.

6. Observations

6.1 Data Notes

None given.

6.2 Field Notes

These are historical data.

7. Data Description

7.1 Spatial Characteristics

7.1.1 Spatial Coverage

The following table contains the latitude and longitude coordinates for each station. Information provided to BOREAS Information System (BORIS) staff indicated that the latitude and longitude coordinates of each station depended on whatever reference map was used at the time of station siting. As such, it is not clear what datum(s) should be associated with the coordinates.

<u>Station Name</u>	<u>Latitude</u>	<u>Longitude</u>
BESNARD, SK	55.3833° N	106.0833° W
DIVIDE, SK	53.8833° N	108.4167° W
VIMY, SK	53.8167° N	107.5500° W
RABBIT HILL, SK	54.3300° N	107.1833° W
BIG RIVER, SK	53.8333° N	107.0333° W
WABENO, SK	54.3500° N	106.4700° W
WASKESIU, SK	53.9167° N	106.0833° W
WEYAKWIN, SK	54.4667° N	105.7833° W
LITTLE BEAR, SK	54.2500° N	104.5000° W
CANDLE LAKE, SK	53.7830° N	105.1330° W
EBCAM, SK	53.6333° N	103.3667° W
WILD CAT HILLS, SK	53.3333° N	102.4844° W
COOKSON, SK	53.6670° N	106.5000° W
TRACEY, SK	54.9167° N	105.5000° W
DORE, SK	54.6081° N	107.3611° W
MIRASTY, SK	54.4730° N	107.1071° W
TAGGART, SK	54.2500° N	107.3968° W
HACKETT, SK	54.0946° N	106.9048° W

7.1.2 Spatial Coverage Map

Not available.

7.1.3 Spatial Resolution

The data represent point measurements of the various parameters at the locations given.

7.1.4 Projection

Not applicable.

7.1.5 Grid Description

Not applicable.

7.2 Temporal Characteristics

7.2.1 Temporal Coverage

All of the stations collected data from 05-May to 30-Sep-1994 and from 01-May to 30-Sep-1995.

7.2.2 Temporal Coverage Map

Not available.

7.2.3 Temporal Resolution

BOREAS received data recorded at 1-hour intervals during the entire data collection period.

7.3 Data Characteristics

7.3.1 Parameter/Variable

The parameters contained in the data files on the CD-ROM are:

Column Name

SITE_NAME
SUB_SITE
DATE_OBS
TIME_OBS
STATION_ID
AIR_TEMP
REL_HUM
WIND_DIR
WIND_SPEED
RAINFALL_LAST_HOUR
RAINFALL_LAST_24HOUR
CRTFCN_CODE
REVISION_DATE

7.3.2 Variable Description/Definition

The descriptions of the parameters contained in the data files on the CD-ROM are:

Column Name

Description

SITE_NAME The identifier assigned to the site by BOREAS, in the format SSS-TTT-CCCCC, where SSS identifies the portion of the study area: NSA, SSA, REG, TRN, and TTT identifies the cover type for the site, 999 if unknown, and CCCCC is the identifier for site, exactly what it means will vary with site type.

SUB_SITE The identifier assigned to the sub-site by BOREAS, in the format GGGGG-IIIIL, where GGGGG is the group associated with the sub-site instrument e.g. HYD06 or STAFF, and IIIIL is the identifier for sub-site, often this will refer to an instrument.

DATE_OBS The date on which the data were collected.

TIME_OBS	The Greenwich Mean Time (GMT) when the data were collected.
STATION_ID	The station identifier from which the measurement came.
AIR_TEMP	The air temperature.
REL_HUM	The calculated relative humidity.
WIND_DIR	The direction from which the wind was traveling, increasing in a clockwise direction from north.
WIND_SPEED	The wind speed.
RAINFALL_LAST_HOUR	The total amount of liquid precipitation that has fallen within the last hour (minute 00).
RAINFALL_LAST_24HOUR	The total amount of rainfall measured during the last 24 hours (12Z to 12Z).
CRTFCN_CODE	The BOREAS certification level of the data. Examples are CPI (Checked by PI), CGR (Certified by Group), PRE (Preliminary), and CPI-??? (CPI but questionable).
REVISION_DATE	The most recent date when the information in the referenced data base table record was revised.

7.3.3 Unit of Measurement

The measurement units for the parameters contained in the data files on the CD-ROM are:

Column Name	Units
SITE_NAME	[none]
SUB_SITE	[none]
DATE_OBS	[DD-MON-YY]
TIME_OBS	[HHMM GMT]
STATION_ID	[none]
AIR_TEMP	[degrees Celsius]
REL_HUM	[percent]
WIND_DIR	[degrees]
WIND_SPEED	[meters][second ⁻¹]
RAINFALL_LAST_HOUR	[millimeters]
RAINFALL_LAST_24HOUR	[millimeters]
CRTFCN_CODE	[none]
REVISION_DATE	[DD-MON-YY]

7.3.4 Data Source

The sources of the parameter values contained in the data files on the CD-ROM are:

Column Name	Data Source
SITE_NAME	[Assigned by BORIS]
SUB_SITE	[Assigned by BORIS]
DATE_OBS	[Supplied by SFFCC]
TIME_OBS	[Supplied by SFFCC]
STATION_ID	[Supplied by SFFCC]
AIR_TEMP	[Supplied by SFFCC]
REL_HUM	[Supplied by SFFCC]
WIND_DIR	[Supplied by SFFCC]
WIND_SPEED	[Supplied by SFFCC]
RAINFALL_LAST_HOUR	[Supplied by SFFCC]

RAINFALL_LAST_24HOUR	[Supplied by SFFCC]
CRTFCN_CODE	[Assigned by BORIS]
REVISION_DATE	[Assigned by BORIS]

7.3.5 Data Range

The following table gives information about the parameter values found in the data files on the CD-ROM.

Column Name	Minimum Data Value	Maximum Data Value	Missng Data Value	Unrel Data Value	Below Detect Limit	Data Not Clctd
SITE_NAME	REG-999-BEA01	SSA-999-WSK01	None	None	None	None
SUB_SITE	STAFF-FRS01	STAFF-FRS01	None	None	None	None
DATE_OBS	05-MAY-94	01-OCT-95	None	None	None	None
TIME_OBS	0	2300	None	None	None	None
STATION_ID	BEAUV	WYKWN	None	None	None	None
AIR_TEMP	-20	37.1	-999	None	None	None
REL_HUM	0	100	-999	None	None	None
WIND_DIR	0	315	-999	None	None	None
WIND_SPEED	0	51.2	-999	None	None	None
RAINFALL_LAST_HOUR	0	31.75	-999	None	None	None
RAINFALL_LAST_24HOUR	0	138.17	None	None	None	Blank
CRTFCN_CODE	CPI	CPI	None	None	None	None
REVISION_DATE	07-AUG-96	04-APR-97	None	None	None	None

Minimum Data Value -- The minimum value found in the column.

Maximum Data Value -- The maximum value found in the column.

Missng Data Value -- The value that indicates missing data. This is used to indicate that an attempt was made to determine the parameter value, but the attempt was unsuccessful.

Unrel Data Value -- The value that indicates unreliable data. This is used to indicate an attempt was made to determine the parameter value, but the value was deemed to be unreliable by the analysis personnel.

Below Detect Limit -- The value that indicates parameter values below the instruments detection limits. This is used to indicate that an attempt was made to determine the parameter value, but the analysis personnel determined that the parameter value was below the detection limit of the instrumentation.

Data Not Clctd -- This value indicates that no attempt was made to determine the parameter value. This usually indicates that BORIS combined several similar but not identical data sets into the same data base table but this particular science team did not measure that parameter.

Blank -- Indicates that blank spaces are used to denote that type of value.

N/A -- Indicates that the value is not applicable to the respective column.

None -- Indicates that no values of that sort were found in the column.

7.4 Sample Data Record

The following are wrapped versions of data record from a sample data file on the CD-ROM.

```
SITE_NAME,SUB_SITE,DATE_OBS,TIME_OBS,STATION_ID,AIR_TEMP,REL_HUM,WIND_DIR,  
WIND_SPEED,RAINFALL_LAST_HOUR,RAINFALL_LAST_24HOUR,CRTFCN_CODE,REVISION_DATE  
'REG-999-BRI02','STAFF-FRS01',05-MAY-94,700,'BRVR',1.1,34.0,90,0.0,0.0,, 'CPI',  
07-AUG-96  
'REG-999-BRI02','STAFF-FRS01',05-MAY-94,800,'BRVR',-.3,38.0,90,0.0,0.0,, 'CPI',  
07-AUG-96
```

8. Data Organization

8.1 Data Granularity

The smallest unit of data is a yearly set of hourly records for one station.

8.2 Data Format(s)

The Compact Disk-Read-Only Memory (CD-ROM) files contain American Standard Code for Information Interchange (ASCII) numerical and character fields of varying length separated by commas. The character fields are enclosed with single apostrophe marks. There are no spaces between the fields.

Each data file on the CD-ROM has four header lines of Hyper-Text Markup Language (HTML) code at the top. When viewed with a Web browser, this code displays header information (data set title, location, date, acknowledgments, etc.) and a series of HTML links to associated data files and related data sets. Line 5 of each data file is a list of the column names, and line 6 and following lines contain the actual data.

9. Data Manipulations

9.1 Formulae

None given.

9.1.1 Derivation Techniques and Algorithms

None given.

9.2 Data Processing Sequence

9.2.1 Processing Steps

BORIS personnel loaded these data into a relational data base and converted the units to match those of other data sets.

9.2.2 Processing Changes

None given.

9.3 Calculations

9.3.1 Special Corrections/Adjustments

None given.

9.3.2 Calculated Variables

None given.

9.4 Graphs and Plots

None given.

10. Errors

10.1 Sources of Error

None given.

10.2 Quality Assessment

None given.

10.2.1 Data Validation by Source

None given.

10.2.2 Confidence Level/Accuracy Judgment

A quality assessment has not been done on these data.

10.2.3 Measurement Error for Parameters

None given.

10.2.4 Additional Quality Assessments

None given.

10.2.5 Data Verification by Data Center

None given.

11. Notes

11.1 Limitations of the Data

See Section 10.2.2.

11.2 Known Problems with the Data

A quality assessment has not been done on these data.

11.3 Usage Guidance

Users are advised to read the information in this document before using the data.

11.4 Other Relevant Information

None given.

12. Application of the Data Set

None given.

13. Future Modifications and Plans

None given.

14. Software

14.1 Software Description

None given.

14.2 Software Access

None given.

15. Data Access

The SFFCC surface meteorological data are available from the Earth Observing System Data and Information System (EOSDIS) Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

15.1 Contact Information

For BOREAS data and documentation please contact:

ORNL DAAC User Services
Oak Ridge National Laboratory
P.O. Box 2008 MS-6407
Oak Ridge, TN 37831-6407
Phone: (423) 241-3952
Fax: (423) 574-4665
E-mail: ornldaac@ornl.gov or ornl@eos.nasa.gov

15.2 Data Center Identification

Earth Observing System Data and Information System (EOSDIS) Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) for Biogeochemical Dynamics
<http://www-eosdis.ornl.gov/>.

15.3 Procedures for Obtaining Data

Users may obtain data directly through the ORNL DAAC online search and order system [<http://www-eosdis.ornl.gov/>] and the anonymous FTP site [<ftp://www-eosdis.ornl.gov/data/>] or by contacting User Services by electronic mail, telephone, fax, letter, or personal visit using the contact information in Section 15.1.

15.4 Data Center Status/Plans

The ORNL DAAC is the primary source for BOREAS field measurement, image, GIS, and hardcopy data products. The BOREAS CD-ROM and data referenced or listed in inventories on the CD-ROM are available from the ORNL DAAC.

16. Output Products and Availability

16.1 Tape Products

None.

16.2 Film Products

None.

16.3 Other Products

These data are available on the BOREAS CD-ROM series.

17. References

17.1 Platform/Sensor/Instrument/Data Processing Documentation

None.

17.2 Journal Articles and Study Reports

Newcomer, J., D. Landis, S. Conrad, S. Curd, K. Huemmrich, D. Knapp, A. Morrell, J. Nickeson, A. Papagno, D. Rinker, R. Strub, T. Twine, F. Hall, and P. Sellers, eds. 2000. Collected Data of The Boreal Ecosystem-Atmosphere Study. NASA. CD-ROM.

Sellers, P. and F. Hall. 1994. Boreal Ecosystem-Atmosphere Study: Experiment Plan. Version 1994-3.0, NASA BOREAS Report (EXPLAN 94).

Sellers, P. and F. Hall. 1996. Boreal Ecosystem-Atmosphere Study: Experiment Plan. Version 1996-2.0, NASA BOREAS Report (EXPLAN 96).

Sellers, P., F. Hall, and K.F. Huemmrich. 1996. Boreal Ecosystem-Atmosphere Study: 1994 Operations. NASA BOREAS Report (OPS DOC 94).

Sellers, P., F. Hall, and K.F. Huemmrich. 1997. Boreal Ecosystem-Atmosphere Study: 1996 Operations. NASA BOREAS Report (OPS DOC 96).

Sellers, P., F. Hall, H. Margolis, B. Kelly, D. Baldocchi, G. den Hartog, J. Cihlar, M.G. Ryan, B. Goodison, P. Crill, K.J. Ranson, D. Lettenmaier, and D.E. Wickland. 1995. The boreal ecosystem-atmosphere study (BOREAS): an overview and early results from the 1994 field year. *Bulletin of the American Meteorological Society*. 76(9):1549-1577.

Sellers, P.J., F.G. Hall, R.D. Kelly, A. Black, D. Baldocchi, J. Berry, M. Ryan, K.J. Ranson, P.M. Crill, D.P. Lettenmaier, H. Margolis, J. Cihlar, J. Newcomer, D. Fitzjarrald, P.G. Jarvis, S.T. Gower, D. Halliwell, D. Williams, B. Goodison, D.E. Wickland, and F.E. Guertin. 1997. BOREAS in 1997: Experiment Overview, Scientific Results and Future Directions. *Journal of Geophysical Research* 102(D24): 28,731-28,770.

17.3 Archive/DBMS Usage Documentation

None.

18. Glossary of Terms

None.

19. List of Acronyms

AES	- Atmospheric and Environment Service
AFM	- Airborne Fluxes and Meteorology
ASCII	- American Standard Code for Information Interchange
BOREAS	- BOREal Ecosystem-Atmosphere Study
BORIS	- BOREAS Information System
CD-ROM	- Compact Disk Read-Only Memory
CGR	- Certified by Group
CPI	- Checked by PI
CPI-???	- CPI but questionable
DAAC	- Distributed Active Archive Center
EOS	- Earth Observing System
EOSDIS	- EOS Data and Information System
GIS	- Geographic Information System
GMT	- Greenwich Mean Time
GSFC	- Goddard Space Flight Center
HTML	- HyperText Markup Language
MARSII	- Meteorological Automatic Reporting System II
MB	- Manitoba
NASA	- National Aeronautics and Space Administration
NSA	- Northern Study Area
ORNL	- Oak Ridge National Laboratory
PANP	- Prince Albert National Park
PI	- Principal Investigator
PRE	- Preliminary
READAC	- Remote Environmental Automated Data Acquisition Concept
SFFCC	- Saskatchewan Forest Fire Control Centre
SK	- Saskatchewan
SSA	- Southern Study Area
T/RH	- Temperature / Relative Humidity
TBRG	- Tipping Bucket Rain Gauge
URL	- Uniform Resource Locator

20. Document Information

20.1 Document Revision Date

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20.2 Document Review Date(s)

BORIS Review: 27-Nov-1998

Science Review:

20.3 Document ID

20.4 Citation

When using these data, please include the following acknowledgment as well as citations of relevant papers in Section 17.2:

These data were collected and provided to BORIS by the Saskatchewan Forest Fire Control Centre. Their willingness and efforts to provide the data are greatly appreciated.

If using data from the BOREAS CD-ROM series, also reference the data as:

Atkinson, G.B. and B. Funk, "BOREAS Staff Science Meteorological Data Acquisition Program." In *Collected Data of The Boreal Ecosystem-Atmosphere Study*. Eds. J. Newcomer, D. Landis, S. Conrad, S. Curd, K. Huemmrich, D. Knapp, A. Morrell, J. Nickeson, A. Papagno, D. Rinker, R. Strub, T. Twine, F. Hall, and P. Sellers. CD-ROM. NASA, 2000.

Also, cite the BOREAS CD-ROM set as:

Newcomer, J., D. Landis, S. Conrad, S. Curd, K. Huemmrich, D. Knapp, A. Morrell, J. Nickeson, A. Papagno, D. Rinker, R. Strub, T. Twine, F. Hall, and P. Sellers, eds. *Collected Data of The Boreal Ecosystem-Atmosphere Study*. NASA. CD-ROM. NASA, 2000.

20.5 Document Curator

20.6 Document URL

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