EARTHDATA

Data Discovery ▾   DAACs ▾   Community ▾   Science Disciplines ▾

ORNL DAAC
DISTRIBUTED ACTIVE ARCHIVE CENTER
FOR BIOGEOCHEMICAL DYNAMICS

NASA

☐ **Sign in**

☐ | **About Us** | **Get Data** | **Submit Data** | **Data Management** | **Tools**

BOREAS AES Canadian Hourly and Daily Surface Meteorological Data, R1

Get Data

Documentation Revision Date: 2017-01-09

Data Set Version: R1

Summary

This data set contains hourly and daily meteorological data from 23 meteorological stations across Canada from January 1975 to January 1997. The surface meteorology parameters include: date, time, temperature, precipitation, snow, snow depth, sea level pressure, station pressure, dew point, wind direction, wind speed, dry and wet bulb temperature, relative humidity, cloud opacity and cloud amount.

The data were provided by The Canadian Atmospheric Environment Service (AES), (later renamed as The Meteorological Service of Canada), for the BOReal Ecosystem-Atmosphere Study (BOREAS) project.

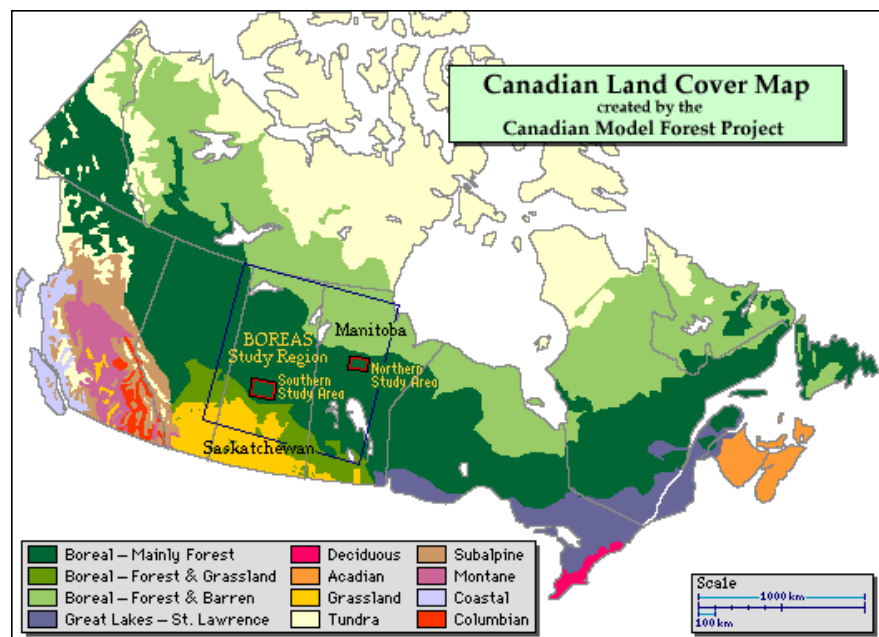There are two data files with this data set in text format (.dat).

Figure 1. Map of the Boreas Project study area. The Northern and Southern study areas are indicated with smaller squares inside the larger red square study area. Background image is Canadian land cover classification at the time of the study.

Citation

Funk, B. 2017. BOREAS AES Canadian Hourly and Daily Surface Meteorological Data, R1. ORNL DAAC, Oak Ridge, Tennessee, USA.

Table of Contents

1. Data Set Overview

This data set contains hourly and daily meteorological data from 23 meteorological stations across Canada from January 1975 to January 1997. The surface meteorology parameters include: date, time, temperature, precipitation, snow, snow depth, sea level pressure, station pressure, dew point, wind direction, wind speed, dry and wet bulb temperature, relative humidity, cloud opacity and cloud amount.

Project: BOReal Ecosystem-Atmosphere Study (BOREAS)

BOREAS was a large-scale experiment initiated in 1990 to investigate interactions between the boreal forest biome and the atmosphere. Data were collected to study the biological and physical processes and conditions that govern the exchanges of radiative energy, water, heat, carbon, and trace gases between boreal forest ecosystems and the atmosphere, particularly those processes that may be sensitive to global change.

Related Data Sets:

Strub, R., and J. A. Newcomer. 1999. BOREAS AES Five-Day Averaged Surface Meteorological and Upper Air Data. ORNL DAAC, Oak Ridge, Tennessee, USA. http://dx.doi.org/10.3334/ORNLDAAC/236

Acknowledgements

For the US, the effort was led by NASA's Earth Science Enterprise with participation from NOAA, NSF, USGS, USFS, and EPA. Significant contributions in the form of funding, data, and personnel were made by the following Canadian agencies: Canada Centre for Remote Sensing, Environment Canada, the Natural Sciences and Engineering Research Council, Agriculture and Agri-Food Canada, National Research Council, Heritage Canada (Parks), Canadian Forest Service, Institute for Space and Terrestrial Science, and Royal Society of Canada.

2. Data Characteristics

Spatial Coverage: BOREAS Study Region as defined in the Boreas Experiment Plan: 1000-km by 1000-km

Spatial Resolution: The data represent point measurements at the locations provided.

Temporal Coverage: 1975-01-01 to 1997-01-01

Temporal Resolution: Daily and hourly data

Study Area: (All latitude and longitude given in decimal degrees)

Site	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Boreas study region	-107.866667	-97.833333	56.866667	52.166667

Table 1. The AES station identifier, the station name, the latitude and longitude coordinates, and the type of reporting for each station. Note that the station numbers starting with 4 are contained in the province of Saskatchewan and the station numbers starting with 5 are in the province of Manitoba.

Station number	Name	Latitude	Longitude	Frequency
4060620	Big River	53.833333	-107 .033333	Daily
4051080	Cameo	53.283333	-106.533333	Daily
4071560	Choiceland	53.5	-104.483333	Daily
4061861	Cree Lake	57.35	-107.133333	Daily
4052448	Ethelton	52.766667	-104.9	Daily

4063020	Green Lake	54.283333	-107.7833333	Daily
4063560	Island Falls	55.533333	-102.25	Daily
4064150	La Ronge A	55.15	-105.266667	Daily, Hourly
4074640	Lost River	53.283333	-104.33333	Daily
4063755	Key Lake	57.25	-105.616667	Daily
4075518	Nipawin A	53.333333	-104	Daily
4056240	Prince Albert A	53.216667	-105.683333	Daily, Hourly
4046360	Rabbit Lake	53.1	-107.866667	Daily
4057120	Saskatoon A	52.166667	-106.683333	Daily, Hourly
4068560	Waskesiu Lake	53.916667	-106.083333	Daily
4068840	Whitesand Dam	56.233333	-103.15	Daily
5060623	Crosslake Jenpeg	53.15	-99.283333	Daily
5050960	Flin Flon A	54.683333	-101.683333	Daily
5031111	Grand Rapids	53.15	-99.283333	Daily
5061646	Lynn Lake A	56.866667	-101.083333	Daily, Hourly
506B047	Norway House A	53.966667	-97.833333	Daily, Hourly
5062529	Ruttan Lake	56.483333	-99.65	Daily
5062922	Thompson A	55.8	-97.866667	Daily, Hourly
5063041	Wabowden	54.916667	-98.65	Daily

Data File Information

There are two data files in a comma-delimited text format (*.dat). Missing values are represented as -999.

Data Filename	Description
canadian_daily.dat	This file contains daily data for the period 1975-01-01 to 1996-11-30
canadian_hourly.dat	This file contains hourly data for the period 1975-01-01 to 1997-01-01

Table 2. Variables in the file **canadian_daily.dat**

Variable name	Units	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.
SUB_SITE		The identifier assigned to the site by BOREAS, in the format GGGGG-IIIII, where GGGGG is the group associated with the sub-site instrument, e.g. HYD06 or STAFF, and IIIII is the identifier for sub-site, often this will refer to an instrument.
DATE_OBS	DD-MON-YYYY	Collection date of data
MAX_AIR_TEMP	Degrees C	The maximum air temperature for the given date

MIN_AIR_TEMP	Degrees C	The minimum air temperature for the given date
MEAN_AIR_TEMP	Degrees C	The mean air temperature for the given date
PRECIP_1200	mm	The total precipitation during the six-hour period ending at 1200 GMT (0600 local time)
PRECIP_1800	mm	The total precipitation during the six-hour period ending at 1800 GMT (1200 local time)
PRECIP_2400	mm	The total precipitation during the six-hour period ending at 2400 GMT (1800 local time)
TOTAL_RAIN_24	mm	The total rainfall within the last 24 hours
TOTAL_SNOW_24	mm	The total snowfall within the last 24 hours
TOTAL_PRECIP_24	mm	The total precipitation (liquid equivalent) in the last 24 hours
SNOW_DEPTH	mm	The depth of snow on the ground
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	DD-MON-YYYY	The most recent date when the information in the referenced data base table record was revised.

Table 3. Variables in the file **canadian_hourly.dat**

Variable name	Units	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.
SUB_SITE		The identifier assigned to the site by BOREAS, in the format GGGGG-IIIII, where GGGGG is the group associated with the sub-site instrument, e.g. HYD06 or STAFF, and IIIII is the identifier for sub-site, often this will refer to an instrument.
DATE_OBS	DD-MM-YYYY	Collection date of data

TIME_OBS	HHMM GMT	The Greenwich Mean Time (GMT) when the data were collected
MSL_PRESS	kPa	The calculated instantaneous mean sea level pressure
DEWPOINT_TEMP	degrees C	The measured dew-point temperature
WIND_DIR	degrees	The direction from which the wind was traveling, increasing in a clockwise direction from north
WIND_SPEED	Meters/second	The wind speed
STN_PRESS	kPa	The measured instantaneous atmospheric pressure at the measurement station
DRY_BULB_TEMP	Degrees C	The temperature measured from the dry-bulb thermometer
WET_BULB_TEMP	Degrees C	The temperature measured from the wet-bulb thermometer
REL_HUM	percent	The calculated relative humidity
TOTAL_CLOUD_AMOUNT	fraction	The total cloud amount (0 -1)
TOTAL_CLOUD_OPACITY	fraction	The total cloud opacity (0-1)
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	DD-MON-YYYY	The most recent date when the information in the referenced data base table record was revised.

3. Application and Derivation

These data could be used for course-scale modeling efforts of for looking at trends in meteorological conditions over time.

4. Quality Assessment

An automated quality assurance program was run on this data set to identify anomalies including sudden jumps or drops (spikes) in the data. Invalid data in the data files are represented as -999.

5. Data Acquisition, Materials, and Methods

The Canadian Atmospheric Environment Service (AES), (renamed as The Meteorological Service of Canada), provided BOREAS with hourly and daily surface meteorological data from 23 of the AES meteorological stations located across Canada (AES 1989). The data include date, time, temperature, precipitation, snow, snow depth, sea level pressure, station pressure, dew point, wind direction, wind speed, dry and wet bulb temperature, relative

humidity, cloud opacity and cloud amount. Generally, these stations were installed before BOREAS began and conform to Environment Canada's criteria for accuracy and exposure. Many of the stations only recorded temperature and precipitation. The AES 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. These data were compiled by AES from historical records held by the Documentation and Data Acquisition Section of the Canadian Climate Centre using combined manual and automated techniques. The data were collected continuously in all types of weather.

Information on the BOREAS project can be found in the following References.

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

[BOREAS AES Canadian Hourly and Daily Surface Meteorological Data, R1](#)

Contact for Data Center Access Information:

- E-mail: uso@daac.ornl.gov
- Telephone: +1 (865) 241-3952

7. References

AES, 1989. Climatological Station Catalogue - Prairie Provinces. Environment Canada. Atmospheric Environment Service.

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

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., F. Hall, and K.F. Huemmrich. 1996. Boreal Ecosystem-Atmosphere Study: 1994 Operations. NASA BOREAS Report (OPS DOC 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. 1997. Boreal Ecosystem-Atmosphere Study: 1996 Operations. NASA BOREAS Report (OPS DOC 96).

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 (JGR), BOREAS Special Issue, 102(D24), Dec. 1997, pp. 28731-28770.

8. Data Set Revisions

This data set contains previously restricted contents made publicly available at this revision. The original data set citation is as follows:

Funk, B. 1999. BOREAS AES Canadian Hourly and Daily Surface Meteorological Data. ORNL DAAC, Oak Ridge, Tennessee, USA.

OAK RIDGE
National Laboratory

Privacy Policy | Feedback | Help

Home	About Us	Get Data	Data Management	Tools	Help	Contact Us
	Who We Are	Complete Data Set List	Plan	Data Search	FAQs	
	Partners	Search for Data	Manage	Site Search		
	User Working Group	Field Campaigns	Archive	Search by DOI		
	Biogeochemical Dynamics	Validation	DAAC Curation	WebGIS		
	Data Citation Policy	Regional/Global	Submit Data	SDAT		
	News	Model Archive		MODIS Land Subsets		
	Workshops			THREDDS		