

Pre-LBA Rondonia Boundary Layer Experiment (RBLE) Data

Summary

This data set contains information about the atmospheric boundary layer conducted during three campaigns conducted over forested and deforested areas in Ji-Parana, Rondonia. Observations were made with radiosondes and tethered balloons. These three Rondonia boundary Layer Experiment (RBLE) campaigns were part of the Anglo-Brazilian Amazonizn Climate Observation study (ABRACOS).

The data were used to characterize differences in the atmospheric boundary layer that develops over forested and cleared areas. In addition the data were used to initialize models that investigate the sensitivity of climate to land-surface parameters and to examine the local effects on climate of deforested areas.

Pre-LBA Data Set Collection Initiative

The Pre-LBA data set collection was dedicated to providing information to the LBA research community about existing data that have been collected in Amazonia during the 20 years prior to 1998. The main goal of this activity was to compile and document existing data sets in a consistent manner and make them available prior to the beginning of the LBA experiment.

The data set compilation efforts included satellite imagery, micrometeorological observations, near surface and upper-air atmospheric conditions, surface biophysical and hydrological measurements obtained from 1970s-1990s in a number of field experiments. Data were collected for several intensive field campaigns, during the rainy and dry seasons, and other periods that vary from short intensive field campaigns to several years worth of observations, measured sometimes with a time resolution of 5 minutes and 1 hour.

Citation:

Cite this data set as follows:

Fisch, G., E. Rocha, S.S. Souza, A.D. Culf, C.A. Nobre, H R. Rocha, R.F. Lyra, A.C.L. Costa, V.N. Ubarana, J. C. Calvet, and I.R. Wright. 2009. Pre-LBA Rondonia Boundary Layer Experiment (RBLE) Data. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/917.

The original CD-ROM citation is as follows:

Marengo, J.A., and R.L. Victoria. 1998. Pre-LBA Data Sets Initiative, 3 vols. [Pre-Large-Scale Biosphere-Atmosphere Experiment in Amazonia Data Sets Initiative, 3 vols.]. CD-ROM. Centro de Previsao de Tempo e Estudos Climaticos, Instituto Nacional de Pesquisas Espaciais (CPTEC/INPE) [Center for Weather Forecasting and Climate Study, National Institute for Space Research], Sao Paulo, Brazil.

Pre-LBA Data Set Collection Metadata

Campaign: RBLE >
Rondonia Boundary Layer
Experiment

Keywords

**RONDONIA
RADIOSONDE
RAWINSONDE
TETHERED BALOON
FOREST
GRASSLAND
PROFILES**

Investigator

Last_name: Fisch
First_name: Gilberto
Email: gfisch@aca.iae.cta.br
Phone: 55 12 3474565
FAX: 55 12 3412522
Address: IAE/CTA/ACA
Praca Marechal Eduardo
Gomes, 5
Vila das Acacias
City: Sao Jose dos Campos
State_or_Province: Sao Paulo
12228-901
Country: Brazil

Last_name: Rocha
First_name: Edson
Middle_name: J. P.
Email: edson@cptec.inpe.br
Phone: +55-12-560.8413
FAX: +55-12-560.8413
Address: INPE/CPTEC
Rodovia Presidente Dutra, Km
40
C. P.01 - Zip code:12630-000
City: Cachoeira Paulista
State_or_Province: Sao Paulo
Country: Brazil

Last_name: Souza
First_name: Solange
Middle_name: Silva
Phone: 55-12-560-8413
FAX: 55-12-561-2835
Address: INPE
Rodvia Presidente Dutra KM 39
City: Cachoeira Paulista 12630-
000
State_or_Province: SP
Country: Brazil

Last_name: Culf
First_name: Alistair
Middle_name: D.
Address: Institute of Hidrology
Crowmarsh Gifford OX108BB
City: Wallingford
Country: UK

Last_name: Nobre
First_name: Carlos
Middle_name: A.
Email: nobre@cptec.inpe.br
Phone: +55 12 561 2822
FAX: +55 12 561 2835
Address: CPTEC-INPE
Rodovia Presidente Dutra, Km

Last_name: Ubarana
First_name: Vinicios
Middle_name: N.
Address: The Weather Channel
Cumberland Parkway
City: Atlanta 30339
State_or_Province: Georgia
Country: USA

Last_name: Calvet
First_name: Jean
Middle_name: Christophe
Email: calvet@meteo.fr
Phone: 33-61079341
FAX: 33-61079626
Address: CNRM
Meteo-France
42 Avenue G Coriolis
City: Toulouse 31057
State_or_Province: Cedex
Country: France

Last_name: Wright
First_name: Ivan
Middle_name: R.
Address: Institute of Hydrology
Crowmarsh Gifford
City: Wallingford OX108BB
Country: UK

Technical_Contact

Last_name: Fisch
First_name: Gilberto
Email: gfisch@aca.iae.cta.br
Phone: 55 12 3474565
FAX: 55 12 3412522
Address: IAE/CTA/ACA
Praca Marechal Eduardo Gomes, 5
Vila das Acacias
City: Sao Jose dos Campos
State_or_Province: Sao Paulo 12228-901
Country: Brazil

Start_Date: 1992-09-10
Stop_Date: 1994-08-25

Coverage

Southernmost_latitude: 11S
Northernmost_latitude: 10S
Westernmost_longitude: 62W
Easternmost_longitude: 61W
Minimum_altitude: 120m
Maximum_altitude: 220m

Location: South America

Author

Last_name: Fisch
First_name: Gilberto
Email: gfisch@aca.iae.cta.br
Phone: 55 12 3474565
FAX: 55 12 3412522
Address: IAE/CTA/ACA
Praca Marechal Eduardo Gomes, 5
Vila das Acacias
City: Sao Jose dos Campos
State_or_Province: Sao Paulo 12228-901
Country: Brazil

Data_Center

Data_Center_Name: CPTEC/INPE,CTA,UFAL,UFGA,IH-UK
Data_Center_URL: <http://www.cptec.inpe.br/lba/prelba/prelba.html>

<p>40 Caixa Postal 01 City: Choeira Paulista - 12630-000 State_or_Province: SP Country: Brazil</p> <p>Last_name: Rocha First_name: Humberto Middle_name: Ribeiro Email: humberto@helicon.iag.usp.br Phone: 55 11 8184705 FAX: 55 11 8184714 Address: Departamento de Ci•ncias Atmosfericas Universidade de Sao Paulo R. Matao 1226 - Cidade Universitaria City: Sao Paulo State_or_Province: Sao Paulo 05508-900 Country: Brazil</p> <p>Last_name: Lyra First_name: Roberto Middle_name: F. da F. Address: Universidade Federal de Alagoas City: Maceio State_or_Province: Alagoas 57072-970 Country: Brazil</p> <p>Last_name: Costa First_name: Antonio Middle_name: Carlos Lola Address: Universidade Federal do Para</p>	<p>Dataset_ID: RBLE</p> <p>Data_Center_Contact Last_name: Fisch First_name: Gilberto Email: gfisch@aca.iae.cta.br Phone: 55 12 3474565 FAX: 55 12 3412522 Address: IAE/CTA/ACA Praca Marechal Eduardo Gomes, 5 Vila das Acacias City: Sao Jose dos Campos State_or_Province: Sao Paulo 12228-901 Country: Brazil</p> <p>Constraints Access: Data may not be used for commercial applications. Use: Data may not be used for commercial applications.</p>
--	---

Data Description

During ABRACOS, three ABL measurement campaigns were carried out. These campaigns were called the Rondonia Boundary Layer Experiment (RBLE) 1, 2 and 3 and were held at Ji-Parana where the scale of the forested and deforested areas is large enough for each surface type to develop its own atmospheric boundary layer (ABL).

The data collected in each of the three campaigns has been compiled and compressed into separate .zip files: RBLE1.zip, RBLE2.zip, and RBLE3.zip.

Descriptions of the campaigns, data file formats, and examples of data files are provided below.

RBLE1: First Mission of the RBLE Project, Reserva Jaru, near Ji-Parana, Rondonia

These files are from the First Mission of the RBLE Project, at the city of Ji-Parana/RO.

This mission took place at the "Reserva" site, in forest area. The data was compiled for the period September 11-October 3 1992.

Initially, 120 radiosonde launchings were scheduled but due to problem with the equipment, 2 were lost.

The soundings with tethered balloon were used to follow the diurnal development of the moisture layer and depended on weather conditions, since the launchings were made in good weather and no rain. 70 launchings were actually made.

1) Files bcddmmhh.lim; the files were checked for consistency (elimination of unusual values and bugs);

2) Files "B(S or D)ddmmhxxx.COR

These were implemented from the files (*.lim). In this case the vertical oscillations of the balloon were eliminated using some software. The ascending and descending were separated in two different files (s=ascending, d=descending). All these information are referred to tethered balloon.

RBLE1: Reserva Jaru, near Ji-Parana, Rondonia, Example Data Records

BC130917.LIM

173655	123.	993.7	23.55	22.70	17.37	297.23	0.8	31.
173706	123.	993.7	23.53	22.63	17.27	297.22	0.6	40.
173716	127.	993.3	23.52	22.63	17.29	297.25	0.9	27.
173726	131.	992.9	23.53	22.60	17.24	297.29	0.6	28.
173737	131.	992.8	23.60	22.56	17.15	297.36	0.5	87.
173747	130.	993.0	23.62	22.54	17.11	297.36	0.5	107.
173758	136.	992.3	23.70	22.51	17.04	297.51	0.6	115.

BD130917.COR

175325	137	978.7	25.78	20.71	13.69	300.78	1.0	139
175335	136	978.9	25.78	20.70	13.67	300.76	1.0	140
175346	134	979.0	25.76	20.68	13.65	300.72	1.2	145
175407	131	979.3	25.72	20.64	13.60	300.66	1.1	148
175427	128	979.7	25.70	20.57	13.50	300.61	1.2	150
175448	125	980.1	25.63	20.53	13.47	300.50	1.1	149
175519	122	980.3	25.35	20.62	13.72	300.20	1.5	150
175530	120	980.6	25.24	20.63	13.77	300.07	1.6	152
175540	119	980.7	25.23	20.63	13.77	300.04	1.6	148
175632	117	980.9	25.17	20.63	13.81	299.97	1.6	145

RBLE2: FARM (farm = fazenda)

README for the FAZENDA data files

Each file, with radiosonde data, shows the following structure: ddmmhh.aed,

where hh is the time of launching, mm is the month, and dd is the date.

The files with tethered balloon were organized in up (ascending) and dow (descending)

with the following structure:

bcddhh.up (des): bc is tethered balloon, dd date, and hh is the time of ascending.

The format of the files *.aed is as follows:

- 1o. column -> minutes
- 2o. column -> seconds
- 3o. column -> altitude from the station level (m)
- 4o. column -> pressure (mb)
- 5o. column -> dry bulb temperature (C)
- 6o. column -> Humidity (%)
- 7o. column -> wet bulb temperature (C)
- 8o. column -> wind direction (degrees)
- 9o. column -> wind speed (m/s)

The format of the *.up and *.dow is as follows:

- 1o. column -> hour
- 2o. column -> height (m)
- 3o. column -> pressure (mb)
- 4o. column -> dry bulb temperature (C)
- 5o. column -> wet bulb temperature (C)
- 6o. column -> potential temperature (C)
- 7o. column -> wind speed (m/s)
- 8o. column -> wind direction (degrees)

The radiosondes were launched with weather balloons of 350 gr, radiosonde Vaisala RS80-15 and equipment MARWIN MW-12. The soundings of tethered balloon were made with balloon type Zepellin and equipment ATMOSPHERIC DATA ACQUISITION SYSTEM - ADAS.

RBLE2: FARM, Example for FAZENDA

170721.AED

0 0	220	983.0	29.9	63	22.1	180	2.0
0 10	274	977.0	28.0	49	16.3	195	2.4
0 20	333	970.6	27.5	50	16.2	206	3.1
0 30	387	964.7	27.0	51	16.0	213	3.8
0 40	436	959.3	26.5	51	15.6	218	4.6
0 50	480	954.6	26.1	52	15.5	222	5.4
1 0	523	950.0	25.8	52	15.2	224	6.2
1 10	570	944.9	25.3	54	15.4	226	6.9
1 20	632	938.2	24.7	55	15.1	227	7.6
1 30	686	932.5	24.2	56	14.9	228	8.1
1 40	737	927.1	23.7	57	14.7	229	8.5

BC1821.UP

214340	2.	982.2	28.16	21.96	302.86	0.3	138.	40050F
214350	2.	982.2	28.03	21.75	302.73	0.6	150.	40050F
214401	2.	982.3	28.02	21.59	302.72	0.8	157.	40050E
214411	6.	981.8	28.09	21.54	302.83	0.7	160.	40050F
214421	2.	982.3	28.04	21.53	302.73	0.7	158.	40050F
214432	3.	982.2	28.01	21.55	302.71	0.7	156.	40050E
214442	7.	981.7	28.12	21.55	302.86	1.0	152.	40050F
214452	16.	980.7	28.39	21.55	303.23	1.2	146.	40050E
214503	22.	980.0	28.45	21.56	303.35	1.4	152.	40050E
214513	22.	980.0	28.57	21.55	303.47	1.3	155.	40050F
214524	29.	979.3	28.55	21.58	303.52	1.3	162.	40050E
214534	33.	978.8	28.54	21.52	303.54	1.4	160.	40050F

BC1821.DOW

220208	88888888	88888888	88888888	19.43	88888888	88888888	88888888	40050F
220218	88888888	88888888	88888888	88888888	88888888	1.9	88888888	40050D
220229	443.	934.4	25.06	19.45	304.05	88888888	88888888	40050E
220239	460.	932.6	24.99	88888888	304.15	1.4	116.	40050F
220249	88888888	88888888	24.99	19.36	88888888	88888888	127.	40050F
220300	88888888	88888888	88888888	19.44	88888888	1.6	135.	40050F
220310	88888888	88888888	88888888	88888888	88888888	1.7	135.	40050E
220320	88888888	936.0	88888888	88888888	88888888	88888888	125.	40050F
220331	566.	921.4	25.07	88888888	305.28	1.8	88888888	40050E
220341	88888888	88888888	25.26	20.51	88888888	1.8	109.	40050E

RBLE2: FLORESTA (floresta = forest)

README for the FLORESTA data files:

These are files about the launching of radiosondes (arquivos *.aed) and tethered balloon (*.dow e *.up).

Each file, with radiosonde data follows this structure: dmmhh.aed, where hh is the launching time, mm is the month and dd the date.

The tethered balloon data was grouped in sub (ascending) and des (descending) with the following structure: bcddhh.up (des),

where bc is the tethered balloon, dd date, hh is the launching time.

The format of the files *.aed is as follows:

- 1o. column -> minutes
- 2o. column -> seconds
- 3o. column -> altitude from the station level (m)
- 4o. column -> pressure (mb)
- 5o. column -> dry bulb temperature (C)
- 6o. column -> Humidity (%)
- 7o. column -> wet bulb temperature (C)
- 8o. column -> wind direction (degrees)
- 9o. column -> wind speed (m/s)

The format of the *.up and *.dow is as follows:

- 1o. column -> hour
- 2o. column -> height (m)
- 3o. column -> pressure (mb)
- 4o. column -> dry bulb temperature (C)
- 5o. column -> wet bulb temperature (C)
- 6o. column -> potential temperature (C)
- 7o. column -> wind speed (m/s)
- 8o. column -> wind direction (degrees)

The radiosondes were launched with weather balloons of 350 gr, radiosonde Vaisala RS80-15 and equipment MARWIN MW-12.

The soundings of tethered balloon were made with balloon type Zepellin and equipment ATMOSPHERIC DATA ACQUISITION SYSTEM - ADAS.

RBLE2: FLORESTA Example for FLORESTA

030700.AED

0 0	120	995.8	27.0	85	24.3	45	0.1
0 10	168	990.5	27.4	86	24.9	9	0.5
0 20	218	984.9	27.8	73	22.5	5	0.9
0 30	266	979.7	28.2	66	21.3	3	1.3
0 40	316	974.2	28.0	64	20.6	2	1.8
0 50	366	968.7	27.8	64	20.4	2	2.2
1 0	413	963.5	27.3	65	20.2	2	2.7
1 10	470	957.4	27.0	67	20.4	1	3.1
1 20	522	951.8	26.5	67	19.9	1	3.4
1 30	574	946.3	26.1	68	19.8	1	3.7

BC0415.UP

145633	0.	999.8	29.04	24.82	302.21	1.1	243.	40050D
145704	5.	999.2	29.58	24.97	302.79	1.6	266.	40050E
145735	19.	997.7	29.20	24.44	302.55	2.0	256.	40050D
145806	31.	996.4	28.96	24.23	302.42	2.5	252.	40050D
145837	49.	994.3	29.04	23.99	302.69	2.0	249.	40050D
145908	62.	992.9	29.00	23.78	302.76	2.7	260.	40050D
145939	76.	991.3	28.81	23.66	302.71	2.4	253.	40050D
150011	93.	989.4	28.60	23.61	302.66	2.5	276.	40050D
150042	103.	988.3	28.51	23.69	302.68	2.7	274.	40050D
150113	118.	986.6	28.32	23.53	302.63	3.1	270.	40050D
150144	129.	985.5	28.13	23.48	302.54	2.9	269.	40050D
150215	144.	983.8	28.06	23.52	302.63	2.6	271.	40050D

BC0415.DOW

153828	1231.	869.3	19.13	18.05	304.23	3.2	39.	40050E
153859	1226.	869.8	20.03	17.28	305.12	0.0	39.	40050E
153930	1221.	870.3	20.76	16.35	305.83	-0.0	39.	40050E
154001	1204.	872.0	21.67	16.54	306.60	0.0	16.	40050E
154032	1183.	874.1	22.15	16.75	306.89	0.0	37.	40050E
154103	1176.	874.8	21.78	16.69	306.43	0.0	47.	40050F
154134	1167.	875.7	22.13	16.84	306.71	0.0	38.	40050F
154205	1161.	876.3	21.70	16.90	306.20	0.0	44.	40050F
154236	1150.	877.4	21.85	17.47	306.24	0.0	35.	40050E
154307	1141.	878.4	22.05	17.92	306.36	0.1	39.	40050E
154339	1130.	879.4	22.08	18.08	306.28	0.0	39.	40050F
154410	1122.	880.3	21.59	17.60	305.69	0.0	41.	40050F
154441	1111.	881.4	21.53	17.96	305.52	0.0	34.	40050F

RBLE3: Fazenda (farm) Nossa Senhora de Aparecida

Documentation on data from RBL3 provided by Dr. Alistair Culf (Institute of Hydrology, UK):

README for filenames: *.dat

COLUMN 1= Date month, location: Fazenda Nossa Senhora de Aparecida
COLUMN 2= year
COLUMN 3= Local time
COLUMN 4= (C) air temperature
COLUMN 5= (C) variance of air temperature
COLUMN 6= (G/KG) specific humidity
COLUMN 7= (G/KG) variance of specific humidity
COLUMN 8= (M/S) vertical velocity
COLUMN 9= (M/S) variance of vertical velocity
COLUMN 10=(M/S) wind speed
COLUMN 11=(M/S) variance of wind speed
COLUMN 12= (V/S) friction velocity
COLUMN 13= (W/M2) - H - sensible heat flux
COLUMN 14= (W/M2) - LE - latent heat flux
COLUMN 15= (W/2) Net radiation (nor measured by HYDRA, data comes from the AWS)
COLUMN 16= Recovery factor (discard RN since it was not measured)
COLUMN 17= Atmospheric stability (Z/L) (L=Monin-Obhukov parameter)
COLUMN 18= Ratio entre sigma/ W/sigma U*
COLUMN 19= QV parameter (if QV4 or QV<-4, then WV are dubious)
COLUMN 20= (S/M) Calculated atmospheric conductance
COLUMN 21= status (correct data= 0000, wrong data=3333)
VALORES -9999 indicates lack of data and values marked as -xxxx in fluxes
indicate that they should be subtracted by -9000 (estimated following Monin-Obhukov theory)

README for filenames: *.pvz

Example Format:

Started at 13 August 94 21:2 GMT1:2

Station : 313

Location : 10.10 S 61.90 W 120 120 m

Sounding type : PTU Omega

RS-number : 072649446

Sounding processor serial number: 644189er:

Ground check : Ref RS Corr Corr

Pressure : 1000.4 998.3 2.1 2.1

Temperature : 29.7 29.8 -0.1-0.1

Humidity : 0 -1 1 1

Clouds : /////

Special 1 : /////

Special 2 : /////

Telemetry noise level : 100 %

P	T	U		
Accepted (%)	: 99.6	99.8	99.499.4	
Replaced (%)	: 0.4	0.2	0.6 0.6	
Rejected (%)	: 0.0	0.0	0.0 0.0	

Omega stations in wind calculations (%)tion

Norway	: 46.6
Liberia	: 20.7
Hawaii	: 100.0
North Dakota	: 100.0
La Reunion	: 87.1
Argentina	: 100.0
Australia	: 99.4
Japan	: 0.0
Krasnodar	: 0.0
Komsomolskamur	: 0.0
Novosibirsk	: 0.0

Reason for termination : Increasing pressure

Time	Pressure	Height	Temperature	RH	Speed	Direction
min	s	hPa	gpm	deg C	%	m/s deg.
0	0	1000.5	120	32.0	80	0.5 330
0	10	992.7	190	29.1	56	0.7 348
0	20	987.1	240	28.7	57	0.8 5
0	30	981.3	293	28.2	58	0.9 22
0	40	975.8	343	27.8	59	1.0 38
...						

RBLE3: Fazenda (farm) Nossa Senhora de Aparecida, Example Data Records

FNSRBLE3.DAT

H2-11AUG 94 11-12	20.8	0.54	11.1	1.90	0.16	0.62	5.2	0.36	0.48	128	76	-1-327.4	-0.06	1.3	-
1.3 23 2100															
H2-11AUG 94 12-13	21.2	0.75	11.0	0.63	0.18	0.66	5.2	0.36	0.50	216	152	-1-604.4	-0.10	1.3	-
1.7 21 0000															
H2-11AUG 94 13-14	21.8	0.74	10.9	0.52	0.19	0.71	5.5	0.35	0.58	238	155	-1-630.5	-0.09	1.2	-
1.8 16 0000															
H2-11AUG 94 14-15	21.6	0.42	11.0	0.77	0.17	0.53	5.1	-9999	0.39	73	70	-1-237.0	-0.04	1.4	-
1.2 32 0000															
H2-11AUG 94 15-16	21.2	0.33	11.2	0.46	0.14	0.53	4.5	0.27	0.39	65	78	-1-228.0	-0.05	1.4	-
1.3 29 0000															
H2-11AUG 94 16-17	20.7	0.19	11.7	-9999	0.14	0.40	4.0	-9999	0.29	28	38	-1-98.7	-0.03	1.4	-
1.1 46 0000															
H2-11AUG 94 17-18	19.7	-9999	12.0	-9999	0.09	0.30	3.1	0.12	0.22	3	19	-1-63.4	-0.02	1.3	-
0.8 61 0000															
H2-11AUG 94 18-19	18.6	-9999	12.3	-9999	0.00	0.12	2.1	-9999	0.06	-4	5	-1-13.1	0.01	2.1	-
0.3 593 0000															

FO081321.PVZ

Complete listing of Fine Structure

File: C:\RBLE3\94081321.02E

Started at 13 August 94 21:2 GMT1:2

Station : 313

Location : 10.10 S 61.90 W 120 120 m

Sounding type : PTU Omega

RS-number : 072649446

Sounding processor serial number: 644189er:

Ground check : Ref RS Corr Corr

Pressure : 1000.4 998.3 2.1 2.1

Temperature : 29.7 29.8 -0.1-0.1

Humidity : 0 -1 1 1

Clouds : ////

Special 1 : ////

Special 2 : ////

Telemetry noise level : 100 %

P T U

Accepted (%) : 99.6 99.8 99.499.4

Replaced (%) : 0.4 0.2 0.6 0.6

Rejected (%) : 0.0 0.0 0.0 0.0

Omega stations in wind calculations (%)tion

Norway : 46.6

Liberia : 20.7

Hawaii : 100.0

North Dakota : 100.0

La Reunion : 87.1

Argentina : 100.0

Australia : 99.4

Japan : 0.0

Krasnodar : 0.0

Komsomolskamur : 0.0

Novosibirsk : 0.0

Reason for termination : Increasing pressure

Time Pressure Height Temperature RH Speed Direction

min	s	hPa	gpm	deg C	%	m/s	deg.
0	0	1000.5	120	32.0	80	0.5	330
0	10	992.7	190	29.1	56	0.7	348
0	20	987.1	240	28.7	57	0.8	5
0	30	981.3	293	28.2	58	0.9	22
0	40	975.8	343	27.8	59	1.0	38
0	50	970.4	392	27.3	60	1.1	52
1	0	964.7	444	26.8	61	1.1	66
1	10	959.1	496	26.3	63	1.1	78
1	20	953.2	550	25.9	63	1.1	88
1	30	947.4	604	25.3	64	0.9	95

BC1317F.SCO

174238	1	1000.40	26.55	24.48	18.76	299.67	0.00	242
174249	3	1000.20	26.55	24.41	18.64	299.68	0.00	266
174259	4	1000.10	26.57	24.38	18.59	299.72	0.00	293
174309	8	999.60	26.67	24.47	18.70	299.86	0.00	284
174320	15	998.80	26.92	24.57	18.78	300.18	0.00	248
174330	25	997.70	27.10	24.74	19.00	300.44	0.10	162
174341	34	996.70	27.61	24.25	17.98	301.05	0.80	132
174351	42	995.80	27.94	23.80	17.12	301.45	1.00	128
174401	51	994.70	28.19	23.45	16.47	301.80	1.30	115
174412	60	993.70	28.23	23.29	16.22	301.93	1.30	111
174422	71	992.60	28.27	23.16	16.02	302.06	1.40	97
174432	81	991.50	28.32	23.05	15.85	302.21	1.40	99
174443	88	990.60	28.29	23.02	15.83	302.25	1.30	105
174453	97	989.70	28.24	23.00	15.84	302.29	1.30	97
174503	107	988.60	28.16	22.96	15.83	302.30	1.30	100
174514	117	987.40	28.12	22.92	15.81	302.36	1.20	98
174524	126	986.40	28.03	22.90	15.84	302.37	1.30	105

Rondonia Boundary Layer Experiment: Background Information

The atmospheric boundary layer (ABL) is the layer of air closest to the ground which is directly influenced on a daily basis by the heating and cooling of the earth's surface. The exact depth of the ABL varies according synoptic weather conditions and the time of day. During the daytime it is usually between 1 and 3 km; during the night it is much shallower. The ABL is important because it links the fluxes of heat and water vapor observed at the surface to the general circulation of the atmosphere. To model climate correctly, it is necessary for the ABL to be well understood and represented in the model. Because the air in the ABL is turbulent, small scale variations (about 1 km or less) in evaporation and heat flux at the surface are smoothed, with the temperature, humidity and depth of the ABL being uniform over the entire area. Larger scale variations (on the scale of 10 km or more) may lead to differences in ABL properties between the different surface types. Such differences may cause local atmospheric circulations to develop which may be important for the local climate of an area. During the Anglo-Brazilian Amazonian Climate Observation Study (ABRACOS), three ABL measurement campaigns were carried out. These campaigns were called the Rondonia Boundary Layer Experiment (RBLE) 1, 2 and 3 and were held at Ji-Parana where the scale of the forested and deforested areas is large enough for each surface type to develop its own ABL. Refer to the related data set, Pre-LBA Anglo-Brazilian Amazonian Climate Observation Study (ABRACOS) Data, for additional information.

The data collected in each of the campaigns and the data file formats are described in the Data Description section. The processed, quality controlled and integrated data in the documented Pre-LBA Data sets were originally published as a set of three CD-ROMs (Marengo and Victoria, 1998) but are now archived individually.

The RBLE campaigns were held during the dry season when the difference in evaporation between the two surfaces types, forest and pasture, is at its greatest. Measurements were made with both free-flying radiosondes which measure temperature, humidity, and wind up to about 12 km and with a tethered balloon which makes more detailed measurements in the lowest 1 km of the atmosphere. Measurements were made at both the forest and clearing sites. Profiles of potential temperature measured during RBLE2 show that the daytime ABL was deeper over the clearing than the forest. The data have been used to test several models of ABL development. The ABL over pastures or over clearings grows more rapidly than predicted by the models, possibly because of the increased turbulence generated by the strips of forest typical of this area. The data have also been used to initialize one-dimensional climate models used in experiments to investigate the sensitivity of climate to land surface parameters, and to initialize a mesoscale model which can predict local effects on climate caused by the pattern of deforestation in this area.

References

- Culf, A.D.; Fisch, G.; Malhi, Y.; Nobre, C.A. The influence of the atmospheric boundary layer of carbon dioxide concentrations over a tropical forest. *Agricultural and Forest Meteorology*, 85 (1-2):149-187, 1997.
- Dolman, A.J.; Silva Dias, M.A.F.; Calvet, J.C.; Ashby, M.; Tahara, A.S.; Delire, C.; Kabat, P.; Fisch, G.; Nobre, C. A. Meso- scale effects of tropical deforestation in Amazonia: preparatory LBA modelling studies, *Annales geophysicae*, 17(8): 1095-1110.
- Fisch, G.; Nobre, C.A. The atmospheric boundary layer in the Amazon region. *Proceedings of the Special Symposium on Boundary Layer and Turbulence (77 Annual Meeting of AMS)*, Long Beach, 2-7/2/97, p. 72-75, 1997.
- Rocha, H.R.; Nobre, C.A.; Bonatti, J.P.; Wright, I.R.; Sellers, P.J. A vegetation-atmosphere interaction study for Amazonia deforestation using field data and a "single column" model. *Quarterly Journal of the Royal Meteorological Society*, 122(531): 567-594.

Academic Thesis and Dissertations:

- da Silva, J.T. Estimativa regional de fluxos de calor sensível e latente em áreas de floresta e pastagem na Amazonia, 111p.
- Carmo, A.M.C. do. Estudo da Estrutura Termodinâmica da Atmosfera sobre a Amazonia. Tese de Mestrado, INPE, São José dos Campos, Brasil, 111 p, 1996.
- Fisch, G. Camada Limite Amazônica: aspectos observacionais e de modelagem. Tese de Doutorado (INPE 6123 - TDI/584), INPE, São José dos Campos, Brasil, 171p, 1996.
- Souza, S. S., A Substituição da Floresta Amazônica por Pastagem e sua Repercussão ao Nível da Termodinâmica da Camada Limite Atmosférica: Projeto RBLE. Tese de Mestrado, UFPB, Campina Grande, 103p, 1997.
- Silva, M.A.V. Modelagem Estatístico-Dinâmica de Média Zonal Incluindo Parametrização explícita da Vegetação. Tese de Doutorado, INPE, São José dos Campos, Brasil, 156 p, 1996.

Books

- Fisch, G.; Culf, A.D.; Nobre, C.A. Modelling convective boundary layer growth in Rondonia. In: Gash, J.H.C.; Nobre, C.A.; Roberts, J.M. e Victoria, R.L. (eds). *Amazonia deforestation and climate*. John Wiley & Sons, Chichester (UK), p. 425-435, 1996.
- Nobre, C.A.; Fisch, G.; Rocha, H.R.; Lyra, R.F.F.; Rocha, E.J.P.; Costa, A.C.L. da; Ubarana, V.N. Observations of the atmospheric boundary layer in Rondonia. In: Gash, J.H.C.; Nobre, C.A.; Roberts, J.M. e Victoria, R.L. (eds.). *Amazonia deforestation and climate*. John Wiley & Sons, Chichester (UK), p.425-435, 1996.
- Silva Dias, M.A.F.; Regnier, P. Simulations of mesoscale circulations in a deforested area in Rondonia in the dry season. In: Gash, J.H.C.; Nobre, C.A.; Roberts, J.M.; Victoria, R.L., ed. *Amazonia deforestation and climate*. John Wiley & Sons, Chichester (UK), p. 425-435, 1996.

Data Access:

This data is available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) [<http://daac.ornl.gov>].

Data Archive Center:

Contact for Data Center Access Information:

E-mail: uso@daac.ornl.gov

Telephone: +1 (865) 241-3952

| [ORNL DAAC Home](#) || [ORNL Home](#) || [NASA](#) || [Privacy, Security, Notices](#) || [Data Citation](#) || [Rate Us](#) || [Help](#) |
[User Services](#) - Tel: +1 (865) 241-3952 or E-mail: uso@daac.ornl.gov .
webmaster@daac.ornl.gov