TITLE

CAMP_NorthEastThai_Nakhornratchasima_20021001_20030331.sfc

CONTACT

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DATE OF THIS DOCUMENT

31 Aug. 2004
(Updated 3 July. 2006)

1. 0 DATASET OVERVIEW

1.1 Introduction

To clarify the energy and water cycle in the Thailand, it is important to understand the characteristics of the basic meteorological elements and surface fluxes.
The purpose of Nakhorn-ratchasima-AWS (Automatic Weather Station) observation is to monitor these meteorological values and analyse the mechanisms of the energy and water cycle in the Cassava field in tropical Monsoon areas.

1.2 Time period covered by the data

Start: 1 October 2002, 00:00
End: 31 March 2003, 23:00

1.3 Temporal characteristics of the data

All parameters are recoded every hour.

1.4 Physical location of the measurement

Latitude : 14.466 N
Longitude : 102.379 E
Elevation : 311.0m a.s.l.
Landscape : Cassava Field
Canopy height : Cassava canopy height: 250cm (in dry season there is no vegetation).
From May to Oct. the height of the Cassava is change with the growing season, while the maximum height is around the 250cm.

Soil Characteristics: Uniform acrisols up to 7 m depth

1.5 Data source

1.6 WWW address references

None

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

The sensors are mounted on several heights.

2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Station Pressure	PTB220C	VAISALA
Air Temperature	TS-801(pt100)	Okazaki
Relative Humidity	HMP45D	VAISALA
Wind Speed	3 cup anemometer(VS-125) Propeller type(WS-D32)	Komatsu Komatsu
Wind Direction	WS-D32	Komatsu
Precipitation	NOAH- Ⅱ	ETI
Incoming Shortwave	CM-21	Kipp & Zonen
Outgoing Shortwave	CM-21	Kipp & Zonen
ncoming Long wave	Precision Infrared Radiometer	Eppley
Outgoing Long wave	Precision Infrared Radiometer	Eppley
Skin Temperature	P-IRt/C･1X-T50F	Exergen

2.3 Instrumentation specification

Station Pressure (0m) : Station Pressure at the 0 m height (hPa)
Air Temperature (9.5m) : Air Temperature at the 9.5m height (deg.C)
Relative Humidity (9.5m) : Specific Humidity at the 9.5m height (%)
Wind Speed (10.5m) : Wind Speed at the 10.5m height (m/s)
Wind Direction (10.5m) : Wind Direction at the 10.5m height (deg.)
Precipitation (Variable) : Precipitation at the 0 to 4m (mm)
(Installation height was changed with the growth of vegetation.)
Incoming Shortwave (4m) : Shortwave Downward Radiation at the 4m height (W/m^2)
Outgoing Shortwave (4m) : Shortwave Upward Radiation at the 4m height (W/m^2)
Incoming Long wave (4m) : Long wave Downward Radiation at the 4m height (W/m^2)
Outgoing Long wave (4m) : Long wave Upward Radiation at the 4m height (W/m^2)
Skin Temperature (4m) : Skin Temperature at the 4 m (deg.C)

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

Observed Data are sent to the data manager everyday using E-mail tele-communication system established by the Tokyo University of Agriculture and Technology.

3.2 Description of derived parameters and processing techniques used

Station Pressure is measured using a capacitive absolute pressure sensor, a kind of aneroid type barometer. When the pressure changes, the silicon diaphragm bend and changes the height of the vacuum gap in the sensor. This changes the capacitance of the sensor, which is measured and converted into a pressure reading.
Air temperature is measured by using Pt100 resistance thermometer.
Relative humidity is measured by using the thin-film polymer sensor. The thin polymer film either absorbs or releases water vapor as the relative humidity of the ambient air rises or drops. The dielectric properties of the polymer film depend on the amount of water contained in it: as the relative humidity changes the dielectric properties of the film change and so the capacitance of the sensor changes. The electronics of the instrument measure the capacitance of the sensor and convert it into a humidity reading.
Wind speed and direction is measured by using Young wind sensor.
Precipitation is measured by tipping bucket rain gauge.
Incoming Shortwave is measured by using pyranometer. The sensing element consists of a wire-wound thermopile constructed of electroplated copper on constantan, covered with black paint that has a spectrally flat absorption response. It is protected from environment effects (wind, etc.) using two concentric glass dome covers. Thermopiles detect the increase in temperature caused by the absorption of heat from solar radiation.
(**Note**: As there were noise upward and downward shortwave radiation in the night-time, the data under 5 W/m2 was replaced in the value 0.00 and flagged I. (G is flagged to the original 0 W/m2 data.))

Long wave radiation beyond 3 micrometer is measured by using pyradiometer. The principal of sensor is the same as pyranometer. It uses a specially coated silicon dome that transmits incoming radiation with wavelength of more than 3 micrometer by cutting off shorter wavelengths.
Skin Temperature is measured by radiation thermometer.

And the Four parameters indicated below were computed by using “CEOP Derived Parameter Equations: http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html”. Also put the data flag “I”,

Dew Point Temperature is computed by using (Bolton 1980):

es = 6.112 * exp((17.67 * T)/(T + 243.5));
e = es * (RH/100.0);
Td = log(e/6.112)*243.5/(17.67-log(e/6.112));

where:
T = temperature in deg C;
es = saturation vapor pressure in mb;
e = vapor pressure in mb;
RH = Relative Humidity in percent;
Td = dew point in deg C

Specific Humidity is computed by using (Bolton 1980):

e = 6.112*exp((17.67*Td)/(Td + 243.5));
q = (0.622 * e)/(p - (0.378 * e));

where:
e = vapor pressure in mb;

Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U, V Components were computed by using (GEMPAK):
U = -sin (direction) * wind_speed;
V = -cos (direction) * wind_speed;

NET radiation (GEMPAK):
NET_radiation = down (in) short + down (in) long - up (out) short - up (out) long;

3.3 Format description

http://www.eol.ucar.edu/projects/ceop/dm/documents/refdata_report/ceop_sfc_met_format.html

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.
The quality control flags follow the CEOP data flag definition document.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS

6.1 PI's assessment of the data

6.1.1 Instruments problems

None.

6.1.2 Quality issues

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided by the Coordinated Enhanced Observation Period (CEOP) Asian Monsoon Project (CAMP) supported by Japan Science and Technology Agency (JST) under the framework of GEWEX Asian Monsoon Experiment Tropics (GAME-T).

8.0 REFERENCES

None

9.0 Missing Data Periods

File Name : CAMP_NorthEastThai_Nakhonrachasima_20030401_20030930.sfc
Data Period : 2003/04/01 00:00 - 2003/09/30 23:00

Station Pressure
2003/09/03 06:00 - 2003/09/04 08:00 (27)

Air Temperature
2003/07/21 18:00
2003/07/21 20:00
2003/07/23 22:00
2003/07/26 19:00
2003/08/14 16:00
2003/08/18 23:00
2003/08/19 23:00 - 2003/09/04 08:00 (370)

Dew Point Temperature
2003/04/27 07:00 - 2003/05/01 03:00 (93)
2003/07/21 18:00
2003/07/21 20:00
2003/07/23 22:00
2003/07/26 19:00
2003/08/14 16:00
2003/08/18 23:00
2003/08/19 17:00 - 2003/08/19 20:00 (4)
2003/08/19 23:00 - 2003/09/04 08:00 (370)

Relative Humidity
2003/04/27 07:00 - 2003/05/01 03:00 (93)
2003/08/20 00:00 - 2003/09/04 08:00 (369)

Specific Humidity
2003/04/27 07:00 - 2003/05/01 03:00 (93)
2003/07/21 18:00
2003/07/21 20:00
2003/07/23 22:00
2003/07/26 19:00
2003/08/14 16:00
2003/08/18 23:00
2003/08/19 17:00 - 2003/08/19 20:00 (4)
2003/08/19 23:00 - 2003/09/04 23:00 (385)

Wind Speed
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Wind Direction

2003/09/03 06:00 - 2003/09/04 07:00 (26)

U Wind Component
2003/09/03 06:00 - 2003/09/04 07:00 (26)

V Wind Component
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Precipitation
2003/09/01 22:00
2003/09/02 22:00

Snow Depth
2003/04/01 00:00 - 2003/09/30 23:00 (ALL)

Incoming Shortwave
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Outgoing Shortwave
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Incoming Longwave
2003/08/04 00:00
2003/08/14 17:00
2003/08/20 21:00
2003/09/03 01:00 - 2003/09/04 07:00 (31)

Outgoing Longwave
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Net Radiation
2003/08/04 00:00
2003/08/14 17:00
2003/08/20 21:00
2003/09/02 18:00 - 2003/09/04 07:00 (38)

Skin Temperature
2003/07/21 18:00
2003/07/23 22:00
2003/07/25 23:00 - 2003/07/26 01:00 (3)
2003/07/26 06:00
2003/07/26 14:00
2003/07/26 16:00
2003/07/26 19:00
2003/07/28 22:00
2003/08/14 16:00
2003/08/17 01:00
2003/09/03 06:00 - 2003/09/04 07:00 (26)

Incoming PAR
2003/04/01 00:00 - 2003/09/30 23:00 (ALL)

Outgoing PAR

2003/04/01 00:00 - 2003/09/30 23:00 (ALL)

TITLE

CAMP_NorthEastThai_Nakhonrachasima_20030401_20030930.sfc

CONTACT

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DATE OF THIS DOCUMENT

29 May 2006

1. 0 DATASET OVERVIEW

1.7 Introduction

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The purpose of Nakhorn-ratchasima-AWS (Automatic Weather Station) observation is to monitor these meteorological values and analyse the mechanisms of the energy and water cycle in the Cassava field in tropical Monsoon areas.

1.8 Time period covered by the data

Start: 1 April 2003, 00:00
End: 30 September 2003, 23:00

1.9 Temporal characteristics of the data

All parameters are recoded every hour.

1.10 Physical location of the measurement

Latitude : 14.466 N
Longitude : 102.379 E
Elevation : 311.0m a.s.l.
Landscape : Cassava Field
Canopy height : Cassava canopy height: 250cm (in dry season there is no vegetation).
From May to Oct. the height of the Cassava is change with the growing season, while the maximum height is around the 250cm.
Soil Characteristics: Uniform acrisols up to 7 m depth

1.11 Data source

1.12 WWW address references

None

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

The sensors are mounted on several heights.

2.2 Description of the instrumentation

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Skin Temperature	P-IRt/C･1X-T50F	Exergen

2.4 Instrumentation specification

Station Pressure (0m) : Station Pressure at the 0 m height (hPa)
Air Temperature (9.5m) : Air Temperature at the 9.5m height (deg.C)
Relative Humidity (9.5m) : Specific Humidity at the 9.5m height (%)
Wind Speed (10.5m) : Wind Speed at the 10.5m height (m/s)
Wind Direction (10.5m) : Wind Direction at the 10.5m height (deg.)
Precipitation (Variable) : Precipitation at the 0 to 4m (mm)
(Installation height was changed with the growth of vegetation.)
Incoming Shortwave (4m) : Shortwave Downward Radiation at the 4m height (W/m^2)
Outgoing Shortwave (4m) : Shortwave Upward Radiation at the 4m height (W/m^2)
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Outgoing Long wave (4m) : Long wave Upward Radiation at the 4m height (W/m^2)
Skin Temperature (4m) : Skin Temperature at the 4 m (deg.C)

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

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Relative humidity is measured by using the thin-film polymer sensor. The thin polymer film either absorbs or releases water vapor as the relative humidity of the ambient air rises or drops. The dielectric properties of the polymer film depend on the amount of water contained in it: as the relative humidity changes the dielectric properties of the film change and so the capacitance of the sensor changes. The electronics of the instrument measure the capacitance of the sensor and convert it into a humidity reading.
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Precipitation is measured by tipping bucket rain gauge.
Shortwave radiation is measured using a pyranometer. The sensing element consists of a wire-wound thermopile constructed of electroplated copper on constantan, covered with black paint that has a spectrally flat absorption response. It is protected from environment effects (wind, etc.) using two concentric glass dome covers. Thermopiles detect the increase in temperature caused by the absorption of heat from solar radiation.
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e = es * (RH/100.0);
Td = log(e/6.112)*243.5/(17.67-log(e/6.112));
```

where:
T = temperature in deg C;
es = saturation vapor pressure in mb;
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RH = Relative Humidity in percent;
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Specific Humidity is computed by using (Bolton 1980):

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e = 6.112*exp((17.67*Td)/(Td + 243.5));
q = (0.622 * e)/(p - (0.378 * e));
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where:
e = vapor pressure in mb;
Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U,V Components are computed by using (GEMPAK):
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;

NET radiation (GEMPAK):
NET_radiation = down (in) short + down (in) long - up (out) short - up (out) long;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.
The quality control flags follow the CEOP data flag definition document.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS

6.1 PI's assessment of the data

6.1.1 Instruments problems

None.

6.1.2 Quality issues

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided by the Coordinated Enhanced Observation Period (CEOP) Asian Monsoon Project (CAMP) supported by Japan Science and Technology Agency (JST).

8.0 REFERENCES

None

9.0 Missing Data Periods

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Dew Point Temperature
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CONTACT

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DATE OF THIS DOCUMENT

29 Nov. 2006
(Updated 08 Feb. 2007)

1. 0 DATASET OVERVIEW

1.13 Introduction

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The purpose of Nakhorn-ratchasima-AWS (Automatic Weather Station) observation is to monitor these meteorological values and analyse the mechanisms of the energy and water cycle in the Cassava field in tropical Monsoon areas.

1.14 Time period covered by the data

Start: 1 October 2003, 00:00
End: 31 December 2004, 23:00

1.15 Temporal characteristics of the data

All parameters are recoded every hour.

1.16 Physical location of the measurement

Latitude : 14.466 N
Longitude : 102.379 E
Elevation : 311.0m a.s.l.
Landscape : Cassava Field
Canopy height : Cassava canopy height: 250cm (in dry season there is no vegetation).
From May to Oct. the height of the Cassava is change with the growing season, while the maximum height is around the 250cm.
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1.17 Data source

1.18 WWW address references

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where:
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es = saturation vapor pressure in mb;
e = vapor pressure in mb;
RH = Relative Humidity in percent;
Td = dew point in deg C

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e = 6.112*exp((17.67*Td)/(Td + 243.5));
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where:
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Td = dew point in deg C;
p = surface pressure in mb;

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U,V Components are computed by using (GEMPAK):
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;

NET radiation (GEMPAK):
NET_radiation = down (in) short + down (in) long - up (out) short - up (out) long;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface. The quality control flags follow the CEOP data flag definition document.
The incoming and outgoing longwave radiation were suspiciously low during 2003/10/22 00:00 to 2004/04/01 23:00 because of sensor maintenance and another reason. Then we put “B” flag for them.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS

6.1 PI's assessment of the data

6.1.1 Instruments problems

None.

6.1.2 Quality issues

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided by the Coordinated Enhanced Observation Period (CEOP) Asian Monsoon Project (CAMP) supported by Japan Science and Technology Agency (JST).

8.0 REFERENCES

None

9.0 Missing Data Periods

File Name : CAMP_NorthEastThai_Nakhonrachasima_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/04/09 23:00
2004/06/14 21:00
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Air Temperature
2003/10/21 13:00 - 2003/10/21 18:00 (6)
2003/11/11 14:00 - 2003/11/12 00:00 (11)
2003/12/29 00:00
2004/01/08 03:00
2004/01/10 10:00
2004/01/10 19:00 - 2004/01/11 02:00 (8)
2004/01/15 00:00 - 2004/01/15 01:00 (2)
2004/01/15 22:00 - 2004/01/16 01:00 (4)
2004/01/17 01:00
2004/01/18 00:00 - 2004/01/18 01:00 (2)
2004/01/19 00:00
2004/01/30 09:00 - 2004/01/30 10:00 (2)
2004/01/30 14:00 - 2004/01/30 18:00 (5)
2004/01/30 20:00
2004/01/31 00:00 - 2004/01/31 01:00 (2)
2004/01/31 09:00
2004/02/01 09:00 - 2004/02/01 10:00 (2)
2004/02/02 06:00 - 2004/02/02 10:00 (5)
2004/02/03 07:00 - 2004/02/03 09:00 (3)
2004/02/03 13:00 - 2004/02/03 21:00 (9)
2004/02/06 01:00 - 2004/02/06 06:00 (6)
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/03/03 12:00 - 2004/03/03 15:00 (4)
2004/03/04 07:00 - 2004/03/04 12:00 (6)
2004/03/05 07:00 - 2004/03/05 11:00 (5)
2004/03/06 05:00 - 2004/03/06 11:00 (7)
2004/03/07 08:00 - 2004/03/07 10:00 (3)
2004/03/08 05:00 - 2004/03/08 12:00 (8)
2004/03/09 04:00 - 2004/03/09 11:00 (8)
2004/03/10 05:00 - 2004/03/10 09:00 (5)
2004/03/11 07:00 - 2004/03/11 10:00 (4)
2004/03/12 08:00 - 2004/03/12 09:00 (2)
2004/03/22 06:00 - 2004/03/22 09:00 (4)
2004/03/23 10:00
2004/03/24 09:00
2004/03/26 05:00
2004/03/26 07:00 - 2004/03/26 10:00 (4)
2004/03/29 09:00 - 2004/03/29 10:00 (2)
2004/03/29 12:00 - 2004/03/29 18:00 (7)
2004/03/29 22:00
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Dew Point Temperature
- 2003/10/21 13:00 - 2003/10/21 18:00 (6)
- 2003/11/11 14:00 - 2003/11/12 00:00 (11)
- 2003/12/29 00:00
- 2004/01/08 03:00
- 2004/01/10 10:00
- 2004/01/10 19:00 - 2004/01/11 02:00 (8)
- 2004/01/15 00:00 - 2004/01/15 01:00 (2)
- 2004/01/15 22:00 - 2004/01/16 01:00 (4)
- 2004/01/17 01:00
- 2004/01/18 00:00 - 2004/01/18 01:00 (2)
- 2004/01/19 00:00
- 2004/01/30 09:00 - 2004/01/30 10:00 (2)
- 2004/01/30 14:00 - 2004/01/30 18:00 (5)
- 2004/01/30 20:00
- 2004/01/31 00:00 - 2004/01/31 01:00 (2)
- 2004/01/31 09:00
- 2004/02/01 09:00 - 2004/02/01 10:00 (2)
- 2004/02/02 06:00 - 2004/02/02 10:00 (5)
- 2004/02/03 07:00 - 2004/02/03 09:00 (3)
- 2004/02/03 13:00 - 2004/02/03 21:00 (9)
- 2004/02/06 01:00 - 2004/02/06 06:00 (6)
- 2004/03/01 00:00 - 2004/03/01 05:00 (6)
- 2004/03/03 12:00 - 2004/03/03 15:00 (4)
- 2004/03/04 07:00 - 2004/03/04 12:00 (6)
- 2004/03/05 07:00 - 2004/03/05 11:00 (5)
- 2004/03/06 05:00 - 2004/03/06 11:00 (7)
- 2004/03/07 08:00 - 2004/03/07 10:00 (3)
- 2004/03/08 05:00 - 2004/03/08 12:00 (8)
- 2004/03/09 04:00 - 2004/03/09 11:00 (8)
- 2004/03/10 05:00 - 2004/03/10 09:00 (5)
- 2004/03/11 07:00 - 2004/03/11 10:00 (4)
- 2004/03/12 08:00 - 2004/03/12 09:00 (2)
- 2004/03/22 06:00 - 2004/03/22 09:00 (4)
- 2004/03/23 10:00
- 2004/03/24 09:00
- 2004/03/26 05:00
- 2004/03/26 07:00 - 2004/03/26 10:00 (4)
- 2004/03/29 09:00 - 2004/03/29 10:00 (2)
- 2004/03/29 12:00 - 2004/03/29 18:00 (7)
- 2004/03/29 22:00
- 2004/12/29 18:00 - 2004/12/30 00:00 (7)
- 2004/12/31 17:00 - 2004/12/31 23:00 (7)

Relative Humidity
- 2004/03/01 00:00 - 2004/03/01 05:00 (6)
- 2004/12/29 18:00 - 2004/12/30 00:00 (7)
- 2004/12/31 17:00 - 2004/12/31 23:00 (7)

Specific Humidity

2003/10/21 13:00 - 2003/10/21 18:00 (6)
2003/11/11 14:00 - 2003/11/12 00:00 (11)
2003/12/29 00:00
2004/01/08 03:00
2004/01/10 10:00
2004/01/10 19:00 - 2004/01/11 02:00 (8)
2004/01/15 00:00 - 2004/01/15 01:00 (2)
2004/01/15 22:00 - 2004/01/16 01:00 (4)
2004/01/17 01:00
2004/01/18 00:00 - 2004/01/18 01:00 (2)
2004/01/19 00:00
2004/01/30 09:00 - 2004/01/30 10:00 (2)
2004/01/30 14:00 - 2004/01/30 18:00 (5)
2004/01/30 20:00
2004/01/31 00:00 - 2004/01/31 01:00 (2)
2004/01/31 09:00
2004/02/01 09:00 - 2004/02/01 10:00 (2)
2004/02/02 06:00 - 2004/02/02 10:00 (5)
2004/02/03 07:00 - 2004/02/03 09:00 (3)
2004/02/03 13:00 - 2004/02/03 21:00 (9)
2004/02/06 01:00 - 2004/02/06 06:00 (6)
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/03/03 12:00 - 2004/03/03 15:00 (4)
2004/03/04 07:00 - 2004/03/04 12:00 (6)
2004/03/05 07:00 - 2004/03/05 11:00 (5)
2004/03/06 05:00 - 2004/03/06 11:00 (7)
2004/03/07 08:00 - 2004/03/07 10:00 (3)
2004/03/08 05:00 - 2004/03/08 12:00 (8)
2004/03/09 04:00 - 2004/03/09 11:00 (8)
2004/03/10 05:00 - 2004/03/10 09:00 (5)
2004/03/11 07:00 - 2004/03/11 10:00 (4)
2004/03/12 08:00 - 2004/03/12 09:00 (2)
2004/03/22 06:00 - 2004/03/22 09:00 (4)
2004/03/23 10:00
2004/03/24 09:00
2004/03/26 05:00
2004/03/26 07:00 - 2004/03/26 10:00 (4)
2004/03/29 09:00 - 2004/03/29 10:00 (2)
2004/03/29 12:00 - 2004/03/29 18:00 (7)
2004/03/29 22:00
2004/04/09 23:00
2004/06/14 21:00
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Wind Speed
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Wind Direction

2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

U Wind Component
2003/10/20 15:00 - 2004/03/31 23:00 (3921)
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

V Wind Component
2003/10/20 15:00 - 2004/03/31 23:00 (3921)
2004/12/29 18:00 - 2004/12/30 00:00 (7)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Precipitation
2004/03/01 01:00 - 2004/03/01 06:00 (6)
2004/06/14 22:00
2004/12/31 18:00 - 2004/12/31 23:00 (6)

Snow Depth
2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Outgoing Shortwave
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Incoming Longwave
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Outgoing Longwave
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/06/14 21:00
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Net Radiation
2003/10/22 00:00 - 2004/04/01 23:00 (3912)
2004/06/14 21:00
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Skin Temperature
2004/03/01 00:00 - 2004/03/01 05:00 (6)
2004/04/09 23:00
2004/06/14 21:00
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Incoming PAR

2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
2003/10/01 00:00 - 2004/12/31 23:00 (ALL)