TITLE

CAMP_ChaoPhrayaRiver_Lampang_20021001_20030331.sfc

CONTACT

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DATE OF THIS DOCUMENT

31 Aug. 2004
Updated 29 May 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 Lampang PBL-Tower (Planetary Boundary Layer -Tower) observation is to monitor these meteorological values and analysis the mechanisms of the energy and water cycle in the Teak Forest 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   : 18.40 N
Longitude   : 99.47 E
Elevation   : 241.0m a.s.l.
Landscape   : Deciduous Tropical Monsoon Forest (38 year old Teak plantation)
Canopy height   : About 17 m
Soil Characteristics: Sandy soil

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- ll	ETI
Incoming Shortwave	CM-21	Kipp & Zonen
Outgoing Shortwave	CM-21	Kipp & Zonen
Incoming 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 (22m)   : Air Temperature at the 22m height (deg.C)
Relative Humidity (22m)   : Relative Humidity at the 22m height (%)
Wind Speed (24m)   : Wind Speed at the 24m height (m/s)
Wind Direction (24m)   : Wind Direction at the 24m height (deg.)
Precipitation (12m)   : Precipitation at the 12 m (mm)
Incoming Shortwave (17m)   : Shortwave Downward Radiation at the 17m height (W/m^2)
Outgoing Shortwave (17m)   : Shortwave Upward Radiation at the 17m height (W/m^2)
Incoming Long wave (17m)   : Long wave Downward Radiation at the 17m height (W/m^2)
Outgoing Long wave (17m)   : Long wave Upward Radiation at the 17m height (W/m^2)
Skin Temperature (17m)   : Skin Temperature at the 17 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 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 using a Pt100 resistance thermometer.

Relative humidity is measured using a 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 using a 3-cup anemometer.

Precipitation is measured by a tipping bucket rain gauge.
(**Note**: Old first-half Precipitation was averaged by post one hour. To be consistent with other observed data, we applied previous one hour average.)

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.
(**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.))

Longwave radiation beyond 3 micrometer is measured using a 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 are 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 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;

3.3 Data Format Description

http://www.joss.ucar.edu/ghp/ceopdm/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).

8.0 REFERENCES

None

9.0 Missing Data Periods

4

File Name   : CAMP_ChaoPhrayaRiver_Lampang_20021001_20030331.sfc
Data Period : 2002/10/01 00:00 - 2003/03/31 23:00

Station Pressure
   No missing data.

Air Temperature
   No missing data.

Dew Point Temperature
   No missing data.

Relative Humidity
   No missing data.

Specific Humidity
   No missing data.

Wind Speed
   No missing data.

Wind Direction
   No missing data.

U Wind Component
   No missing data.

V Wind Component
   No missing data.

Precipitation
   No missing data.

Snow Depth
   2002/10/01 00:00 - 2003/03/31 23:00 (ALL)

Incoming Shortwave
   No missing data.

Outgoing Shortwave
   No missing data.

Incoming Longwave
   No missing data.

Outgoing Longwave
   No missing data.

Net Radiation
   No missing data.

Skin Temperature
  No missing data.

Incoming PAR
  2002/10/01 00:00 - 2003/03/31 23:00 (ALL)

Outgoing PAR
  2002/10/01 00:00 - 2003/03/31 23:00 (ALL)

TITLE

CAMP_ChaoPhrayaRiver_Lampang_20030401_20030930.sfc

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1.8 <u>Time period covered by the data</u>

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

1.9 <u>Temporal characteristics of the data</u>

All parameters are recoded every hour.

1.10   <u>Physical location of the measurement</u>

Latitude   : 18.40 N
Longitude   : 99.47 E
Elevation   : 241.0m a.s.l.
Landscape   : Deciduous Tropical Monsoon Forest (38 year old Teak plantation)
Canopy height   : About 17 m
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1.12 WWW address references

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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;
     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));
  q = (0.622 * e)/(p - (0.378 * e));
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     e = vapor pressure in mb;
     Td = dew point in deg C;
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     q = specific humidity in kg/kg.

U,V Components are computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
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NET radiation (GEMPAK):
   NET_radiation = down (in) short + down (in) long - up (out) short - up (out) long;

4.0 QUALITY CONTROL PROCEDURES

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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

File Name   : CAMP_ChaoPhrayaRiver_Lampang_20030401_20030930.sfc
Data Period : 2003/04/01 00:00 - 2003/09/30 23:00

Station Pressure
   2003/04/29 01:00 - 2003/08/09 17:00 (2465)
   2003/08/19 17:00 - 2003/09/03 16:00 (360)

Air Temperature
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Dew Point Temperature
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Relative Humidity
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Specific Humidity
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Wind Speed
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Wind Direction
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

U Wind Component
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

V Wind Component
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Precipitation
    2003/04/29 02:00 - 2003/08/09 18:00 (2465)
    2003/08/19 18:00 - 2003/09/03 17:00 (360)

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

Incoming Shortwave
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Outgoing Shortwave
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Incoming Longwave
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Outgoing Longwave
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Net Radiation
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)

Skin Temperature
    2003/04/29 01:00 - 2003/08/09 17:00 (2465)
    2003/08/12 03:00 - 2003/08/12 04:00 (2)
    2003/08/14 12:00 - 2003/08/14 14:00 (3)
    2003/08/15 23:00
    2003/08/16 23:00 - 2003/08/17 00:00 (2)
    2003/08/17 02:00
    2003/08/17 04:00
    2003/08/17 21:00 - 2003/08/18 01:00 (5)
    2003/08/18 22:00 - 2003/08/19 02:00 (5)
    2003/08/19 17:00 - 2003/09/03 16:00 (360)
    2003/09/04 18:00 - 2003/09/05 00:00 (7)
    2003/09/05 15:00 - 2003/09/06 01:00 (11)
    2003/09/06 10:00
    2003/09/07 13:00 - 2003/09/08 00:00 (12)
    2003/09/08 06:00 - 2003/09/08 08:00 (3)
    2003/09/09 01:00
    2003/09/09 07:00 - 2003/09/10 01:00 (19)
    2003/09/10 19:00 - 2003/09/11 01:00 (7)
    2003/09/11 04:00 - 2003/09/11 05:00 (2)
    2003/09/11 08:00
    2003/09/11 12:00
    2003/09/11 15:00
    2003/09/12 00:00
    2003/09/12 05:00
    2003/09/12 12:00 - 2003/09/13 03:00 (16)
    2003/09/13 05:00 - 2003/09/13 09:00 (5)
    2003/09/13 23:00 - 2003/09/14 01:00 (3)
    2003/09/14 13:00
    2003/09/14 16:00 - 2003/09/15 00:00 (9)
    2003/09/15 10:00 - 2003/09/15 11:00 (2)
    2003/09/15 18:00 - 2003/09/16 00:00 (7)
    2003/09/18 20:00 - 2003/09/19 01:00 (6)
    2003/09/20 11:00 - 2003/09/21 00:00 (14)
    2003/09/21 11:00 - 2003/09/22 01:00 (15)
    2003/09/22 10:00 - 2003/09/22 20:00 (11)
    2003/09/24 13:00 - 2003/09/25 00:00 (12)
    2003/09/25 09:00 - 2003/09/25 11:00 (3)
    2003/09/25 13:00 - 2003/09/26 00:00 (12)
    2003/09/26 23:00 - 2003/09/27 00:00 (2)
    2003/09/29 00:00
    2003/09/29 08:00

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

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CAMP_ChaoPhrayaRiver_Lampang_20031001_20041231.sfc

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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   : 18.40 N
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Precipitation (12m)	: Precipitation at the 12 m (mm)
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None

9.0 Missing Data Periods

File Name   : CAMP_ChaoPhrayaRiver_Lampang_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
   2003/10/03 17:00 - 2003/10/04 16:00 (24)

2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
2004/01/01 08:00
2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/19 01:00 - 2004/06/30 10:00 (1738)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
2004/09/02 01:00 - 2004/09/03 00:00 (24)
2004/09/26 10:00 - 2004/09/28 09:00 (48)
2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Air Temperature
2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
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2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/19 01:00 - 2004/06/30 10:00 (1738)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
2004/09/02 01:00 - 2004/09/03 00:00 (24)
2004/09/26 10:00 - 2004/09/28 09:00 (48)
2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)

2004/11/20 10:00 - 2004/11/27 09:00 (168)
        2004/12/05 02:00 - 2004/12/08 09:00 (80)
        2004/12/25 23:00 - 2004/12/26 09:00 (11)
        2004/12/31 17:00 - 2004/12/31 23:00 (7)

Dew Point Temperature
        2003/10/03 17:00 - 2003/10/04 16:00 (24)
        2003/10/24 10:00 - 2003/11/20 16:00 (655)
        2003/12/14 17:00 - 2003/12/15 16:00 (24)
        2003/12/22 13:00 - 2003/12/24 00:00 (36)
        2003/12/31 02:00 - 2003/12/31 16:00 (15)
        2004/01/01 08:00
        2004/01/18 19:00 - 2004/01/21 09:00 (63)
        2004/01/24 17:00 - 2004/01/27 10:00 (66)
        2004/04/19 01:00 - 2004/06/30 10:00 (1738)
        2004/07/20 10:00 - 2004/07/21 02:00 (17)
        2004/07/24 09:00 - 2004/07/28 00:00 (88)
        2004/08/15 01:00 - 2004/08/16 07:00 (31)
        2004/08/20 01:00 - 2004/08/22 00:00 (48)
        2004/08/30 03:00 - 2004/08/31 00:00 (22)
        2004/09/02 01:00 - 2004/09/03 00:00 (24)
        2004/09/26 10:00 - 2004/09/28 09:00 (48)
        2004/10/05 01:00 - 2004/10/06 09:00 (33)
        2004/10/24 10:00 - 2004/10/26 09:00 (48)
        2004/11/02 01:00 - 2004/11/03 09:00 (33)
        2004/11/06 10:00 - 2004/11/12 09:00 (144)
        2004/11/13 23:00 - 2004/11/14 01:00 (3)
        2004/11/14 18:00 - 2004/11/15 01:00 (8)
        2004/11/15 21:00 - 2004/11/16 02:00 (6)
        2004/11/20 10:00 - 2004/11/27 09:00 (168)
        2004/12/05 02:00 - 2004/12/08 09:00 (80)
        2004/12/25 23:00 - 2004/12/26 09:00 (11)
        2004/12/31 17:00 - 2004/12/31 23:00 (7)

Relative Humidity
        2003/10/03 17:00 - 2003/10/04 16:00 (24)
        2003/10/24 10:00 - 2003/11/20 16:00 (655)
        2003/12/14 17:00 - 2003/12/15 16:00 (24)
        2003/12/22 13:00 - 2003/12/24 00:00 (36)
        2003/12/31 02:00 - 2003/12/31 16:00 (15)
        2004/01/01 08:00
        2004/01/18 19:00 - 2004/01/21 09:00 (63)
        2004/01/24 17:00 - 2004/01/27 10:00 (66)
        2004/04/19 01:00 - 2004/06/30 10:00 (1738)
        2004/07/20 10:00 - 2004/07/21 02:00 (17)
        2004/07/24 09:00 - 2004/07/28 00:00 (88)
        2004/08/15 01:00 - 2004/08/16 07:00 (31)
        2004/08/20 01:00 - 2004/08/22 00:00 (48)
        2004/08/30 03:00 - 2004/08/31 00:00 (22)
        2004/09/02 01:00 - 2004/09/03 00:00 (24)
        2004/09/26 10:00 - 2004/09/28 09:00 (48)

2004/10/05 01:00 - 2004/10/06 09:00 (33)
    2004/10/24 10:00 - 2004/10/26 09:00 (48)
    2004/11/02 01:00 - 2004/11/03 09:00 (33)
    2004/11/06 10:00 - 2004/11/12 09:00 (144)
    2004/11/13 23:00 - 2004/11/14 01:00 (3)
    2004/11/14 18:00 - 2004/11/15 01:00 (8)
    2004/11/15 21:00 - 2004/11/16 02:00 (6)
    2004/11/20 10:00 - 2004/11/27 09:00 (168)
    2004/12/05 02:00 - 2004/12/08 09:00 (80)
    2004/12/25 23:00 - 2004/12/26 09:00 (11)
    2004/12/31 17:00 - 2004/12/31 23:00 (7)

Specific Humidity
    2003/10/03 17:00 - 2003/10/04 16:00 (24)
    2003/10/24 10:00 - 2003/11/20 16:00 (655)
    2003/12/14 17:00 - 2003/12/15 16:00 (24)
    2003/12/22 13:00 - 2003/12/24 00:00 (36)
    2003/12/31 02:00 - 2003/12/31 16:00 (15)
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    2004/01/18 19:00 - 2004/01/21 09:00 (63)
    2004/01/24 17:00 - 2004/01/27 10:00 (66)
    2004/04/19 01:00 - 2004/06/30 10:00 (1738)
    2004/07/20 10:00 - 2004/07/21 02:00 (17)
    2004/07/24 09:00 - 2004/07/28 00:00 (88)
    2004/08/15 01:00 - 2004/08/16 07:00 (31)
    2004/08/20 01:00 - 2004/08/22 00:00 (48)
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    2004/10/24 10:00 - 2004/10/26 09:00 (48)
    2004/11/02 01:00 - 2004/11/03 09:00 (33)
    2004/11/06 10:00 - 2004/11/12 09:00 (144)
    2004/11/13 23:00 - 2004/11/14 01:00 (3)
    2004/11/14 18:00 - 2004/11/15 01:00 (8)
    2004/11/15 21:00 - 2004/11/16 02:00 (6)
    2004/11/20 10:00 - 2004/11/27 09:00 (168)
    2004/12/05 02:00 - 2004/12/08 09:00 (80)
    2004/12/25 23:00 - 2004/12/26 09:00 (11)
    2004/12/31 17:00 - 2004/12/31 23:00 (7)

Wind Speed
    2003/10/03 17:00 - 2003/10/04 16:00 (24)
    2003/10/24 10:00 - 2003/11/20 16:00 (655)
    2003/12/14 17:00 - 2003/12/15 16:00 (24)
    2003/12/22 13:00 - 2003/12/24 00:00 (36)
    2003/12/31 02:00 - 2003/12/31 16:00 (15)
    2004/01/01 08:00
    2004/01/18 19:00 - 2004/01/21 09:00 (63)
    2004/01/24 17:00 - 2004/01/27 10:00 (66)
    2004/04/19 01:00 - 2004/06/30 10:00 (1738)

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    2004/07/20 10:00 - 2004/07/21 02:00 (17)
    2004/07/24 09:00 - 2004/07/28 00:00 (88)
    2004/08/15 01:00 - 2004/08/16 07:00 (31)
    2004/08/20 01:00 - 2004/08/22 00:00 (48)
    2004/08/30 03:00 - 2004/08/31 00:00 (22)
    2004/09/02 01:00 - 2004/09/03 00:00 (24)
    2004/09/26 10:00 - 2004/09/28 09:00 (48)
    2004/10/05 01:00 - 2004/10/06 09:00 (33)
    2004/10/24 10:00 - 2004/10/26 09:00 (48)
    2004/11/02 01:00 - 2004/11/03 09:00 (33)
    2004/11/06 10:00 - 2004/11/12 09:00 (144)
    2004/11/13 23:00 - 2004/11/14 01:00 (3)
    2004/11/14 18:00 - 2004/11/15 01:00 (8)
    2004/11/15 21:00 - 2004/11/16 02:00 (6)
    2004/11/20 10:00 - 2004/11/27 09:00 (168)
    2004/12/05 02:00 - 2004/12/08 09:00 (80)
    2004/12/25 23:00 - 2004/12/26 09:00 (11)
    2004/12/31 17:00 - 2004/12/31 23:00 (7)

Wind Direction
    2003/10/03 17:00 - 2003/10/04 16:00 (24)
    2003/10/24 10:00 - 2003/11/20 16:00 (655)
    2003/12/14 17:00 - 2003/12/15 16:00 (24)
    2003/12/22 13:00 - 2003/12/24 00:00 (36)
    2003/12/31 02:00 - 2003/12/31 16:00 (15)
    2004/01/01 08:00
    2004/01/18 19:00 - 2004/01/21 09:00 (63)
    2004/01/24 17:00 - 2004/01/27 10:00 (66)
    2004/04/19 01:00 - 2004/06/30 10:00 (1738)
    2004/07/20 10:00 - 2004/07/21 02:00 (17)
    2004/07/24 09:00 - 2004/07/28 00:00 (88)
    2004/08/15 01:00 - 2004/08/16 07:00 (31)
    2004/08/20 01:00 - 2004/08/22 00:00 (48)
    2004/08/30 03:00 - 2004/08/31 00:00 (22)
    2004/09/02 01:00 - 2004/09/03 00:00 (24)
    2004/09/26 10:00 - 2004/09/28 09:00 (48)
    2004/10/05 01:00 - 2004/10/06 09:00 (33)
    2004/10/24 10:00 - 2004/10/26 09:00 (48)
    2004/11/02 01:00 - 2004/11/03 09:00 (33)
    2004/11/06 10:00 - 2004/11/12 09:00 (144)
    2004/11/13 23:00 - 2004/11/14 01:00 (3)
    2004/11/14 18:00 - 2004/11/15 01:00 (8)
    2004/11/15 21:00 - 2004/11/16 02:00 (6)
    2004/11/20 10:00 - 2004/11/27 09:00 (168)
    2004/12/05 02:00 - 2004/12/08 09:00 (80)
    2004/12/25 23:00 - 2004/12/26 09:00 (11)
    2004/12/31 17:00 - 2004/12/31 23:00 (7)

U Wind Component
    2003/10/03 17:00 - 2003/10/04 16:00 (24)
    2003/10/24 10:00 - 2003/11/20 16:00 (655)
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2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
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2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
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2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

V Wind Component
2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
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2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/19 01:00 - 2004/06/30 10:00 (1738)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
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2004/08/30 03:00 - 2004/08/31 00:00 (22)
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2004/11/02 01:00 - 2004/11/03 09:00 (33)
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2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)

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2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)
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Precipitation
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2003/10/03 18:00 - 2003/10/04 17:00 (24)
2003/10/24 11:00 - 2003/11/20 17:00 (655)
2003/12/14 18:00 - 2003/12/15 17:00 (24)
2003/12/22 14:00 - 2003/12/24 01:00 (36)
2003/12/31 03:00 - 2003/12/31 17:00 (15)
2004/01/01 09:00
2004/01/18 20:00 - 2004/01/21 10:00 (63)
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2004/11/02 02:00 - 2004/11/03 10:00 (33)
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2004/11/14 00:00 - 2004/11/14 02:00 (3)
2004/11/14 19:00 - 2004/11/15 02:00 (8)
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2004/11/20 11:00 - 2004/11/27 10:00 (168)
2004/12/05 03:00 - 2004/12/08 10:00 (80)
2004/12/26 00:00 - 2004/12/26 10:00 (11)
2004/12/31 18:00 - 2004/12/31 23:00 (6)
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Snow Depth
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2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
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Incoming Shortwave
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2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
2004/01/01 08:00
2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
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2004/07/20 10:00 - 2004/07/21 02:00 (17)
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2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
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2004/09/02 01:00 - 2004/09/03 00:00 (24)
2004/09/26 10:00 - 2004/09/28 09:00 (48)
2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)
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Outgoing Shortwave
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2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
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2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)
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Incoming Longwave
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2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
2004/01/01 08:00
2004/01/18 19:00 - 2004/01/21 09:00 (63)
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2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/19 01:00 - 2004/06/30 10:00 (1738)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
2004/09/02 01:00 - 2004/09/03 00:00 (24)
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2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
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2004/11/13 23:00 - 2004/11/14 01:00 (3)
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2004/12/31 17:00 - 2004/12/31 23:00 (7)

Outgoing Longwave
2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
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2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
2004/09/02 01:00 - 2004/09/03 00:00 (24)
2004/09/26 10:00 - 2004/09/28 09:00 (48)
2004/10/05 01:00 - 2004/10/06 09:00 (33)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Net Radiation

2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
2004/01/01 08:00
2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/19 01:00 - 2004/06/30 10:00 (1738)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
2004/08/30 03:00 - 2004/08/31 00:00 (22)
2004/09/02 01:00 - 2004/09/03 00:00 (24)
2004/09/13 01:00 - 2004/09/13 11:00 (11)
2004/09/14 06:00 - 2004/09/14 09:00 (4)
2004/09/15 03:00 - 2004/09/15 10:00 (8)
2004/09/16 03:00 - 2004/09/16 06:00 (4)
2004/09/17 04:00 - 2004/09/17 06:00 (3)
2004/09/17 08:00
2004/09/18 05:00 - 2004/09/18 06:00 (2)
2004/09/19 05:00 - 2004/09/19 09:00 (5)
2004/09/20 03:00
2004/09/21 05:00 - 2004/09/21 08:00 (4)
2004/09/22 02:00 - 2004/09/22 07:00 (6)
2004/09/22 09:00
2004/09/23 03:00 - 2004/09/23 08:00 (6)
2004/09/24 02:00 - 2004/09/24 09:00 (8)
2004/09/25 02:00 - 2004/09/25 09:00 (8)
2004/09/26 02:00 - 2004/09/28 09:00 (56)
2004/09/29 03:00 - 2004/09/29 08:00 (6)
2004/09/30 02:00 - 2004/09/30 08:00 (7)
2004/10/01 02:00 - 2004/10/01 07:00 (6)
2004/10/02 01:00 - 2004/10/02 03:00 (3)
2004/10/02 06:00
2004/10/03 03:00 - 2004/10/03 09:00 (7)
2004/10/04 01:00 - 2004/10/04 12:00 (12)
2004/10/05 01:00 - 2004/10/06 11:00 (35)
2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)
2004/12/31 17:00 - 2004/12/31 23:00 (7)

Skin Temperature

2003/10/01 00:00
2003/10/02 00:00
2003/10/03 17:00 - 2003/10/04 16:00 (24)
2003/10/06 08:00 - 2003/10/06 09:00 (2)
2003/10/06 23:00 - 2003/10/07 01:00 (3)
2003/10/13 21:00 - 2003/10/14 00:00 (4)
2003/10/15 10:00 - 2003/10/15 18:00 (9)
2003/10/16 01:00
2003/10/24 10:00 - 2003/11/20 16:00 (655)
2003/12/14 17:00 - 2003/12/15 16:00 (24)
2003/12/22 13:00 - 2003/12/24 00:00 (36)
2003/12/31 02:00 - 2003/12/31 16:00 (15)
2004/01/01 08:00
2004/01/13 23:00 - 2004/01/14 00:00 (2)
2004/01/18 00:00
2004/01/18 19:00 - 2004/01/21 09:00 (63)
2004/01/22 23:00 - 2004/01/23 00:00 (2)
2004/01/24 17:00 - 2004/01/27 10:00 (66)
2004/04/06 13:00
2004/04/19 00:00 - 2004/06/30 10:00 (1739)
2004/06/30 18:00 - 2004/07/01 00:00 (7)
2004/07/01 21:00 - 2004/07/01 23:00 (3)
2004/07/06 14:00 - 2004/07/07 00:00 (11)
2004/07/08 18:00 - 2004/07/09 02:00 (9)
2004/07/10 11:00 - 2004/07/11 01:00 (15)
2004/07/11 10:00 - 2004/07/12 01:00 (16)
2004/07/12 09:00 - 2004/07/13 01:00 (17)
2004/07/14 18:00 - 2004/07/14 21:00 (4)
2004/07/14 23:00 - 2004/07/15 00:00 (2)
2004/07/17 20:00 - 2004/07/17 23:00 (4)
2004/07/20 10:00 - 2004/07/21 02:00 (17)
2004/07/21 13:00 - 2004/07/22 04:00 (16)
2004/07/22 15:00 - 2004/07/23 07:00 (17)
2004/07/23 13:00 - 2004/07/24 01:00 (13)
2004/07/24 05:00 - 2004/07/24 07:00 (3)
2004/07/24 09:00 - 2004/07/28 00:00 (88)
2004/08/15 01:00 - 2004/08/16 07:00 (31)
2004/08/20 01:00 - 2004/08/22 00:00 (48)
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2004/10/24 10:00 - 2004/10/26 09:00 (48)
2004/11/02 01:00 - 2004/11/03 09:00 (33)
2004/11/06 10:00 - 2004/11/12 09:00 (144)
2004/11/13 23:00 - 2004/11/14 01:00 (3)
2004/11/14 18:00 - 2004/11/15 01:00 (8)
2004/11/15 21:00 - 2004/11/16 02:00 (6)
2004/11/20 10:00 - 2004/11/27 09:00 (168)
2004/12/05 02:00 - 2004/12/08 09:00 (80)
2004/12/25 23:00 - 2004/12/26 09:00 (11)

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)