

TITLE

CAMP_SiberiaTaiga_LarchForest_20021001_20030331.twr

CONTACT

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DATE OF THIS DOCUMENT

27 Aug. 2004
Updated 22 Jan. 2005

1. 0 DATASET OVERVIEW

1.1 Introduction

Objectives

The goal of the GAME-Siberia project is to clarify the characteristics and processes of water accumulation and transfer and their relation with the energy cycle, in the atmosphere-land surface interface of cold environments from the seasonal to the inter-annual time scale. This study will contribute to one of the primary GAME objectives;

- To understand multi-scale interactions in the energy and hydrologic cycles in the Asian Monsoon Region

and one scientific objective;

- To assess the impact of monsoon variability on the regional hydrologic cycle.

The objectives of Taiga study subgroup include:

1. Develop seasonal and inter-annual variation of one-dimensional energy and water vapor fluxes over tundra.
2. Characterize the water balance components in these Taiga watersheds.
3. Determine the areal distribution of ground surface properties.

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 30 minutes.

1.4 Physical location of the measurement

Latitude : 62.255 N
Longitude : 129.618 E
Elevation : 220.0m a.s.l.
Landscape : Larch Forest
Canopy height : About 18 m
Soil Characteristics: Sandy soil

1.5 Data source

Original data provided by the Institute of Observational Research for Global Change (IORGC), Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology (JAMSTEC) financially supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT).

1.6 WWW address references

Website: <http://www.hyarc.nagoya-u.ac.jp/game/siberia/p-taiga.html>

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 | Analog Barometer PTB101 | VAISALA |
| Air Temperature | HMP-35D | VAISALA |
| Relative Humidity | HMP-35D | VAISALA |
| Wind Speed | AC750 | Makino |
| Wind Direction | VR036 | Makino |

2.3 Instrumentation specification

Station Pressure (1.2m) : Air Pressure at the 1.2m height (hPa)
Air Temperature (32m) : Air Temperature at the 32m height (deg.C)
Air Temperature (24m) : Air Temperature at the 24m height (deg.C)
Air Temperature (6m) : Air Temperature at the 6m height (deg.C)
Air Temperature (1.8m) : Air Temperature at the 1.8m height (deg.C)
Relative Humidity (32m) : Relative Humidity at the 32m height (%)
Relative Humidity (24m) : Relative Humidity at the 24m height (%)
Relative Humidity (6m) : Relative Humidity at the 6m height (%)

Relative Humidity (1.8m) : Relative Humidity at the 1.8m height (%)
 Wind Speed (32m) : Wind Speed at the 32m height (m/s)
 Wind Speed (24.8m) : Wind Speed at the 24.8m height (m/s)
 Wind Speed (6m) : Wind Speed at the 6m height (m/s)
 Wind Speed (2m) : Wind Speed at the 2m height (m/s)
 Wind Direction (32m) : Wind Direction at the 32m height (deg.)

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

Data are downloaded from the Tower twice every year, in spring and autumn. Then, data are sent to Japan, where they are processed.

3.2 Description of derived parameters and processing techniques used

Temperature, relative humidity is instantaneous values. Atmospheric pressure is averaged over the previous 30 minutes. Wind speed and direction are the *resulting* average speed and direction over the previous 30 minutes (calculated by the data logger by means of data recorded every 5 seconds): this to minimize data unreliability due to sudden gusts.

And the **Three** 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”, **In the case of calculated by using dubious value fagged “D”, the data flag was put “D”.**

Dew Point Temperature were 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 were 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 (10m) were computed by using (GEMPAK):

$$U = -\sin(\text{direction}) * \text{wind_speed};$$

$$V = -\cos(\text{direction}) * \text{wind_speed};$$

3.3 Data format

These data are in the CEOP EOP-3 data format agreed to by the CEOP Scientific Steering Committee. This format is described in detail as part of the CEOP Reference Site Data Set Procedures Report which is available at the following URL:

http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/ceop_met_tower_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 through 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

6.2 Missing data periods

| | |
|--------------------------|--|
| Station Pressure (1.2m) | : 2002/12/07 08:30 - 2003/03/31 23:30 |
| Air Temperature (32m) | : 2002/12/07 06:30 - 2003/03/31 23:30 |
| Air Temperature (24m) | : 2002/12/07 00:30 - 2003/03/31 23:30 |
| Air Temperature (6m) | : 2003/01/18 13:30 - 2003/01/20 05:30 , 2003/03/30 03:00 - 2003/03/31 23:30 |
| Air Temperature (1.8m) | : 2002/12/07 06:30 - 2003/03/31 23:30 |
| Relative Humidity (32m) | : 2002/12/07 06:30 - 2003/03/31 23:30 |
| Relative Humidity (24m) | : 2002/12/07 00:30 - 2003/03/31 23:30 |
| Relative Humidity (6m) | : 2003/01/18 13:30 - 2003/01/20 05:30 , 2003/03/30 03:00 - 2003/03/31 23:30 |
| Relative Humidity (1.8m) | : 2002/12/07 06:30 - 2003/03/31 23:30 |
| Wind Speed (32m) | : 2002/11/17 13:00 - 2003/03/31 23:30 |
| Wind Speed (24.8m) | : 2002/10/01 00:00 - 2003/03/31 23:30 |
| Wind Speed (6m) | : 2002/10/01 00:00 - 2003/03/31 23:30 |
| Wind Speed (2m) | : 2002/11/17 13:00 - 2003/03/31 23:30 |
| Wind Direction (32m) | : 2002/12/07 06:30 - 2003/03/31 23:30 |

These missing data periods are caused by snow or frost coverage on the sensor in winter season.

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the Institute of Observational Research for Global Chang (IORGC), Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology (JAMSTEC), financially supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT).

8.0 REFERENCES

Ohta, T., T. Hiyama, H. Tanaka, T. Kuwada, T. C. Maximov, T. Ohata and Y. Fukushima (2001) Seasonal variation in the energy and water exchanges above and below a larch forest in Eastern Siberia. HYDROLOGICAL PROCESSES. 15, 1459-1476.

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1. Develop seasonal and inter-annual variation of one-dimensional energy and water vapor fluxes over tundra.
2. Characterize the water balance components in these Taiga watersheds.
3. Determine the areal distribution of ground surface properties.

1.8 Time period covered by the data

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

1.9 Temporal characteristics of the data

All parameters are recorded every 30 minutes.

1.10 Physical location of the measurement

Latitude : 62.255 N
Longitude : 129.618 E
Elevation : 220.0m a.s.l.
Landscape : Larch Forest
Canopy height : About 18 m
Soil Characteristics: Sandy soil

1.11 Data source

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Air Temperature (24m) : Air Temperature at the 24m height (deg.C)
Air Temperature (6m) : Air Temperature at the 6m height (deg.C)
Air Temperature (1.8m) : Air Temperature at the 1.8m height (deg.C)
Relative Humidity (32m) : Relative Humidity at the 32m height (%)
Relative Humidity (24m) : Relative Humidity at the 24m height (%)

| | |
|--------------------------|--|
| Relative Humidity (6m) | : Relative Humidity at the 6m height (%) |
| Relative Humidity (1.8m) | : Relative Humidity at the 1.8m height (%) |
| Wind Speed (32m) | : Wind Speed at the 32m height (m/s) |
| Wind Speed (27m) | : Wind Speed at the 27m height (m/s) |
| Wind Speed (24.8m) | : Wind Speed at the 24.8m height (m/s) |
| Wind Speed (6m) | : Wind Speed at the 6m height (m/s) |
| Wind Speed (2m) | : Wind Speed at the 2m height (m/s) |
| Wind Direction (32m) | : Wind Direction at the 32m height (deg.) |

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

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Temperature, relative humidity is instantaneous values. Atmospheric pressure is averaged over the previous 30 minutes. Wind speed and direction are the *resulting* average speed and direction over the previous 30 minutes (calculated by the data logger by means of data recorded every 5 seconds): this to minimize data unreliability due to sudden gusts.

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

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$$e = es * (RH/100.0);$$

$$Td = \log(e/6.112)*243.5/(17.67-\log(e/6.112));$$

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

Specific Humidity were 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;
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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

6.2 Missing data periods

Station Pressure (1.2m)

2003/07/23 16:00 - 2003/08/30 05:30

2003/09/17 04:00

2003/09/30 15:30 - 2003/09/30 23:30

Air Temperature (32m)

2003/04/11 06:00

2003/04/11 10:30

2003/04/13 01:00

2003/05/06 00:00

2003/05/20 06:00

2003/05/23 10:00

2003/07/23 19:30 - 2003/07/23 22:30

2003/08/20 23:30 - 2003/08/30 05:30

2003/09/17 04:00

2003/09/30 15:30 - 2003/09/30 23:30

Air Temperature (24m):

2003/04/12 02:30

2003/05/03 11:30

2003/05/08 23:30

2003/06/07 18:00

2003/07/23 16:00 - 2003/08/30 05:30

2003/09/16 08:00

2003/09/17 04:00

2003/09/30 15:30 - 2003/09/30 23:30

Air Temperature (6m):

2003/04/18 09:00

2003/04/23 20:30

2003/04/24 01:30

2003/05/09 19:00
2003/07/23 16:00 - 2003/09/16 06:30
2003/09/16 07:30
2003/09/17 04:00
2003/09/19 21:00
2003/09/27 20:00
2003/09/30 15:30 - 2003/09/30 23:30

Air Temperature (1.8m):

2003/07/23 16:00 - 2003/08/30 05:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Relative Humidity (32m):

2003/06/17 13:30
2003/07/23 19:30 - 2003/07/23 22:30
2003/08/09 16:30
2003/08/20 23:30 - 2003/08/30 05:30
2003/08/30 13:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Relative Humidity (24m):

2003/07/23 16:00 - 2003/08/30 05:30
2003/09/16 08:00
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Relative Humidity (6m):

2003/07/23 16:00 - 2003/09/16 06:30
2003/09/16 07:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Relative Humidity (1.8m) :

2003/05/04 08:30
2003/07/23 16:00 - 2003/08/30 05:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Wind Speed (32m):

2003/07/23 19:30 - 2003/07/23 22:30
2003/08/20 23:30 - 2003/08/30 05:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Wind Speed (27m) :

2003/04/01 00:00 - 2003/09/16 06:30
2003/09/17 03:30
2003/09/30 15:30 - 2003/09/30 23:30

Wind Speed (24.8m):

2003/07/23 16:00 - 2003/08/30 05:30
2003/09/16 08:00
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Wind Speed (6m) :
2003/09/01 00:00 – 2003/09/30 23:30

Wind Speed (2m) :
2003/07/23 16:00 - 2003/08/30 05:30
2003/09/17 04:00
2003/09/30 15:30 - 2003/09/30 23:30

Wind Direction (32m):
2003/04/08 23:00
2003/04/21 14:30
2003/05/03 16:30
2003/05/23 12:30
2003/06/03 07:30
2003/07/19 07:00
2003/07/23 20:00
2003/07/23 21:00 - 2003/07/23 21:30
2003/08/03 22:30
2003/08/20 23:30 - 2003/08/30 05:00
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16 May 2006

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1.14 Time period covered by the data

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1.16 Physical location of the measurement

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Air Temperature (1.8m) : Air Temperature at the 1.8m height (deg.C)
Relative Humidity (32m) : Relative Humidity at the 32m height (%)
Relative Humidity (24m) : Relative Humidity at the 24m height (%)

| | |
|--------------------------|--|
| Relative Humidity (6m) | : Relative Humidity at the 6m height (%) |
| Relative Humidity (1.8m) | : Relative Humidity at the 1.8m height (%) |
| Wind Speed (32m) | : Wind Speed at the 32m height (m/s) |
| Wind Speed (24.8m) | : Wind Speed at the 24.8m height (m/s) |
| Wind Speed (6m) | : Wind Speed at the 6m height (m/s) |
| Wind Speed (2m) | : Wind Speed at the 2m height (m/s) |
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where:

- T = temperature in deg C;
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- e = vapor pressure in mb;
- RH = Relative Humidity in percent;
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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.

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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

6.2 Missing data periods

The missing data period are listed in chapter 9.0.

7.0 REFERENCE REQUIREMENTS

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9.0 Missing Data Periods

File Name : CAMP_SiberiaTaiga_LarchForest_20031001_20040331.twr
Data Period : 2003/10/01 00:00 - 2004/03/31 23:30

Station Pressure (1.80m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (2.00m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (6.00m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (24.00m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (24.80m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (27.00m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Station Pressure (32.00m)

2003/10/01 00:00
2003/11/21 08:00 - 2004/03/08 15:30 (5200)
2004/03/17 12:00 - 2004/03/18 05:30 (36)
2004/03/18 11:30 - 2004/03/19 07:00 (40)
2004/03/19 10:00 - 2004/03/20 04:30 (38)
2004/03/20 18:00 - 2004/03/26 05:00 (263)
2004/03/26 20:30 - 2004/03/27 01:30 (11)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Air Temperature (1.80m)

2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Air Temperature (2.00m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Air Temperature (6.00m)

2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Air Temperature (24.00m)

2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Air Temperature (24.80m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Air Temperature (27.00m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Air Temperature (32.00m)

2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Dew Point Temperature (1.80m)

2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Dew Point Temperature (2.00m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Dew Point Temperature (6.00m)
2003/10/01 00:00
2004/01/22 06:30
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Dew Point Temperature (24.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Dew Point Temperature (24.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Dew Point Temperature (27.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Dew Point Temperature (32.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Relative Humidity (1.80m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Relative Humidity (2.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Relative Humidity (6.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Relative Humidity (24.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Relative Humidity (24.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Relative Humidity (27.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Relative Humidity (32.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Specific Humidity (1.80m)
2003/10/01 00:00
2003/11/13 04:30 - 2003/11/13 06:30 (5)
2003/11/20 23:30 - 2004/03/09 03:00 (5240)
2004/03/09 09:00 - 2004/03/09 12:30 (8)
2004/03/11 18:30 - 2004/03/11 19:30 (3)
2004/03/14 01:00

2004/03/14 06:00
2004/03/14 15:00
2004/03/16 00:00 - 2004/03/16 01:30 (4)
2004/03/16 14:00 - 2004/03/18 08:00 (85)
2004/03/18 10:00 - 2004/03/20 05:30 (88)
2004/03/20 16:00 - 2004/03/26 05:30 (268)
2004/03/26 17:30 - 2004/03/27 02:30 (19)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Specific Humidity (2.00m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Specific Humidity (6.00m)

2003/10/01 00:00
2003/11/13 04:30 - 2003/11/13 06:30 (5)
2003/11/20 23:30 - 2004/03/09 03:00 (5240)
2004/03/09 09:00 - 2004/03/09 12:30 (8)
2004/03/11 18:30 - 2004/03/11 19:30 (3)
2004/03/14 01:00
2004/03/14 06:00
2004/03/14 15:00
2004/03/16 00:00 - 2004/03/16 01:30 (4)
2004/03/16 14:00 - 2004/03/18 08:00 (85)
2004/03/18 10:00 - 2004/03/20 05:30 (88)
2004/03/20 16:00 - 2004/03/26 05:30 (268)
2004/03/26 17:30 - 2004/03/27 02:30 (19)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Specific Humidity (24.00m)

2003/10/01 00:00
2003/11/13 04:30 - 2003/11/13 06:30 (5)
2003/11/20 23:30 - 2004/03/09 03:00 (5240)
2004/03/09 09:00 - 2004/03/09 12:30 (8)
2004/03/11 18:30 - 2004/03/11 19:30 (3)
2004/03/14 01:00
2004/03/14 06:00
2004/03/14 15:00
2004/03/16 00:00 - 2004/03/16 01:30 (4)
2004/03/16 14:00 - 2004/03/18 08:00 (85)
2004/03/18 10:00 - 2004/03/20 05:30 (88)
2004/03/20 16:00 - 2004/03/26 05:30 (268)
2004/03/26 17:30 - 2004/03/27 02:30 (19)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Specific Humidity (24.80m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Specific Humidity (27.00m)

2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Specific Humidity (32.00m)

2003/10/01 00:00
2003/11/13 04:30 - 2003/11/13 06:30 (5)
2003/11/20 23:30 - 2004/03/09 03:00 (5240)
2004/03/09 09:00 - 2004/03/09 12:30 (8)
2004/03/11 18:30 - 2004/03/11 19:30 (3)
2004/03/14 01:00
2004/03/14 06:00
2004/03/14 15:00
2004/03/16 00:00 - 2004/03/16 01:30 (4)
2004/03/16 14:00 - 2004/03/18 08:00 (85)
2004/03/18 10:00 - 2004/03/20 05:30 (88)
2004/03/20 16:00 - 2004/03/26 05:30 (268)
2004/03/26 17:30 - 2004/03/27 02:30 (19)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Wind Speed (1.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Speed (2.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Wind Speed (6.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Speed (24.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Speed (24.80m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Wind Speed (27.00m)
2003/10/01 00:00
2003/10/27 08:00 - 2003/10/27 09:30 (4)
2003/12/13 03:00 - 2003/12/13 05:30 (6)
2003/12/21 02:30 - 2003/12/22 04:30 (53)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Wind Speed (32.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

Wind Direction (1.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (2.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (6.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (24.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (24.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (27.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Wind Direction (32.00m)
2003/10/01 00:00
2004/03/31 15:30 - 2004/03/31 23:30 (17)

U Wind Component (1.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (2.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (6.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (24.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (24.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (27.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

U Wind Component (32.00m)
2003/10/01 00:00
2003/11/21 10:00 - 2004/03/03 04:00 (4933)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

V Wind Component (1.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (2.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (6.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (24.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (24.80m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (27.00m)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

V Wind Component (32.00m)
2003/10/01 00:00
2003/11/21 10:00 - 2004/03/03 04:00 (4933)
2004/03/31 15:30 - 2004/03/31 23:30 (17)

TITLE

CAMP_SiberiaTaiga_LarchForest_20040401_20041217.twr

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DATE OF THIS DOCUMENT

18 July 2006

1. 0 DATASET OVERVIEW

1.19 Introduction

Objectives

The goal of the GAME-Siberia project is to clarify the characteristics and processes of water accumulation and transfer and their relation with the energy cycle, in the atmosphere-land surface interface of cold environments from the seasonal to the inter-annual time scale. This study will contribute to one of the primary GAME objectives;

- To understand multi-scale interactions in the energy and hydrologic cycles in the Asian Monsoon Region

and one scientific objective;

- To assess the impact of monsoon variability on the regional hydrologic cycle.

The objectives of Taiga study subgroup include:

1. Develop seasonal and inter-annual variation of one-dimensional energy and water vapor fluxes over tundra.
2. Characterize the water balance components in these Taiga watersheds.
3. Determine the areal distribution of ground surface properties.

1.20 Time period covered by the data

Start: 1 April 2004, 00:00
End: 17 December 2004, 23:00

1.21 Temporal characteristics of the data

All parameters are recorded every 30 minutes.

1.22 Physical location of the measurement

Latitude : 62.255 N
Longitude : 129.618 E
Elevation : 220.0m a.s.l.
Landscape : Larch Forest
Canopy height : About 18 m
Soil Characteristics: Sandy soil

1.23 Data source

Original data provided by the Institute of Observational Research for Global Change (IORGC), Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology (JAMSTEC) financially supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT).

1.24 WWW address references

Website: <http://www.hyarc.nagoya-u.ac.jp/game/siberia/p-taiga.html>

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 | Analog Barometer PTB101 | VAISALA |
| Air Temperature | HMP-35D | VAISALA |
| Relative Humidity | HMP-35D | VAISALA |
| Wind Speed | AC750 | Makino |
| Wind Direction | VR036 | Makino |

2.6 Instrumentation specification

Station Pressure (1.2m) : Air Pressure at the 1.2m height (hPa)
Air Temperature (32m) : Air Temperature at the 32m height (deg.C)
Air Temperature (24m) : Air Temperature at the 24m height (deg.C)
Air Temperature (6m) : Air Temperature at the 6m height (deg.C)
Air Temperature (1.8m) : Air Temperature at the 1.8m height (deg.C)
Relative Humidity (32m) : Relative Humidity at the 32m height (%)
Relative Humidity (24m) : Relative Humidity at the 24m height (%)

| | |
|--------------------------|--|
| Relative Humidity (6m) | : Relative Humidity at the 6m height (%) |
| Relative Humidity (1.8m) | : Relative Humidity at the 1.8m height (%) |
| Wind Speed (32m) | : Wind Speed at the 32m height (m/s) |
| Wind Speed (24.8m) | : Wind Speed at the 24.8m height (m/s) |
| Wind Speed (6m) | : Wind Speed at the 6m height (m/s) |
| Wind Speed (2m) | : Wind Speed at the 2m height (m/s) |
| Wind Direction (32m) | : Wind Direction at the 32m height (deg.) |

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

Data are downloaded from the Tower twice every year, in spring and autumn. Then, data are sent to Japan, where they are processed.

3.2 Description of derived parameters and processing techniques used

Temperature, relative humidity is instantaneous values. Atmospheric pressure is averaged over the previous 30 minutes. Wind speed and direction are the *resulting* average speed and direction over the previous 30 minutes (calculated by the data logger by means of data recorded every 5 seconds): this to minimize data unreliability due to sudden gusts. The **Relative Humidity data values over 100% was replaced zero. These data flags were put "I" as an Interpolated flag.**

And the Three 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", In the case of calculated by using dubious value fagged "D", the data flag was put "D".

Dew Point Temperature were 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 were 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 (10m) were computed by using (GEMPAK):

$U = -\sin(\text{direction}) * \text{wind_speed};$
 $V = -\cos(\text{direction}) * \text{wind_speed};$

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 through 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

6.2 Missing data periods

The missing data period are listed in chapter 9.0.

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the Institute of Observational Research for Global Chang (IORGC), Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology (JAMSTEC), financially supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT).

8.0 REFERENCES

Ohta, T., T. Hiyama, H. Tanaka, T. Kuwada, T. C. Maximov, T. Ohata and Y. Fukushima (2001) Seasonal variation in the energy and water exchanges above and below a larch forest in Eastern Siberia. HYDROLOGICAL PROCESSES. 15, 1459-1476.

9.0 Missing Data Periods

File Name : CAMP_SiberiaTaiga_LarchForest_20040401_20041217.twr
Data Period : 2004/04/01 00:00 - 2004/12/17 23:30

Station Pressure (1.80m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (2.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (6.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (24.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (24.80m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (27.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Station Pressure (32.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Air Temperature (1.80m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/09/17 05:30
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Air Temperature (2.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Air Temperature (6.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Air Temperature (24.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Air Temperature (24.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Air Temperature (27.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Air Temperature (32.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)

2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Dew Point Temperature (1.80m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/09/17 05:30
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Dew Point Temperature (2.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Dew Point Temperature (6.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Dew Point Temperature (24.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Dew Point Temperature (24.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Dew Point Temperature (27.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Dew Point Temperature (32.00m)

2004/05/23 00:00 - 2004/05/28 07:30 (256)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Relative Humidity (1.80m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Relative Humidity (2.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Relative Humidity (6.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Relative Humidity (24.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Relative Humidity (24.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Relative Humidity (27.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Relative Humidity (32.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Specific Humidity (1.80m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/09/17 05:30
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Specific Humidity (2.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Specific Humidity (6.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Specific Humidity (24.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Specific Humidity (24.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Specific Humidity (27.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Specific Humidity (32.00m)

2004/04/01 00:00 - 2004/05/28 07:30 (2752)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/06/20 03:00 - 2004/06/20 06:30 (8)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Wind Speed (1.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Speed (2.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Wind Speed (6.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Speed (24.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Speed (24.80m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Wind Speed (27.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Wind Speed (32.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Wind Direction (1.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (2.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (6.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (24.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (24.80m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (27.00m)

2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

Wind Direction (32.00m)

2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/05/29 06:00
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 04:30 (268)

2004/12/17 20:30 - 2004/12/17 23:30 (7)

U Wind Component (1.80m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (2.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (6.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (24.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (24.80m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (27.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

U Wind Component (32.00m)
2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/05/29 06:00
2004/06/16 08:30 - 2004/06/18 04:30 (89)
2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 05:00 (269)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

V Wind Component (1.80m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (2.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (6.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (24.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (24.80m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (27.00m)
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)

V Wind Component (32.00m)
2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/05/29 06:00
2004/06/16 08:30 - 2004/06/18 04:30 (89)

2004/08/07 01:00 - 2004/08/10 06:00 (155)
2004/08/20 22:00 - 2004/08/21 05:00 (15)
2004/09/11 15:00 - 2004/09/17 05:00 (269)
2004/12/17 20:30 - 2004/12/17 23:30 (7)