TITLE

CAMP_SiberiaTaiga_LarchForest_20021001_20030331.sfc

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DATE OF THIS DOCUMENT

27 Aug. 2004
Updated 22 Jan. 2005
(Updated 5 October 2006)

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
Precipitation	(Missing)	(Missing)
Snow Depth	SR-50	CAMBEL
Incoming Shortwave	CM6F	Kipp & Zonen)
Outgoing Shortwave	CM6F	Kipp & Zonen)
Incoming Longwave	Pyradiometer MS-202F	EKO
Outgoing Longwave	Pyradiometer MS-202F	EKO
Net Radiation	NET RADIOMETER Q7	REBS
Skin Temperature	4000GL	EVEREST

2.3 Instrumentation specification

Station Pressure (1.2m)	: Station Pressure at the 1.2m height (hPa)
Air Temperature (32m)	: Air Temperature at the 32m height (deg.C)
Relative Humidity (32m)	: Relative Humidity at the 32m height (%)
Wind Speed (32m)	: Wind Speed at the 32m height (m/s)
Wind Direction (32m)	: Wind Direction at the 32m height (deg.)
Precipitation	: Missing
Snow Depth(3m)	: Snow depth at the 3m height(cm)
Incoming Shortwave (32m)	: Shortwave Downward Radiation at the 32m height (W/m^2)
Outgoing Shortwave (28m)	: Shortwave Upward Radiation at the 28m height (W/m^2)
Incoming Longwave (32m)	: Longwave Downword Radiation at the 32m height (W/m^2)
Outgoing Longwave (28m)	: Longwave Upword Radiation at the 28m height (W/m^2)
Net Radiation (1.2m)	: Net Radiation at the 1.2m height (W/m^2)
Skin Temperature (1.2m)	: Surface Temperature at the 1.2m height (deg.C)

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 and radiation are 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. Snow depth is instantaneous values of each 2 hours. The snow sensor is based on a 50 kHz (Ultrasonic) electrostatic transducer. The SR50 determines the distance to a target by sending out ultrasonic pulses and listening for the returning echoes that are reflected from the target. Air temperature is used to compensate the snow data which is measured by using snow depth sensor. A temperature compensated distance from SR50 to snow surface is obtained by multiplying the SR50 reading by the square root of the air temperature in degree Kelvin divided by 273.15.
DISTANCE = READINGSR50×root(T (K) / 273.15(K))

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

Net radiation were computed by using (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

Snow depth was applied linear interpolation to make 30 minute data. The "off-time" observations flagged “I”.

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
Relative Humidity (32m)	: 2002/12/07 06:30 - 2003/03/31 23:30
Wind Speed (32m)	: 2002/11/17 13:00 - 2003/03/31 23:30
Wind Direction (32m)	: 2002/12/07 06:30 - 2003/03/31 23:30
Precipitation	: 2002/10/01 00:00 - 2003/03/31 23:30

Snow depth(3m)	: 2002/10/01 00:00 - 2002/11/01 00:30
Incoming Shortwave (32m)	: 2002/12/07 06:30 - 2003/03/31 23:30
Outgoing Shortwave (28m)	: 2002/12/06 08:30 - 2003/03/31 23:30
Incoming Longwave (32m)	: 2002/12/07 06:30 - 2003/03/31 23:30
Outgoing Longwave (28m)	: 2002/12/07 06:30 - 2003/03/31 23:30
Net Radiation (1.2m)	: 2002/12/06 08:30 - 2003/03/31 23:30
Skin Temperature (1.2m)	: 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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22 January 2005

1. 0 DATASET OVERVIEW

1.7 Introduction

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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.

1.8 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 recoded 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

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).

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Snow Depth	SR-50	CAMBEL
Incoming Shortwave	CM6F	Kipp & Zonen)
Outgoing Shortwave	CM6F	Kipp & Zonen)
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Net Radiation	NET RADIOMETER Q7	REBS
Skin Temperature	4000GL	EVEREST

2.4 Instrumentation specification

Station Pressure (1.2m)	: Station Pressure at the 1.2m height (hPa)
Air Temperature (32m)	: Air Temperature at the 32m height (deg.C)
Relative Humidity (32m)	: Relative Humidity at the 32m height (%)
Wind Speed (32m)	: Wind Speed at the 32m height (m/s)
Wind Direction (32m)	: Wind Direction at the 32m height (deg.)
Precipitation	: Missing
Snow Depth(3m)	: Snow depth at the 3m height(cm)
Incoming Shortwave (32m)	: Shortwave Downward Radiation at the 32m height (W/m^2)
Outgoing Shortwave (28m)	: Shortwave Upward Radiation at the 28m height (W/m^2)
Incoming Longwave (32m)	: Longwave Downword Radiation at the 32m height (W/m^2)
Outgoing Longwave (28m)	: Longwave Upword Radiation at the 28m height (W/m^2)
Net Radiation (32m)	: Net Radiation at the 32m height (W/m^2)
Skin Temperature (1.2m)	: Surface Temperature at the 1.2m height (deg.C)

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.

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Temperature, relative humidity and radiation are 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. Both of them are calculated weighting the frequency distribution of both variables within each 30 minutes. Snow depth is instantaneous values of each 2 hours.

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

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

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

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 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
2003/09/21 19:00
2003/09/30 15:30 - 2003/09/30 23:30

Precipitation:
2003/04/01 00:00 - 2003/09/30 23:30

Snow depth(3m):
2003/04/01 00:00 - 2003/09/30 23:30

Incoming Shortwave (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

Outgoing Shortwave (28m):
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

Incoming Longwave (32m):
2003/05/06 22:00
2003/05/19 20:00
2003/06/12 19:00
2003/07/03 19:00
2003/07/04 22:30
2003/07/23 18:30 - 2003/07/23 22:30
2003/08/20 23:30 - 2003/08/30 05:30
2003/09/10 10:00
2003/09/16 06:30

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

Outgoing Longwave (28m):
2003/04/06 22:30
2003/05/30 19:30
2003/06/02 09:00
2003/06/16 22:00
2003/07/23 18:30 - 2003/07/23 22:30
2003/07/25 05:00
2003/08/20 23:30 - 2003/08/30 05:30
2003/09/13 09:00
2003/09/16 06:30
2003/09/17 03:30
2003/09/23 21:30
2003/09/30 15:30 - 2003/09/30 23:30

Net Radiation (32m):
2003/05/18 08:30
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

Skin Temperature (1.2m):
2003/05/01 00:30
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

7.0 REFERENCE REQUIREMENTS

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(Updated 5 October 2006)

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1.14 Time period covered by the data

Start: 1 October 2003, 00:00
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1.15 Temporal characteristics of the data

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1.16 Physical location of the measurement

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e = es * (RH/100.0);
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 where:
   T = temperature in deg C;
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RH = Relative Humidity in percent;
Td = dew point in deg C

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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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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_20031001_20040331.sfc
Data Period : 2003/10/01 00:00 - 2004/03/31 23:30

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

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

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

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

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

U Wind Component
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
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)

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

Snow Depth
2003/10/01 00:00 - 2003/10/13 02:30 (582)
2004/03/31 23:30

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

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

Incoming Longwave
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)

Outgoing Longwave
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)

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

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

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

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

TITLE

CAMP_SiberiaTaiga_LarchForest_20040401_20041217.sfc

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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 recoded 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
Precipitation	(Missing)	(Missing)
Snow Depth	SR-50	CAMBEL
Incoming Shortwave	CM6F	Kipp & Zonen)
Outgoing Shortwave	CM6F	Kipp & Zonen)
Incoming Longwave	Pyradiometer MS-202F	EKO
Outgoing Longwave	Pyradiometer MS-202F	EKO
Net Radiation	NET RADIOMETER Q7	REBS
Skin Temperature	4000GL	EVEREST

2.6 Instrumentation specification

Station Pressure (1.2m)	: Station Pressure at the 1.2m height (hPa)
Air Temperature (32m)	: Air Temperature at the 32m height (deg.C)
Relative Humidity (32m)	: Relative Humidity at the 32m height (%)
Wind Speed (32m)	: Wind Speed at the 32m height (m/s)
Wind Direction (32m)	: Wind Direction at the 32m height (deg.)
Precipitation	: Missing
Snow Depth (3m)	: Snow depth at the 3m height (cm)
Incoming Shortwave (32m)	: Shortwave Downward Radiation at the 32m height (W/m^2)
Outgoing Shortwave (28m)	: Shortwave Upward Radiation at the 28m height (W/m^2)
Incoming Longwave (32m)	: Longwave Downword Radiation at the 32m height (W/m^2)
Outgoing Longwave (28m)	: Longwave Upword Radiation at the 28m height (W/m^2)
Net Radiation (1.2m)	: Net Radiation at the 1.2m height (W/m^2)
Skin Temperature (1.2m)	: Surface Temperature at the 1.2m height (deg.C)

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 and radiation are 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 incoming and outgoing shortwave data values at night time were replaced zero and Relative Humidity data values over 100% was replaced zero. These data flags were put "I" as an Interpolated flag.

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

Net radiation were computed by using (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

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.sfc
Data Period : 2004/04/01 00:00 - 2004/12/17 23:30

Station Pressure
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
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
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
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
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
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
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
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
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)

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

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

Incoming Shortwave
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 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Outgoing Shortwave
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 01:00
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Incoming Longwave
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)
2004/12/16 21:30
2004/12/16 23:30 - 2004/12/17 01:00 (4)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Outgoing Longwave
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)
2004/12/16 21:30
2004/12/16 23:30 - 2004/12/17 02:00 (6)
2004/12/17 03:00 - 2004/12/17 03:30 (2)
2004/12/17 20:30 - 2004/12/17 23:30 (7)

Net Radiation
2004/05/28 07:00 - 2004/05/28 07:30 (2)
2004/05/28 22:30 - 2004/05/29 00:00 (4)
2004/05/29 02:00 - 2004/05/29 04:30 (6)
2004/05/29 05:30
2004/05/29 06:30 - 2004/05/29 07:30 (3)
2004/05/29 23:00
2004/05/30 01:30
2004/05/30 04:00 - 2004/05/30 05:30 (4)
2004/05/30 22:30
2004/05/31 01:00
2004/05/31 03:30
2004/05/31 05:00
2004/05/31 23:00 - 2004/06/01 03:00 (9)
2004/06/01 04:00 - 2004/06/01 04:30 (2)
2004/06/02 01:00 - 2004/06/02 02:00 (3)

2004/06/02 06:00 - 2004/06/02 07:30 (4)
2004/06/03 00:30
2004/06/03 01:30 - 2004/06/03 02:00 (2)
2004/06/03 03:30 - 2004/06/03 04:30 (3)
2004/06/04 00:00 - 2004/06/04 05:30 (12)
2004/06/05 02:30 - 2004/06/05 03:00 (2)
2004/06/05 06:30 - 2004/06/05 07:30 (3)
2004/06/05 23:00 - 2004/06/06 00:30 (4)
2004/06/06 01:30 - 2004/06/06 08:30 (15)
2004/06/06 22:30 - 2004/06/07 03:30 (11)
2004/06/07 05:00
2004/06/07 06:30 - 2004/06/07 08:30 (5)
2004/06/07 22:30 - 2004/06/08 08:00 (20)
2004/06/09 00:00 - 2004/06/09 08:30 (18)
2004/06/09 23:30 - 2004/06/10 03:30 (9)
2004/06/10 05:00
2004/06/10 22:30 - 2004/06/11 01:00 (6)
2004/06/11 07:30
2004/06/11 08:30
2004/06/11 22:30 - 2004/06/12 00:30 (5)
2004/06/12 22:30 - 2004/06/13 08:30 (21)
2004/06/14 02:00
2004/06/15 22:30 - 2004/06/16 04:30 (13)
2004/06/16 06:00
2004/06/16 07:00
2004/06/16 08:00 - 2004/06/18 08:00 (97)
2004/06/19 02:00 - 2004/06/19 03:30 (4)
2004/06/19 06:00
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)

Skin Temperature
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)

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

Outgoing PAR
2004/04/01 00:00 - 2004/12/17 23:30 (ALL)
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)