TITLE

CAMP_SiberiaTundra_Tiksi_20021001_20030331.sfc

CONTACT

Tetsuo Ohata
Hokkaido University / Frontier Observational Research System for Global Change
Kita-19, Nishi-8, Kita-ku, Sapporo 060-0819, JAPAN
TEL: +81-11-706-5488
FAX: +81-11-706-5488
E-mail: ohata@pop.lowtem.hokudai.ac.jp

Hironori Yabuki
Frontier Observational Research System for Global Change
3173-25 Showa-machi Kanazawa-ku Yokohama-city Kanagawa 236-0001, JAPAN
TEL: +81-45-778-5645
FAX: +81-45-778-5706
E-mail: yabuki@jamstec.go.jp

DATE OF THIS DOCUMENT

21 Mayl 2004

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 tundra 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 tundra 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 hour.

1.4 Physical location of the measurement

Latitude : 71.617 N
Longitude: 128.750E
Elevation: 38.0m a.s.l.

1.5 Data source

Original data provided by the Frontier Observational Research System for Global Change (FORSGC), Japan Marine Science and Technology Center (JAMSTEC) under the research collaboration with Japan Science and Technology Agency (JST).

1.6 WWW address references

Website: http://www.hyarc.nagoya-u.ac.jp/game/siberia/tundra/home.html

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

The sensors are mounted on several heights.

2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Air Temperature	HMP-45D	VAISALA
Relative Humidity	HMP-45D	VAISALA
Wind Speed	AC860	Makino
Short-wave Radiation	MS-802F	EKO
Long-wave Radiation	MS-802F	EKO
Net Radiation	NET RADIOMETER Q7	REBS
Precipitation	RS-102	Ogasawara
Wind Direction	VR236	Makino
Air pressure	ANALOG BAROMETER PTB101	VAISALA
Skin Temperature	4000.4G	EVEREST

2.3 Instrumentation specification

StationPressure(1.5m) : Air Pressureat the 1.5m height (hPa)
AirTemperature(10m) : Air Temperature at the 10m height (deg.C)
RelativeHumidity(10m) : Relative Humidity at the 10m height (%)
WS(10m) : Wind Speed at the 10m height (m/s)
WD(10m) : Wind Direction at the 10m height (deg.)
Precip(0.5m) : Precipitation at the 0.5m height (mm) (No precipitation data during the first half of EOP-3.
Short_Down(1.5m) : Shortwave downward Radiation at the 1.5m height (W/m^2)
Long_Down(1.5m) : Longwave downword radiation at the 1.5m height (W/m^2)
Long_Upper(1.5m) : Longwave upword radiation at the 1.5m height (W/m^2)
Net Radiation(1.5m) : Net Radiation at the 1.5m height (W/m^2)

Skin Temp.(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. Precipitation is accumulated on the previous hour. Atmospheric pressure is averaged over the previous hour. Wind speed and direction are the *resulting* average speed and direction over the previous hour (calculated by the datalogger 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 hour. Snow depth is averaged over the previous hour.

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

Dew Point Temperature (10m) 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 (10m) 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(direction) * wind_speed;
V = -cos(direction) * wind_speed;

Outgoing Short wave radiation(1.5m) were computed by using (GEMPAK):

Up(Out)short radiation = down(in)short + down(in)long - up(out)long - NET_radiation;

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

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.
The quality control flags follow the CEOP data flag definition document.
"D" is put as a questionable or dubious flag for the Longwave downword Radiation, the Shortwave downward Radiation, and the Net Radiation data.
We assume that these Radiation data were caused by snow or frost coverage on the sensor in winter season.

4.2 UCAR/JOSS Quality Control Procedures

UCAR/JOSS conducted two primary quality assurance/control procedures on the reference site data. First the data has been evaluated by a detailed QA algorithm that Verifies the format is correct, examines any QC flags, and conducts basic checks on data values. Second, JOSS conducts a manual inspection of time series plots of each parameter.

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

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the research collaboration between Frontier Observational Research System for Global Change (FORSGC), Japan Marine Science and Technology Center (JAMSTEC) and Japan

Science and Technology Agency (JST), financially supported by the Japanese Ministry of Education, Science and Culture.

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Hayasaka,Y., Kanda,H., Sato,T. 1999. Distribution patterns of bryophytes in micro-scales of tundra in relation to water levels. GAME Publication No.14 Activity Report of GAME-Siberia, 1998, p49 – 52.

Kiyosawa,H., Mizoguchi,M. 1999. Soil Temperature Analysis of Active Layer in Siberian Tundra. GAME Publication No.14 Activity Report of GAME-Siberia, 1998, p53 – 54.

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CONTACT

Tetsuo Ohata
Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology
Institute of Observational Research for Global Change
2-15 Natsushima-cho, Yokosuka, 237-0061, JAPAN
TEL: +81-46-867-9250
FAX: +81-46-867-9255
E-mail: ohatat@jamstec.go.jp

Hironori Yabuki
Independent Administrative Institution Japan Agency for Marine-Earth Science and Technology
Institute of Observational Research for Global Change
2-15 Natsushima-cho, Yokosuka, 237-0061, JAPAN
TEL: +81-46-867-9268
FAX: +81-46-867-9255
E-mail: yabuki@jamstec.go.jp

DATE OF THIS DOCUMENT

20 January 2005

1. 0 DATASET OVERVIEW

1.7 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 tundra 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 tundra 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, 23:00

1.9 Temporal characteristics of the data

All parameters are recoded every hour.

1.10 Physical location of the measurement

Latitude : 71.617 N
Longitude: 128.750E
Elevation: 38.0m a.s.l.
Landscape : Tundra (moss and sedge)
Canopy height : Moss : Thickness of maximun 20cm, sedge : less than 30cm
Soil Characteristics: clayey silt

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).

1.12 WWW address references

Website: http://www.hyarc.nagoya-u.ac.jp/game/siberia/tundra/home.html

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2.1 Platform

The sensors are mounted on several heights.

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Parameter	Model	Manufacturer
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Relative Humidity	HMP-45D	VAISALA
Wind Speed	AC860	Makino
Short-wave Radiation	MS-802F	EKO
Long-wave Radiation	MS-802F	EKO
Net Radiation	NET RADIOMETER Q7	REBS
Precipitation	RS-102	Ogasawara
Wind Direction	VR236	Makino
Air pressure	ANALOG BAROMETER PTB101	VAISALA
Skin Temperature	4000.4G	EVEREST

2.4 Instrumentation specification

StationPressure(1.5m) : Air Pressureat the 1.5m height (hPa)

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WS(10m) : Wind Speed at the 10m height (m/s)
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Precip(0.5m) : Precipitation at the 0.5m height (mm)
Short_Down(1.5m) : Shortwave downward Radiation at the 1.5m height (W/m^2)
Long_Down(1.5m) : Longwave downword radiation at the 1.5m height (W/m^2)
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Net Radiation(1.5m) : Net Radiation at the 1.5m height (W/m^2)
Skin Temp.(1.2m) : Surface Temperature at the 1.2m height(deg.C)

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Temperature, relative humidity and radiation are instantaneous values. Precipitation is accumulated on the previous hour. Atmospheric pressure is averaged over the previous hour. Wind speed and direction are the *resulting* average speed and direction over the previous hour (calculated by the datalogger 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 hour. Snow depth is averaged over the previous hour.

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;
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U = -sin(direction) * wind_speed;
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Outgoing Short wave radiation were computed by using (GEMPAK):
Up(Out)short radiation = down(in)short + down(in)long - up(out)long - NET_radiation;

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

Precipitation Sensor had a problem during latter half EOP-3.

6.1.2 Quality issues

6.2 Missing data periods

Precipitation : 2003/04/01 00:00:00 - 2003/09/30 23:00:00
Snow Depth : 2003/04/01 00:00:00 - 2003/09/30 23:00:00
Downward/Upward Longwave Radiation: 2003/07/10 04:00:00 - 2003/09/06 04:00:00
The other elements : 2003/09/30 16:00:00 - 2003/09/30 23:00:00

7.0 REFERENCE REQUIREMENTS

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CONTACT

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TEL: +81-46-867-9268
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TEL: +81-46-867-9250
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16 May 2006

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q = (0.622 * e)/(p - (0.378 * e));

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U,V Components (10m) were computed by using (GEMPAK):

U = -sin(direction) * wind_speed;
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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 were followed the CEOP data flag definition document.
The incoming and outgoing shortwave data values at night time were replaced zero and "I" was put as an Interpolated flag. The soil moisture data was unable to be observed due to the permafrost during winter time.

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 research collaboration between Frontier Observational Research System for Global Change (FORSGC), Japan Marine Science and Technology Center (JAMSTEC) and Japan Science and Technology Agency (JST), financially supported by the Japanese Ministry of Education, Science and Culture.

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Sato,T., Hayasaka,Y., Kodama,Y. 1999. Perspective of spatial distribution patterns and frequency of cryospheric vascular plants of tundra in micro scales at Tiksi, northernmost Sakha (Yakutia). GAME Publication No.14 Activity Report of GAME-Siberia, 1998, p43 – 48.

Hayasaka,Y., Kanda,H., Sato,T. 1999. Distribution patterns of bryophytes in micro-scales of tundra in relation to water levels. GAME Publication No.14 Activity Report of GAME-Siberia, 1998, p49 – 52.

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9.0 Missing Data Periods

File Name : CAMP_SiberiaTundra_Tiksi_20031001_20040331.sfc
Data Period: 2003/10/01 00:00 - 2004/03/31 23:00

Station Pressure
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Air Temperature
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Dew Point Temperature
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Relative Humidity
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Specific Humidity
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Wind Speed
2003/10/01 00:00

2004/03/31 16:00 - 2004/03/31 23:00 (8)

Wind Direction
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

U Wind Component
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

V Wind Component
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

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

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

Incoming Shortwave
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Outgoing Shortwave
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Incoming Longwave
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Outgoing Longwave
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

Net Radiation
2003/10/01 00:00
2004/03/31 16:00 - 2004/03/31 23:00 (8)

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

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

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