TITLE: CAMP_Tibet_Gaize_20021001_20030331.sfc.txt

CONTACT(S):

	Contact 1	Contact 2
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1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

To clarify the energy and water cycle in the Tibetan Plateau, it is important to understand the characteristics of the basic meteorological elements and surface fluxes. The porpose of gaize AWS (Automatic Weather Station) observation is to monitor these meteorological values.

This data set includes hourly observations of precipitation, station pressure, air temperature, relative humidity, dew point, specific humidity, wind speed, wind direction, U wind component, V wind component, incoming longwave radiation, incoming shortwave radiation, net radiation, outgoing longwave radiation, outgoing shortwave radiation, and skin temperature.

There are no observations of incoming PAR, outgoing PAR, or snow depth at this station.

1.2 Time period covered by the data

The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Physical location (including lat/lon/elev) of the measurement or platform

Station name	Lat.(deg.)	Long. (deg.)	Alt.(m)	Measurement interval
Gaize	32.30	84.05	4416	1 hour

1.4 Data source if applicable (e.g. for operational data include agency)

1.5 Any World Wide Web address references

http://monsoon.t.u-tokyo.ac.jp/camp/tibets/

2.0 INSTRUMENTATION DESCRIPTION:

Table : AWS Type of Data.

Parameter/Variable Description	Range	Units	Source
air temperature	-50 - +50	degC	thermometer
relative humidity	0 - 100	%	VAISALA hygrometer HMP45D
wind speed	2 - 60	m/s	anemometer
wind direction	0 - 360	deg	wind vane
precipitation	0 - 100	mm/h	rain gauge
pressure	500 - 1100	hPa	VAISALA barometer PTB220
surface radiation temperature	-50 - +150	degC	OPTEX Thermo-hunter IK3
solar radiation	0 - 2000	W/m^2	EKO pyranometer MS-802
long wave radiation	0 - 2000	W/m^2	EKO pyradiometer MS-202

StationPressure(0.5m) : Air Pressureat the 0.5m height (hPa)
AirTemperature(0.5m) : Air Temperature at the 0.5m height (deg.C)
RelativeHumidity(0.5m) : Relative Humidity at the 0.5m height (%)
WS(4.6m) : Wind Speed at the 4.6m height (m/s)
WD(4.6m) : Wind Direction at the 4.6m height (deg.)
Precip(0.5m) : Precipitation at the 0.5m height (mm)
Short_Down(1.67m) : Shortwave downward Radiation at the 1.67m height (W/m^2)
Short_Upper(1.30m) : Shortwave upword Radiation at the 1.30m height (W/m^2)
Long_Down(1.67m) : Longwave downword radiation at the 1.67m height (W/m^2)
Long_Upper(1.30m) : Longwave upword radiation at the 1.30m height (W/m^2)
Skin Temp.(1.37m) : Surface Temperature at the 1.37m height(deg.C)

3.0 DATA COLLECTION AND PROCESSING:

Air and soil temperature are measured by using Pt100 resistance thermometer.

Wind speed and direction at 4.6m level is measured by using windmill type anemometer. Wind speed at the residual level is measured by 3-cup anemometer.

Relative humidity is measured by using the thin-film polymer sensor. The thin polymer film either absorbs or releases water vapor as the relative humidity of the ambient air rises or drops. The dielectric properties of the polymer film depend on the amount of water contained in it: as the relative humidity changes the dielectric properties of the film change and so the capacitance of the sensor changes. The electronics of the instrument measure the capacitance of the sensor and convert it into a humidity reading.

Precipitation is measured by tipping bucket rain gauge.

Pressure is measured by using the capacitive absolute pressure sensor, a kind of aneroid type barometer. When the pressure changes, the silicon diaphragm bends 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.

Surface radiation temperature is measured by radiation thermometer.

Solar radiation is measured by using pyranometer. The sensing element consists of a wire-wound thermopile constructed of electroplated copper on constantan, covered with black paint that has a spectrally flat absorption response. It is protected from environment effects (wind, etc.) using two concentric glass dome covers. Thermopiles detect the increase in temperature caused by the absorption of heat from solar radiation.

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

Dew Point Temperature (0.5m) 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 (0.5m) 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 (4.6m) were computed by using (GEMPAK):

```
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;
```

NET radiation (1.30m-1.67m) were computed by using (GEMPAK):

```
  NET_radiation = down(in)short + down(in)long - up(out)short - up(out)long;
```

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_sfc_met_format.html

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

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

Filled in gap by the Missing value "-999.99".

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences

8.0 REFERENCES:

S. Haginoya, 2001: Seasonal and annual variation of heat balance in the western Tibet, Proceedings of the International Workshop on GAME-AAN/Radiation, Thailand, 63-66.

S. Haginoya, 2001: Study on the Surface Heat Balance in the Tibetan Plateau - Precision of Bowen Ratio Method, Proc. of the 2nd International Workshop on TIPEX/GAME-Tibet, Kunming, China.

J. Xu and S. Haginoya, 2001: An Estimation of Heat and Water Balances in the Tibetan Plateau, J. Meteor. Soc. Japan, 79(1B), 485-504.

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CONTACT

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DATE OF THIS DOCUMENT

14 Jan. 2005
(Updated 05 Sep. 2006)

1. 0 DATASET OVERVIEW

1.1 Introduction

To clarify the energy and water cycle in the Tibetan Plateau, it is important to understand the characteristics of the basic meteorological elements and surface fluxes. The purpose of Gaize AWS (Automatic Weather Station) observation is to monitor these meteorological values.

1.2 Time period covered by the data

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

1.3 Temporal characteristics of the data

All parameters are recoded every 1 hour.

1.4 Physical location of the measurement

Latitude : 32.30 N
Longitude : 84.05 E
Elevation : 4416 m a.s.l.
Landscape : Bare land (with the thin weed-like plant): Plain land
Canopy height : Less than 5cm.
Soil Characteristics: Silt loam

1.5 Data source

1.6 WWW address references

http://monsoon.t.u-tokyo.ac.jp/camp/tibets/

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	Thermometer	?
Relative Humidity	HMP45D	VAISALA
Wind Speed	3 cup anemometer(VS-125)	?
Wind Direction	WS-D32	?
Precipitation	Rain Guage	?
Incoming Shortwave	MS-802	EKO
Outgoing Shortwave	MS-802	EKO
Incoming Long wave	MS-802	EKO
Outgoing Long wave	MS-802	EKO
Skin Temperature	Thermo-hunter IK3	OPTEX

2.3 Instrumentation specification

StationPressure(0.5m) : Air Pressureat the 0.5m height (hPa)
AirTemperature(0.5m) : Air Temperature at the 0.5m height (deg.C)
RelativeHumidity(0.5m) : Relative Humidity at the 0.5m height (%)
WS(4.6m) : Wind Speed at the 4.6m height (m/s)
WD(4.6m) : Wind Direction at the 4.6m height (deg.)
Precip(0.5m) : Precipitation at the 0.5m height (mm)
Short_Down(1.67m) : Shortwave downward Radiation at the 1.67m height (W/m^2)
Short_Upper(1.30m) : Shortwave upword Radiation at the 1.30m height (W/m^2)
Long_Down(1.67m) : Longwave downword radiation at the 1.67m height (W/m^2)
Long_Upper(1.30m) : Longwave upword radiation at the 1.30m height (W/m^2)
Skin Temp.(1.37m) : Surface Temperature at the 1.37m height(deg.C)

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

3.2 Description of derived parameters and processing techniques used

Air and **soil temperature** are measured by using Pt100 resistance thermometer.

Wind speed and **direction** at 4.6m level is measured by using windmill type anemometer.
Wind speed at the residual level is measured by 3-cup anemometer.

Relative humidity is measured by using the thin-film polymer sensor. The thin polymer film either absorbs or releases water vapor as the relative humidity of the ambient air rises or drops. The dielectric properties of the polymer film depend on the amount of water contained in it: as the relative humidity changes the dielectric properties of the film change and so the capacitance of the sensor changes. The electronics of the instrument measure the capacitance of the sensor and convert it into a humidity reading.

Precipitation is measured by tipping bucket rain gauge.

Pressure is measured by using the capacitive absolute pressure sensor, a kind of aneroid type barometer. When the pressure changes, the silicon diaphragm bends 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.

Surface radiation temperature is measured by radiation thermometer.

Solar radiation is measured by using pyranometer. The sensing element consists of a wire-wound thermopile constructed of electroplated copper on constantan, covered with black paint that has a spectrally flat absorption response. It is protected from environment effects (wind, etc.) using two concentric glass dome covers. Thermopiles detect the increase in temperature caused by the absorption of heat from solar radiation.
Long wave radiation beyond 3 micrometer is measured by using pyradiometer. The principal of sensor is the same as pyranometer. It uses a specially coated silicon dome that transmits incoming radiation with wavelength of more than 3 micrometer by cutting off shorter wavelengths.

Dew Point Temperature (0.5m) 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 (0.5m) 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 (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

NET radiation (1.30m-1.67m) 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

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

The incoming and outgoing shortwave data at night time was replaced 0 w/m2 and data flag were put “I”.

6.2 Missing data periods
There are missing data at 2003/04/01 00:00:00 and 2003/07/28 05:00:00

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences.

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TITLE

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CONTACT

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DATE OF THIS DOCUMENT

30 May. 2006

1. 0 DATASET OVERVIEW

1.7 Introduction

To clarify the energy and water cycle in the Tibetan Plateau, it is important to understand the characteristics of the basic meteorological elements and surface fluxes. The purpose of Gaize AWS (Automatic Weather Station) observation is to monitor these meteorological values.

1.8 Time period covered by the data

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

1.9 Temporal characteristics of the data

All parameters are recoded every 1 hour.

1.10 Physical location of the measurement

Latitude : 32.30 N
Longitude : 84.05 E
Elevation : 4416 m a.s.l.
Landscape : Bare land (with the thin weed-like plant): Plain land
Canopy height : Less than 5cm.
Soil Characteristics: Silt loam

1.11 Data source

1.12 WWW address references

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2.1 Platform

The sensors are mounted on several heights.

2.2 Description of the instrumentation

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Air Temperature	Thermometer	Ogasawara Keik
Relative Humidity	HMP45D	VAISALA
Wind Speed	3 cup anemometer(VS-125)	Ogasawara Keiki
Wind Direction	WS-D32	Ogasawara Keiki
Precipitation	Rain Guage	Ogasawara Keiki
Incoming Shortwave	MS-802	EKO
Outgoing Shortwave	MS-802	EKO
Incoming Long wave	MS-202	EKO
Outgoing Long wave	MS-202	EKO
Skin Temperature	Thermo-hunter IK3	OPTEX

2.4 Instrumentation specification

StationPressure(0.5m) : Air Pressureat the 0.5m height (hPa)
AirTemperature(0.5m) : Air Temperature at the 0.5m height (deg.C)
RelativeHumidity(0.5m) : Relative Humidity at the 0.5m height (%)
WS(4.6m) : Wind Speed at the 4.6m height (m/s)
WD(4.6m) : Wind Direction at the 4.6m height (deg.)
Precip(0.5m) : Precipitation at the 0.5m height (mm)
Short_Down(1.67m) : Shortwave downward Radiation at the 1.67m height (W/m^2)
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Long_Down(1.67m) : Longwave downword radiation at the 1.67m height (W/m^2)
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3.1 Description of data collection

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  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 (0.5m) 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 (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

NET radiation (1.30m-1.67m) 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

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

Note: As there were noise upward and downward shortwave radiation in the night-time, the data under 5.00 W/m2 was replaced in the value 0.00 and flagged I. (G is flagged to the original 0.00 W/m2 data.)

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences.

8.0 REFERENCES

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J. Xu and S. Haginoya, 2001: An Estimation of Heat and Water Balances in the Tibetan Plateau, J. Meteor. Soc. Japan, 79(1B), 485-504.

9.0 Missing Data Periods

File Name   : CAMP_Tibet_Gaize_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    2004/05/23 23:00

Air Temperature
    2004/05/23 23:00

Dew Point Temperature
    2004/05/23 23:00

Relative Humidity
    2004/05/23 23:00

Specific Humidity
    2004/05/23 23:00

Wind Speed
    2004/05/23 23:00

Wind Direction
    2004/05/23 23:00

U Wind Component
    2004/05/23 23:00

V Wind Component
    2004/05/23 23:00

Precipitation
    2004/05/23 23:00

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

Incoming Shortwave
    2004/05/21 01:00
    2004/05/23 23:00

Outgoing Shortwave
    2004/05/21 01:00
    2004/05/22 02:00
    2004/05/23 23:00

Incoming Longwave
    2004/05/21 01:00

2004/05/23 10:00
2004/05/23 23:00 - 2004/05/24 00:00 (2)

Outgoing Longwave
2004/05/21 01:00
2004/05/22 02:00
2004/05/23 10:00
2004/05/23 23:00 - 2004/05/24 00:00 (2)

Net Radiation
2004/05/21 01:00
2004/05/22 02:00
2004/05/23 10:00
2004/05/23 23:00 - 2004/05/24 00:00 (2)

Skin Temperature
2004/05/23 23:00

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)