TITLE

CAMP_Himalayas_Pyramid_20021001_20030331.stm

CONTACT

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DATE OF THIS DOCUMENT

17 February 2004

1. 0 DATASET OVERVIEW

1.1 Introduction

Intensive meteorological observations in the Khumbu Valley, Nepal Himalayas, have been conducted since the middle 90's (Ueno et al., 1996; Tartari et al., 1999; Bertolani et al., 2000; Ueno et al., 2001; Bollasina et al., 2002; Ueno and Pokhrel, 2002) in order to provide long-term monitoring of the monsoon at high altitude. This area, being located on the windward side of the Range with respect to the Indian monsoon, is well exposed to the summer winds. The studies conducted have demonstrated
that the region is a significant point of observation both of local climate and large-scale circulation. A network of Automated Weather Stations (AWSs) has been established in the Eastern Himalayas: the AWSs are located at different altitudes, over a 40 km stretch oriented approximately south to north. The observation of surface and sub-surface parameters is crucial for studying the feedback mechanisms and the physical exchange processes between the land and the atmosphere, very important in the modulation of the monsoon.

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 hourly. This data set includes soil temperature at 5 and 20 cm depths and soil moisture at 5 cm depth.

The soil moisture is entirely missing at the 20 cm depth.

1.4 Physical location of the measurement

Latitude: 27° 57' 32.5" N
Longitude: 86° 48' 47.6" E
Elevation: 5035 m a.s.l.

1.5 Data source

Original data provided by the Ev-K2-CNR Committee.

1.6 WWW address references

http://news.epson-meteo.org
http://www.montagna.org

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

Soil temperature and moisture sensors are mounted on rigid arms to keep them vertically.

2.2 Description of the instrumentation

Parameter	Model	Manifacturer
Soil Temperature	DLA400	Lsi-Lastem (Italy)
Soil Moisture	HMS9000	Sdec (France)

2.3 Instrumentation specification

Parameter	Sensor Type	Depth of sensor (cm)	Accuracy	Resolution
Soil Temperature	Pt-100	-5; -20	0.15°C	0.1°C
Soil Moisture	Electrical capacity of permittivity; volumetric	-5	2%	0.025 point 0.1% of humidity

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

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

3.2 Description of derived parameters and processing techniques used

Soil temperature and moisture data are instantaneous values. The soil moisture sensor

actually measures the dielectric permittivity (e) of the soil. To derive the volumetric soil moisture humidity (Hv, in %), a linear conversion was done using the relation:

e = A? (Hv/100) + B,

where the constants A and B depend on the soil type. They were determined (with laboratory tests in Italy) by the gravimetric method (see http://www.sdec-france.com), introducing the probe into soil samples collected around the sensor at the Pyramid. The values attributed to the constants and used in deriving this dataset are:
A = 34 , B = 3.3 .

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_soils_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. Cross-checking with the variation of other measured parameters (ground heat flux, snow cover, etc.) was also performed to assure the consistency among the variations of different variables under the same conditions.

The quality control flags follow the CEOP data flag definition document.

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

Soil moisture missing data until 22 October 2002 at 15:00 are due to problems with the correct positioning of the sensor in the soil. Its datalogger failed on 27 October 2002.

6.1.2 Quality issues

None.

6.2 Missing data periods

All data are missing on 1 October 2002 from 8:00 to 15:00 due to operations on the datalogger (i.e., channels configuration). The soil moisture sensor was definitely and correctly placed in the soil on 22 October 2002 at 16:00, so values during the period 1 October 2002 00:00 - 22 October 2002 15:00 are missing. Due to a datalogger fault, soil moisture data are also missing on 27 October 2002 from 8:00 to 23:00.

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the Ev-K2-CNR/RONAST
Joint Scientific and Technological Research Project, funded by Italian Ministries and National Research Council through the Ev-K2-CNR Committee.

8.0 REFERENCES

Ueno K., and A. P. Pokhrel, 2002: Intra-seasonal air temperature variation in the Nepal Himalayas, Mausam, 53, 281-288.

Bollasina, M., L. Bertolani, and G. Tartari, 2002: Meteorological observations in the Khumbu Valley, Nepal Himalayas, 1994-1999, Bull. Glac. Res., 19, 1-11.

Ueno K., R. B. Kayastha, M. R. Chitrakar, O. R. Bajracharya, A. P. Pokhrel, H. Fujinami, T. Kadota, H. Iida, D. P. Manandhar, M. Hattori, T. Yasunari, and M. Nakawo, 2001: Meteorological observations during 1994-2000 at the Automatic Weather Station (GEN-AWS)
in Khumbu region, Nepal Himalayas, Bull. Glac. Res., 18, 23-30.

Bertolani, L., M. Bollasina, and G. Tartari, 2000: Recent biennial variability of meteorological features in the Eastern Highland Himalayas, Geophys. Res. Lett., 17, 2185-2188.

Tartari, G., G. P. Verza, and L. Bertolani, 1999: Meteorological data at the Pyramid Laboratory. In: A. Lami, R. Mosello, G. Giussani (Eds), Limnology of high altitude in the Khumbu Valley, Nepal. Documenta Ist. Ital. Idrobiol.

Ueno K., H. Iida, H. Yabuki, K. Seko, A. Sakai, G. S. Lhakupa, R. B. Kayastha, A. P. Pokhrel, M. L. Shrestha, T. Yasunari, and M. Nakawo, 1996: Establishment of the GEN Automatic Weather Station (AWS) in Khumbu region, Nepal Himalayas, Bull. Glac. Res., 14, 13-22.

TITLE

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CONTACT

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DATE OF THIS DOCUMENT

05 October 2004

1. 0 DATASET OVERVIEW

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1.2 Time period covered by the data

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

1.3 Temporal characteristics of the data

All parameters are recorded hourly. Hour is UTC.

1.4 Physical location of the measurement

Latitude: 27° 57' 32.5" N
Longitude: 86° 48' 47.6" E
Elevation: 5035 m a.s.l.

1.5 Data source

Original data provided by the Ev-K^2-CNR Committee.

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Soil Moisture	Electrical capacity	-5	2%	0.025 point of permittivity; 0.1% of volumetric humidity

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3.1 Description of data collection

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

3.2 Description of derived parameters and processing techniques used

Soil temperature and moisture data are instantaneous values. The soil moisture sensor actually measures the dielectric permittivity (ε) of the soil. To derive the volumetric soil moisture humidity (H_v, in %), a linear conversion was done using the relation:

$$\varepsilon = A \cdot (H_v/100) + B,$$

where the constants A and B depend on the soil type. They were determined (with laboratory tests in Italy) by the gravimetric method (see http://www.sdec-france.com), introducing the probe into soil samples collected around the sensor at the Pyramid. The values attributed to the constants and used in deriving this dataset are:

$$A = 34 \text{ , } B = 3.3 \text{ .}$$

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. Cross-checking with the variation of other measured parameters (air temperature, ground heat flux, snow cover, precipitation, etc.) was also performed to assure the consistency among the variations of different variables under the same conditions.
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

None.

6.2 Missing data periods

Soil temperature is missing on 5 April 2003 at 11:00 due to operations on the datalogger. For the same reason, soil moisture is missing on 5 April 2003 from 11:00 to 12:00. Soil moisture is missing also from 7 September 2003 at 6:00 to 8 September at 5:00 due to configuration of the datalogger.

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the Ev-K^2-CNR/RONAST Joint Scientific and Technological Research Project, funded by Italian Ministries and National Research Council through the Ev-K^2-CNR Committee.

8.0 REFERENCES

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Bertolani, L., M. Bollasina, and G. Tartari, 2000: Recent biennial variability of meteorological features in the Eastern Highland Himalayas, *Geophys. Res. Lett.*, **17**, 2185-2188.

Tartari, G., G. P. Verza, and L. Bertolani, 1999: Meteorological data at the Pyramid Laboratory. In: A. Lami, R. Mosello, G. Giussani (Eds), *Limnology of high altitude in the Khumbu Valley*, Nepal. Documenta Ist. Ital. Idrobiol.

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