TITLE

CAMP_Himalayas_Pyramid_20060101_20061231.stm

CONTACT

Elisa Vuillermoz
Ev-K2-CNR Committee
Via San Bernardino, 145
24126 Bergamo
Italy
E-mail: elisa.vuillermoz@evk2cnr.org

Gianni Tartari
E-mail: tartari@irsa.cnr.it

Laura Bertolani
E-mail: laura.bertolani@epson-meteo.org

DATE OF THIS DOCUMENT

September 8, 2008

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: January 1, 2006, 00:00
End: December 31, 2006, 23:00

1.3 Temporal characteristics of the data

All parameters are recoded hourly.

1.4 Physical location of the measurement

Latitude: 27° 57' 33" N
Longitude: 86° 48' 48" 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://www.evk2cnr.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	-5	2%	0.025 point of permittivity; 0.1% of volumetric 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 (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 , B = 3.3 .

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.

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
Rain gauge sensor was damaged: precipitation flags B/D during monsoon season.

6.1.2 Quality issues

None.

6.2 Missing data periods

None.

7.0 REFERENCE REQUIREMENTS

Original data was collected and is provided within the framework of the Ev-K2-CNR/NAST 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 R. Aryal. 2008. Impact of tropical convective activity on monthly temperature variability during non-monsoon season in the Nepal Himalayas. Accepted to Jour. Geo. Res.

Ueno K., K. Toyotsu, L. Bertolani and G. Tartari, 2008. Stepwise onset of monsoon weather observed in the Nepal Himalayas. Mon. Wea. Rev., **136**, 2507-2522.

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.