

## TITLE

CEOP\_Tsukuba\_TERC-UT\_20070701\_20071231.twr

## CONTACT

Jun Asanuma  
Terrestrial Environment Research Center, University of Tsukuba  
Tenno-dai 1-1-1  
Tsukuba, Ibaraki 305-8572 Japan  
E-mail: [asanuma@suii.tsukuba.ac.jp](mailto:asanuma@suii.tsukuba.ac.jp)

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## 1. 0 DATASET OVERVIEW

### 1.1 Introduction

Terrestrial Environment Research Center (TERC) started its long-term measurement of the surface heat and water balance at its surface heat and water balance field in 1981, and is continuing the observation. The field is circle in shape and has a 30-meter tower at its center. On the tower, profiles of air temperature, humidity and turbulence fluxes are measured and while, on the ground of the field, various measurements relevant to the surface heat and water budget are also being made. These include radiation components, ground water levels, soil temperature and soil heat flux. The measured data averaged over various time scale (30min., 1hour, 1day) are available on the web page (<http://www.suii.tsukuba.ac.jp>). Some of the can be dated back to 1980's. Among the measurements, basic meteorological and hydrological parameters are provided for CEOP2.

### 1.2 Time period covered by the data

Start: 1 July 2007, 00:00 UTC  
End: 31 December 2007, 00:00 UTC

### 1.3 Temporal characteristics of the data

Original data, from which the data submitted to CEOP2, is averaged for 30 minutes.

### 1.4 Physical location of the measurement

Latitude: 36°06'35" N  
Longitude: 140°06'00" E  
Altitude: 27.0 m a.s.l.

### 1.5 Data source

Original data provided by the Terrestrial Environment Research Center, University of Tsukuba. Dew-point temperature, specific humidity are calculated using the original data.

## 1.6 WWW address references

<http://www.suiri.tsukuba.ac.jp/>

## 2.0 INSTRUMENTATION DESCRIPTION

### 2.1 Platform

On the tower, thermometers and humidity-meters are mounted at the 3 vertical levels, namely, 1.6, 12.3 and 29.5 m above the ground. Also, 3 sonic anemometer-thermometers are mounted at 2 vertical levels, 1 at 1.6 m and 2 at 29.5m. The one of the 2 sonic anemometers at 29.5 m is facing southeast, while the other faces toward northwest.

### 2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Wind Speed	DA-600	Kaijo Inc
Air temperature	HMP-45D	Vaisala
Relative Humidity	HMP-45D	Vaisala
Air pressure	PTB-210	Vaisala

### 2.3 Instrumentation specification

Parameter	Sensor Type	Height of sensor (m)	Accuracy	Resolution
Wind Speed	Sonic Anemometer-thermometer	1.6, 29.5	0.005m/s	0.1m/s
Air temperature		1.6, 12.3, 29.5	0.2 deg	0.1 deg
Relative Humidity	High polymer film	1.6, 12.3, 29.5	2 % (0-90%) 3 % (above 90%)	1%
Air pressure	silicon capacitive sensor	1.5	0.30 hPa	0.1hPa

## 3.0 DATA COLLECTION AND PROCESSING

### 3.1 Description of data collection

Measurements of sonic anemometers are sampled at 10Hz, and those of the other sensors at every 10 seconds, and they are averaged over 30 minutes in the loggers. Averaged data stored in the these loggers are retrieved simultaneously through the local network and they are stored in the data server of TERC. These data are subject to the post-processed for CEOP2

### 3.2 Description of derived parameters and processing techniques used

The observations from the two sonic anemometers at 29.5 m on the tower are both recorded, and one of the two was selected with the wind direction as a reference during the post-processing. Dew point temperature, specific humidity were computed from the

relative humidity and the temperature, and the air pressure at 1.5 m was used when necessary

#### 4.0 QUALITY CONTROL PROCEDURES

Measurements during the maintenance of the instruments as well as other possible causes such as electric shutdown are marked as “m” (missing), and the data value is replaced with the value -999.99. The measurements that are out of the ordinary range are marked as “B” (bad). When external influence, such as maintenance works, are possible the data is marked as “D”(dubious). Otherwise, the data is marked as “G” (good).

#### 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

On Dec. 20, one of the sonic anemometer at 29.5 meter was found to produce abnormal values due to instrumental problem, and the data during Dec 18 and 20 were marked as missing.

Wind direction at 29.5 m has been mentioned to be biased when compared with a nearby meteorological station operated by Meteorological Agency (Watarai et al, 2006). However, this has not been found in this data set, and further investigation are needed. Until then, the wind direction and u, v component of the wind are filled with the missing value and flagged as missing.

###### 6.1.2 Quality issues

Data quality is almost good.

Relative humidity (RH) data at 1.6 m, 12.3 m and 29.5 m include a small drift due to deterioration of the sensor. For instance, the maximum value for each year at three levels had decreased from 2007 to 2010 as listed below.

	1.6m	12.3m	29.5m
2007	99.9	99.8	100.5
2008	98	96.9	97.3
2009	96.3	94.8	94.6
2010	95.9	102.9	93.7

Also, you may see that RH at 12.3 meter gives a larger value than 100 %, and the sensor was replaced during 2010.

##### 6.2 Missing data periods

Regular electric shutdown occurred between Oct 13 and Oct 15, and no data were recorded during this time.

Grass mowing works on July 4, Oct 18 and Oct 22.

Regular maintenance was made on Oct 15, Nov 5, Nov 15, Nov 21, Nov. 26, Dec 5, and Dec 14.

Quality flags are marked "D", "M" or "G" depending on the possible influence on the measured values.

(The wind direction/Uwind/Vwind are currently entirely missing in 2007 dataset. Station PI is investigating the reason.)

## **7.0 REFERENCE REQUIREMENTS**

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