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OTHER_Italy_MP_MetEROBS_20100101_20101231.sfc

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DATE OF THIS DOCUMENT

April 7, 2011

1. 0 DATASET OVERVIEW

1.1 Introduction

Intensive meteorological observations in the Benevento (Calore River Basin), have been conducted since 1994. However, only MetER**OBS** ensured a continuous and silent observation in order to provide long-term monitoring of the climate at hilly environment.
The landscape in the region around Monte Pino is in fact formed by undulating surface with height differences above 1000 m towards SW, and 300 m towards NE, over distances of about 20 km. The terrain at west of the MetER**OBS** is more roughness with height differences of 200 m over a distance of about 2 km. The core area of the site is sloped and covered by short grass (managed regularly so that the vegetation height is always less then 20 cm), this area is surrounded by grassland and agricultural fields in the immediate vicinity (Olive and fruit tree and copse). The basic installation of the MetER**OBS** was performed in 1986, and the number of sensors and measurement systems has gradually been complemented over the following years.

1.2 Time period covered by the data

Start: January 1, 2010, 19:00 UTC, End: December 31, 2010, 23:00 UTC

1.3 Temporal characteristics of the data

All parameters are recoded hourly.

1.4 Physical location of the measurement

Geographical coordinate:41.1072 N, and 14.7412 E

Elevation: 184 m a.s.l.

1.5 Data source

MetEROBS – Met European Research Observatory Committee.

1.6 Web address
http://www.fao.org/gtos/tems/tsite_show.jsp?TSITE_ID=3730

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

The meteorological data are measured upon a field opened of about 100 squared-meters. Both the digital and mechanical thermo-hygrometer sensors, plus ordinary instruments (thermometers and psycrometer) are housed in a wooden set-screen free-rain and naturally ventilated at ~ 2 meters from ground. The radiometer, atmometer and rain-gauges are operated around the above set-screen, with high of 2, 1 and 0.5 meters, respectively. In this context, the mechanical measurements are continuosly accompained with the Meteorology Integrate Digital Station (MIDS) to obtain 1-h statistics of surface global radiation, wind speed, wind direction, air temperature and relative humidity and rain-rate. Barometric Pressure is measured in house-laboratory.
Instrumentation technology: Mechanical and digital for conventional meteorological-data; manual for experimental manipulation.

2.2 Description of the instrumentation

- Station pressure (at 188 meters a.s.l.; Davis)
- Air Temperature (2 m; Davis: Thermistor –40 /+ 70 °C)
- Specific humidity and Dew point (2 m; derived)
- Relative humidity (2 m; Davis)
- Psychrometer (2 m; Hygromat cod 36020)
- Wind speed and direction (6 m; Davis: Wind cups with magnetic switch, and Wind potentiometer, respectively; UPC code 011698 79110 1)
- Precipitation (0.5 m; Davis Pluvio weighing; collector of 400 cm^2 with 0.2 mm resolution)
- Snow depth (Snow stick manual)
- Incoming shortwave radiation (2 m; Davis silicon photodiode sensor 6450)
- Atmometer (1 m; Etgage mod E(A))
- ThermoHygrograph Lambrecht (2 m)
- Pluviograph with weakly recording chart (1.5 m; SIAP UM8100)
- Precision thermometers min and max (2 m; SIAP TM7A and TM6A, respectively).

2.3 Instrumentation specification

Parameter	Sensor Type	Height of sensor (m)	Accuracy	Resolution
Air Temperature	Thermoresistance	2	0.1°C	0.025°C

Precipitation	Tipping Bucket	0.5	1% (0-1 mm/min); 2% (1-3 mm/min)	0.2 mm
Relative Humidity	Capacitive Plate	2	2.5%	0.2%
Atmospheric Pressure	Slice of Silica	4	1 hPa	0.1 hPa
Wind Speed	3-cup anemometer	6	0.1 m/s	0.05 m/s
Wind Direction	Potentiometer	6	1%	0.1°
Downward Shortwave Radiation	Thermopile	2	10% (daily total)	-

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

Data are transmitted from AWS-station to consol so that human observation can directly control with actual weather and compare its with mechanical station. Then, data downloaded from the AWS consol to PC one every week and on which doing 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.

The four parameters indicated below were computed by using “CEOP Derived Parameter Equations” available at: http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html. These data have the flag “I”. In the case of calculated by using dubious value flagged “D”, the data flag was put D”.

Dew Point Temperature was 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 was 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.

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. Nocturnal shortwave radiation data has been checked for non-zero values; wind speed and direction for sensor freezing; precipitation data has been checked for delayed measurement due to the melting of solid precipitation.
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

Dew deposition could be temporally observed on the radiation sensor.

6.2 Missing data periods

21.01.2010 (04-06 h)
01.07.2010 (00-17 h)
31.10.2010 (23 h)

7.0 REFERENCE REQUIREMENTS

None.

8.0 REFERENCES

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