BUCL Urban Meteorological Network Read Me Guide

Dataset Description

The dataset has been provided by the Birmingham Urban Climate Laboratory (BUCL), from the University of Birmingham, through the completion of the HiTemp research project. It is comprised of 25 WXT520 automatic weather station and 74 Aginova Sentinel Micro (ASM) observation time series, spanning various lengths, in minute resolution, between June 2012 and June 2014.

The data is divided into daily files; however the WXT data is complete from their commission date to June 2014, whereas daily files have been omitted from the ASM data where no observation was taken for that day, in order to reduce redundant memory storage. All data files are in a Comma Separated Value format (CSV).

Detailed metadata forms for every site are included, including sketch maps, horizons, photographs and maintenance logs (Muller et al., 2013). Compiled location and elevation data are provided in CSV files for both the WXTs and ASMs, along with an exported metadata file for the WXTs. Each time series has a unique, 4 character ID, with WXT and ASM IDs beginning with 'W' and 'S' respectively, e.g. 'W008' for WXT number 8.

Flag Explanation

Flags have been assigned to each observation with a composite flag calculated for the observation period. These 'numeric flag' files are also divided daily, and are constructed so the location of each observation and its respective flag is the same. These have been created using a combination of automatic and manual quality assurance/quality control (QAQC) procedures, following what was outlined in Chapman et al., 2014.

Flag	Description
0	Good
1	Suspect
2	Warning
5	Likely Good (BUCL input)
9	Missing data

Data with warning flags should be omitted from use. Suspect data is most likely erroneous but did not fail the QAQC tests to the same extent and, unless it is scrutinised further individually, should be omitted as well. As a final note, the number of flags in winter generally increases for the WXTs due to the lack of power and extra care should be taken. Flags marked with 5 were assigned suspect by the automatic QAQC but were overwritten after a manual check. Flags marked with 9 are missing with dummy values of '-999' for the observations. Rain, rainfall rate and hail have all been intentionally omitted for the data upload and have been replaced by dummy values.

File Formats

WXT520 – Minute Resolution

Column	Code	Variable	Units	Type
1	YEAR	Year	-	TIME
2	MONX	Month	-	TIME
3	DAYX	Day	-	TIME
4	HOUR	Hour	-	TIME
5	MINX	Minute	-	TIME
6	TAIR	Air Temperature	degC	AVG
7	TDEW	Dew point Temperature	degC	CALC
8	RELH	Relative Humidity	%	AVG
9	PRES	Station Pressure	hPa	AVG
10	PSML	Mean Sea Level Pressure	hPa	CALC
11	SRAD	Solar Radiation	$W\ m^{-2}$	AVG
12	RTOT	Rainfall Total	mm	TOT
13	RRAT	Rainfall Rate	$kg\ m^{-2}$	CALC
14	WSPD	Wind Speed	$m\ s^{-1}$	AVG
15	WDIR	Wind Direction	deg	AVG
16	WMAX	Maximum Wind Gust	$m\ s^{-1}$	MAX
17	HAIL	Hail	$Hits\ cm^{2}$	AVG
18	FLAG	Data Quality Control Flag	-	CALC

ASM – Minute Resolution

Column	Code	Variable	Units	Type
1	YEAR	Year	-	TIME
2	MONX	Month	-	TIME
3	DAYX	Day	-	TIME
4	HOUR	Hour	-	TIME
5	MINX	Minute	-	TIME
6	TAIR	Air Temperature	degC	AVG
7	FLAG	Data Quality Control Flag	-	CALC

Explanation of Type Values

Type	Explanation
AVG	Average
CALC	Calculated
MAX	Maximum
TOT	Total

Bibliography

Muller, C.L., Chapman, L. Young, D.T., Grimmond, C.S.B., Cai, X.-M. (2013) Towards a Standardised Metadata Protocol for Urban Meteorological Networks. *Bulletin of the American Meteorological Society*. **94**, pp 1161–1185

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