

CU/MONSON NIWOT RIDGE AMERIFLUX DATA INFORMATION (“LTER NWT1”)

Updated : March 11, 2008

Contacts: Sean Burns (sean.burns@colorado.edu), Jeff Beauregard (jeffrey.beauregard@colorado.edu), Russ Monson (russell.monson@colorado.edu)

This document describes the data and documentation available from the CU/Monson AmeriFlux webpage (http://urquell.colorado.edu/data_ameriflux/).

These data files are freely available to the public; however, we do ask that you abide by the Fair Use Policy listed below. This policy was originally developed by the Harvard Forest AmeriFlux site and was subsequently adopted by AmeriFlux as a whole.

FAIR USE POLICY:

–Kindly inform the appropriate Principal Investigators of how you are using site data and of any publication plans. If the PIs feel that they should be acknowledged or offered participation as authors, they will let you know and we assume that an agreement on such matters will be reached prior to publishing and/or use of the data for publication. If your work directly competes with the PIs analysis they may ask that they have the opportunity to submit a manuscript before you submit the one that uses their data. In addition, when publishing, please acknowledge the agency that supported the research.–

Data and information are available for download from the following subdirectories:

data_30min/	% 30-min Average Flux/Climate/Soil Data files
data_5min/	% 5-min Average Data (additional parameters)
docs/	% addition documentation about the data

1. The 30-min data are organized into three types of files: “climate”, “flux”, and “soil” files. For example, the 2007 30-min data files are:

```
-rw-r--r--  1 sburns    5543886 Mar 10 16:29 climate_2007.dat
-rw-r--r--  1 sburns    2826826 Mar 10 16:30 climate_flags_2007.dat
-rw-r--r--  1 sburns    2911583 Mar 10 16:31 flux_2007.dat
-rw-r--r--  1 sburns    1860291 Mar 10 16:32 flux_flags_2007.dat
-rw-r--r--  1 sburns    4172273 Mar  6 09:40 soil_2007.dat
```

The header at the top of each 30-min data file describes what is within the file, as well as information about the Version and date the file was created. “Climate” files contain meteorological (Air temperature, Humidity, etc.) and radiation (PPFD, Net Radiation, etc.) data. “Flux” files include CO₂ fluxes, sensible and latent heat fluxes, etc. The “flag” files indicate whether data were available, questionable, or rejected for various reasons as well as how data gaps are filled. The soil data files have soil-related parameters measured by multiple sensors and are currently available for 2005-2007.

All data files are space-delimited ASCII (5-min data are also available in NetCDF format). Data are reported as averages with the time tag signifying the center of the time period. Time tags are in Mountain Standard Time which is seven hours behind UTC (ie, MST = UTC-7 hours). These data are subject to change, and versions will be tracked in the header of each data file. **To be added to an email list and get updates on any subsequent changes to these data please e-mail Sean Burns (sean.burns@colorado.edu).**

2. The 5-minute data files include supplementary data from all levels of wind and temperature that were measured on the CU tower (note, some of the 5-min parameters are included in the “climate”, “flux”, and “soil” data files and some are not). An example of the 2007 5-minute data set is:

```
58699600 Jan 31 15:48 niwot_5min_070101.000230_071231.235730.nc (netCDF file)
30784576 Jan 31 18:32 niwot_5min_070101.000230_071231.235730_ascii.zip (zipped ASCII archive)

15506 Jan 31 17:49 cu_5min_2007_01.stats
15529 Jan 31 17:51 cu_5min_2007_02.stats
15568 Jan 31 17:53 cu_5min_2007_03.stats
15549 Jan 31 17:55 cu_5min_2007_04.stats
15511 Jan 31 17:57 cu_5min_2007_05.stats
etc, etc.
```

The “stats” files are ASCII files with more information about the parameters within the 5-minute data files. Note: data in netCDF format and zipped ASCII are the same (so download your preferred format).

3. The documentation files (in the “docs” subdirectory) are:

```
-rw-rw-r-- 1 sburns      9681 Jan  2  2003 Readme1st.pdf (this document)
-rw-rw-r-- 1 sburns     61490 Jan  2  2003 Climate.pdf
-rw-rw-r-- 1 sburns     55925 Jan  2  2003 Fluxes.pdf
-rw-r--r-- 1 sburns    127254 Dec 13  2005 Sensors.pdf
-rw-rw-r-- 1 sburns     10169 Jan 28 11:20 Soil.txt
```

A thorough description of the instrumentation and data files (i.e., which sensors are used, corrections applied, description of the flags) is contained in the above documents. “Climate.pdf” and “Fluxes.pdf” provide information about the corresponding “Climate” and “Flux” data files; “Soil.txt” describes the motivation for creating the soil data files, and “Sensors.pdf” is a list of the sensors operating at the site.

Within the “docs” subdirectory there is also information about important “events” that happened at the tower each year and the “biological summary” of the site. These files are:

```
1582 Jan 27 13:19 ReadME_notes_YYYY.txt (where YYYY= year of interest)

149504 Mar 10 13:27 AmeriFlux_Biological_Data_LTER_NWT1.xls (info for our site)
513024 Mar 10 13:27 AmeriFlux_Biological_Data_Submission_Guidelines.doc (info about xls file)
```

PDFs of published journal articles with more details about the CU tower measurements can be found in the “docs/journal-articles” subdirectory. The following articles are available (note: there are other published articles using data from the site, but these articles were the first to describe the tower measurements):

```
-rw-r--r-- 1 sburns     556352 May 16  2005 agforest02_v110_turnipseed_energy.pdf
-rw-r--r-- 1 sburns     569254 Mar  8  2005 agforest03_v119_turnipseed.pdf
-rw-r--r-- 1 sburns     804594 Nov  8  2004 agforest04_v125_turnipseed.pdf
-rw-rw-r-- 1 sburns    2006385 Nov  8  2005 gcb02_v8_monson_carbonseq.pdf
```

These articles are:

Monson, R.K., A.A. Turnipseed, J.P. Sparks, P.C. Harley, L.E. Scott-Denton, K. Sparks, and T.E. Huxman, 2002: Carbon sequestration in a high-elevation subalpine forest. *Global Change Biology*, **8**, 1-20.

Turnipseed, A.A., P.D. Blanken, D.E. Anderson, and R.K. Monson, 2002: Surface energy balance above a high-elevation subalpine forest. *Agricultural and Forest Meteorology*, **110**, 177-201.

Turnipseed, A.A., D.E. Anderson, P.D. Blanken, W. Baugh, and R.K. Monson, 2003: Airflows and turbulent flux measurements in mountainous terrain, Part 1: Canopy and local effects. *Agricultural and Forest Meteorology*, **119**, 1-21.

Turnipseed, A.A., D.E. Anderson, S. Burns, P.D. Blanken, and R.K. Monson, 2004: Airflows and turbulent flux measurements in mountainous terrain, Part 2: Mesoscale effects. *Agricultural and Forest Meteorology*, **125**, 187-205.

Current Data Files and Version History :

<u>Year</u>	<u>Current Version</u>	<u>Previous Version</u>
1998	2.1 (11 Mar 2008)	2.0 (4 May 2005)
1999	2.1 (11 Mar 2008)	2.0 (4 May 2005)
2000	1.2 (11 Mar 2008)	1.1 (20 Jul 2004)
2001	2.1 (11 Mar 2008)	2.0 (20 Jul 2004)
2002	2.1 (11 Mar 2008)	2.0 (20 Jul 2004)
2003	2.0 (11 Mar 2008)	1.0 (20 Jul 2004)
2004	2.0 (11 Mar 2008)	1.0 (4 May 2005)
2005	1.1 (11 Mar 2008)	1.0 (29 Apr 2006)
2006	1.0 (10 Mar 2008)	N.A.
2007	1.0 (10 Mar 2008)	N.A.

Example version history contained in the header of each data file (this is from climate_1999.dat):

Current Data Version: 2.1 (March 11, 2008)

Updates and Changes from Version 2.0 to 2.1 (11 Mar 2008):

- * changed the time stamp to the CENTER of the averaging period (previously the time stamp was at the START of the 30-min time period)

Updates and Changes from Version 1.1 to 2.0 (4 May 2005):

- * removed Tsoil data which when the sensor was not in the ground (this is for days = 169.45 to 175 MST)
- * replaced 932 missing Tsoil data with "optimized-fit" data (provided by Bill Sacks)
- * a 10 percent increase in the s_Rppfd_in_25m data prior to July 1, 1999 (prev were calculated from a fit to Rnet_REBS data)

Updates and Changes from Version 1.0 to 1.1 (20 July 2004):

- * recalculate vpd
- * use local standard time (MST) for the time stamp (previous data versions used a combination of MST and MDT)
- * add decimal day of year (column 7)