

DRI Surface Network Measurements during the Terrain-induced Rotor Experiment (T-REX) Special Observation Period in March-April 2006

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Contains post-processes GPS coordinates of DRI AWS towers.

1. General Description

The data enclosed represents the automatic weather station (AWS) data from the 16 stations of the Desert Research Institute network for the period 00 PST March 1 to 00 PST May 1, 2006 during the T-REX field campaign. The location of the T-REX field activities was Owens Valley in the southern Sierra Nevada in eastern California.

2. AWS Locations

The coordinates of the AWS locations were measured using GPS post-processed data. The error in position measurements in all three directions is less than 0.5 m. The latitude, longitude, and elevation of 16 stations of the DRI network are the following:

Station #	Lat (deg)	Lon (deg)	Elevation (m)
01	36.768435	-118.276056	1710.2
02	36.777773	-118.243217	1449.0
03	36.786456	-118.207862	1244.5
04	36.794699	-118.166160	1143.1
05	36.800682	-118.132846	1117.6
06	36.810954	-118.091421	1188.6
07	36.754175	-118.254373	1549.7
08	36.760990	-118.229160	1413.4
09	36.765776	-118.189628	1214.8
10	36.772978	-118.163339	1152.9
11	36.780817	-118.127424	1122.1
12	36.785210	-118.106541	1115.5

13	36.719302	-118.204140	1411.7
14	36.728549	-118.171114	1206.8
15	36.741148	-118.115641	1111.3
16	36.739741	-118.088228	1109.1

3. File Naming Convention

Data files are named using the following notation: sr##yyymmdd.cdf, where ## is the two-digit station number, yyyy is four-digit year, mm is two-digit month, and dd is two-digit day.

4. Data Set Description

The data is in the NetCDF format. The temporal resolution of the data set is 30 sec. All observation times are PST. Each file contains one whole day of data for one station of the network. There are 19 fields saved in each file. In sequential order these are:

maxat: maximum atmospheric temperature in a 30 second interval, unit: °C
 minat: minimum atmospheric temperature in a 30 second interval, unit: °C
 aveat: average atmospheric temperature in a 30 second interval, unit: °C
 stdat: standard deviation of atmospheric temperature in a 30 second interval, unit: °C
 maxrh: maximum relative humidity in a 30 second interval, unit: %
 minrh: minimum relative humidity in a 30 second interval, unit: %
 averh: average relative humidity in a 30 second interval, unit: %
 stdrh: standard deviation of relative humidity in a 30 second interval, unit: %
 maxbp: maximum barometric pressure in a 30 second interval, unit: hPa
 minbp: minimum barometric pressure in a 30 second interval, unit: hPa
 avebp: average barometric pressure in a 30 second interval, unit: hPa
 stdbp: standard deviation of barometric pressure in a 30 second interval, unit: hPa
 avews: average wind speed in a 30 second interval, unit: m s^{-1}
 wdvctmg: average wind vector magnitude of wind vectors in 30 second interval, unit: m s^{-1}
 wdir: average wind direction in a 30 second interval, unit: deg
 stddir: standard deviation of wind direction in a 30 second interval, unit: deg
 maxws: maximum wind speed in a 30 second interval, unit: m s^{-1}
 maxwdir: wind direction of wind speed maximum within a 30 second interval, unit: deg
 stdws : standard deviation of wind speed in a 30 second interval, unit: deg

For more information on variables, see NetCDF header file.

5. Description of the Instrumentation

The individual automatic weather stations have been built with the Campbell Scientific instrumentation (CSI; [HYPERLINK "http://www.campbellscientific.com"](http://www.campbellscientific.com))

www.campbellscientific.com). Each station has a 10-meter tower with sensors for pressure, temperature, relative humidity and wind mounted directly on the tower or on arms attached to the tower (see figures below). The sensors are sampled every 3 seconds, and the data is temporally averaged over 30-second non-overlapping intervals. A radio telemetry system connects individual stations to the base station located in Independence, CA to allow remote transmission of temporally averaged data to the central repository at DRI. The radio communication is through 900 MHz spread spectrum wireless radios, manufactured by Freewave.

The network was constructed and is operated in collaboration with Western Regional Climate Center at DRI ([HYPERLINK "http://www.wrcc.dri.edu" www.wrcc.dri.edu](http://www.wrcc.dri.edu)). The network has been in continuous operation since late February 2004.

Sensors:

1. Air Temperature and Relative Humidity

Air temperature and relative humidity sensors are Vaisala HMP45C-L. The two separate sensors are packaged in the same sensor housing mounted two meters above the ground.

2. Wind

Wind is measured by 05103-L Wind Monitor, which has a propeller-type anemometer and a wind vane with fuselage and tail, manufactured by RM Young. It is mounted at the top of the tower, 10 meter above the ground.

3. Pressure

Air pressure is measured by Vaisala PTB210 digital barometer ([HYPERLINK "http://www.vaisala.com" www.vaisala.com](http://www.vaisala.com)) using Vaisala BAROCAP Sensor, a silicon capacitive absolute pressure sensor. The sensors and the attached static pressure heads are mounted two meters above the ground.

All sensors are field calibrated by the Western Region Climate Center once a year. The last calibration was in mid-February 2006, close to the start of the T-REX campaign.

6. Data Quality

The data has been quality controlled, and can be used as is. There is only one data record missing (station 11, 8:13:30 PST on March 15, 2006) in the entire two-month period.

7. Use of the Data

Please use the following citation as an acknowledgement, if using this data in any scientific report/paper/presentation:

"This AWS data was gathered as part of the Terrain-induced Rotor Experiment (T-REX).

The primary sponsor of T-REX was the US National Science Foundation. The acquisition of this data was carried out by the Desert Research Institute (DRI) team (PI Grubišić) funded in part by NSF grants ATM-0242886 and ATM-0524891 to DRI. "

If the contribution of this data product is significant to the publication/presentation, the DRI PI should be offered the right to joint authorship.

Any redistribution of this data must include this data acknowledgement statement.