



# Tarfala Research Station automatic weather station, 1991

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## 1 Instrumentation

The TRS met station consisted of the following instruments during 1991

Sensor	Serial number	Remark
Pt100		in Stevenson screen
T/Rh		at 2 m
Young Wind Monitor		at 3 m
LiCor Li-200SB pyranometer		at 2 m
CS Q-7 net radiometer		at 2 m
Tipping bucket precipitation gauge		at 2 m
CR21X data logger		

## 2 Notes on the station data

- NOTE 3-hr sampling of data during winter, 1-hr sampling during summer.
- No daily output.
- Pt100 added to Stevenson screen on 1991- .
- The standard deviation of net radiation was removed at 1991-09-01 14:00:00.
- Original logger files are missing and existing data files are based on processed data.

## 3 Data coverage

- NaN in column 3 is padding for sensor added in fall.
- NaN padding in column 13 from when standard deviation of net radiation was removed
- Wind data missing from  
1991-01-01 03:00:00 to 1991-01-02 15:00:00  
1991-09-20 05:00:00 to 1991-09-20 09:00:00  
1991-10-06 12:00:00 to 1991-10-06 18:00:00  
1991-10-14 18:00:00 to 1991-10-15 06:00:00  
1991-10-17 06:00:00 to 1991-10-17 09:00:00  
1991-11-03 03:00:00 to 1991-11-04 12:00:00.

## 4 Notes on data storage

Example data line for hourly data:

1991,185,1300,NaN,5.495,71.1,9.82,9.63,356.8,11.2,170.6,173.1,17.68,0,0

1991,244,1400,9.65,6.977,63.69,4.691,3.817,45.85,34.97,113.1,116.2,NaN,0,0

The first line shows data before addition of a Pt100, second line when new sensor has been added.

Column	Example data	Description
01:	1991	Year
02:	185	Day of Year
03:	1300	Hour-minute (hhmm)
04:	NaN	2 Pt100 T in Stevenson screen)
05:	5.495	3 T in Young screen
06:	71.1	4 Rh in Young screen
07:	9.82	5 Mean horizontal wind speed
08:	9.63	6 Resultant mean wind speed
09:	356.8	7 resultant mean wind direction
10:	11.2	8 Standard deviation of wind direction
11:	170.6	9 Global radiation
12:	173.1	10 net radiation
13:	17.68	11 Standard deviation of net radiation
14:	0	12 Precipitation
15:	0	13 Precipitation intensity

## 5 Data files and content

TRSmnet1991.csv Raw data file

TRS\_met\_1991\_Precipitation.csv

Date-time, hourly totalized P

1991-01-01 03:00:00,0.00,0.00

TRS\_met\_1991\_Radiation.csv

Date-time, Global radiation, Net radiation, Standard deviation of net radiation?

1991-01-01 03:00:00,1.3,0.5,1.3

TRS\_met\_1991\_Relative\_humidity.csv

Date-time, hourly average Rh

1991-01-01 03:00:00,82.9

TRS\_met\_1991\_Temperature.csv

Date-time, hourly average T (Stevenson), hourly average T (Young)

1991-09-01 14:00:00,9.65,6.98

TRS\_met\_1991\_Wind.csv

Date-time, Mean horizontal wind speed, Resultant mean wind speed, resultant mean wind direction, Standard deviation of wind direction

1991-01-02 18:00:00,2.5,2.4,185.1,18.8

The data collected during 1991 is summarized the figure 1 and Table 1.

## Logger program

No documentation of the logger program exists for this year.

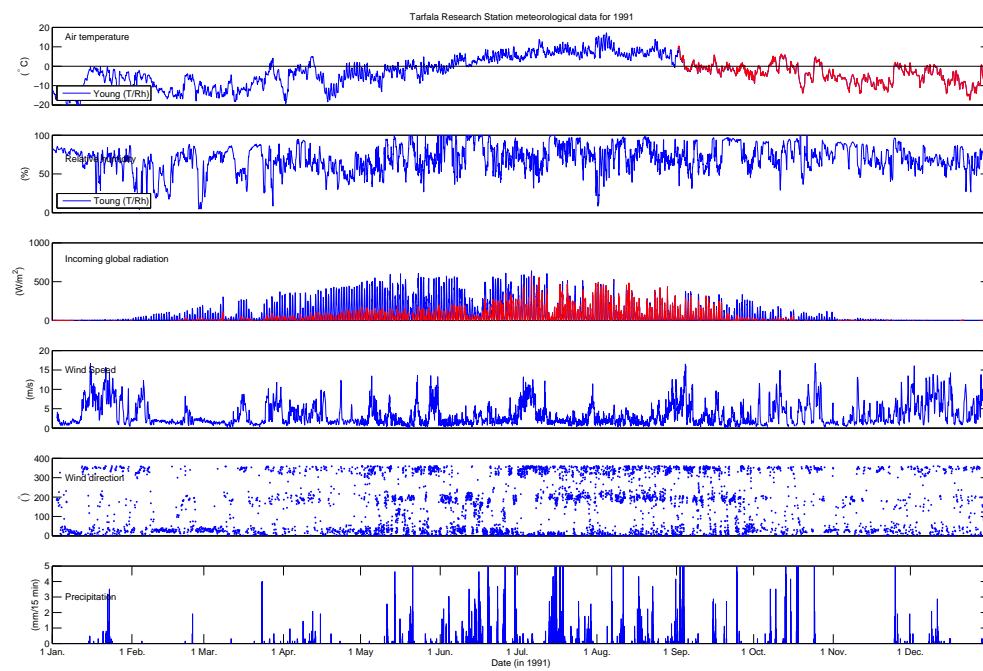


Figure. 1. Summary of meteorological data from Tarfala Research Station automatic weather station 1991.

Table. 1. Monthly averages of meteorological parameters from the Tarfala Research Station automatic weather station 1991.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Average air temperature (Stevenson)												
(°C)	—	—	—	—	—	—	—	—	−0.7	−2.3	−6.5	−6.4
<i>n</i>	—	—	—	—	—	—	—	—	706	271	247	255
Average air temperature												
(%)	−9.0	−9.9	−9.9	−5.9	−2.7	3.1	7.4	7.7	−0.7	−2.3	−6.5	−6.4
<i>n</i>	247	223	255	247	743	743	743	767	743	271	247	255
Average relative humidity												
(°C)	71.5	52.1	65.1	62.1	69.3	87.5	75.5	73.0	74.2	74.9	75.2	65.8
<i>n</i>	247	223	255	247	743	743	743	767	743	271	247	255
Positive degree sum												
(°C)	0	0	20	70	145	2480	5494	5884	633	236	14	9
<i>n</i>	0	0	10	31	141	611	743	762	227	85	17	13
Average incoming global radiation												
(W m <sup>−2</sup> )	2.5	17.7	47.4	122.5	166.8	146.0	114.0	94.1	57.9	26.3	4.2	1.5
<i>n</i>	247	223	255	247	743	743	743	767	743	271	247	255
Global incoming energy sum												
(W m <sup>−2</sup> )	625	3956	12093	30246	123903	108456	84727	72162	43008	7121	1046	383
<i>n</i>	247	223	255	247	743	743	743	767	743	271	247	255
Average net radiation												
(W m <sup>−2</sup> )	−1431	−4344	−1279	3932	23772	40844	57876	60968	16500	−2028	−2319	−2670
<i>n</i>	247	223	255	247	743	743	690	765	743	271	247	255
Totalized precipitation												
(mm)	14.08	2.88	8.96	12.64	48.00	252.32	175.68	124.32	178.40	85.76	16.32	17.44
<i>n</i>	247	223	255	247	743	743	743	767	743	271	247	255
Average wind speed												
(m s <sup>−1</sup> )	5.2	2.8	2.8	3.0	3.2	2.2	3.6	2.6	3.4	3.8	3.0	6.1
<i>n</i>	234	223	255	247	743	743	743	767	738	261	235	255