

# WOKINGHAM METEOROLOGICAL DATA

## Wokingham Climatological Station, Emmbrook, Berkshire.

Lat/Long 51°25'N 00°51'W NGR (SU)798701 Altitude 46m ASL.

### Monthly Means and Totals

### NOVEMBER 2017

Temperature (°C)		Anomaly	Rank in the past 136 years
Mean maximum	10.6	-0.3	54 <sup>th</sup> highest
Mean minimum	3.4	-0.7	66 <sup>th</sup> highest
Daily mean	7.0	-0.5	60 <sup>th</sup> highest
Highest maximum	15.5	on 22 <sup>nd</sup>	Lowest maximum 4.0 on 30 <sup>th</sup>
Highest minimum	11.4	on 22 <sup>nd</sup>	Lowest minimum -2.5 on 25 <sup>th</sup>
Mean grass minimum	0.0	-1.1	Lowest grass minimum -7.2 on 25 <sup>th</sup>
Mean earth @30 cm	10.0	+0.6	Earth @ 100 cm 12.4
Frost duration (hrs)	31.6		Rain duration (hrs) 41.0
Rainfall total (mm)	40.2	58 %	29 <sup>th</sup> lowest
Highest daily fall	10.8	on 7 <sup>th</sup>	
Number of: Dry days (<0.2mm)	18	Wet days (>0.9mm) 7	days ≥5mm 3
Sunshine total (hrs) 98.9	Daily mean 3.30	139 %	Sunniest day 8.6 on 6 <sup>th</sup>
N° days with: Air frost 5	Ground frost 18	Snow falling 0	Snow lying 0
Thunder 0	Hail ≥5mm 0	Small hail/ice 0	Fog @09 2 Nil sun 2
Pressure MSL: Mean @09 GMT, mbar 1016.8	+2.4	Highest 1031.3 on 17 <sup>th</sup>	Lowest 985.9 on 23 <sup>rd</sup>
Relative humidity : Mean (%) 84.5	Lowest 45 on 10 <sup>th</sup>	Water vapour (g/kg), mean at 09 and 15 GMT 5.6,	5.6
Overall mean wind speed (mph) 6.3	Windyest day 15.9 on 22 <sup>nd</sup>	Max gust 50	on 22 <sup>nd</sup>
Wind direction (days) N 0 NE 1 E 0 SE 0 S 4 SW 15 W 5 NW 5			
Least windy day (mph) 1.7 on 3 <sup>rd</sup>	Calm; less than 0.5 mph (minutes) 663		

Anomaly = departure from 1981 to 2010 average (degrees C, percent and mbar).

Notes: **Dry and Very Sunny. Cooler than Average**

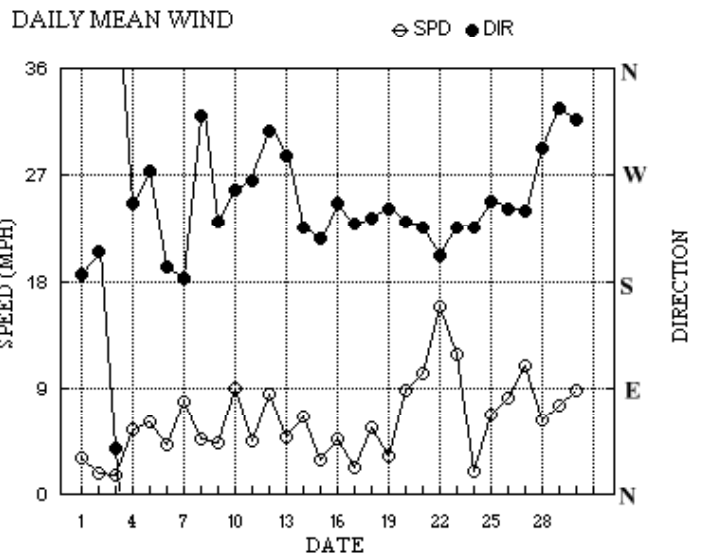
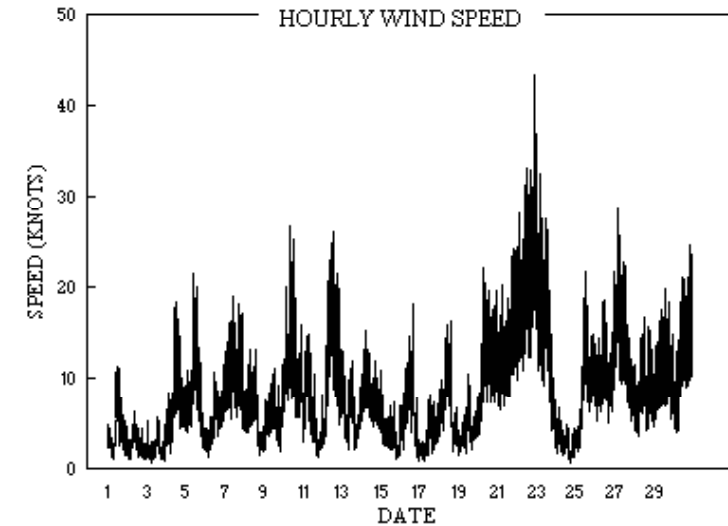
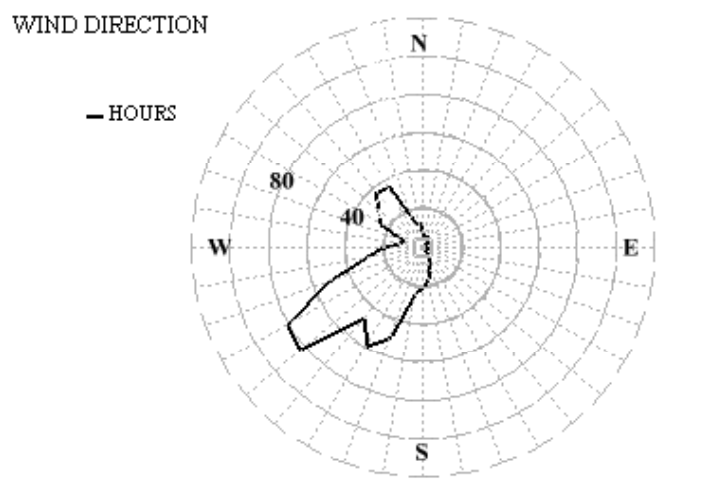
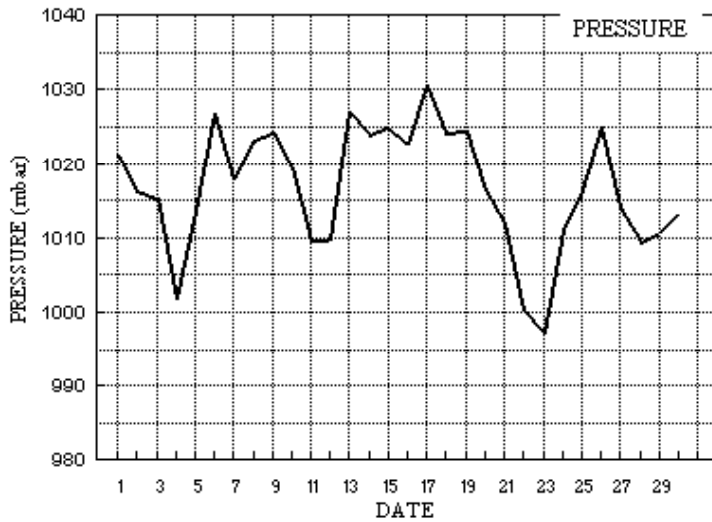
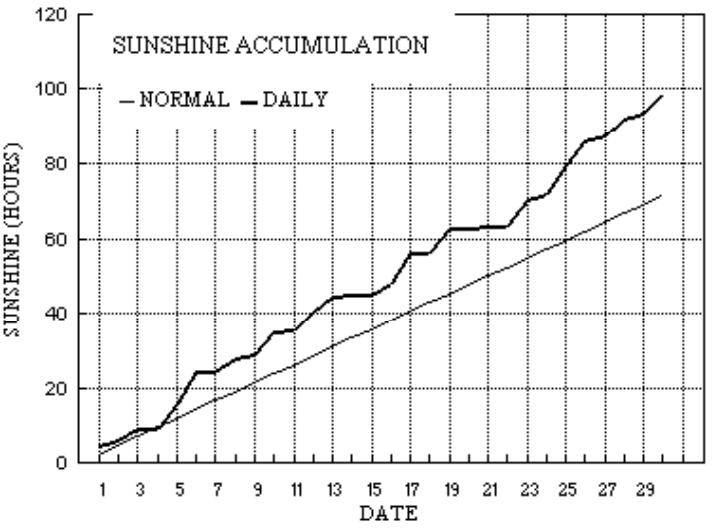
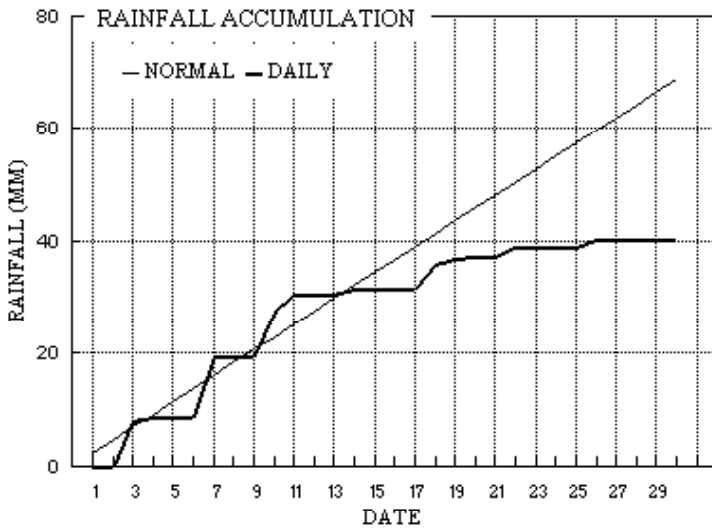
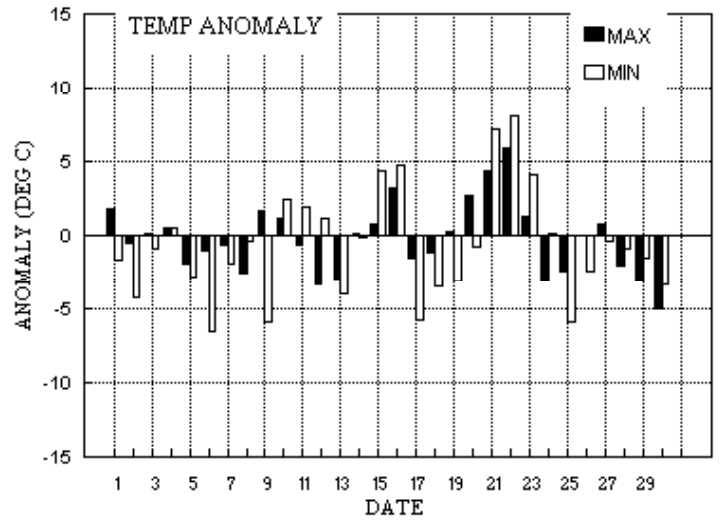
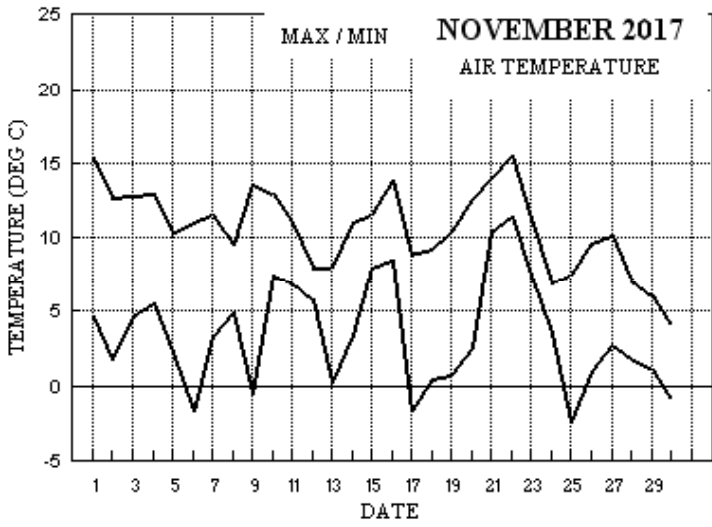
**Temperature:** The mean this month is 0.5° below the current 30 year climatological average, but is 0.9° above the mean in this month last year. In recent years, since 2000, 12 Novembers have been milder than this year's, but in the longer term this month's mean is 0.2° above the 136 year median. The highest max is close to the median and the lowest max is 0.6° below its median. The highest min is 0.8° above the median while the lowest min is 1.1° above its median. The mean grass min, while 1.1° below average, is 1.9° above the lowest on record for this station, set in 1988. The mean earth temperature at both 30cm and 1m depth is above average. The number of air frosts is near average, but there were 5 more ground frosts than average and the duration of air frost is 9.9 hours below average. Anomalies for daily max were within 3° of normal up to the 20<sup>th</sup>, and from the 24<sup>th</sup> to 29<sup>th</sup>, but reached +5.8° on the 22<sup>nd</sup> and -5.0° on the 30<sup>th</sup>. Anomalies for daily min exceeded -5° on the 6<sup>th</sup>, 9<sup>th</sup>, 17<sup>th</sup> and 25<sup>th</sup>, and +4° on the 15<sup>th</sup>, 16<sup>th</sup>, 21<sup>st</sup> and 22<sup>nd</sup>, with extreme values of -6.6° on the 6<sup>th</sup> and +8.0° on the 22<sup>nd</sup>. **Rainfall:** This has been a dry November with just over half the average rainfall. The total is 28.6 mm below the climatological average, and is lowest for the month since 2004. In the longer term, the ranking of 29<sup>th</sup> lowest in 136 years puts it firmly in the dry category. The highest daily fall is also quite low, 5.2 mm below the median. There were 3 more dry days than average. Rainfall duration is 69% of average. There was no thunder or hail this November, and the highest rainfall rate was 45 mm/hr at 1705 GMT on the 7<sup>th</sup>. Most of the month's rain fell in the first 11 days, the accumulated departure from normal being 5 mm in surplus by the 11<sup>th</sup>, then falling into deficit by the 14<sup>th</sup>, the deficit increasing to 26 mm by the 30<sup>th</sup>. **Sunshine:** The total this month is 27 hours above average and is highest for November since 2007. The number of sunless days is 6 below average, fewest since 2006 and 2<sup>nd</sup> lowest since before 1979. Daily accumulation compared with normal was zero on the 4<sup>th</sup>, after which it was continuously in surplus, by 18 hours on the 19<sup>th</sup>, 24 hours on the 26<sup>th</sup> and 27 hours by the 30<sup>th</sup>. Overall there were 16 days with <3 hours and 7 days with ≥6 hours. **Wind:** The mean speed this November is exactly average. After a quiet start there was a very windy spell from the 20<sup>th</sup> to the 23<sup>rd</sup>, culminating in a mean speed of 15.9 mph on the 22<sup>nd</sup>, making it the windiest November day since 1996. However, the month's highest gust of 50 mph, also on the 22<sup>nd</sup>, is highest only since 2015. Daily winds were light or very light until the 4<sup>th</sup>, then light or moderate to the 11<sup>th</sup>, temporarily fresh on the 12<sup>th</sup>, then light until the 17<sup>th</sup>, then mainly moderate but strong on the 22<sup>nd</sup> and 23<sup>rd</sup>, and fresh on the 27<sup>th</sup>, but falling very light on the 24<sup>th</sup>. Directions were variable until the 4<sup>th</sup> then W'ly backing S'ly by the 6<sup>th</sup>, veering W'ly on the 8<sup>th</sup>, backing SW'ly on the 14<sup>th</sup>, then veering NW'ly on the 28<sup>th</sup>.

Table 1. Mean anomalies (max, min, rain, sun) for specified periods.

From the 1 <sup>st</sup> to the 10 <sup>th</sup>				From the 11 <sup>th</sup> to the 20 <sup>th</sup>				From the 21 <sup>st</sup> to the 30 <sup>th</sup>			
-0.1°	-2.1°	122%	147%	-0.3°	-0.5°	44%	118%	-0.4°	+0.5°	13%	151%

B J Burton FRMetS. Hon. Met. Officer to Wokingham Town Council.

# Wokingham climatological graphs for November 2017



Month: NOVEMBER 2017

Date	Max C	Min C	Rain mm	Grass Min	30cm C	100cm C	Sun hrs	Frost hrs	pp09 mbar	Af Gf	Sf Sl	Th Ha	Ic Fg	Vec ddd	mean ff	sp	Max gust ddd	gg HHhh	High hr ddd	ff	Rain HH	hrs
1	15.3	4.7	0.0	1.2	12.1	14.3	4.9	0.0	1021.2	0	0	0	0	186	2.5	2.7	188	11 1132	186	6	12	0.0
2	12.7	1.7	0.0	-2.1	11.7	14.1	1.5	0.0	1016.4	0	1	0	0	205	0.8	1.6	207	6 0902	193	3	10	0.0
3	12.8	4.6	7.9	-0.5	11.8	14.0	2.6	0.0	1015.4	0	1	0	0	39	0.3	1.5	298	6 1253	170	3	01	6.6
4	13.0	5.6	0.6	7.5	11.9	13.8	0.4	0.0	1001.8	0	0	0	0	247	3.2	4.8	283	18 1212	272	8	10	0.8
5	10.3	2.2	0.0	-3.0	11.8	13.7	6.4	0.0	1013.5	0	1	0	0	274	4.6	5.3	279	22 1047	311	9	14	0.0
6	11.0	-1.7	tr	-6.3	10.9	13.6	8.6	5.9	1026.9	1	1	0	0	192	3.4	3.7	158	12 2359	235	6	12	0.0
7	11.5	3.3	10.8	-1.4	10.4	13.4	0.0	0.0	1017.9	0	1	0	0	183	3.1	6.8	166	19 1105	160	9	11	7.4
8	9.5	4.9	0.0	3.3	10.6	13.2	3.7	1.5	1023.1	0	0	0	0	319	3.4	4.0	323	13 1515	324	6	07	0.0
9	13.6	-0.6	tr	-5.4	10.1	13.0	1.1	0.9	1024.2	1	1	0	0	231	3.3	3.8	244	11 2353	245	6	23	0.0
10	13.0	7.5	8.2	5.4	10.4	12.9	5.8	0.0	1019.3	0	0	0	0	258	6.8	7.8	294	27 0928	285	11	13	6.6
11	11.0	6.9	3.1	2.3	10.5	12.7	0.5	0.0	1009.7	0	0	0	0	265	1.9	3.9	267	15 0749	249	8	06	5.1
12	8.0	5.8	0.0	4.1	10.7	12.6	5.3	0.0	1009.7	0	0	0	0	306	6.9	7.4	340	26 1429	309	12	12	0.0
13	8.0	0.2	tr	-4.4	10.1	12.5	3.8	0.0	1027.1	0	1	0	0	286	3.0	4.2	320	13 0043	321	6	03	0.1
14	11.0	3.4	0.8	0.8	9.6	12.4	0.3	0.0	1024.0	0	0	0	0	226	5.8	5.8	228	15 0510	225	8	04	2.8
15	11.5	8.0	tr	8.0	10.0	12.3	0.4	0.0	1025.0	0	0	0	0	216	1.7	2.6	232	11 0050	231	6	00	0.0
16	13.8	8.5	0.2	6.3	10.4	12.2	2.9	0.0	1022.7	0	0	0	0	247	2.6	4.1	5	18 1621	237	7	11	0.5
17	8.9	-1.7	tr	-6.3	10.2	12.1	7.8	6.0	1030.7	1	1	0	0	228	1.5	2.0	325	8 1427	216	4	23	0.0
18	9.2	0.5	4.3	-2.5	9.4	12.0	0.1	0.0	1024.3	0	1	0	0	234	4.1	4.9	24	17 1555	226	8	08	5.0
19	10.4	0.7	0.9	-4.1	9.2	11.9	6.5	0.0	1024.6	0	1	0	0	241	2.1	2.9	325	11 1126	308	5	11	0.7
20	12.5	2.5	0.4	-2.0	8.9	11.8	0.0	0.0	1016.4	0	1	0	0	231	7.6	7.7	223	22 0732	236	10	22	0.8
21	14.0	10.4	0.1	9.6	9.6	11.7	0.6	0.0	1012.1	0	0	0	0	225	8.9	9.0	224	24 2013	221	11	23	0.3
22	15.5	11.4	1.6	10.3	10.2	11.6	0.2	0.0	1000.2	0	0	0	0	201	13.6	13.8	209	43 2158	198	18	23	1.3
23	11.3	7.4	tr	4.3	10.6	11.6	6.9	0.0	997.1	0	0	0	0	226	9.8	10.3	211	37 0138	195	17	00	0.1
24	6.9	3.5	tr	-1.2	10.3	11.6	1.7	5.5	1010.9	0	1	0	0	225	1.3	1.8	215	7 0404	207	3	05	0.0
25	7.4	-2.5	0.0	-7.2	9.4	11.6	7.7	6.6	1016.3	1	1	0	0	248	5.6	5.9	259	22 1420	266	10	14	0.0
26	9.6	1.0	1.3	-4.2	8.5	11.6	6.2	0.0	1025.1	0	1	0	0	242	6.8	7.1	261	19 1301	223	10	23	2.9
27	10.1	2.7	tr	-2.3	8.1	11.4	1.7	0.0	1014.1	0	1	0	0	240	9.2	9.4	236	29 0559	231	14	05	0.0
28	7.1	1.8	tr	-3.2	8.3	11.2	4.3	0.0	1009.4	0	1	0	0	293	4.6	5.5	314	17 1404	312	8	13	0.0
29	6.0	1.1	tr	-2.4	7.9	11.0	1.7	0.0	1010.8	0	1	0	0	326	6.4	6.6	317	20 1614	325	8	09	0.0
30	4.0	-0.9	tr	-5.0	7.5	10.9	5.3	5.2	1013.2	1	1	0	0	317	7.3	7.6	326	25 2102	326	10	19	0.0
Total			40.2				98.9	31.6														41.0
Mean	10.6	3.4		-0.0	10.0	12.4	3.30	1.1	1016.8					245	3.7	5.5						
Anom	-0.3	-0.7	58%	-1.1	+0.6	+0.6	139%															
Daily mean		7.0																				
Anom		-0.5																				

Number of days with:  
 Air frost = 5      Ground frost = 18      Nil sun = 2  
 Snow falling = 0      Snow lying = 0      Thunder = 0  
 Hail=>5mm = 0      Hail<5mm or ice = 0      Fog at 09GMT = 2

Abbreviations.

Max/min = highest and lowest air temperature at 1.2m in 24 hour period ending at 09 GMT  
 Rain = total rainfall and melted snowfall in 24 hour period ending at 09 GMT, millimetres. (Tr = trace, <.05mm).  
 Grass min = Lowest overnight temperature at grass tip level.  
 Sun = hours of bright sunshine, measured electronically. Frost = Number of hours with air temp below 0 deg C.  
 pp09 = Air pressure corrected to mean sea level at 0900 GMT, millibars.  
 Af = Air frost. Gf = Ground frost. Sf = Snow falling. Sl = Snow lying at 09 GMT.  
 Th = Thunder. Ha = Hail =>5mm. Ic = Hail <5mm or ice. Fg = Fog at 09 GMT.  
 Vec mean = 24 hour mean wind vector, ddd = direction in degrees from true north, ff = speed in knots.  
 Sp = 24 hour mean wind speed in knots.  
 Max gust = Highest gust in 24 hours, gg = speed in knots, HHhh = Time, hours and minutes, GMT.  
 High hr = Highest hourly mean wind, HH = hour commencing. Rain Hrs = Duration of rain, 24 hours to 09 GMT. Excludes snow/hail.  
 30cm and 100 cm are earth temperatures at those depths, read at 09 GMT.  
 Anom = Departure from 1981-2010 climatological average.  
 All temperatures in degrees Celsius.



Weather observations. Emmbrook, Wokingham, Berkshire.

Observations at 1500 GMT for november 2017

Date	VV	N	dd	ff	gg	TT	TdTd	RH	r	PPP	a	pppww	W1W2	NhCl	hCrCl	NChshs	NChshs	NChshs	Date	Remarks						
1	81	7	18	03	07	14.9	7.9	63	6.6	1017.0	7	024	02	2	2	0	0	9	0	8	82070	87273	1	COTRA Halo 22° part		
2	65	7	04	01	05	12.5	9.3	81	7.2	1016.1	7	003	02	2	2	7	8	4	/	/	81818	87645	2	Cu hum		
3	35	6	35	02	05	11.1	9.5	90	7.4	1012.4	7	016	05	1	1	1	0	9	3	1	81368	86080	3	COTRA		
4	82	7	28	07	17	11.4	7.1	75	6.3	1004.9	2	013	15	2	2	7	8	5	/	/	82820	87650	4	jpS		
5	84	3	32	07	20	9.3	2.8	64	4.6	1016.6	2	017	01	1	1	2	8	5	0	0	83828		5	1Sc40		
6	81	4	23	05	10	9.9	3.6	65	7.2	1024.7	6	012	03	0	0	1	4	6	0	4	81830	84080	6	1Sc35 COTRA Cu hum Parhelia		
7	56	8	18	07	13	10.7	9.5	92	7.3	1015.1	6	014	58	6	5	8	5	4	/	/	85710	88625	7			
8	84	3	34	06	12	9.2	2.1	61	4.3	1024.7	2	008	01	1	1	2	5	6	0	5	81640		8	2Cs78 Cs edge NW		
9	68	7	26	04	10	13.1	10.3	83	7.7	1023.1	7	004	02	9	2	2	7	8	4	/	/	81815	85635	87650	9	Cu hum
10	84	7	30	06	17	11.1	1.1	50	4.1	1021.1	3	005	03	1	1	1	4	6	3	1	81845	83367	87075	10	1Sc45 COTRA Halo 22° part	
11	80	7	35	04	11	8.7	7.3	91	6.3	1011.8	2	009	01	5	2	6	8	4	3	1	82812	85620		11	3Sc35 4Ac65 /Ci70 Cu hum	
12	86	1	33	09	26	7.0	-0.5	59	3.7	1013.8	3	025	01	1	1	1	1	6	0	0	81830			12	Cu hum	
13	81	6	29	05	10	6.4	0.5	66	3.9	1026.8	7	010	02	2	2	6	0	9	7	/	83360	85363		13	/Ac66	
14	20	8	21	05	09	10.2	9.1	93	7.1	1023.8	6	005	58	6	5	8	7	3	/	/	83708	88710		14		
15	58	7	20	03	05	11.1	9.9	92	7.4	1024.4	5	008	05	2	2	7	5	4	/	/	86612	87640		15		
16	75	7	24	05	13	12.3	7.2	71	6.2	1022.7	3	004	03	2	2	7	5	5	1	/	83625	86656	87466	16		
17	75	6	30	04	08	8.0	-0.2	56	3.7	1028.9	6	016	03	1	1	1	5	6	0	1	81635	86070		17	COTRA	
18	58	8	23	05	13	9.0	8.1	94	6.6	1020.6	7	019	21	6	2	8	7	3	/	/	87709	88711		18		
19	81	5	31	04	08	7.4	2.3	70	4.4	1024.4	7	005	02	1	1	5	0	9	7	1	85360			19	1Ci75 COTRA	
20	30	8	23	10	18	11.9	10.3	90	7.8	1013.4	6	015	58	6	5	8	5	4	/	/	85712	87618	88625	20		
21	80	8	22	08	19	13.0	9.4	79	7.4	1008.7	7	022	03	2	2	7	5	4	/	1	86617	87645		21	/Ci75	
22	72	7	20	16	30	14.5	9.9	74	7.7	995.2	7	026	02	2	2	7	5	5	/	/	86620	87630		22		
23	80	4	23	13	27	10.8	2.6	57	4.6	1002.5	2	021	02	0	0	4	4	6	0	0	82840	83645		23	Cu hum	
24	81	3	32	02	04	6.5	2.0	73	4.4	1012.5	3	001	01	1	1	3	0	9	7	0	82463	83366		24		
25	84	1	26	08	22	6.2	-0.1	64	3.7	1018.2	2	009	02	0	0	1	1	6	0	1	81832			25	1Ci70 Cu hum	
26	84	7	26	06	16	6.9	1.4	68	4.1	1025.6	7	002	03	1	1	6	8	5	/	1	81828	86650		26	/Ci75 Cu hum	
27	80	8	25	12	22	9.3	3.9	69	5.0	1011.1	7	021	15	2	2	3	8	5	4	7	81825	83645	86367	27	8Cs70 jpNW	
28	86	4	29	06	17	6.0	-0.3	64	3.7	1008.7	5	005	03	0	0	4	8	6	0	0	81830	84640		28	Cu hum	
29	81	7	32	06	19	5.5	1.2	74	4.1	1011.3	3	004	02	2	2	7	5	5	/	/	87622			29		
30	89	7	33	10	21	3.2	-4.3	58	2.8	1012.0	5	000	03	1	1	7	5	6	/	/	87635			30		

Mean vis = 31.7 km  
 Mean cloud = 5.9 74%  
 Mean wind speed = 6.3 kn  
 Mean gust = 14 kn  
 Mean TT = 9.6 °C  
 Mean TdTd = 4.8 °C  
 Mean RH = 72.9 %  
 Mean r = 5.6 g/kg  
 Mean PPP = 1016.4 mbar

See appendix 2 below for full code details

VV = Visibility code (Code FM12-4377)  
 N = Total cloud amount, oktas  
 dd = Direction from which wind is blowing, tens of degrees true  
 ff = 10 minute mean wind speed, knots  
 gg = Highest gust in past hour, knots  
 TT = Air temperature at 1.2 m, deg Celsius  
 TdTd = Dew point temperature at 1.2 m, deg Celsius  
 RH = Relative humidity at 1.2 m  
 r = Humidity mixing ratio at 1.2 m, g/kg  
 PPP = Air pressure reduced to sea level, mbar  
 a = Characteristic of pressure tendency (Code FM12-0200)  
 ppp = 3 hr pressure tendency, tenths of mbar  
 ww = Present weather code (Code FM12-4677)  
 W1, W2 = Past weather code (Code FM12-4561)-  
 covers past 3 hours.  
 Nh = Amount of low cloud present, oktas  
 Cl = Type of low cloud (Code Fm12-0513)  
 h = Height of low cloud (Code FM12-1600)  
 Cm = Type of medium cloud (Code FM12-0515)  
 Ch = Type of high cloud (Code FM12-0509)  
 8 groups. 8 = indicator for cloud detail  
 N = Amount of cloud, oktas  
 C = Type of cloud (FM12-0500)  
 hshs= Height of cloud (FM12-1677)  
 Remarks : COTRA = persistent condensation trails present

Wokingham	Hour	01-Nov	02-Nov	03-Nov	04-Nov	05-Nov	06-Nov	07-Nov	08-Nov	09-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov
Sunshine	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hourly analysis	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.33	0.32	0.00	0.00	0.00	0.00	0.00	0.12	0.25	0.00	0.00	0.00
	8	0.41	0.04	0.00	0.00	0.98	1.00	0.00	0.90	0.00	0.22	0.00	0.36	1.00	0.18	0.00	0.00
	9	0.71	0.16	0.00	0.00	1.00	1.00	0.00	0.80	0.00	0.76	0.00	0.23	1.00	0.11	0.00	0.02
	10	0.00	0.25	0.00	0.00	1.00	1.00	0.00	0.00	0.16	0.46	0.00	0.68	0.15	0.00	0.00	0.11
	11	0.65	0.33	0.00	0.00	0.89	1.00	0.00	0.00	0.45	0.77	0.00	0.56	0.00	0.00	0.00	0.96
	12	0.99	0.58	0.32	0.15	0.39	1.00	0.00	0.02	0.41	0.96	0.00	0.82	0.80	0.00	0.00	0.90
	13	1.00	0.12	0.89	0.21	0.33	1.00	0.00	0.28	0.00	0.93	0.00	0.87	0.15	0.00	0.04	0.89
	14	0.69	0.00	1.00	0.00	0.78	1.00	0.00	0.89	0.05	1.00	0.00	0.53	0.36	0.00	0.30	0.02
	15	0.26	0.00	0.42	0.00	0.49	1.00	0.00	0.72	0.00	0.72	0.46	0.88	0.13	0.00	0.00	0.00
	16	0.23	0.00	0.00	0.00	0.22	0.25	0.00	0.06	0.00	0.03	0.00	0.25	0.00	0.00	0.00	0.00
	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot		<b>4.94</b>	<b>1.47</b>	<b>2.62</b>	<b>0.36</b>	<b>6.42</b>	<b>8.57</b>	<b>0.00</b>	<b>3.67</b>	<b>1.06</b>	<b>5.84</b>	<b>0.46</b>	<b>5.32</b>	<b>3.83</b>	<b>0.29</b>	<b>0.35</b>	<b>2.91</b>

	Hour	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	Mean
	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	8	1.00	0.00	0.00	0.00	0.00	0.00	0.44	0.54	0.71	0.86	0.00	0.00	0.81	0.66	0.39
	9	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	1.00	1.00	0.00	0.48	0.60	1.00	0.46
	10	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.08	0.68	0.00	1.00	0.37
	11	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.81	0.76	0.00	1.00	0.47
	12	1.00	xxx	xxx	0.00	xxx	xxx	0.94	0.00	1.00	1.00	0.68	0.48	0.22	1.00	0.53
	13	0.87	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.68	0.17	0.83	0.04	0.39	0.45
	14	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.23	1.00	0.33	0.00	0.90	0.01	0.22	0.43
	15	0.91	0.00	0.00	0.00	0.00	0.00	0.50	0.94	0.94	0.29	0.00	0.18	0.00	0.05	0.34
	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot		<b>7.80</b>	<b>0.10</b>	<b>6.53</b>	<b>0.00</b>	<b>0.63</b>	<b>0.17</b>	<b>6.88</b>	<b>1.72</b>	<b>7.65</b>	<b>6.17</b>	<b>1.74</b>	<b>4.31</b>	<b>1.69</b>	<b>5.32</b>	<b>98.81</b>

Technical fault 17th, 18th 20th and 21st. Hourly data not available.

NOVEMBER 2017	T mn	Tx	Time	Tn	Time	RHmn	RH x	Time	RH n	Time	Tdmn	r mn	r x	Time	r n	Time	p mn	p x	Time	p n	Time	R tot
1	8.67	15.4	1253	3.2	2339	88.8	98.7	853	57.9	1312	6.7	6.1	7.8	1017	4.593	2358	1019.15	1023.1	12	1015.6	2313	0
2	7.45	12.8	1328	1.6	356	93.6	98.9	912	79.2	1456	6.4	6.1	7.7	1220	4.158	356	1016.20	1017.4	2143	1014.8	310	0
3	8.38	11.3	1410	4.5	442	96.5	99.3	1055	89.4	1505	7.9	6.6	7.6	1304	5.085	444	1013.47	1017.1	19	1008.0	2358	0.1
4	10.18	13.1	953	4.4	2321	89.3	98.6	531	69.3	1649	8.5	7.1	9.2	953	4.626	2302	1005.26	1009.3	2354	1001.6	902	7.3
5	5.49	10.4	1155	1.0	2333	83.0	98.2	2338	61.6	1447	2.7	4.6	5.5	1154	3.911	2333	1015.69	1024.6	2359	1009.2	25	0
6	4.48	11.1	1255	-1.8	711	87.2	99.2	718	61.1	1406	2.4	4.5	5.8	1209	3.232	711	1025.07	1027.1	954	1021.7	2358	0
7	9.19	11.6	1019	5.0	2354	87.3	95.1	1703	78.4	111	7.2	6.3	7.5	1354	4.942	2320	1017.70	1021.8	7	1014.5	1654	9.9
8	5.14	9.6	1409	-0.6	2350	84.2	98.7	2343	58.1	1452	2.5	4.5	5.2	440	3.494	2350	1023.38	1026.6	2040	1018.6	0	0
9	8.35	13.7	1249	-0.8	15	88.4	98.9	56	77.0	2239	6.5	6.1	7.9	1322	3.471	15	1023.86	1026.0	0	1022.4	2358	0
10	9.50	13.1	943	6.8	2357	72.4	93.3	657	45.0	1426	4.5	5.3	7.6	808	3.706	1352	1020.26	1022.5	2	1017.9	642	1.1
11	9.13	12.3	816	6.8	3	94.7	97.5	239	87.5	1524	8.3	6.8	8.2	834	5.678	0	1011.87	1018.1	0	1009.0	733	6.7
12	6.24	8.1	1317	3.6	2359	77.3	97.3	410	56.8	1505	2.4	4.6	6.2	3	3.371	2344	1013.53	1023.3	2359	1008.6	559	2.2
13	4.10	6.8	1307	0.1	729	75.5	89.9	800	63.5	1003	0.1	3.8	4.4	2342	3.147	551	1026.33	1027.9	1025	1023.2	2	0
14	8.75	11.1	1334	5.2	0	86.8	96.2	1624	76.6	51	6.7	6.1	7.3	1550	4.279	105	1024.12	1025.9	0	1023.3	540	0.2
15	9.86	11.6	1427	8.5	2208	95.7	98.3	2259	88.9	1428	9.2	7.1	7.6	1335	6.617	2208	1024.22	1025.4	1016	1023.1	2349	0.5
16	9.49	13.9	1206	1.4	2359	87.4	98.7	116	62.8	1358	7.4	6.4	7.6	1110	4.021	2359	1023.82	1029.0	2359	1021.2	523	0.3
17	3.17	9.1	1312	-1.9	737	85.9	99.5	705	50.7	1427	0.8	4.0	5.0	1129	3.212	737	1029.43	1031.3	959	1027.4	2357	0.1
18	6.45	9.3	1524	3.0	331	89.4	97.6	1827	77.6	49	4.8	5.3	6.9	1548	4.043	324	1023.24	1027.6	3	1020.4	1513	3.8
19	4.20	7.8	1355	0.6	705	88.9	99.7	706	59.8	1320	2.4	4.5	5.3	1056	3.684	1320	1023.78	1025.1	1127	1021.9	33	0
20	10.50	12.6	1943	5.0	6	89.1	95.3	453	81.4	1114	8.8	7.1	8.2	1821	4.659	1	1015.81	1022.3	1	1013.1	1518	1.2
21	12.39	13.6	2258	10.9	619	85.1	90.8	2351	75.6	1424	9.9	7.6	8.3	2349	7.01	1401	1009.93	1013.5	24	1004.7	2358	0.1
22	13.96	15.6	2334	12.5	0	75.1	89.9	0	60.9	1925	9.6	7.5	8.3	48	6.274	1754	996.93	1004.9	0	986.9	2345	0.2
23	10.19	14.5	121	6.8	2356	72.1	89.8	252	51.4	1313	5.3	5.7	8.5	303	4.235	1304	998.14	1007.1	2118	985.9	329	1.5
24	3.73	7.1	1357	-1.9	2337	88.1	98.3	2123	66.0	1406	1.9	4.4	5.2	1004	3.213	2337	1010.97	1013.8	2230	1005.8	52	0
25	2.31	7.5	1255	-2.6	245	83.2	98.8	751	58.9	1305	-0.4	3.7	4.3	1030	3.024	245	1017.22	1022.2	2332	1013.0	125	0
26	4.07	7.9	1234	0.9	514	81.3	92.7	2150	59.3	1252	1.1	4.1	5.3	2359	3.508	509	1024.38	1025.9	1718	1021.9	2357	0
27	8.23	10.3	1239	3.7	2358	80.1	93.6	753	67.4	1328	5.0	5.4	6.8	753	4.239	2357	1013.68	1022.1	0	1010.0	2223	1.2
28	4.28	7.2	1306	1.7	303	79.5	95.1	728	53.8	1253	0.9	4.1	4.9	739	3.317	1253	1009.16	1010.1	0	1008.3	510	0
29	3.34	6.1	1337	1.0	726	79.6	87.1	317	70.7	1346	0.1	3.8	4.4	1645	3.334	2357	1011.58	1014.8	2354	1009.5	519	0
30	1.68	4.1	1310	-1.0	441	70.5	88.1	410	55.0	1223	-3.3	3.0	3.4	3	2.7	1347	1013.16	1014.8	2346	1011.5	1257	0
Total																						36.4
Mean	7.10	10.61		2.92		84.5	95.77		66.72		4.54	5.40	6.60		4.16		1016.71	1020.68		1013.09		
Max	13.96	15.59		12.54		96.5	99.70		89.40		9.94	7.61	9.19		7.01		1029.43	1031.28		1027.42		
Min	1.68	4.08		-2.61		70.5	87.10		44.99		-3.25	2.99	3.39		2.70		996.93	1004.86		985.91		

Wokingham Automatic Weather Station  
AWS samples taken every 0.5 seconds  
x and n refer to maximum and minimum respectively

**Readings taken at Wokingham Climatological Station, Emmbrook, Berkshire**  
**Lat 51.425 N, Long 0.853 W, NGR (SU) 798701**  
**Altitude 45 m ASL.**

Tmn = 00 to 24 GMT mean air temperature at 1.2 m, deg C  
RHmn = 00-24 GMT mean relative humidity at 1.2 m, percent  
Tdmn = 00-24 GMT mean dew point at 1.2 m, deg C  
rmn = 00-24 GMT mean humidity mixing ratio, g/kg  
pmn = 00-24 GMT mean air pressure reduced to mean sea level, mbar  
Time = hours and minutes in GMT of extreme values

Temperature and humidity are from an aspirated Vaisala HMP45 unit  
Pressure is from a Setra CS100 sensor  
Data is logged on a Campbell Scientific CR10X measurement and control system

# WOKINGHAM METEOROLOGICAL DATA

Wokingham Climatological Station, Emmbrook, Berkshire.

Lat 51°25'N 00°51'W NGR (SU)798701 Altitude 46m ASL

## Seasonal Means and Totals

AUTUMN 2017

Temperature (°C)					Rank in the past 136 years				
Mean maximum	15.3	(+0.1)			33 <sup>rd</sup> highest				
Mean minimum	7.6	(+0.5)			13 <sup>th</sup> highest				
Daily mean	11.4	(+0.3)			21 <sup>st</sup> highest				
Rainfall total (mm)	127.1	( 65%)			25 <sup>th</sup> lowest				
Sunshine total (hours)	330.1	(101%)							
N° of:	Dry days	48 (-2)	Wet days	29 (-1)					
Days with:	Air frost	6 (-2)	Ground frost	21 (-1)	Snow falling	0 (-1)	Snow lying	0 (0)	
Thunder	1 (-2)	Hail ≥5mm	0 (0)	Small hail/ice	1 (0)	Fog @09 GMT	2 (-2)	Nil sun	8 (-7)
Air pressure MSL : Mean @09 GMT (mbar)	1016.6	(+1.5)							

Departure from 1981 to 2010 average shown in brackets.

Notes: **Mild and Dry with Sunshine Near Normal.**

**Temperature:** This has been a fairly normal autumn season with respect to temperature, the mean just 0.3° above the climatological average. In the 17 years since 2000, 9 have had a milder autumn, and the 5 mildest since 1882 have occurred in the past 12 years, but this year, the mean temperature is 2.1° below the record set in 2006. There is quite a large difference in ranking between the mean maximum, 33<sup>rd</sup> highest, and mean minimum, 13<sup>th</sup> highest, suggesting that there have been fewer clear, cold, and still nights than is usual in autumn. The highest max was 22.4° on the 4<sup>th</sup> September, 2.1° below the median, but lowest only since 2015. The lowest max was 4.0° on the 30<sup>th</sup> November, 0.6° below its median. The highest min was 15.6° on the 5<sup>th</sup> September, 0.3° above the median while the lowest min was -2.5° on the 25<sup>th</sup> November, 1.3° above its median. The mean daily temperature range of 7.7° is lowest since 2004. The mean grass min was 4.4°, 0.4° above average, and the lowest was -7.2° on the 25<sup>th</sup> November. The mean earth temperature at 30 cm depth was 13.7°, anomaly +0.6°, and at 1 m depth the mean was 14.8°, anomaly +0.3°. September was the mildest month, mean 14.2° and November the coolest, mean 7.0°, but the October mean had the largest anomaly of +1.8°, anomalies for both September and November being -0.5°. The first ground frost of the season was on the 22<sup>nd</sup> September after 133 frost free days, and the first air frost was on the 30<sup>th</sup> October after 185 days free of air frost. The duration of air frost was 34.8 hours, 14.6 hours less than average. **Rainfall:** With the total 35 % below average this has been a dry autumn season, with the lowest rainfall since 2011, and before that, 1990. On average autumn is the wettest season of the year, and in some years has been extremely wet, the record being 368.7 mm in 1976, but more recently, 366.8 mm in 2000. This year, the season's highest daily fall of 13.4 mm on the 24<sup>th</sup> September is lowest since 1990 and 9<sup>th</sup> lowest in 114 years, the median being 24.7 mm. September was the wettest month with 69.7 mm, 130 % of average, but October was exceptionally dry with only 17.2 mm, 24 % of average, and November was also dry with 40.2 mm, 58 % of average. Despite this general lack of rainfall, the number of dry days is 2 less than average, but the number of days with 5 mm or more, 9, is 4 below average. The duration of measurable rain, 111.2 hours, is 76 % of average. The highest rainfall rate was 123 mm/hr during a thunderstorm with ice pellets at 1552 GMT on the 9<sup>th</sup> September. Overall, thunder was less frequent than average, occurring on just one day. Although 14 of the past 42 autumns have had at least one day with snowfall, there was none this year. **Sunshine:** The total this autumn is close to average, and although a little less than last year, it is more than in the previous three autumns. In respect of the daily mean, September was the sunniest month with 4.42 hours, 93% of average, and November the next with 3.30 hours, 139 % of average, while October only managed 3.18 hours, 89 % of average. From these figures it is evident that the season's near average sunshine results entirely from a sunny November which offset the poor showing in the other months. The season's highest daily sunshine is 10.5 hours, recorded on the 1<sup>st</sup> and 2<sup>nd</sup> of September. The number of days with nil sun, 8, is 7 fewer than average and lowest since 2006. Overall there were 45 days with <3 hours, 24 with =>6 hours and 4 with =>9 hours. **Wind:** The mean speed this autumn is 6.6 mph, 0.5 mph above average and highest since 2011. The windiest day was the 22<sup>nd</sup> November, 15.9 mph, but the season's highest gust of 59 mph was on the 13<sup>th</sup> September. The least windy day was the 3<sup>rd</sup> November, mean 1.7 mph, and there were 1802 minutes of calm. Daily mean direction/number of days: N,1 NE,4 E,0 SE,3 S,14 SW,43 W,15 NW,11. The value for SW winds is a new record high for the past 30 years. Compared with average, winds from SW were 15 % more frequent, with W and NW combined 8.5 % more frequent, at the expense of N and NE, 12.8 % less frequent, and E and SE combined, 10.3 % less frequent. October was the windiest month, mean 7.4 mph, and September the least windy, mean 6.0 mph. **Pressure:** The season's highest pressure was 1035.5 mbar on the 27<sup>th</sup> October, and the lowest was 985.9 mbar on the 23<sup>rd</sup> November, a span of 49.6 mbar, 6.0 mbar below average. **Humidity:** This autumn's mean relative humidity was 83.7 %, and the lowest was 38 % on the 1<sup>st</sup> September. The mean water vapour content per kg of air was 7.3 g at 0900 GMT and 7.1 g at 1500 GMT, both close to normal. **September:** Cooler, wetter and duller than average. Since 2000 only 4 Septembers have been colder. Apart from 2016, the wettest since 2000. Number of wet days most since 1974. Wind gust of 59 mph highest for September since before 1988. **October:** Very mild and very dry with sunshine below average. Daily mean 10<sup>th</sup> mildest in 136 years, mean min 7<sup>th</sup> highest in same period. Driest since 1978. Rainfall duration lowest since before 1993. 2<sup>nd</sup> windiest since 1998. **November:** Dry and very sunny. Cooler than average. Driest since 2004. Sunniest since 2007. Number of sunless days 2<sup>nd</sup> lowest since before 1979.

Month	Mean	Anom	Mean	Anom	Rain	Anom	Sun	Anom	Mean	Max	Mean	Anom
	Max		Min		mm		hrs		Wind mph	gust	pressure	
Sep.	18.6°	-0.8°	9.8°	-0.2°	69.7	130%	132.7	93%	6.0	59	1014.0	-2.7
Oct.	16.5°	+1.3°	9.5°	+2.3°	17.2	24%	98.5	89%	7.4	41	1018.9	+4.6
Nov.	10.6°	-0.3°	3.4°	-0.7°	40.2	58%	98.9	139%	6.3	50	1016.8	+2.4



## **Explanation and definition of some of the terms used in the Wokingham Weather Reports.**

**Average:** Generally refers to the 30 year climatological average, currently 1981 to 2010. This will be next updated in 2020. For some parameters, notably wind, the climatological average is not available, and if the word average is used in the context of wind, it refers to the average for the period for which data is held, namely 1988 to present.

For sunshine, there was a change, in July 1999, in the type of instrument used to detect sunshine amount, making the climatological average based on the old instrument of little use. In general, the new instrument produces higher values in the winter half year, and lower ones in the summer half, than the old type, due to a combination of faster reaction and higher sensitivity than the old type. The average used in this case is based on a theoretical equivalent 1981 to 2010 average, drawn from comparison with the Met Office published tables of departure from climatological average sunshine in the months since 2000 for their area 'Southern England'. Users of the Wokingham Monthly Weather reports should be aware of this, and regard anomalies for sunshine published therein as a guide only, until such time has elapsed since the introduction of the new instrument that a genuine average becomes available.

**Mean:** The mean of the data under discussion, often the monthly mean of daily data. The mean is obtained by summation of the individual values and dividing by the number of values. The term 'daily mean' in respect of temperature is defined as '(max + min) / 2'. A true daily 24 hour (00 to 24 GMT) mean temperature is available from the Automatic Weather Station (AWS), and is currently published on page 7 of the Wokingham Monthly Weather report, on the Wokingham Weather web site, page 1. <http://www.woksat.info/wwp1.html>

**Anomaly:** When a value is given for anomaly, this will have one of the following meanings:

- a): The departure of a mean from the current climatological average.
- b): The departure of a value on a particular day from the average for that day, (this need not be a climatological average).

When the word anomaly is used in respect of temperature, any values given are in °C. In respect of rainfall or sunshine, percent. In respect of wind, mph. In respect of pressure, millibars (hpa).

**Categories:** Reference may be made in the reports to 'categories'. Each category has a strict statistical range, as outlined below.

**Temperature:** The terms cold/mild are used in the winter half year, and cool/warm in the summer half. The term 'normal' is used when the individual mean (monthly, seasonal or annual) value is within 20 % of the median of all ranked values for that month/season/year.

**Mild/warm:** The value lies between 10 % and 30 % below the highest value in the ranked series.

**Very mild/very warm:** The value lies within 10 % of the highest value in the ranked series.

**Cold/cool:** The value lies between 10 % and 30 % above the lowest value in the ranked series.

**Very cold/very cool:** The value lies within 10 % of the lowest value in the ranked series.

**Sunshine:** The terms for sunshine are very sunny, sunny, normal, dull and very dull.

The definition of these terms follow the same rules as for temperature.

**Rainfall:** The terms for rainfall are very dry, dry, normal, wet and very wet.

The definition of the term 'normal' follows the same rule as for temperature and sunshine.

**Wet:** The value lies between 10 % and 30% of the highest value in the ranked series.

**Very wet:** The value lies within 10 % of the highest value in the ranked series.

**Dry:** The value lies between 10 % and 30 % above the lowest value in the ranked series.

**Very dry:** The value lies within 10 % of the lowest value in the ranked series.

**Long-term:** Mention may be made in the reports to the 'long-term'. The long-term record comprises a temperature/rainfall/sunshine data series compiled from records of various weather stations in the Wokingham area in the years prior to the establishment of the weather station at Emmbrook in 1976 together with data from this station.

In the case of monthly max, min and mean temperature and of rainfall total the series starts in 1882. For temperature extremes, the highest max and lowest min go back to 1904, and lowest max and highest min to 1913.

**Rank:** The word rank refers to the position of a value for a particular month/season/year in the ranked series, and may be expressed relative to either the highest or lowest value in the series. The central value in the ranked series is known as the **median**. This value may be different from the average of the whole series if the population is skewed. It can also be different from the climatological average which only refers to a 30 year period.

**Month:** Calendar month.

**Season:** Spring, March to May.

Summer, June to August

Autumn, September to November

Winter, December to February.

When discussing 'winter', if a single year is given this refers to the year in which the January/February fall.

**Annual or Year:** The calendar year, 1<sup>st</sup> January to 31<sup>st</sup> December.

**The climatological day:** runs from 0900 to 0900 GMT. The max temperature and rainfall read at 0900 hours are attributed to the previous day (thrown back), as is the duration of measurable rain. The min temperature and grass min read at 0900 hours are attributed to the day of reading. Pressure read at 0900 GMT, and the monthly mean pressure is the mean of the 0900 GMT readings. Sunshine data, wind data, rainfall rate data and 24 hour data from the AWS use the normal 00-24 GMT day.

**Frost:** An air frost day is recorded when the minimum temperature read at 0900 GMT on that day is  $-0.1^{\circ}\text{C}$  or below. A ground frost day is recorded when the grass minimum temperature read at 0900 GMT on that day is  $-0.1^{\circ}\text{C}$  or lower.

Duration of air frost is defined as the number of minutes that the AWS one minute average temperature is below  $0.0^{\circ}\text{C}$ , and the day runs from midnight to midnight.

**Snow:** A day with snow falling is triggered if snow falls at any time in the 24 hours from midnight on that day. A day with snow lying is entered if there is at least 50% snow cover at the 0900 GMT observation.

Snow depth is the depth of undrifted snow. Snow that collects in the raingauge funnel is melted and the amount recorded as rainfall.

**Hail:** A day of hail is recorded if hailstones 5 mm or more in diameter are observed or recorded on the hail pad in a 24 hour period starting at midnight.

A day of small hail is recorded if hailstones less than 5 mm diameter are observed or recorded in a 24 hour period starting at midnight. The term small hail also includes various other types of ice meteor such as ice pellets, snow grains and some types of snow pellets.

**Fog:** A day with fog is recorded if the horizontal visibility at 0900 GMT is below 1000 m.

**Thunder:** A day of thunder is recorded if thunder is heard in the 24 hour period from midnight on that day. The appearance of lightning without thunder being heard does not qualify as a thunder day.

**Trace of rainfall:** A trace of rain, entered as 'tr' in the daily log, is recorded if rain is observed to fall but is of insufficient quantity to collect in the raingauge, or if the amount of rain in the gauge is less than 0.05 mm.

**Dry spell:** A dry spell is defined as a period of 5 or more consecutive dry days.

**Dry day:** A dry day is one with less than 0.2 mm of rainfall.

**Rain day:** A rain day is one with 0.2 mm or more of rainfall.

**Wet day:** A wet day is one having 1.0 mm or more of rainfall.

## Appendix 2.

Explanation and decode for code figures used in the Wokingham 0900 and 1500 GMT observations

**VV** : Visibility.

Code figures 00 to 50 are in km and tenths e.g. 01 = 0.1 km = 100 m, 33 = 3.3 km, 50 = 5.0 km

Code figures 60 to 80. Subtract 50 to obtain visibility in km. e.g. 56 = 6 km, 65 = 15 km, 77 = 27 km.

Code figures 81 to 89. Subtract 50 and add 5 for every one above 80. e.g. 83 = 45 km, 86 = 60 km.

Code figure 89 = visibility above 70 km.

**N** : Total cloud amount in okta (eighths of sky covered). 9 = sky obscured (e.g. by fog or snow)

**dd** : Wind direction in tens of degrees from true north. Wind is measured at a height of 10 m, and the direction is the mean over a period of 10 minutes ending at the observation time.

**ff** : Wind speed in knots, measured at 10 m, and is the mean over a period of 10 minutes ending at observation time.

**gg** : Wind gust in knots at 10 m. The highest gust in the 60 minutes up to observation time.

**TT** : Air temperature at 1.2m, degrees C and tenths.

**TdTd** : Dew point temperature at 1.2m, degrees C and tenths.

**RH** : Relative humidity at 1.2m, %.

**r** : Humidity mixing ratio (amount of water vapour per kg of air), grams and tenths.

**PPP** : Air pressure reduced to MSL, millibars and tenths.

**a** : Characteristic of pressure tendency during the past 3 hours.

Code figures 0 to 3, pressure higher than 3 hours ago, 5 to 8, pressure lower than 3 hours ago

Code figure 0 = Increasing then decreasing, pressure the same as or higher than 3 hours ago

1 = Increasing then steady or increasing more slowly

2 = Increasing steadily or unsteadily

3 = Decreasing or steady then increasing, or increasing then increasing more rapidly

4 = Steady, pressure the same as 3 hours ago

5 = Decreasing then increasing, pressure lower than 3 hours ago

6 = Decreasing then steady or decreasing more slowly

7 = Decreasing steadily or unsteadily

8 = Steady or increasing then decreasing, or decreasing then decreasing more rapidly

**ppp** : 3 hour pressure tendency in tenths of a millibar

**ww** : Present weather code figures, 00 to 99.

Present weather decode:

00 = Cloud development not observed or not observable

01 = Clouds generally dissolving or becoming less developed

02 = State of sky on the whole unchanged

03 = Clouds generally increasing or becoming more developed

04 = Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes.

05 = Haze, visibility reduced by extremely small dry particles (RH less than appx. 95 %)

06 = Widespread dust in suspension, not raised by the wind near the station at the time of the observation

07 = Dust or sand raised by the wind at or near the station at the time of the observation, but no well-developed dust whirls or sand whirls, and no duststorm or sandstorm seen: In marine environments, blowing spray at the station.

08 = Well-developed dust or sand whirls seen at or near the station during the preceding hour or at the time of the observation, but no duststorm or sandstorm.

09 = Duststorm or sandstorm within sight at the time of the observation, or at the station during the preceding hour

10 = Mist  
11 = Patches of shallow fog not deeper than 2 metres on land  
12 = More or less continuous shallow fog not deeper than 2 metres on land  
13 = Lightning visible, no thunder heard  
14 = Precipitation within sight, not reaching the ground  
15 = Precipitation within sight, reaching the ground more than 5 km from the station  
16 = Precipitation within sight, reaching the ground, near to but not at the station  
17 = Thunderstorm, but no precipitation at the time of the observation  
18 = Squalls at or within sight of the station at the time of the observation or during the preceding hour  
19 = Funnel cloud(s) at or within sight of the station at the time of the observation or during the preceding hour

20 = Drizzle (not freezing) at the station during the preceding hour but not at the time of the observation  
21 = Rain (not freezing) at the station during the preceding hour but not at the time of the observation  
22 = Snow at the station during the preceding hour but not at the time of the observation  
23 = Rain and snow or ice pellets at the station during the preceding hour but not at the time of the observation  
24 = Freezing drizzle or freezing rain at the station during the preceding hour but not at the time of the observation  
25 = Shower(s) of rain at the station during the preceding hour but not at the time of the observation  
26 = Shower(s) of snow or rain and snow at the station during the preceding hour but not at the time of the observation  
27 = Shower(s) of hail or rain and hail at the station during the preceding hour but not at the time of the observation  
28 = Fog or ice fog at the station during the preceding hour but not at the time of the observation  
29 = Thunderstorm, with or without precipitation at the station during the preceding hour but not at the time of the observation

30 = Slight or moderate duststorm or sandstorm has decreased during the preceding hour  
31 = Slight or moderate duststorm or sandstorm with no appreciable change during the past hour  
32 = Slight or moderate duststorm or sandstorm has begun or increased during the past hour  
33 = Severe duststorm or sandstorm has decreased during the preceding hour  
34 = Severe duststorm or sandstorm with no appreciable change during the past hour  
35 = Severe duststorm or sandstorm has begun or increased during the past hour  
36 = Slight or moderate drifting snow generally below eye level  
37 = Heavy drifting snow generally below eye level  
38 = Slight or moderate blowing snow generally above eye level  
39 = Heavy blowing snow generally above eye level

40 = Fog or ice fog at a distance at the time of the observation, but not at the station during the preceding hour, the fog extending to a level above that of the observer.  
41 = Fog or ice fog in patches  
42 = Fog or ice fog, sky visible has become thinner during the past hour  
43 = Fog or ice fog, sky invisible has become thinner during the past hour  
44 = Fog or ice fog, sky visible no appreciable change during the past hour  
45 = Fog or ice fog, sky invisible no appreciable change during the past hour  
46 = Fog or ice fog, sky visible has begun or become thicker during the past hour  
47 = Fog or ice fog, sky invisible has begun or become thicker during the past hour  
48 = Fog, depositing rime, sky visible  
49 = Fog depositing rime, sky invisible

50 = Drizzle, not freezing, intermittent slight at time of observation  
51 = Drizzle, not freezing, continuous slight at time of observation  
52 = Drizzle, not freezing, intermittent moderate at time of observation  
53 = Drizzle, not freezing, continuous moderate at time of observation  
54 = Drizzle, not freezing, intermittent heavy at time of observation  
55 = Drizzle, not freezing, continuous heavy at time of observation  
56 = Drizzle, freezing, slight  
57 = Drizzle, freezing, moderate or heavy (dense)  
58 = Drizzle and rain, slight  
59 = Drizzle and rain, moderate or heavy

60 = Rain, not freezing, intermittent slight at time of observation  
61 = Rain, not freezing, continuous slight at time of observation  
62 = Rain, not freezing, intermittent moderate at time of observation  
63 = Rain, not freezing, continuous moderate at time of observation  
64 = Rain, not freezing, intermittent heavy at time of observation  
65 = Rain, not freezing, continuous heavy at time of observation  
66 = Rain, freezing, slight  
67 = Rain, freezing, moderate or heavy  
68 = Rain or drizzle and snow, slight  
69 = Rain or drizzle and snow, moderate or heavy

70 = Intermittent fall of snowflakes slight at time of observation  
71 = Continuous fall of snowflakes slight at time of observation  
72 = Intermittent fall of snowflakes moderate at time of observation  
73 = Continuous fall of snowflakes moderate at time of observation  
74 = Intermittent fall of snowflakes heavy at time of observation  
75 = Continuous fall of snowflakes heavy at time of observation  
76 = Diamond dust (with or without fog)  
77 = Snow grains (with or without fog)  
78 = Isolated star-like snow crystals (with or without fog)  
79 = Ice pellets

80 = Rain shower(s), slight  
81 = Rain shower(s), moderate or heavy  
82 = Rain shower(s), violent  
83 = Shower(s) of rain and snow mixed, slight  
84 = Shower(s) of rain and snow mixed, moderate or heavy  
85 = Snow shower(s), slight  
86 = Snow shower(s), moderate or heavy  
87 = Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed, slight  
88 = Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed, moderate or heavy  
89 = Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder, slight  
90 = Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder, moderate or heavy

91 = Slight rain at time of observation, thunderstorm during the past hour but not at time of observation  
92 = Moderate or heavy rain at time of observation, thunderstorm during the past hour but not at time of observation  
93 = Slight snow, or rain and snow mixed, or hail at time of observation, thunderstorm during the past hour but not at time of observation  
94 = Moderate or heavy snow, or rain and snow mixed, or hail at time of observation, thunderstorm during the past hour but not at time of observation  
95 = Thunderstorm, slight or moderate, without hail but with rain and or snow at time of observation  
96 = Thunderstorm, slight or moderate, with hail at time of observation  
97 = Thunderstorm, heavy, without hail but with rain and or snow at time of observation  
98 = Thunderstorm combined with duststorm or sandstorm at time of observation  
99 = Thunderstorm, heavy, with hail at time of observation

Hail includes large hail, small hail and snow pellets.

**W1, W2 :** Past weather (for 0900 and 1500 GMT observations, the period covered is 3 hours)

Code figures:

- 0 = Cloud covering half or less of the sky throughout the period
- 1 = Cloud covering more than half the sky during only part of the period
- 2 = Cloud covering more than half the sky throughout the period
- 3 = Sandstorm, duststorm or blowing snow
- 4 = Fog or ice fog or thick haze (visibility less than 1000 m)
- 5 = Drizzle
- 6 = Rain
- 7 = Snow or rain and snow mixed
- 8 = Shower(s)
- 9 = Thunderstorm(s) with or without precipitation

**Nh :** Amount of low cloud, or medium cloud if no low cloud present, okta

**Cl :** Type of low cloud

- 0 = No low cloud
- 1 = Cumulus with little vertical extent and seemingly flattened, or ragged Cumulus other than bad weather, or both
- 2 = Cumulus of moderate or strong vertical extent, either accompanied or not by other Cumulus or Stratocumulus all having their bases at the same level
- 3 = Cumulonimbus whose summits, at least partially, lack sharp outline, but are neither clearly fibrous (cirriform), nor in the form of an anvil; Cumulus, Stratocumulus or Stratus may also be present
- 4 = Stratocumulus formed by the spreading out of Cumulus; Cumulus may also be present
- 6 = Stratus in a more or less continuous sheet or layer, or ragged shreds, or both, but no Stratus fractus of bad weather
- 7 = Stratus fractus of bad weather or Cumulus fractus of bad weather or both (pannus), usually below Altostratus or Nimbostratus
- 8 = Cumulus and Stratocumulus other than that formed by the spreading out of Cumulus, the bases of the Cumulus and Stratocumulus are not at the same level.
- 9 = Cumulonimbus, the upper part of which is clearly fibrous (cirriform), often in the form of an anvil, either accompanied or not by any other type(s) of low cloud
- / = Types of low cloud invisible due to darkness, fog, blowing dust or sand or other similar phenomena.

'Bad weather' denotes the conditions which generally exist during precipitation and a short time before and after.

**Cm :** Type of medium cloud.

- 0 = No medium cloud.
- 1 = Altostratus, the greater part of which is semi-transparent; through this part the sun or moon may be weakly visible, as through ground glass
- 2 = Altostratus, the greater part of which is sufficiently dense to hide the sun or moon, or Nimbostratus
- 3 = Altocumulus, the greater part of which is semi-transparent; the various elements of the cloud change only slowly and are all at a single level
- 4 = Altocumulus in patches (often in the form of almonds or fishes), the greater part of which is semi-transparent ; the clouds occur at one or more levels and the elements are continually changing in appearance
- 5 = Altocumulus in bands semi-transparent, of Altocumulus in one or more fairly continuous layers (semi-transparent or opaque), progressively invading the sky; these Altocumulus clouds generally thicken as a whole
- 6 = Altocumulus resulting from the spreading out of Cumulus (or Cumulonimbus)
- 7 = Altocumulus in two or more layers, usually opaque in places, and not progressively invading the sky; or opaque layer of Altocumulus not progressively invading the sky; or Altocumulus together with Altostratus or Nimbostratus
- 8 = Altocumulus with sproutings in the form of small towers or battlements, or Altocumulus having the appearance of cumuliform tufts
- 9 = Altocumulus of a chaotic sky, generally at several levels
- / = Types of medium cloud invisible owing to darkness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.

**Ch :** Type of high cloud

0 = No high cloud

1 = Cirrus in the form of filaments, strands or hooks, not progressively invading the sky.

2 = Dense cirrus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus with sproutings in the form of small turrets or battlements, or Cirrus having the appearance of cumuliform tufts

3 = Dense Cirrus, often in the form of an anvil, being the remains of the upper part of Cumulonimbus, or where the rest of the Cumulonimbus is below the horizon

4 = Cirrus in the form of hooks or filaments, or both, progressively invading the sky; they generally become denser as a whole

5 = Cirrus (often in bands converging towards one or two opposite points on the horizon) and Cirrostratus, or Cirrostratus alone; in either case they are progressively invading the sky, and generally growing denser as a whole, but the continuous veil does not reach 45 degrees above the horizon.

6 = Cirrus (often in bands converging towards one or two opposite points on the horizon) and Cirrostratus, or Cirrostratus alone; in either case they are progressively invading the sky, and generally growing denser as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered

7 = Veil of Cirrostratus covering the celestial dome.

8 = Cirrostratus not progressively invading the sky and not completely covering the celestial dome

9 = Cirrocumulus alone, or accompanied by Cirrus or Cirrostratus, or both, but Cirrocumulus is predominant.

/ = Types of high cloud invisible owing to darkness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.

**8 Groups**

**N** = Amount of cloud reported by C, okta.

**C** = Type of cloud

0 = Cirrus (Ci)

1 = Cirrocumulus (Cc)

2 = Cirrostratus (Cs)

3 = Altocumulus (Ac)

4 = Altostratus (As)

5 = Nimbostratus (Ns)

6 = Stratocumulus (Sc)

7 = Stratus (St)

8 = Cumulus (Cu)

9 = Cumulonimbus (Cb)

/ = Cloud type not visible owing to darkness, fog, duststorm, or other analogous phenomena.

**hshs** = Height of cloud above station level reported by type C

00 to 50 = Height in hundreds of feet

51 to 55 Not used

56 to 80 = Subtract 50 to obtain cloud height in thousands of feet

81 to 88 = Height of cloud between 35000 and 70000 ft in 5000 ft steps.