

MARSEILLE, FRANCE

Latitude = 43.45 N

Longitude = 5.23 E

Period of Record = 1973 to 1996

WMO No. 076500

Elevation = 118 feet

Average Pressure = 29.88 inches Hg

Design Criteria Data

	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	93	71	78	14.2	W
0.4% Occurrence	90	71	83	13.4	W
1.0% Occurrence	87	70	83	13.4	W
2.0% Occurrence	84	69	81	13.5	W
Mean Daily Range	16	-	-	-	-
97.5% Occurrence	34	32	23	6.8	SE
99.0% Occurrence	30	28	19	5.7	SSE
99.6% Occurrence	27	26	17	5.7	SE
Median of Extreme Lows	24	22	13	10.4	N
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T_{wb})	(°F)				
Median of Extreme Highs	76	85	118	11.1	W
0.4% Occurrence	74	83	110	10.3	W
1.0% Occurrence	73	82	106	10.4	W
2.0% Occurrence	71	81	97	10.4	W
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)	(gr/lb)				
Median of Extreme Highs	125	80	0.83	9.1	SSW
0.4% Occurrence	117	79	0.78	8.5	SSW
1.0% Occurrence	110	78	0.74	8.5	W
2.0% Occurrence	103	77	0.69	8.2	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		8	517	98	819

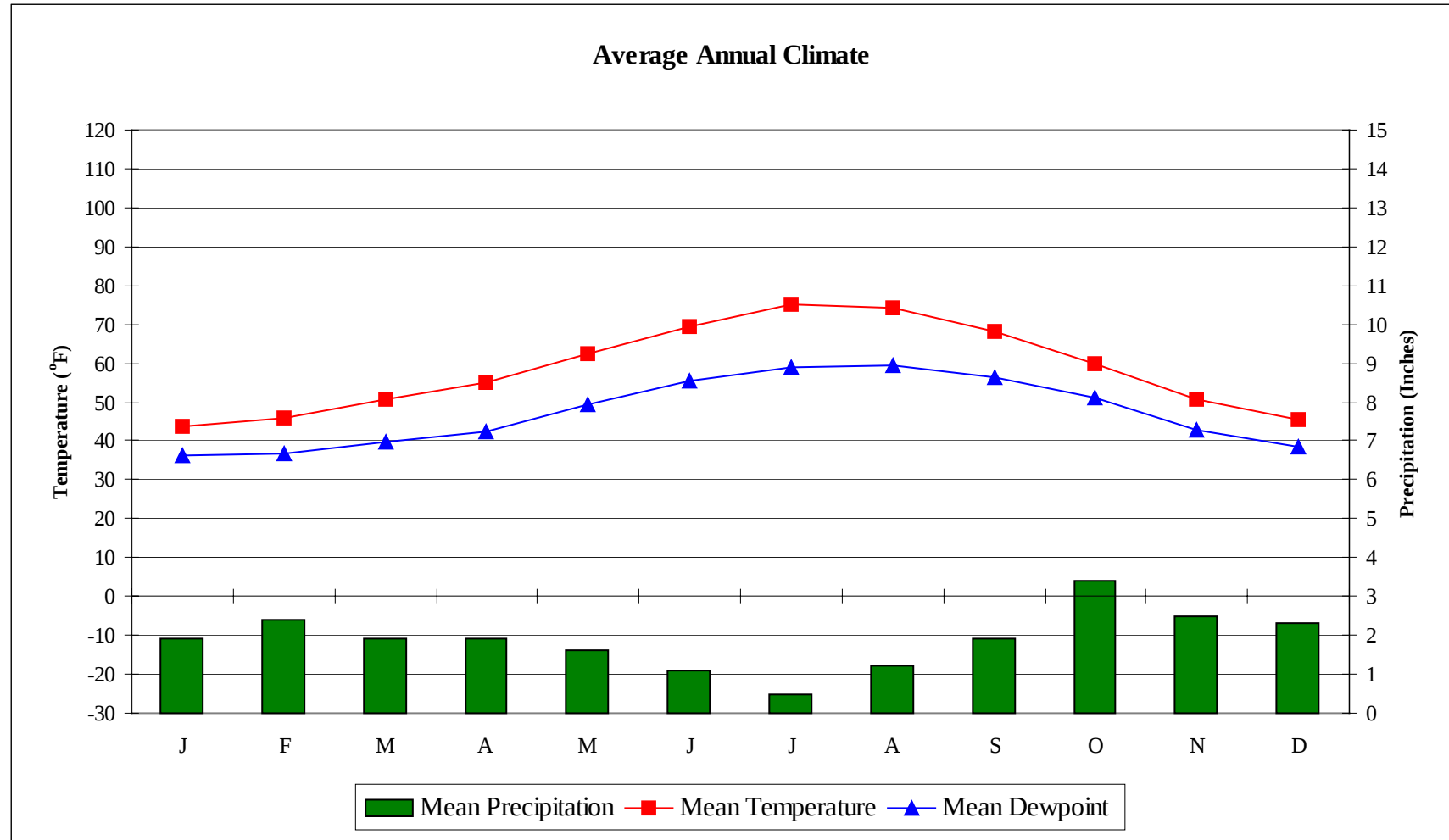
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
8	N/A	N/A	0.7 + 0.5
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
60.9	N/A	N/A	16

*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

MARSEILLE, FRANCE

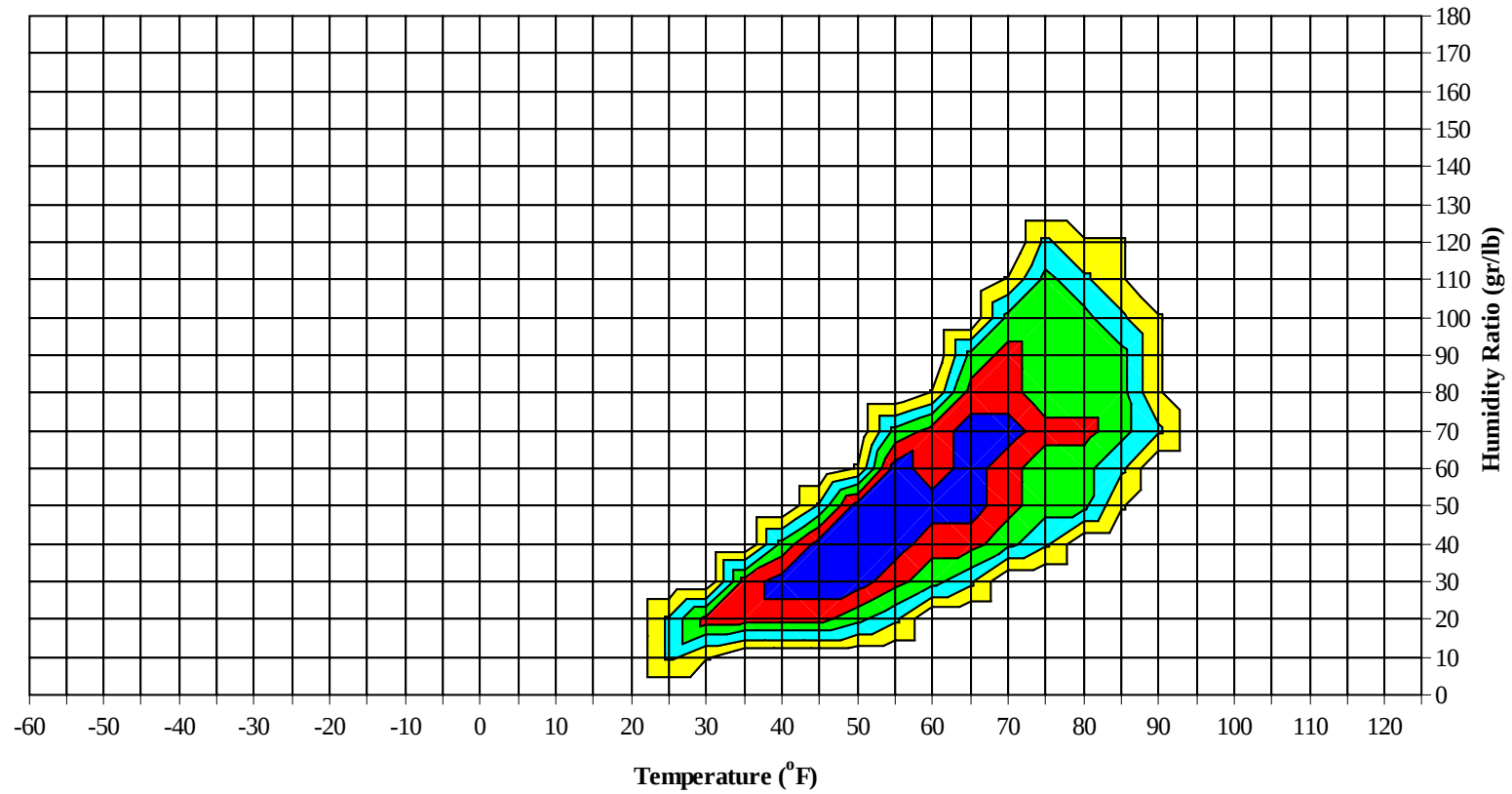
WMO No. 076500



MARSEILLE, FRANCE

WMO No. 076500

Long Term Psychrometric Summary

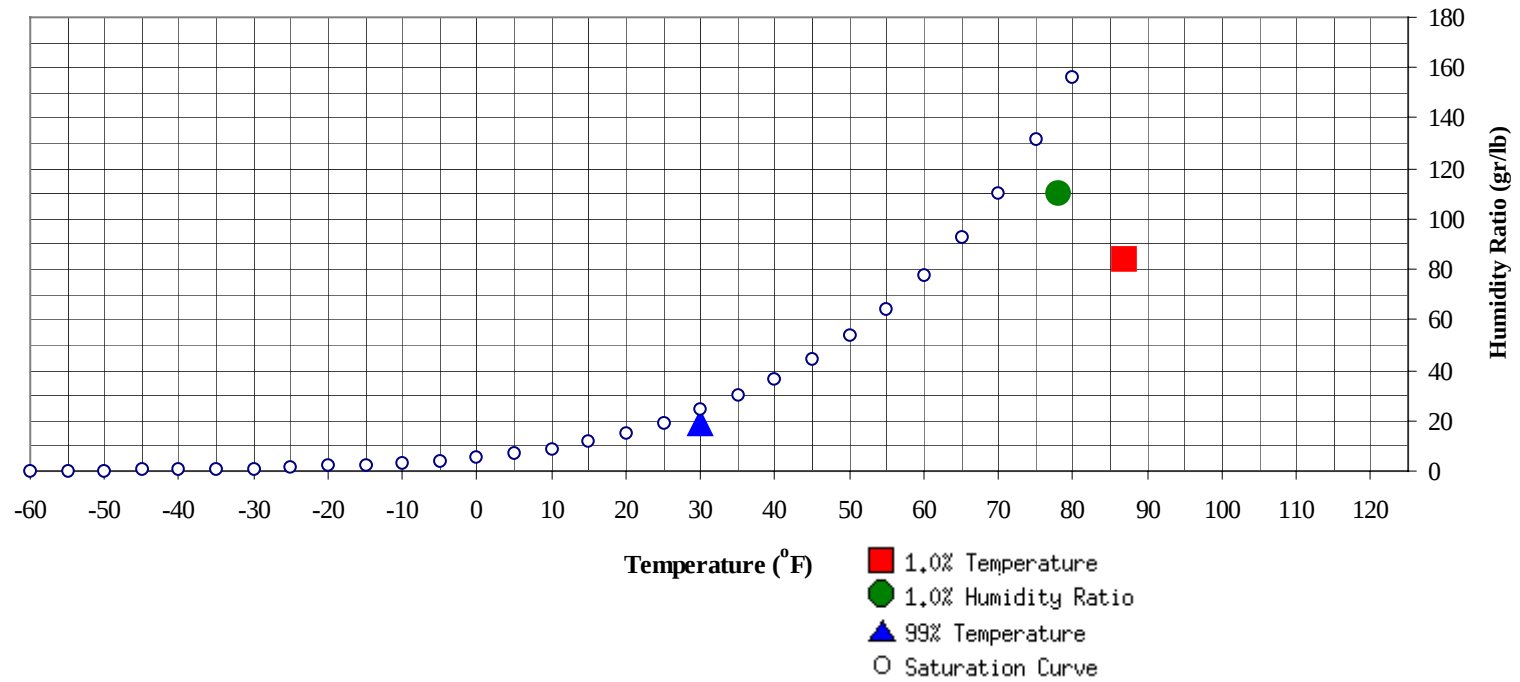


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

MARSEILLE, FRANCE

WMO No. 076500

Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
99% Dry Bulb	30	19.3	10.2		109.9	78.1	72.3	69.8	35.9

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	87	83.8	70.1	34.0

MARSEILLE, FRANCE

WMO No. 076500

Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January					February					March				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79												0		0	57.7
70 / 74							0	0	0	57.0		3	1	4	56.8
65 / 69						0	1	0	1	56.5	1	9	3	13	55.5
60 / 64		3		3	54.1	0	11	2	13	53.3	1	41	16	58	53.2
55 / 59	8	37	16	61	51.2	5	47	24	76	50.4	14	75	58	147	50.1
50 / 54	32	65	49	146	47.3	28	60	60	147	46.9	56	68	84	208	46.9
45 / 49	48	66	74	188	42.8	55	55	64	173	42.8	79	38	60	178	42.6
40 / 44	42	33	47	122	38.9	42	27	38	107	38.7	52	10	18	81	38.7
35 / 39	55	26	38	119	35.0	52	17	26	95	34.8	33	4	6	43	34.9
30 / 34	40	11	15	66	30.3	32	6	8	46	30.2	11	0	1	12	30.0
25 / 29	19	4	5	28	25.3	9	1	1	11	25.1	1	0		1	25.4
20 / 24	3	1	2	6	20.1	1	0	1	2	19.2		0		0	18.0
15 / 19	2	1	1	4	15.9	1	0		1	16.1					
10 / 14	1	0	0	1	11.4										

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MARSEILLE, FRANCE

WMO No. 076500

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	April					May					June				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99															
90 / 94												2	0	2	70.9
85 / 89												11	2	13	68.9
80 / 84		0		0	63.5		5	1	6	64.2	0	38	15	53	66.8
75 / 79		2	0	2	59.6	0	33	11	44	62.1	4	73	43	119	64.5
70 / 74	0	13	4	17	57.5	3	69	34	106	60.0	28	67	75	169	62.3
65 / 69	0	29	9	38	55.5	13	51	45	109	58.2	56	32	58	145	60.2
60 / 64	4	74	43	121	53.4	60	57	81	198	55.8	99	15	41	155	57.5
55 / 59	43	69	84	197	50.8	95	26	58	179	52.5	49	3	7	59	53.1
50 / 54	86	39	70	195	47.3	60	6	16	82	48.4	5	0	0	5	49.6
45 / 49	73	12	25	110	42.5	16	0	1	17	43.4	0		0	0	45.3
40 / 44	26	1	4	31	38.4	2			2	39.6					
35 / 39	8	0	0	8	34.6	0			0	33.0					
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															

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MARSEILLE, FRANCE

WMO No. 076500

Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	July					August					September				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104		0		0	70.6										
95 / 99		2	1	3	71.3		1	0	1	70.6					
90 / 94		16	4	20	70.7		14	3	17	71.3		0		0	67.2
85 / 89	0	43	14	57	69.9	0	37	10	47	70.2	0	5	0	5	68.1
80 / 84	3	81	52	135	68.1	1	80	44	125	68.5	0	32	7	39	67.9
75 / 79	26	65	81	171	66.2	18	65	82	165	66.9	2	71	36	109	66.0
70 / 74	91	31	69	191	63.8	87	38	75	200	64.4	24	66	75	165	63.9
65 / 69	69	8	21	98	60.9	78	10	25	113	61.6	48	36	56	140	61.3
60 / 64	53	2	7	62	57.1	57	2	9	68	57.8	92	25	48	165	57.7
55 / 59	6		0	6	53.2	8	0	0	8	53.2	57	5	15	77	53.1
50 / 54						0			0	49.0	16	1	2	19	48.8
45 / 49						0			0	45.0	2			2	45.2
40 / 44											0			0	38.0
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															

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MARSEILLE, FRANCE

WMO No. 076500

Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	October					November					December				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99															
90 / 94															
85 / 89		0		0	69.0										
80 / 84		2		2	66.5										
75 / 79	0	14	2	16	65.2		0		0	57.5					
70 / 74	4	45	18	67	62.8	0	1	0	1	61.3					
65 / 69	17	52	36	105	60.7	1	12	2	15	58.5	0	1	0	1	57.6
60 / 64	47	65	70	181	57.4	11	46	20	77	56.1	1	11	3	15	55.3
55 / 59	65	48	69	182	53.0	30	64	56	150	52.4	18	45	23	86	52.1
50 / 54	65	18	39	123	48.8	55	59	64	178	48.1	35	69	57	161	47.9
45 / 49	35	4	12	51	44.0	62	36	54	152	43.3	53	60	67	179	43.2
40 / 44	11	0	1	12	40.0	36	13	24	73	39.1	41	30	42	113	39.0
35 / 39	4		0	4	36.6	30	7	15	52	35.1	53	23	38	114	35.1
30 / 34						13	2	4	19	30.8	34	8	15	57	30.5
25 / 29						3	0	0	3	26.2	14	1	2	17	26.1
20 / 24						0			0	22.7	1	0		1	20.7
15 / 19															
10 / 14															

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MARSEILLE, FRANCE

WMO No. 076500

Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

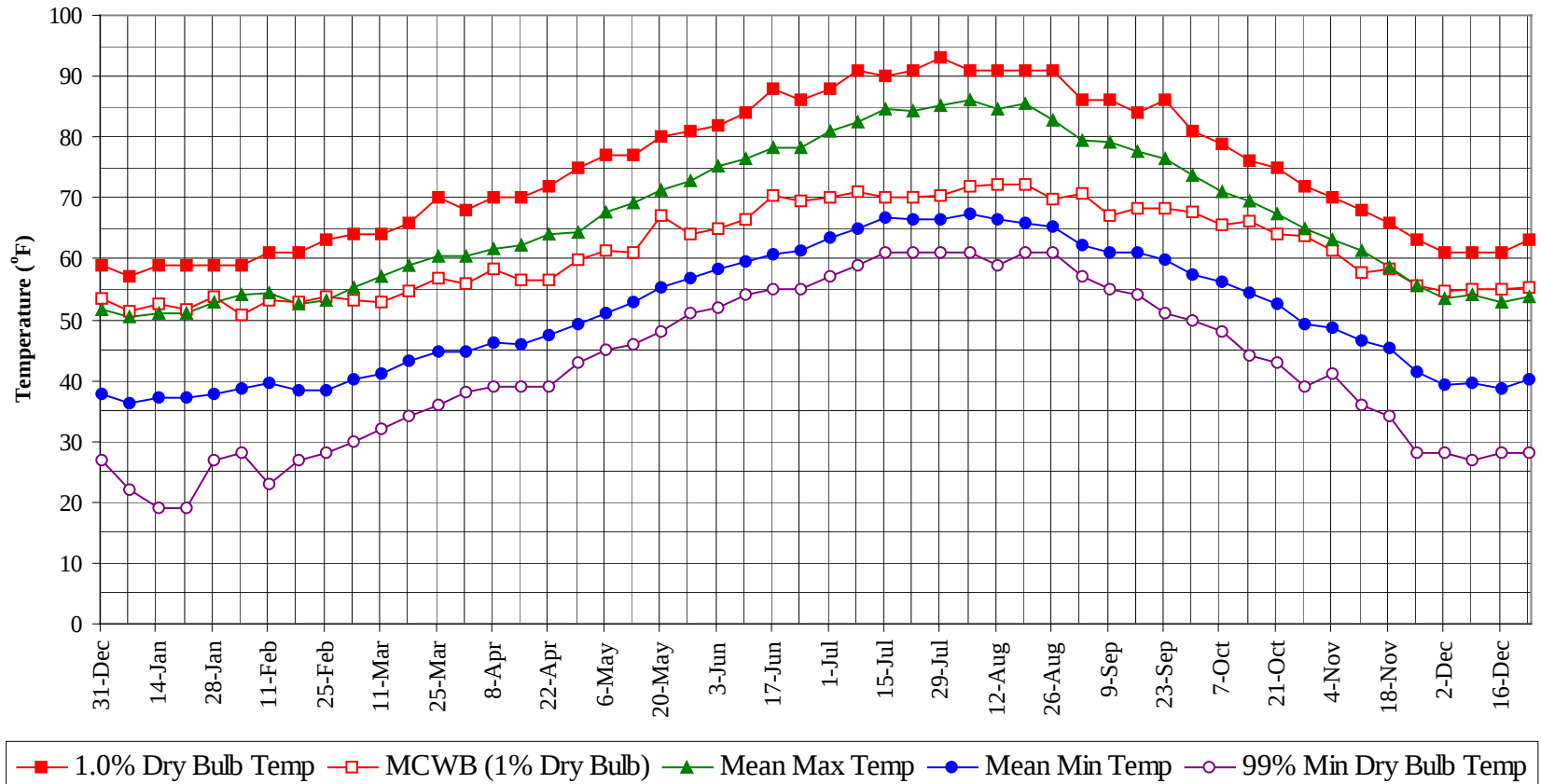
Annual Totals						
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	
	01 To 08	09 To 16	17 To 00			
100 / 104	0			0	70.6	
95 / 99	2			1	3	71.1
90 / 94	32			7	39	70.9
85 / 89	0	95	26	121	69.8	
80 / 84	4	236	118	358	68.0	
75 / 79	51	321	253	625	65.7	
70 / 74	236	333	350	920	63.0	
65 / 69	281	240	254	775	60.1	
60 / 64	421	353	339	1113	56.4	
55 / 59	397	420	415	1232	51.9	
50 / 54	439	386	445	1270	47.6	
45 / 49	423	272	358	1053	42.9	
40 / 44	252	115	174	541	38.9	
35 / 39	234	77	125	436	35.0	
30 / 34	129	26	42	197	30.4	
25 / 29	45	7	8	60	25.6	
20 / 24	5	2	3	10	20.0	
15 / 19	3	1	1	5	15.9	
10 / 14	1	0	0	1	11.4	

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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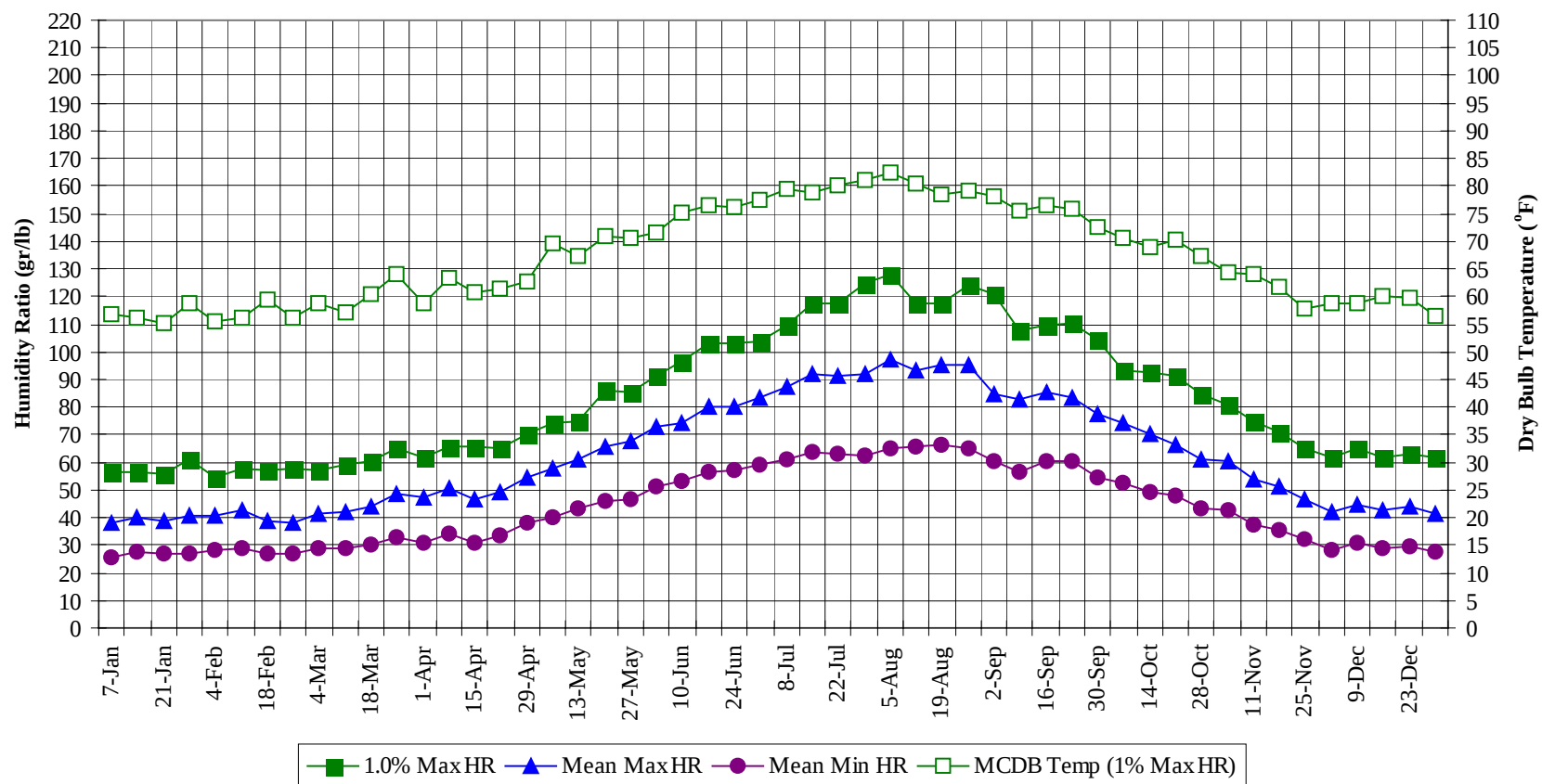
Annual Summary of Temperatures



MARSEILLE, FRANCE

WMO No. 076500

Long Term Humidity and Dry Bulb Temperature Summary

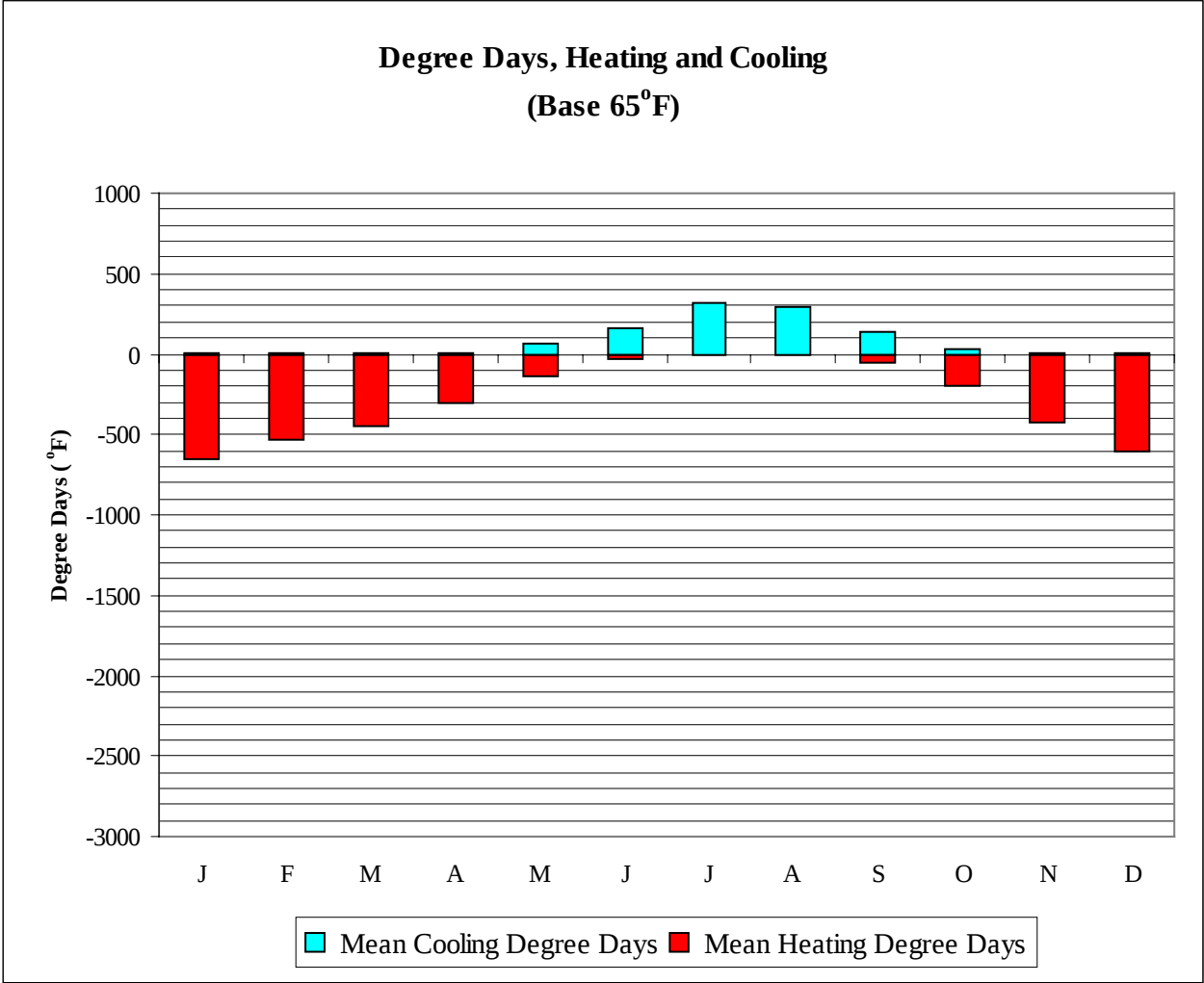


MARSEILLE, FRANCE

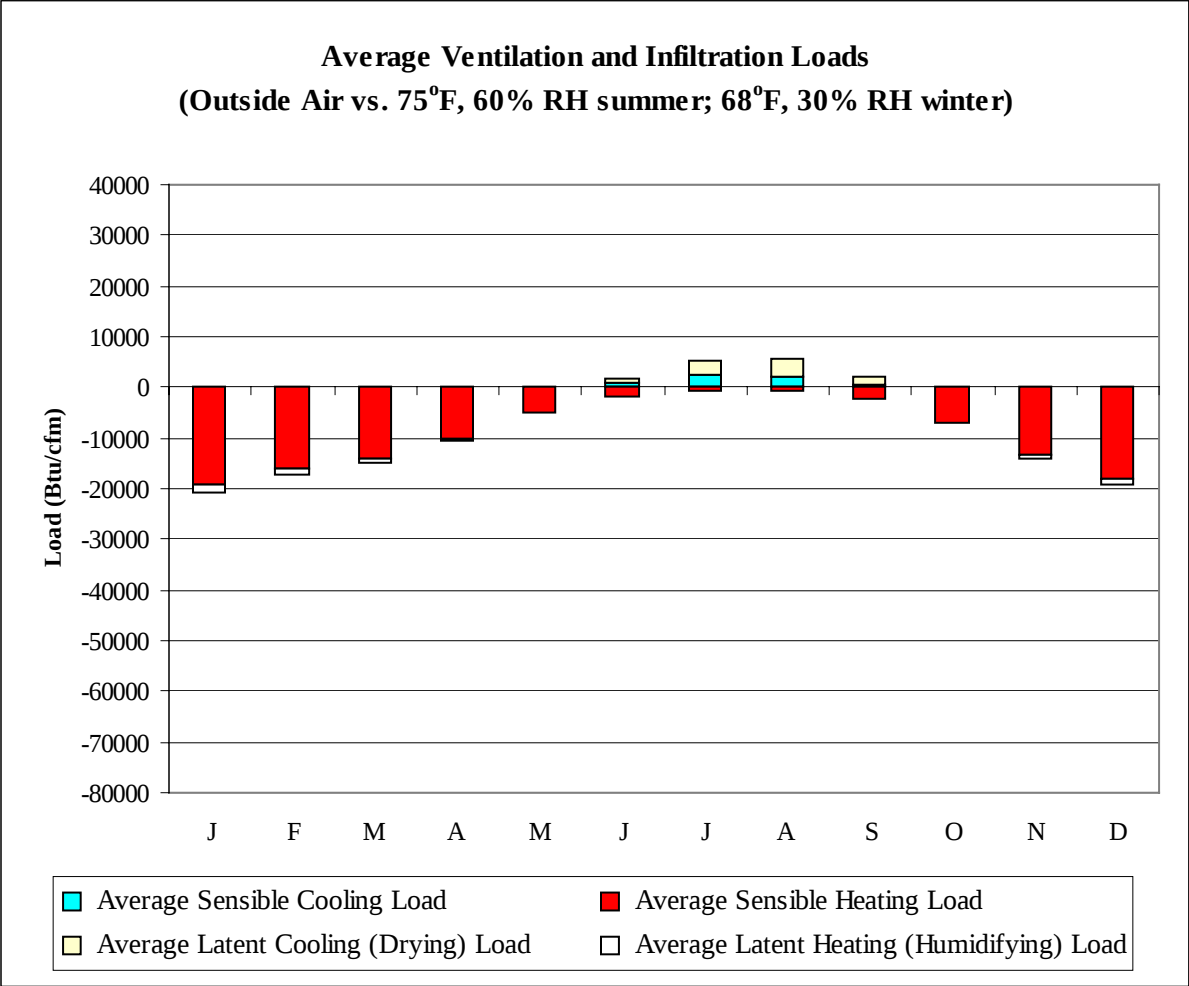
WMO No. 076500

Long Term Dry Bulb Temperature and Humidity Summary

Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	57.0	51.5	50.3	36.2	22.0	56.7	56.7	38.4	25.4
14-Jan	59.0	52.6	51.1	37.3	19.0	56.7	56.0	39.8	27.7
21-Jan	59.0	51.6	51.0	37.3	19.0	56.0	55.1	38.6	26.7
28-Jan	59.0	53.8	52.8	37.7	27.0	60.9	58.7	40.8	27.1
4-Feb	59.0	50.9	54.1	38.8	28.0	54.6	55.6	41.0	28.0
11-Feb	61.0	53.2	54.3	39.5	23.0	58.1	56.2	42.9	29.0
18-Feb	61.0	53.0	52.6	38.2	27.0	57.4	59.3	38.8	26.8
25-Feb	63.0	53.7	53.3	38.4	28.0	58.1	56.3	38.3	26.7
4-Mar	64.0	53.2	55.3	40.3	30.0	57.4	58.7	41.6	29.0
11-Mar	64.0	53.0	57.2	40.9	32.0	58.8	57.1	42.3	29.0
18-Mar	66.0	54.5	58.8	43.1	34.0	60.2	60.4	44.0	30.3
25-Mar	70.0	56.9	60.6	44.8	36.0	65.1	64.1	48.7	33.0
1-Apr	68.0	55.8	60.3	44.8	38.0	61.6	58.9	47.1	31.1
8-Apr	70.0	58.3	61.5	46.1	39.0	65.8	63.5	50.5	34.3
15-Apr	70.0	56.5	62.1	45.9	39.0	65.8	60.6	46.6	30.9
22-Apr	72.0	56.4	64.0	47.6	39.0	65.1	61.5	49.2	33.4
29-Apr	75.0	59.8	64.3	49.3	43.0	70.0	62.6	54.4	38.2
6-May	77.0	61.4	67.7	51.0	45.0	74.2	69.8	57.5	40.1
13-May	77.0	61.1	69.2	53.0	46.0	74.9	67.2	61.2	43.2
20-May	80.0	67.0	71.3	55.3	48.0	86.1	70.8	65.7	46.2
27-May	81.0	64.2	72.9	56.7	51.0	85.4	70.7	67.9	46.3
3-Jun	82.0	64.9	75.1	58.2	52.0	91.0	71.5	72.6	51.0
10-Jun	84.0	66.6	76.4	59.6	54.0	96.6	75.3	74.2	53.0
17-Jun	88.0	70.4	78.2	60.7	55.0	102.9	76.6	79.8	56.6
24-Jun	86.0	69.5	78.4	61.4	55.0	102.9	76.1	80.3	57.2
1-Jul	88.0	70.2	81.0	63.5	57.0	103.6	77.4	83.1	58.9
8-Jul	91.0	71.0	82.5	64.8	59.0	109.9	79.5	87.4	61.0
15-Jul	90.0	70.2	84.7	66.7	61.0	117.6	78.7	91.7	63.7
22-Jul	91.0	70.2	84.4	66.6	61.0	117.6	80.2	91.3	62.7
29-Jul	93.0	70.5	85.2	66.6	61.0	124.6	81.0	91.9	62.4
5-Aug	91.0	71.9	86.2	67.4	61.0	128.1	82.3	97.0	64.7
12-Aug	91.0	72.2	84.5	66.4	59.0	117.6	80.4	93.2	65.6
19-Aug	91.0	72.1	85.4	66.0	61.0	117.6	78.4	95.3	66.3
26-Aug	91.0	69.8	82.8	65.4	61.0	123.9	79.3	95.1	65.2
2-Sep	86.0	70.8	79.4	62.4	57.0	121.1	78.3	84.6	60.6
9-Sep	86.0	67.2	79.2	60.9	55.0	107.8	75.4	82.7	56.2
16-Sep	84.0	68.4	77.7	61.0	54.0	109.9	76.4	85.6	60.6
23-Sep	86.0	68.4	76.5	60.0	51.0	110.6	75.8	83.5	60.4
30-Sep	81.0	67.7	73.6	57.5	50.0	104.3	72.5	77.6	54.8
7-Oct	79.0	65.4	71.0	56.3	48.0	93.1	70.6	74.4	52.7
14-Oct	76.0	66.3	69.4	54.3	44.0	92.4	69.0	70.2	49.5
21-Oct	75.0	64.1	67.3	52.6	43.0	91.0	70.1	66.6	47.9
28-Oct	72.0	63.7	64.9	49.4	39.0	84.7	67.2	60.9	43.6
4-Nov	70.0	61.4	63.1	48.6	41.0	80.5	64.4	60.6	42.9
11-Nov	68.0	57.6	61.3	46.5	36.0	74.9	63.9	53.6	37.6
18-Nov	66.0	58.4	58.5	45.2	34.0	70.7	61.7	51.3	35.6
25-Nov	63.0	55.7	55.5	41.5	28.0	65.1	57.9	46.7	32.0
2-Dec	61.0	54.8	53.4	39.2	28.0	61.6	58.7	42.2	28.2
9-Dec	61.0	55.1	54.1	39.6	27.0	65.1	58.7	44.9	30.8
16-Dec	61.0	55.1	52.9	38.8	28.0	61.6	60.1	42.9	29.1
23-Dec	63.0	55.3	53.7	40.1	28.0	63.0	59.8	44.1	29.9
31-Dec	59.0	53.4	51.7	37.8	27.0	61.6	56.5	41.1	27.6



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	654
FEB	0	535
MAR	2	448
APR	8	307
MAY	62	133
JUN	162	33
JUL	320	6
AUG	299	8
SEP	139	50
OCT	34	195
NOV	1	429
DEC	0	599
ANN	1027	3397



	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-19343	0	-1580
FEB	0	-16035	0	-1255
MAR	0	-13991	0	-847
APR	3	-10151	0	-444
MAY	107	-5126	72	-37
JUN	748	-1680	780	0
JUL	2469	-464	2791	-1
AUG	2155	-549	3316	-1
SEP	528	-2312	1662	0
OCT	30	-6995	257	-38
NOV	0	-13430	4	-550
DEC	0	-17944	0	-1160
ANN	6040	-108020	8882	-5913

Average Annual Solar Radiation – Nearest Available Site
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

No Solar Radiation
Data Available

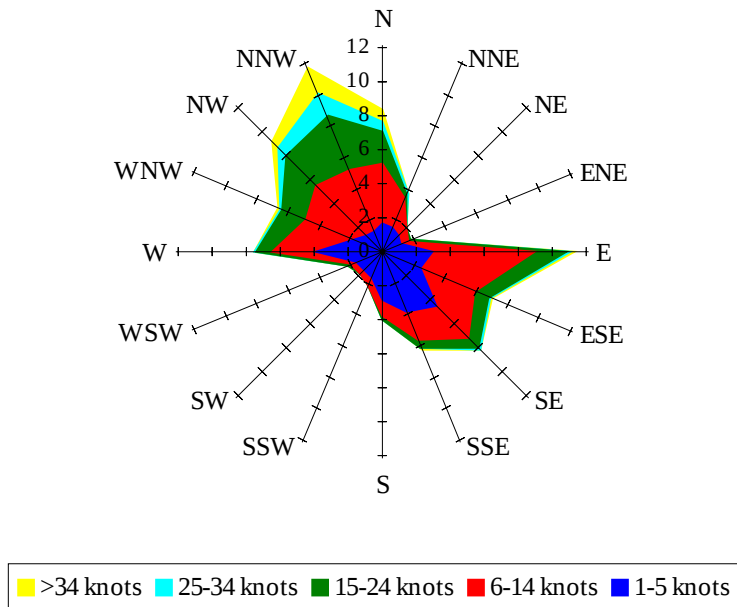


Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

Wind Summary - December, January, and February

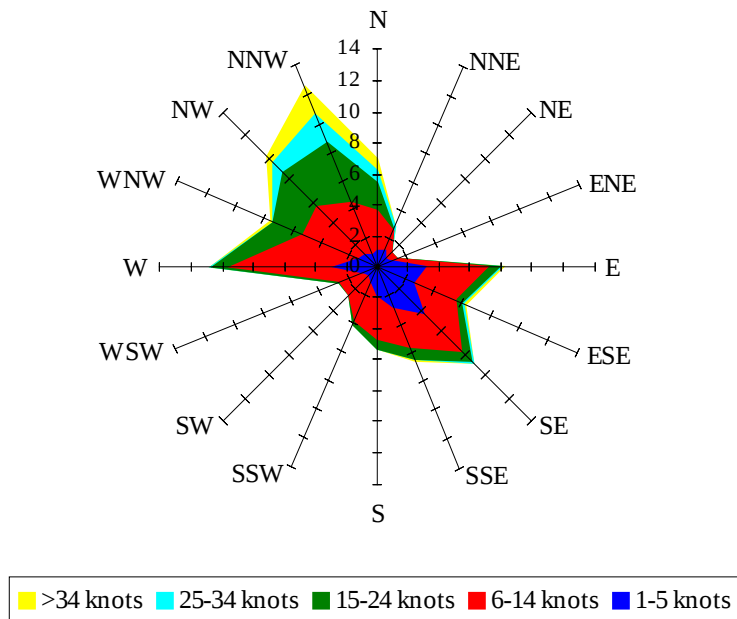
Labels of Percent Frequency on North Axis



Percent Calm = 7.34

Wind Summary - March, April, and May

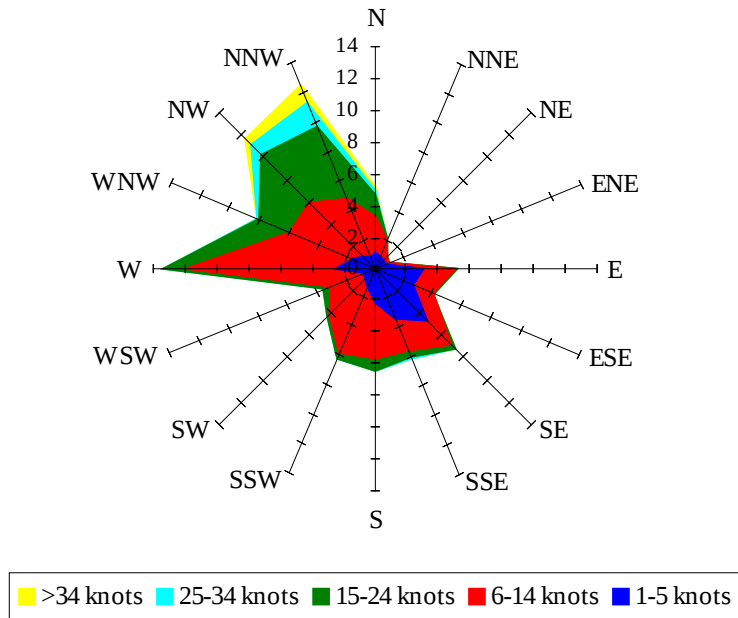
Labels of Percent Frequency on North Axis



Percent Calm = 2.97

Wind Summary - June, July, and August

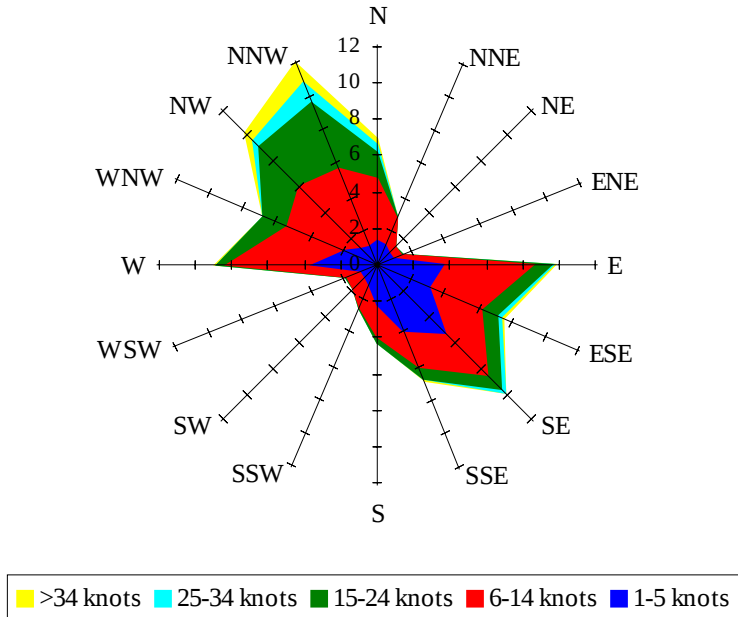
Labels of Percent Frequency on North Axis



Percent Calm = 2.39

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 5.03