

MORON AB, SPAIN

Latitude = 37.15 N

Longitude = 5.62 W

Period of Record = 1967 to 1996

WMO No. 083970

Elevation = 289 feet

Average Pressure = 29.72 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	108	74	74	9.0	W
0.4% Occurrence	102	71	68	8.8	W
1.0% Occurrence	100	71	69	8.9	W
2.0% Occurrence	97	70	69	9.0	W
Mean Daily Range	21	-	-	-	-
97.5% Occurrence	38	37	30	3.9	NE
99.0% Occurrence	34	33	25	3.3	NE
99.6% Occurrence	32	31	23	3.1	NE
Median of Extreme Lows	28	27	18	2.9	NE
	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	77	98	104	9.1	W
0.4% Occurrence	76	96	101	9.0	W
1.0% Occurrence	74	93	94	9.0	W
2.0% Occurrence	72	91	87	9.0	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	111	87	0.74	8.6	W
0.4% Occurrence	109	86	0.72	10.9	WSW
1.0% Occurrence	104	84	0.69	8.0	W
2.0% Occurrence	97	83	0.65	8.5	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		417	1598	161	1127

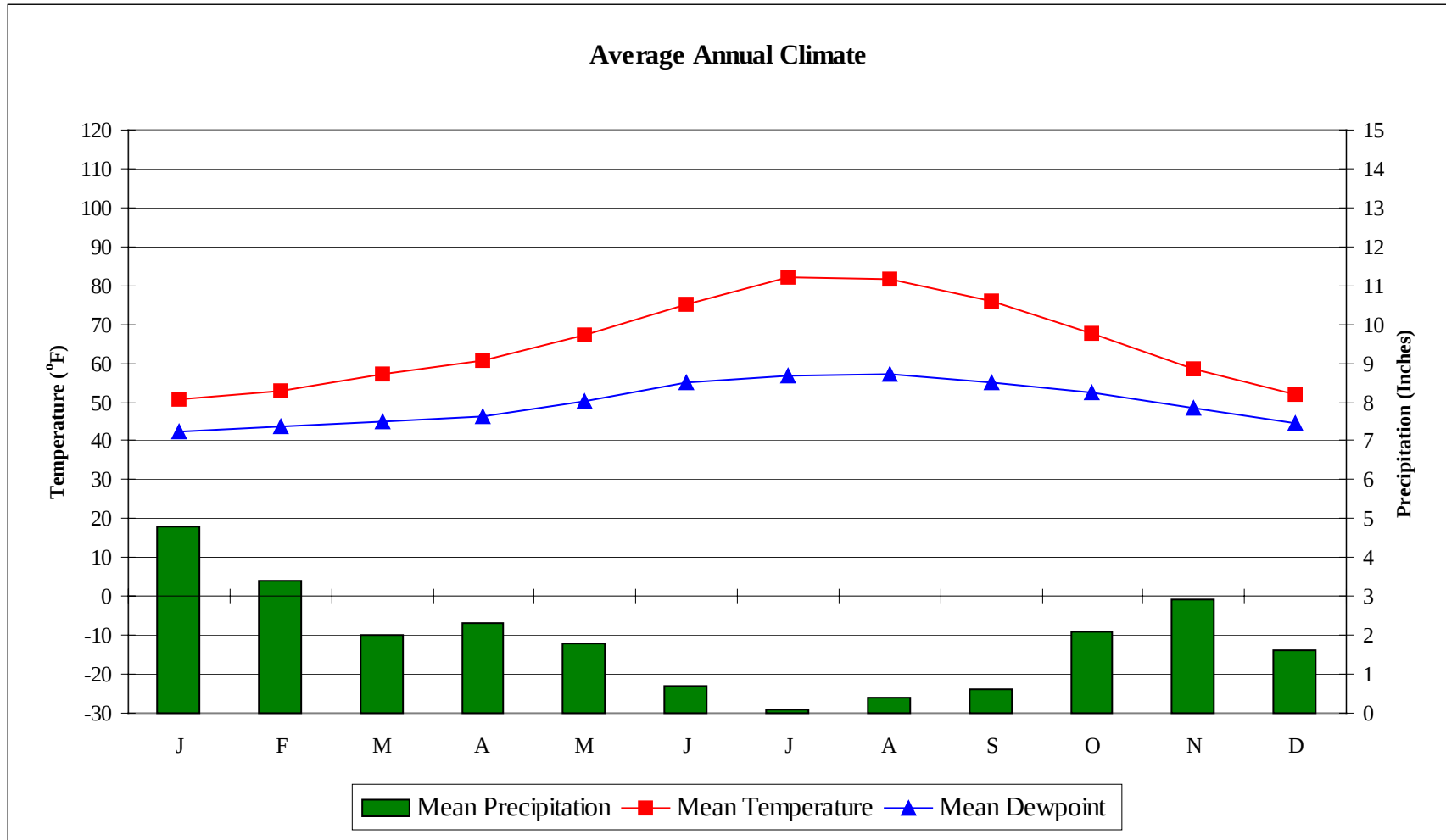
Other Site Data

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
10	N/A	N/A	0.2 + 1.6
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 (#)
67.7	N/A	N/A	6

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

MORON AB, SPAIN

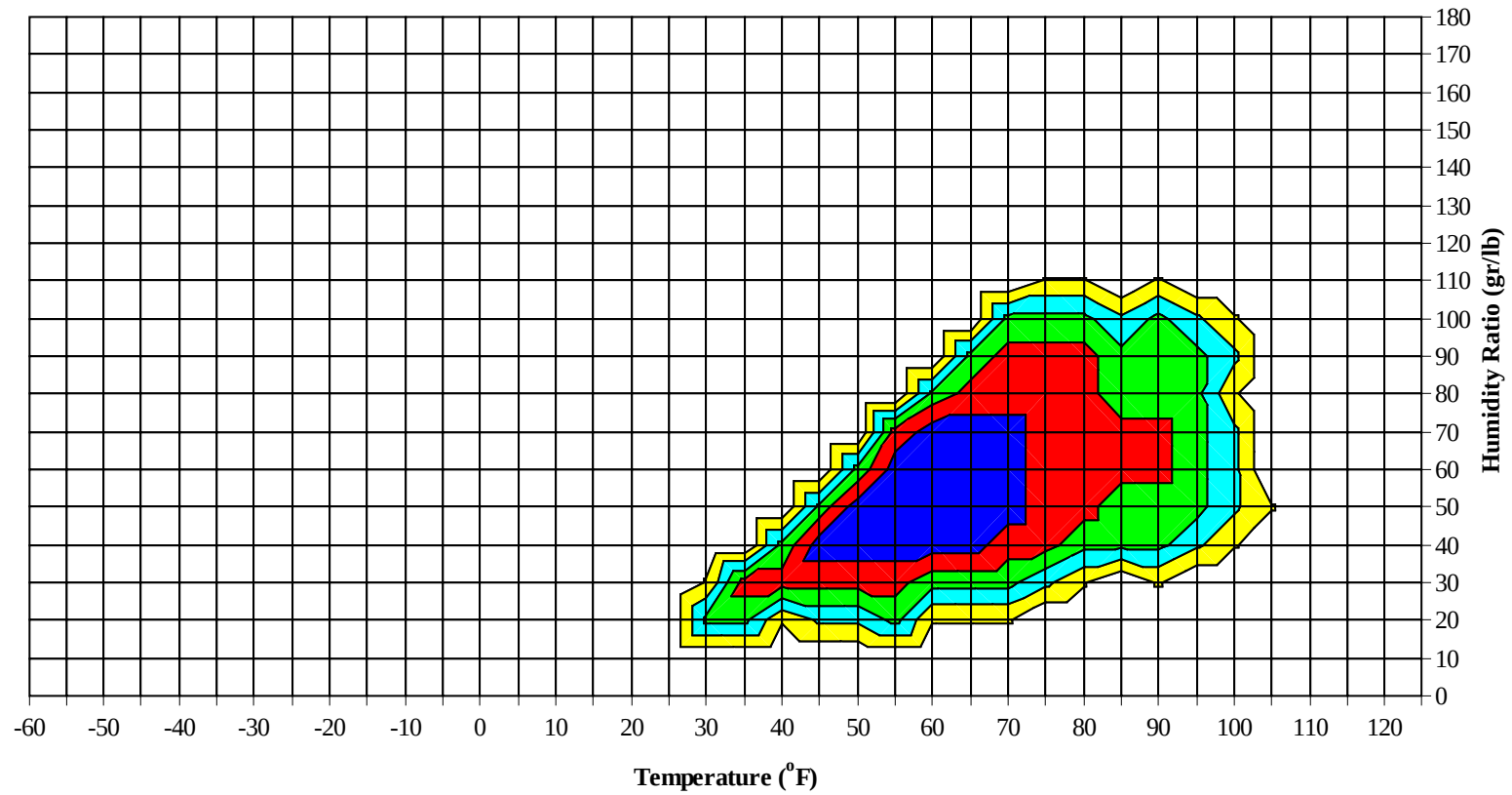
WMO No. 083970



MORON AB, SPAIN

WMO No. 083970

Long Term Psychrometric Summary

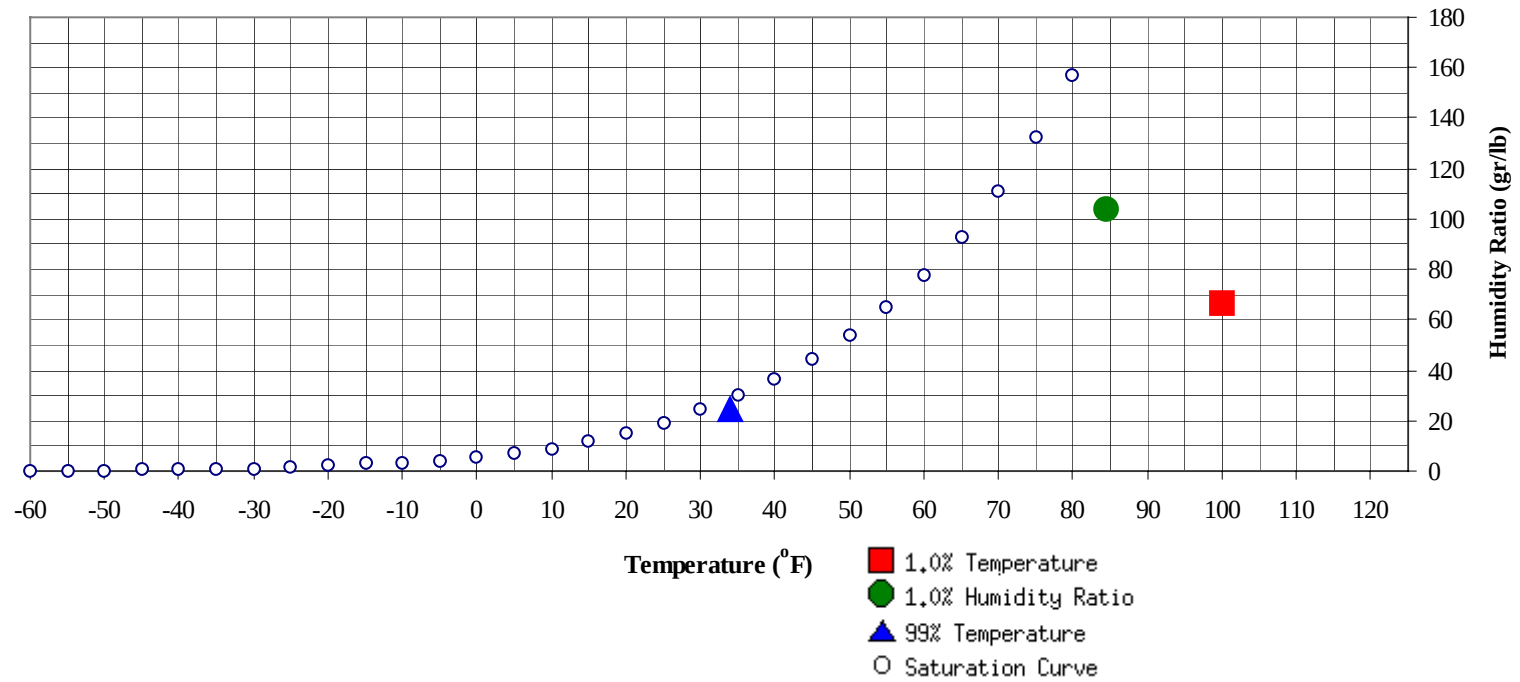


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

MORON AB, SPAIN

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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	34	24.7	12.0		103.6	84.4	72.8	68	36.5

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	100	66.6	70.6	34.5

MORON AB, SPAIN

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

Period of Record = 1967 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		
110 / 114															
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89												0	0	0	62.7
80 / 84												1	4	5	61.9
75 / 79							1	1	2	60.1		9	14	23	59.4
70 / 74		1	1	2	54.7		3	5	8	56.6		21	28	50	57.6
65 / 69		5	5	10	53.9		12	14	26	55.3	0	30	31	60	55.6
60 / 64	5	35	36	76	54.0	0	42	47	89	54.1	2	59	55	116	53.9
55 / 59	17	71	81	169	51.7	13	64	57	133	51.6	22	63	55	140	51.6
50 / 54	41	62	66	170	48.5	39	53	55	148	48.7	61	40	38	139	49.1
45 / 49	41	33	30	104	44.3	60	29	29	118	44.8	75	18	17	111	44.8
40 / 44	40	17	15	72	40.1	47	12	11	70	40.6	55	5	5	64	40.8
35 / 39	55	17	11	83	35.7	44	7	5	56	36.2	28	2	1	31	36.5
30 / 34	43	7	1	51	31.2	18	3	0	21	31.4	5	0		5	31.8
25 / 29	5	1	0	6	26.6	2	0		2	26.4	0			0	26.5
20 / 24	2	0		2	20.7	0			0	23.0					

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

Period of Record = 1967 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		
110 / 114															
105 / 109												1	0	1	70.4
100 / 104												2	3	5	70.7
95 / 99							1	1	2	68.7		8	13	21	69.9
90 / 94		0		0	66.5		5	8	13	66.5		24	30	54	68.1
85 / 89		1	3	4	63.6		11	13	24	64.7	0	28	28	56	66.4
80 / 84		7	9	16	61.9		24	25	49	63.3	0	43	41	84	65.4
75 / 79		17	23	40	59.7	0	38	40	78	61.1	3	49	40	91	63.5
70 / 74		32	34	66	57.5	3	54	47	103	59.4	19	47	36	102	61.7
65 / 69	0	37	32	68	55.9	9	45	35	89	57.7	41	25	23	90	60.4
60 / 64	6	63	55	124	54.2	40	46	42	128	56.3	98	12	23	133	58.4
55 / 59	39	54	50	143	52.3	90	21	29	139	53.8	65	2	4	71	55.0
50 / 54	89	23	25	137	49.4	78	3	8	89	50.1	12	0		12	50.8
45 / 49	68	5	9	82	45.0	25	0	1	27	45.7	1			1	45.1
40 / 44	29	1	1	30	40.9	3		0	3	42.0					
35 / 39	11	0		11	36.5	0			0	38.0					
30 / 34	0			0	33.5										
25 / 29															
20 / 24															

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

Period of Record = 1967 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		
110 / 114		1	0	1	74.2										
105 / 109		3	5	8	74.4		1	2	4	71.6		1	0	1	73.2
100 / 104		13	21	34	71.6		10	16	26	71.5		2	2	4	68.7
95 / 99		32	43	75	70.3		27	38	64	70.2		10	17	28	69.0
90 / 94	0	47	45	92	68.7		51	51	102	69.2		26	32	58	68.4
85 / 89	1	39	33	74	67.6	0	41	35	77	68.0		32	27	59	67.1
80 / 84	3	48	37	88	66.6	3	49	37	89	66.8	0	50	40	89	65.7
75 / 79	22	37	32	91	65.1	19	40	33	93	65.5	2	51	37	90	64.0
70 / 74	65	21	22	108	63.5	71	23	27	120	64.0	24	41	35	100	62.6
65 / 69	81	6	7	94	61.2	92	5	7	103	61.3	58	17	28	104	60.6
60 / 64	63	1	1	66	58.5	55	1	1	57	57.7	79	9	17	105	57.7
55 / 59	13			13	54.3	9			9	52.9	54	2	4	59	53.2
50 / 54						0			0	49.5	21	0	0	21	49.0
45 / 49											2	0		2	44.3
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															

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

Period of Record = 1967 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		
110 / 114															
105 / 109															
100 / 104															
95 / 99		0		0	64.0										
90 / 94		3	4	6	65.9										
85 / 89		10	10	20	64.9										
80 / 84		27	30	57	64.1		2	1	3	60.2					
75 / 79		43	40	83	62.5		8	6	14	60.1					
70 / 74	2	53	54	108	60.9	0	26	25	52	59.3		2	3	5	58.3
65 / 69	16	41	47	105	59.6	2	34	33	69	58.3	0	11	6	17	57.3
60 / 64	72	41	49	162	57.6	18	61	65	144	56.5	10	50	47	107	56.4
55 / 59	90	21	12	124	53.7	50	54	58	162	53.1	28	66	72	166	52.3
50 / 54	50	8	2	60	49.2	66	31	37	134	49.4	36	56	56	148	48.4
45 / 49	14	2	0	16	43.9	67	14	13	94	45.3	56	32	32	120	44.7
40 / 44	3	0		3	39.6	27	5	1	33	41.3	43	15	15	73	40.6
35 / 39	0			0	35.0	10	3	0	12	36.0	41	12	11	64	36.1
30 / 34						2	1		2	31.4	25	4	5	33	31.3
25 / 29											10	1	0	10	26.3
20 / 24											0	0		0	22.0

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

Period of Record = 1967 to 1996

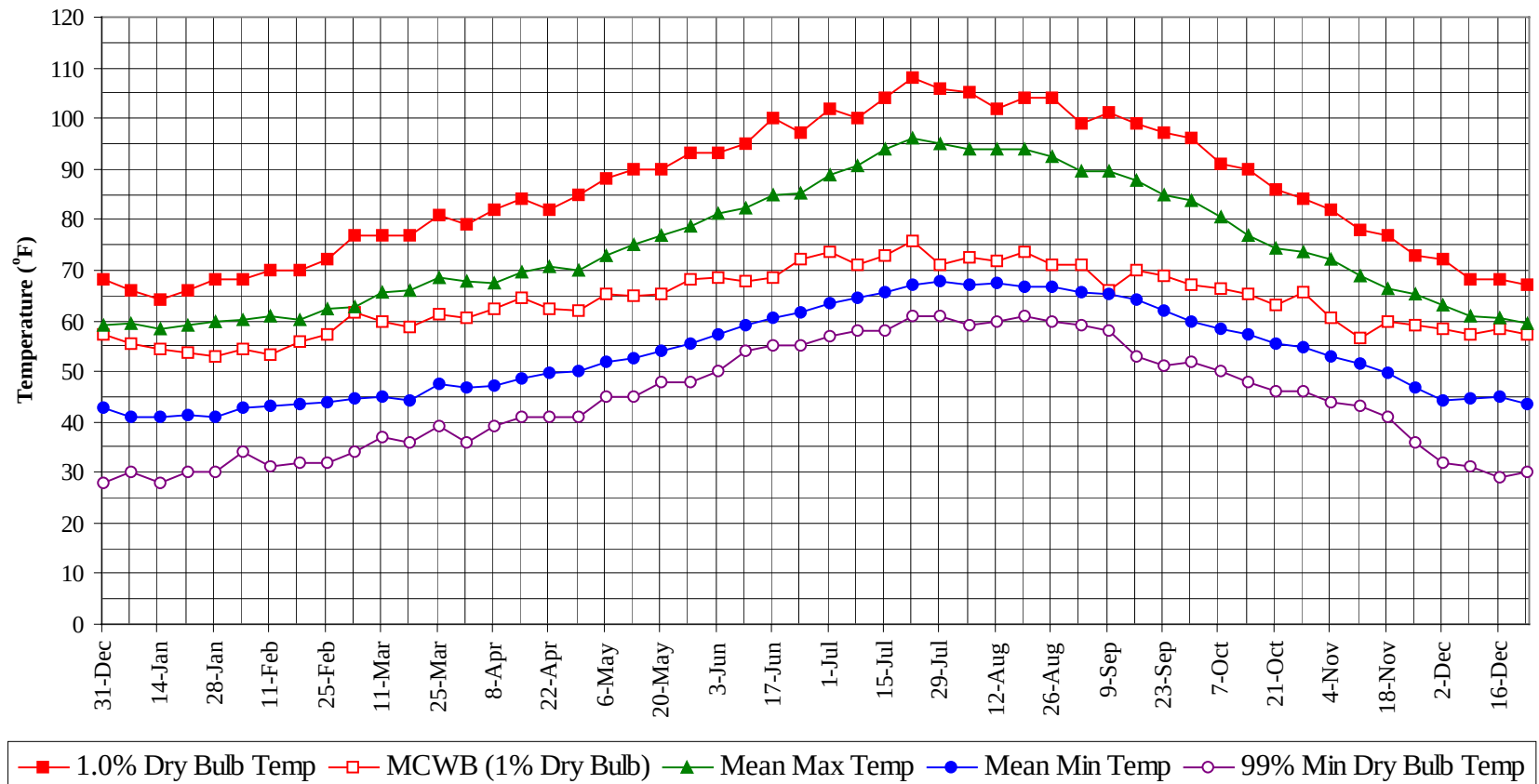
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
110 / 114		1	0	1	74.2
105 / 109		5	9	14	73.3
100 / 104		27	42	70	71.3
95 / 99		76	115	191	70.0
90 / 94	0	154	172	327	68.6
85 / 89	2	160	150	311	67.0
80 / 84	6	247	222	475	65.4
75 / 79	50	288	266	604	63.1
70 / 74	195	320	315	830	60.9
65 / 69	313	268	269	850	58.7
60 / 64	452	425	436	1313	56.0
55 / 59	485	423	422	1330	52.5
50 / 54	491	280	289	1059	49.0
45 / 49	404	136	130	670	44.8
40 / 44	243	54	49	346	40.6
35 / 39	178	41	27	246	36.1
30 / 34	87	14	6	106	31.3
25 / 29	14	2	0	16	26.4
20 / 24	2	0		2	21.3
</					

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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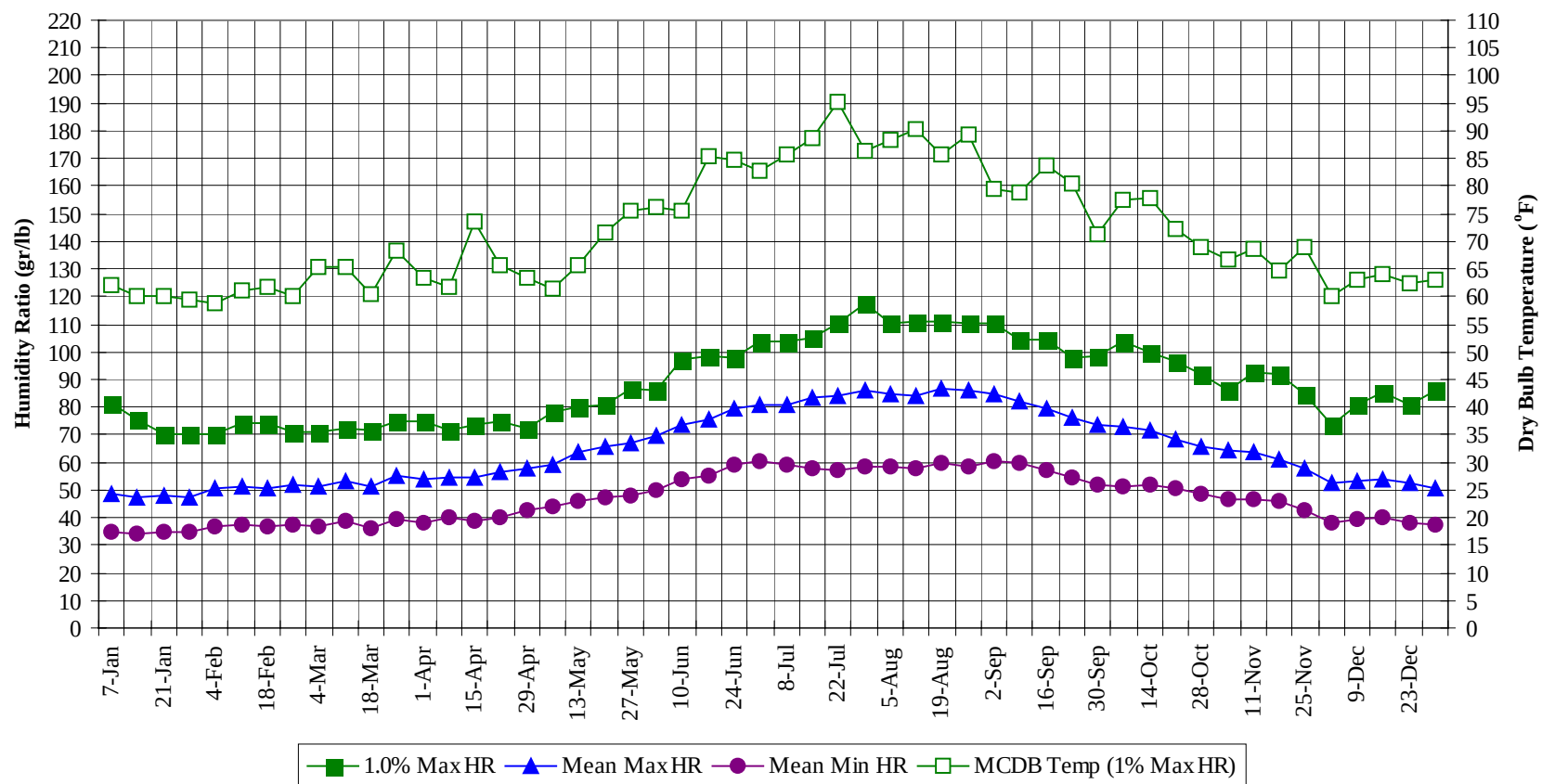
Annual Summary of Temperatures



MORON AB, SPAIN

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Long Term Humidity and Dry Bulb Temperature Summary



MORON AB, SPAIN

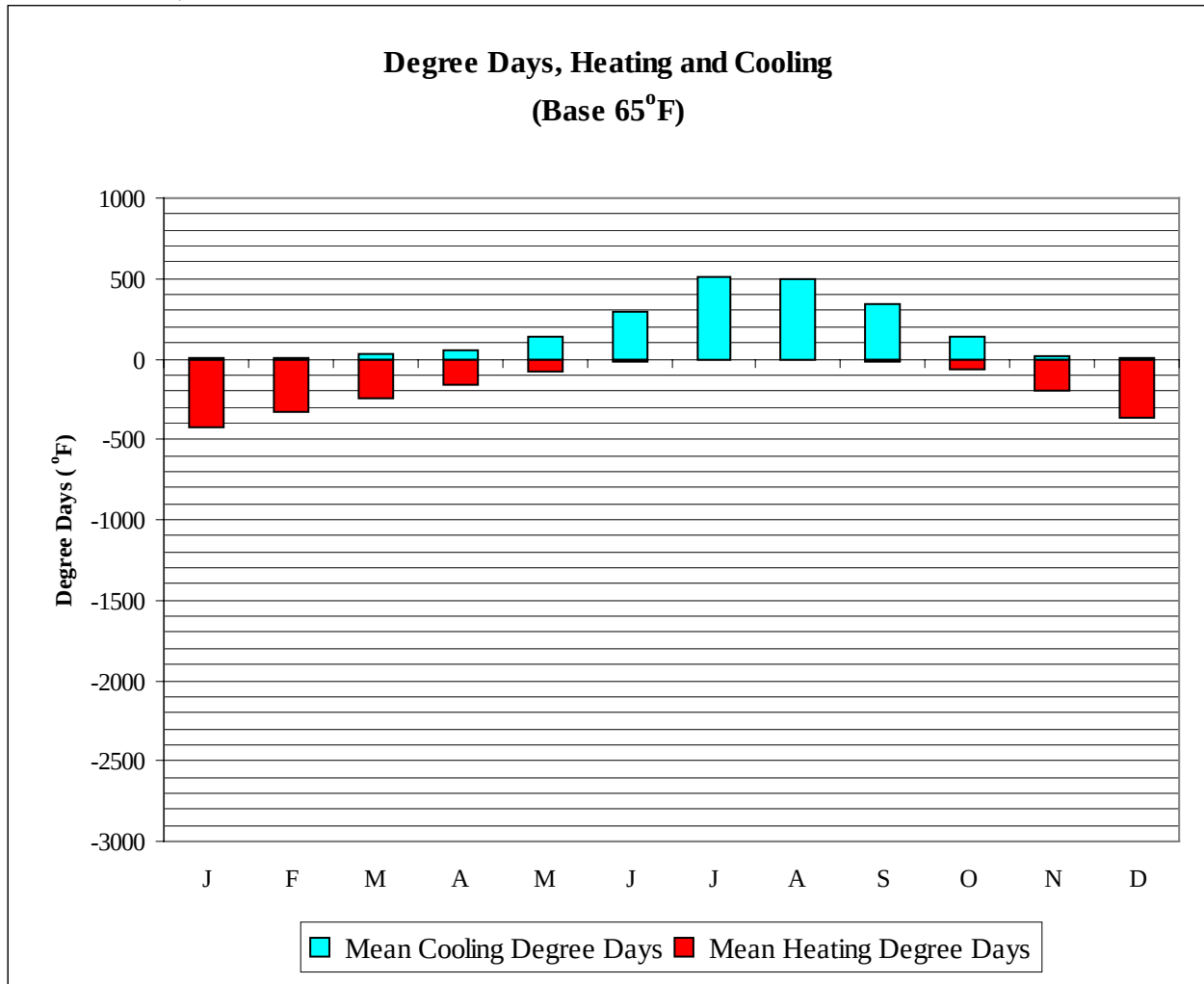
WMO No. 083970

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	66.0	55.3	59.4	40.9	30.0	81.2	62.0	48.7	34.5
14-Jan	64.0	54.5	58.3	40.9	28.0	75.6	60.0	47.5	34.3
21-Jan	66.0	53.6	59.0	41.3	30.0	70.0	60.0	48.1	34.8
28-Jan	68.0	52.8	60.0	41.0	30.0	70.0	59.4	47.6	34.5
4-Feb	68.0	54.4	60.2	42.9	34.0	70.0	58.6	50.6	36.6
11-Feb	70.0	53.4	61.1	43.0	31.0	74.2	60.9	51.1	37.2
18-Feb	70.0	55.9	60.2	43.6	32.0	74.2	61.7	50.6	37.0
25-Feb	72.0	57.4	62.3	43.9	32.0	70.7	60.0	52.0	37.4
4-Mar	77.0	61.5	62.9	44.6	34.0	70.7	65.2	51.0	36.9
11-Mar	77.0	59.8	65.8	45.1	37.0	72.1	65.2	53.2	38.7
18-Mar	77.0	58.7	66.0	44.4	36.0	71.4	60.3	51.4	36.4
25-Mar	81.0	61.2	68.4	47.4	39.0	74.9	68.4	55.4	39.4
1-Apr	79.0	60.6	67.7	46.7	36.0	74.9	63.3	53.7	38.3
8-Apr	82.0	62.3	67.5	47.1	39.0	71.4	61.8	54.8	39.8
15-Apr	84.0	64.6	69.7	48.5	41.0	73.5	73.7	54.7	38.7
22-Apr	82.0	62.2	70.7	49.6	41.0	74.9	65.8	56.3	40.2
29-Apr	85.0	62.0	70.1	49.9	41.0	72.1	63.3	58.0	42.9
6-May	88.0	65.3	72.8	52.0	45.0	78.4	61.3	59.3	43.8
13-May	90.0	65.0	75.1	52.5	45.0	79.8	65.7	63.5	46.3
20-May	90.0	65.4	76.7	54.2	48.0	80.5	71.7	65.6	47.1
27-May	93.0	68.0	78.8	55.5	48.0	86.8	75.5	67.0	47.8
3-Jun	93.0	68.5	81.3	57.4	50.0	86.1	76.1	69.6	49.7
10-Jun	95.0	67.8	82.4	59.1	54.0	97.3	75.5	73.7	54.2
17-Jun	100.0	68.6	84.7	60.7	55.0	98.7	85.4	75.6	55.3
24-Jun	97.0	72.1	85.3	61.6	55.0	98.0	84.8	79.1	59.2
1-Jul	102.0	73.6	88.8	63.4	57.0	103.6	82.6	80.5	60.4
8-Jul	100.0	71.1	90.7	64.5	58.0	103.6	85.7	80.9	58.9
15-Jul	104.0	72.9	93.8	65.8	58.0	105.0	88.7	83.3	57.9
22-Jul	108.0	75.8	96.0	67.0	61.0	110.6	95.2	84.1	57.3
29-Jul	106.0	71.1	94.9	67.8	61.0	117.6	86.2	86.2	58.4
5-Aug	105.0	72.5	94.0	67.0	59.0	110.6	88.2	84.6	58.3
12-Aug	102.0	71.8	93.9	67.6	60.0	111.3	90.3	84.2	57.8
19-Aug	104.0	73.6	94.0	66.8	61.0	111.3	85.9	86.6	59.9
26-Aug	104.0	70.9	92.6	66.8	60.0	110.6	89.3	85.9	58.6
2-Sep	99.0	71.2	89.7	65.5	59.0	110.6	79.5	84.9	60.6
9-Sep	101.0	66.0	89.7	65.3	58.0	104.3	78.9	82.1	59.9
16-Sep	99.0	70.1	87.7	64.3	53.0	104.3	83.7	79.2	56.9
23-Sep	97.0	68.8	84.9	61.8	51.0	98.0	80.4	76.0	54.8
30-Sep	96.0	67.0	83.6	59.9	52.0	98.7	71.3	73.2	51.9
7-Oct	91.0	66.2	80.6	58.4	50.0	103.6	77.4	72.6	51.5
14-Oct	90.0	65.4	76.8	57.2	48.0	100.1	77.7	71.6	51.7
21-Oct	86.0	63.1	74.3	55.6	46.0	96.6	72.3	68.6	50.8
28-Oct	84.0	65.5	73.6	54.7	46.0	91.7	69.0	65.8	48.4
4-Nov	82.0	60.4	72.1	52.9	44.0	86.1	66.8	64.1	46.9
11-Nov	78.0	56.7	68.7	51.5	43.0	92.4	68.5	63.4	46.8
18-Nov	77.0	59.9	66.5	49.5	41.0	91.7	64.6	60.8	45.7
25-Nov	73.0	59.2	65.3	46.7	36.0	84.7	68.9	57.7	42.4
2-Dec	72.0	58.2	63.0	44.2	32.0	73.5	60.3	52.7	38.1
9-Dec	68.0	57.2	61.0	44.5	31.0	80.5	63.0	53.4	39.2
16-Dec	68.0	58.4	60.5	45.0	29.0	85.4	64.2	53.9	40.0
23-Dec	67.0	57.3	59.5	43.6	30.0	80.5	62.5	52.4	38.3
31-Dec	68.0	57.2	59.1	42.8	28.0	86.1	63.2	50.7	37.3

MORON AB, SPAIN

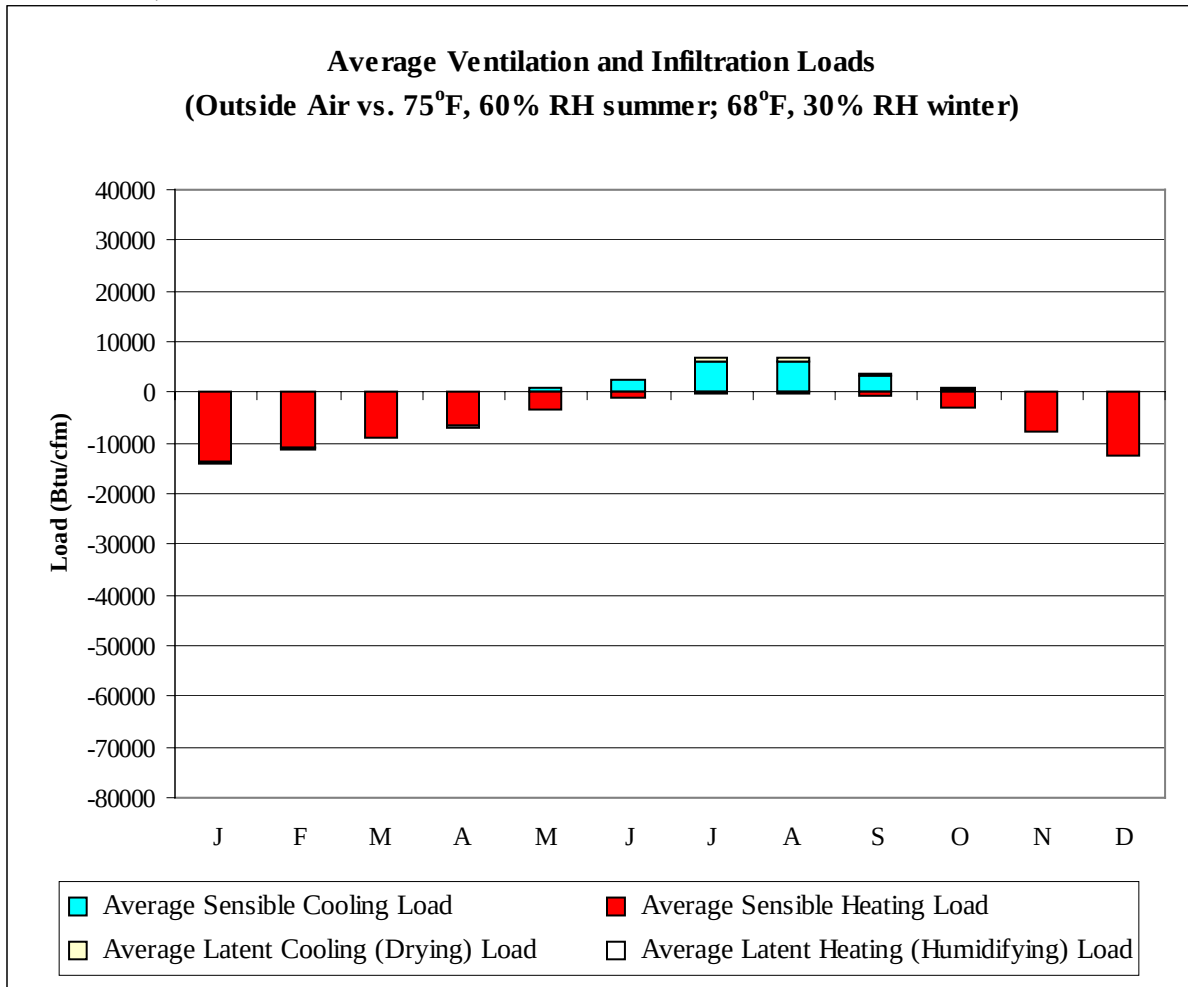
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	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	1	422
FEB	3	325
MAR	25	243
APR	48	166
MAY	142	72
JUN	297	18
JUL	503	4
AUG	497	3
SEP	347	16
OCT	133	64
NOV	23	203
DEC	1	371
ANN	2021	1907

MORON AB, SPAIN

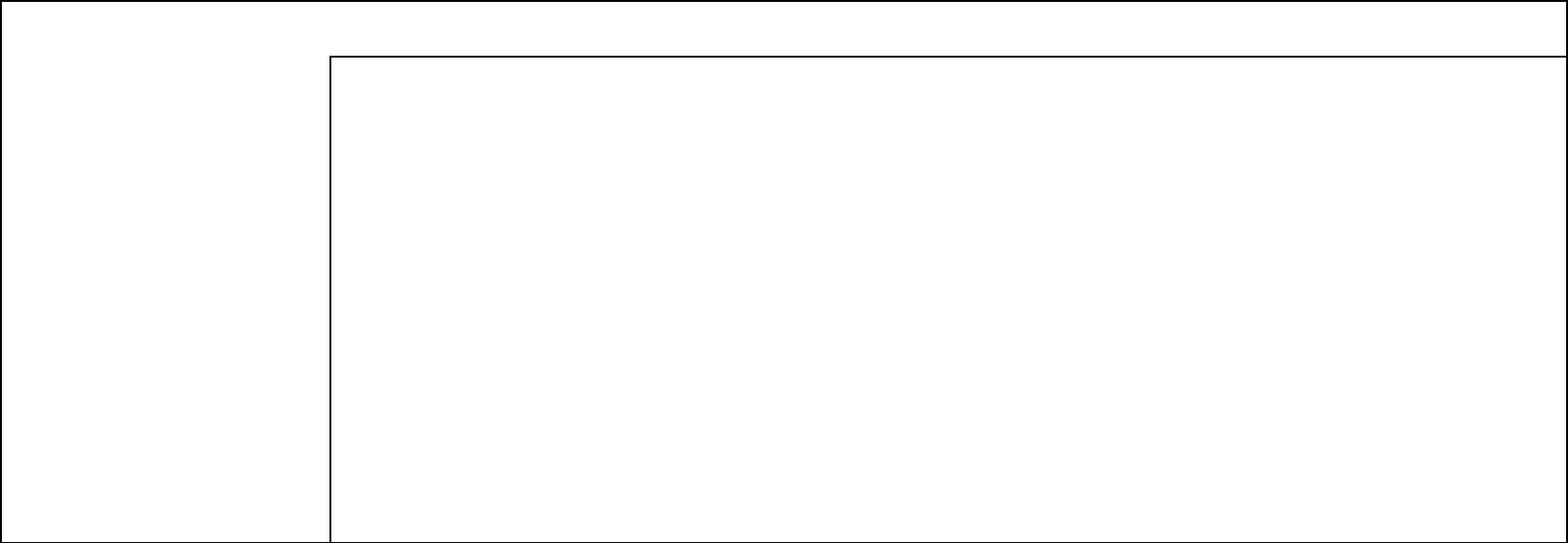
WMO No. 083970



	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	-13783	2	-265
FEB	1	-11061	0	-162
MAR	44	-9002	1	-104
APR	150	-6716	1	-67
MAY	763	-3404	27	-11
JUN	2410	-964	273	-1
JUL	6061	-237	774	-2
AUG	5882	-210	1057	-4
SEP	3121	-799	490	-6
OCT	615	-3080	176	-20
NOV	30	-7734	44	-55
DEC	0	-12361	15	-172
ANN	19077	-69351	2860	-869

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

No Solar Radiation
Data Available

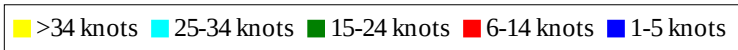
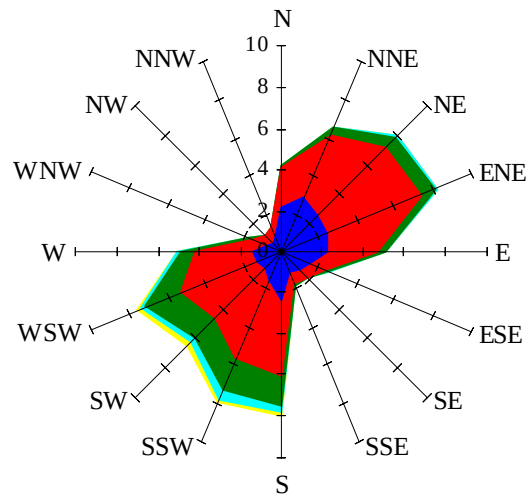


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

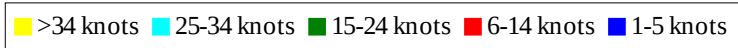
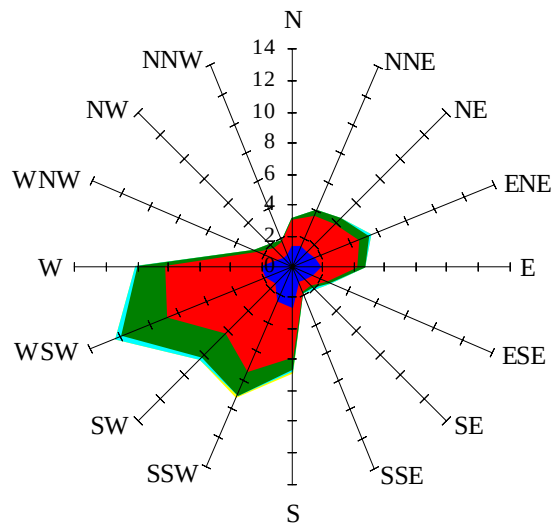
Labels of Percent Frequency on North Axis



Percent Calm = 23.00

Wind Summary - March, April, and May

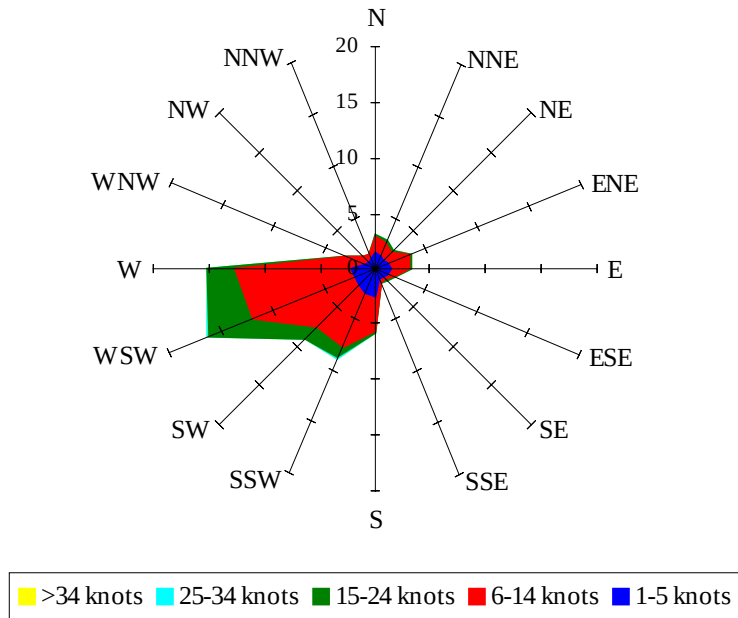
Labels of Percent Frequency on North Axis



Percent Calm = 19.49

Wind Summary - June, July, and August

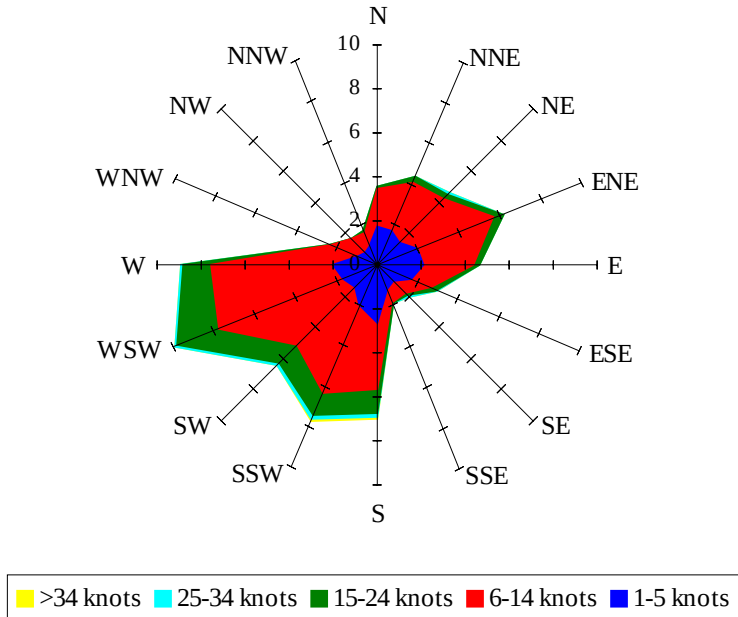
Labels of Percent Frequency on North Axis



Percent Calm = 19.11

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 24.02