

SEVILLA, SPAIN

Latitude = 37.42 N

Longitude = 5.90 W

Period of Record = 1973 to 1996

WMO No. 083910

Elevation = 102 feet

Average Pressure = 29.92 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	109	76	87	6.7	W
0.4% Occurrence	104	75	83	7.7	WSW
1.0% Occurrence	100	72	74	7.4	WSW
2.0% Occurrence	97	71	74	7.8	SW
Mean Daily Range	23	-	-	-	-
97.5% Occurrence	41	39	31	3.4	NE
99.0% Occurrence	37	35	27	2.8	NE
99.6% Occurrence	34	32	24	2.3	NE
Median of Extreme Lows	30	29	20	1.7	NNE
	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	78	97	111	7.2	WSW
0.4% Occurrence	77	96	106	7.6	SW
1.0% Occurrence	75	95	97	7.3	SW
2.0% Occurrence	73	92	89	7.2	SW
	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	127	92	0.80	6.0	W
0.4% Occurrence	117	87	0.78	6.6	SW
1.0% Occurrence	104	81	0.69	6.0	SW
2.0% Occurrence	97	78	0.65	5.7	SW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		370	1362	194	1255

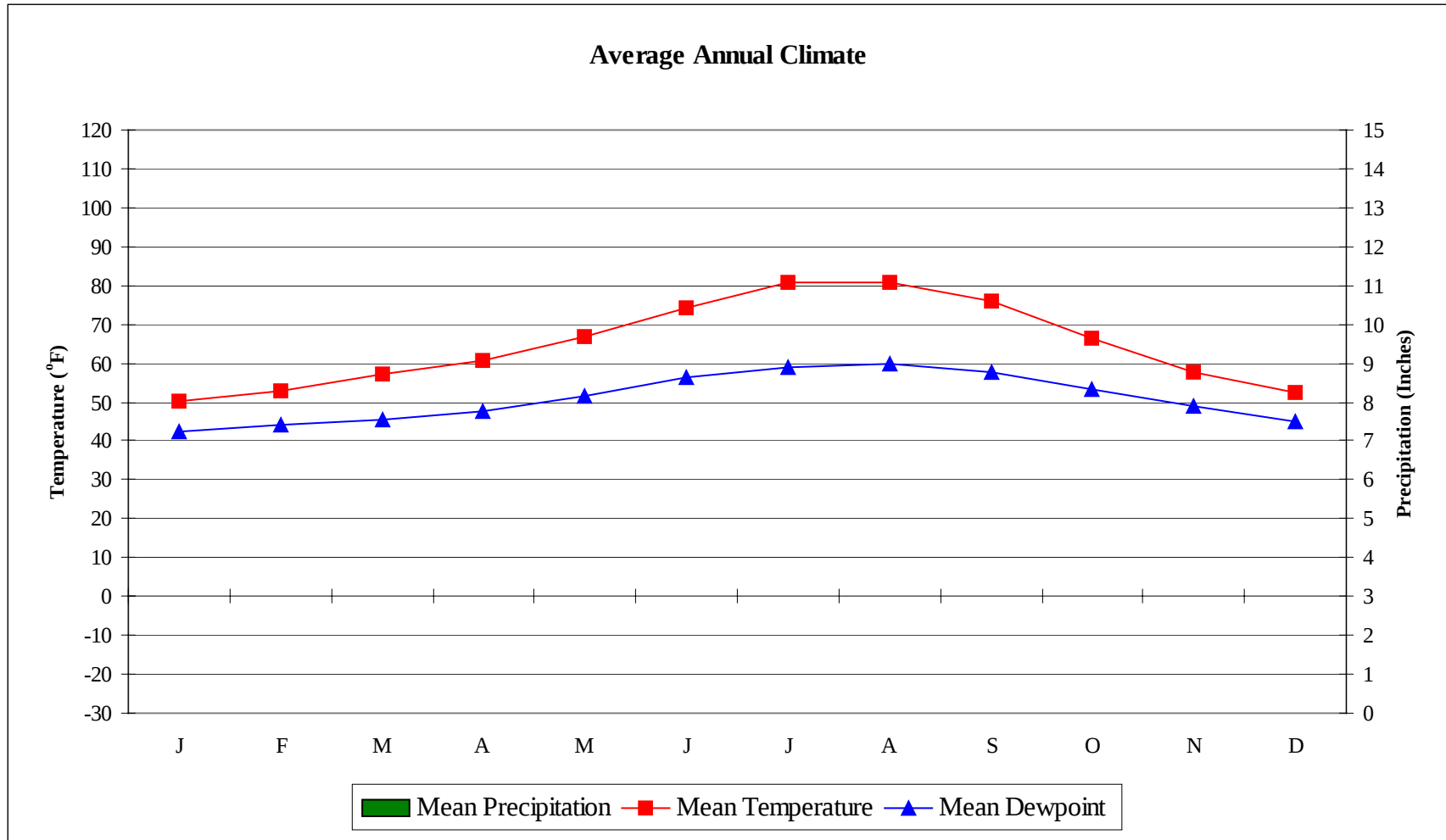
Other Site Data

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
11	N/A	N/A	0.7 + 1.8
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 (#)
67.1	N/A	N/A	2

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

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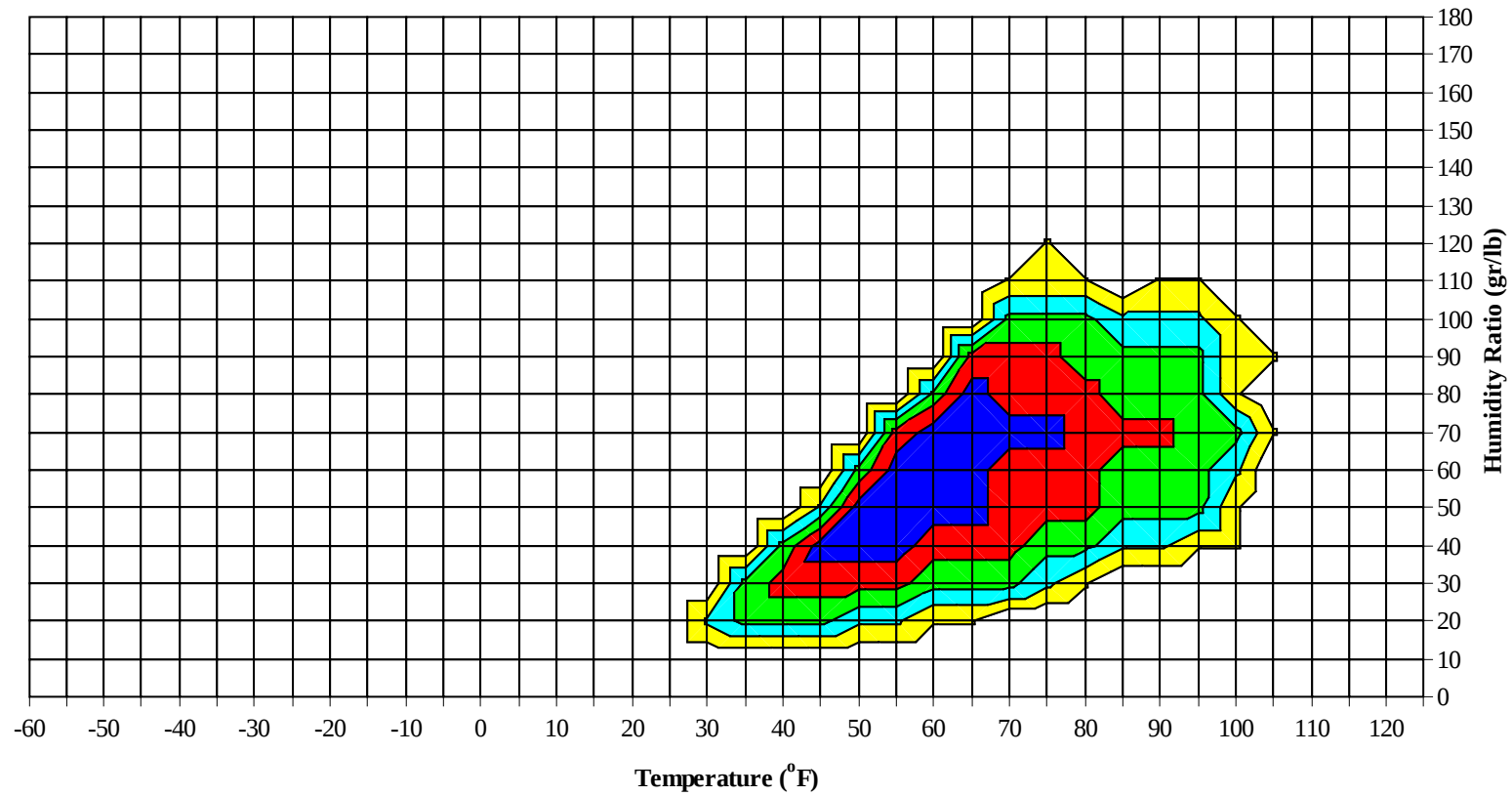


No Precipitation Data Available

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Long Term Psychrometric Summary

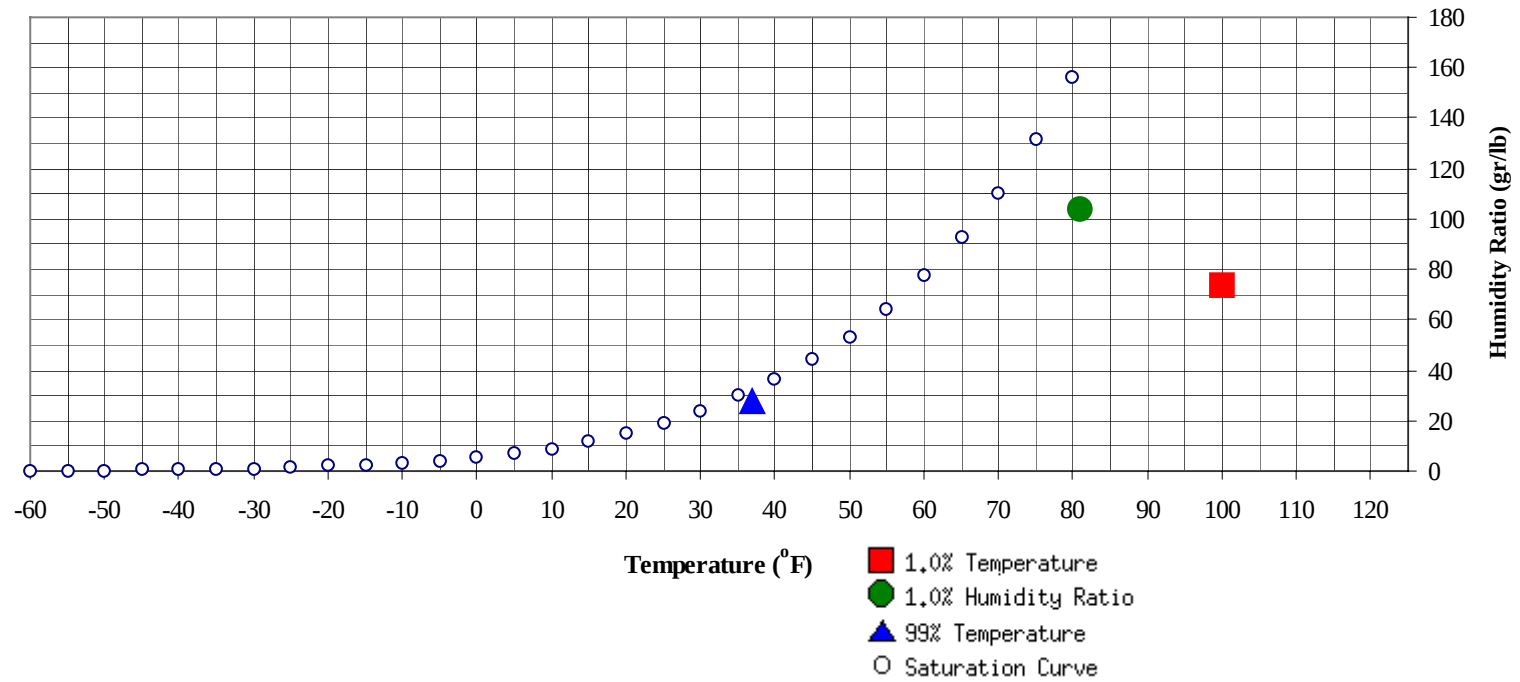


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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	37	27.6	13.1		103.6	80.9	71.8	68	35.7

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	100	74	72.3	35.7

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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		
115 / 119															
110 / 114															
105 / 109															
100 / 104															
95 / 99															
90 / 94													0	0	63.0
85 / 89												1	1	2	64.7
80 / 84												3	4	7	61.3
75 / 79							0	1	1	60.6		14	13	27	60.1
70 / 74		1	1	2	56.0		5	6	11	57.1		29	24	53	57.7
65 / 69		6	4	10	55.5	0	16	14	30	55.5	0	31	29	60	55.8
60 / 64	2	38	31	71	54.0	1	48	41	90	54.5	3	59	59	121	53.9
55 / 59	16	67	69	152	51.9	21	57	65	143	52.2	44	55	67	166	52.1
50 / 54	49	60	75	184	48.6	63	49	63	175	48.6	93	38	40	171	48.8
45 / 49	63	37	46	146	44.0	77	29	26	132	44.4	75	15	10	100	44.3
40 / 44	55	18	15	88	39.8	36	11	6	53	39.8	24	3	1	28	39.8
35 / 39	50	15	6	71	35.9	22	7	2	31	35.9	8	1	0	9	36.2
30 / 34	12	5	0	17	31.2	5	2	0	7	31.1	0	0	0	0	30.8
25 / 29	1	1	0	2	26.5	0	0		0	27.3	0			0	26.0
20 / 24															

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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WMO No. 083910

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		
115 / 119															
110 / 114															
105 / 109												1	1	2	74.3
100 / 104							0	0	0	70.0		4	4	8	72.0
95 / 99							2	2	4	68.2		11	11	22	70.3
90 / 94		0	0	0	65.2		7	7	14	66.9		27	25	52	68.4
85 / 89		3	3	6	64.8		12	10	22	65.3		27	21	48	67.4
80 / 84		9	9	18	62.3		28	23	51	63.3	1	47	39	87	65.7
75 / 79		23	19	42	59.9	0	48	36	84	61.4	8	52	48	108	64.0
70 / 74	0	38	30	68	57.9	4	55	46	105	59.8	38	42	45	125	62.7
65 / 69	1	39	32	72	56.5	17	39	40	96	58.4	59	21	28	108	61.6
60 / 64	16	60	59	135	55.0	68	40	54	162	57.1	99	9	16	124	59.3
55 / 59	70	44	60	174	52.9	102	15	25	142	54.1	31	1	1	33	55.2
50 / 54	98	21	25	144	49.5	48	2	4	54	49.9	4		0	4	51.0
45 / 49	45	3	3	51	44.9	9	0	0	9	45.5	0			0	45.6
40 / 44	8	0	0	8	40.3										
35 / 39	1			1	36.6										
30 / 34															
25 / 29															
20 / 24															

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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		
115 / 119		0	0	0	80.5										
110 / 114		0	0	0	78.1		0	0	0	76.1					
105 / 109		4	5	9	75.9		3	4	7	76.4		1	0	1	74.5
100 / 104		17	19	36	73.4		12	13	25	73.4		5	5	10	71.8
95 / 99		33	33	66	71.3	0	32	32	64	71.6		15	13	28	70.8
90 / 94	0	49	40	89	69.5	0	50	42	93	70.0		30	24	54	69.1
85 / 89	1	36	33	70	68.3	1	41	32	74	68.8	0	31	25	56	67.9
80 / 84	8	47	44	99	67.2	8	44	48	101	67.9	1	49	46	96	66.6
75 / 79	40	38	40	118	65.8	40	38	44	122	66.5	15	48	54	117	65.2
70 / 74	89	20	25	134	64.2	101	24	27	152	65.1	68	36	45	149	64.2
65 / 69	67	4	6	77	62.2	66	4	4	74	62.7	71	17	18	106	62.4
60 / 64	42	1	1	44	59.6	29	1	0	30	59.3	61	8	8	77	58.7
55 / 59	2			2	57.0	3	0		3	54.6	22	2	0	24	53.6
50 / 54											3	0		3	49.2
45 / 49											0			0	43.0
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 = 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		
115 / 119															
110 / 114															
105 / 109															
100 / 104															
95 / 99		1	0	1	68.8										
90 / 94		4	3	7	67.7										
85 / 89		9	6	15	66.4		0	0	0	60.1					
80 / 84		26	19	45	64.8	0	2	1	3	63.0					
75 / 79	0	43	32	75	62.9	0	10	6	16	61.4		0		0	58.0
70 / 74	7	53	53	113	61.5	1	32	20	53	59.8		4	2	6	59.0
65 / 69	29	39	47	115	60.5	3	35	28	66	58.6	0	15	7	22	58.1
60 / 64	79	42	60	181	58.3	24	61	66	151	56.9	10	54	45	109	56.6
55 / 59	79	23	23	125	54.0	59	50	68	176	53.6	36	67	76	179	52.9
50 / 54	41	7	5	53	49.3	76	31	37	144	49.3	57	52	65	174	48.9
45 / 49	11	1		12	44.2	51	14	13	78	44.5	64	32	37	133	44.3
40 / 44	1	0		1	39.5	16	4	2	22	40.1	39	12	12	63	39.9
35 / 39	0			0	34.0	10	2	0	12	36.3	32	10	3	45	36.1
30 / 34						0	0		0	31.6	8	2	0	10	31.1
25 / 29											1	0		1	26.1
20 / 24											0	0		0	21.3

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

Period of Record = 1973 to 1996

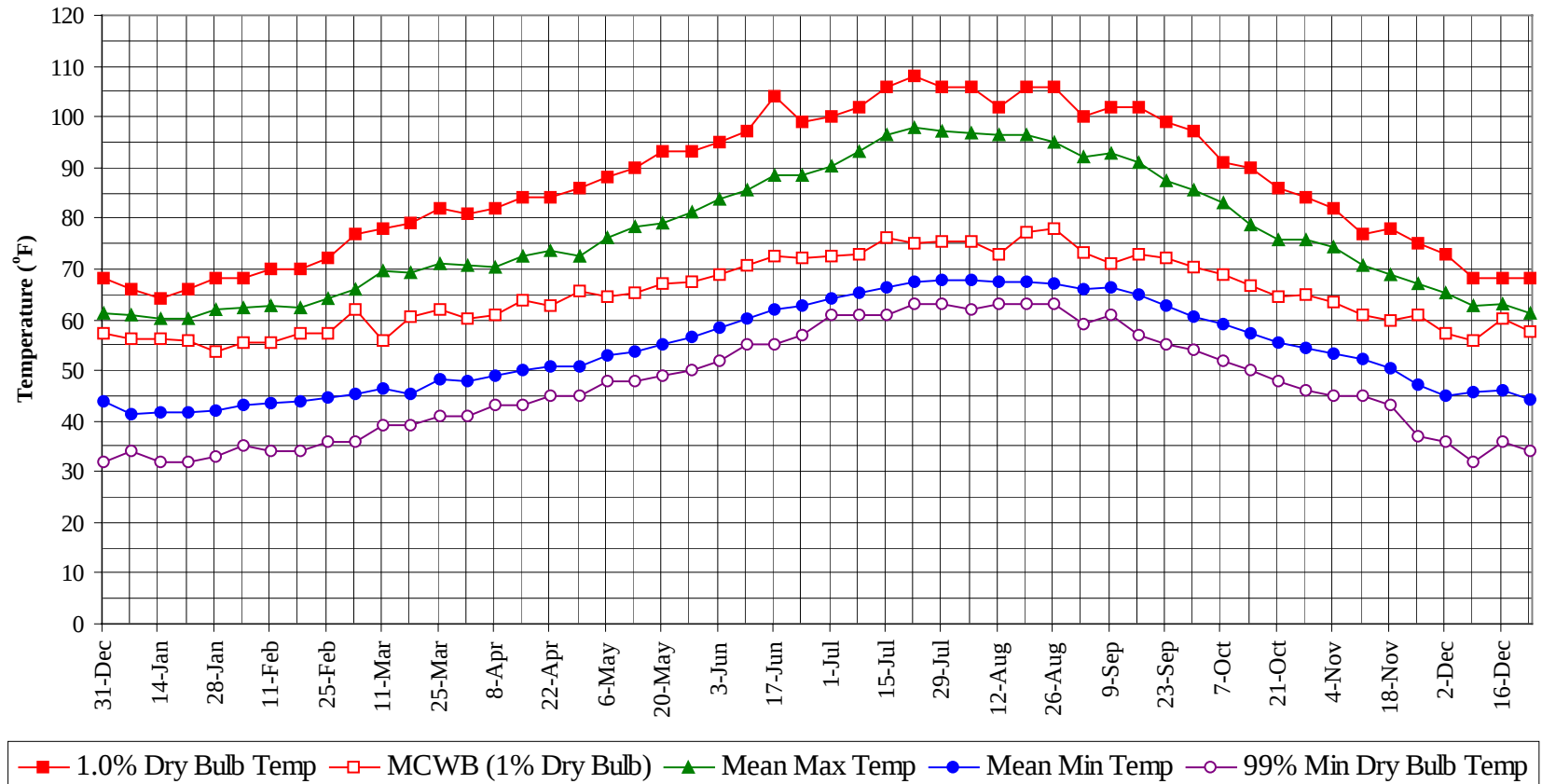
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
115 / 119		0	0	0	80.5
110 / 114		1	0	1	77.4
105 / 109		8	10	18	75.9
100 / 104		37	40	77	73.1
95 / 99	0	92	90	182	71.1
90 / 94	0	165	139	304	69.2
85 / 89	2	156	129	288	67.8
80 / 84	17	251	232	499	66.1
75 / 79	101	311	292	704	64.0
70 / 74	303	336	323	962	62.2
65 / 69	310	266	260	835	59.8
60 / 64	430	423	442	1295	56.8
55 / 59	486	385	458	1329	53.0
50 / 54	536	263	319	1118	49.0
45 / 49	399	132	137	669	44.3
40 / 44	181	50	36	267	39.9
35 / 39	125	35	12	172	36.0
30 / 34	27	9	1	37	31.1
25 / 29	2	1	0	3	26.5
20 / 24	0	0		0	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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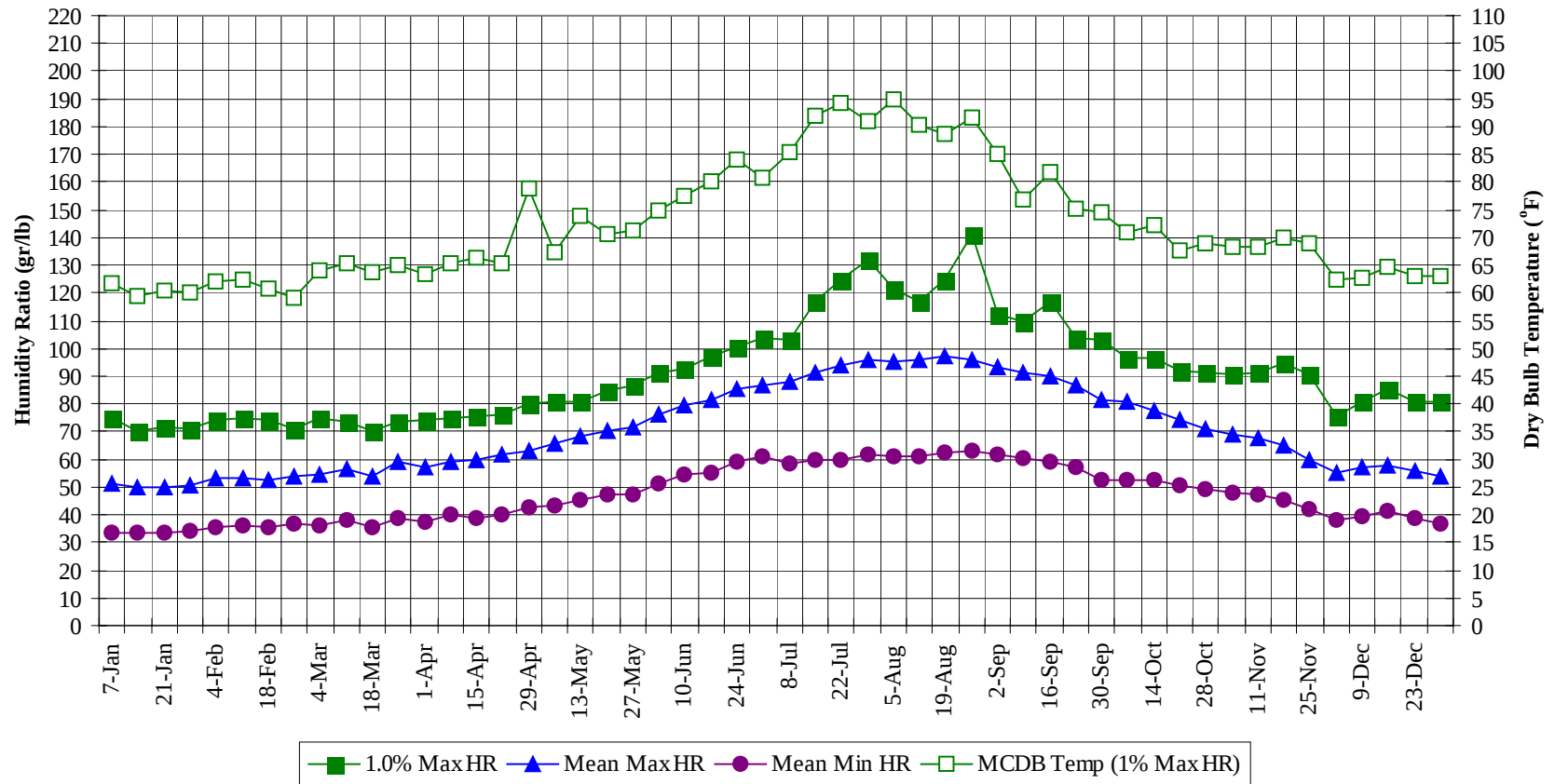
Annual Summary of Temperatures



SEVILLA, SPAIN

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Long Term Humidity and Dry Bulb Temperature Summary



SEVILLA, SPAIN

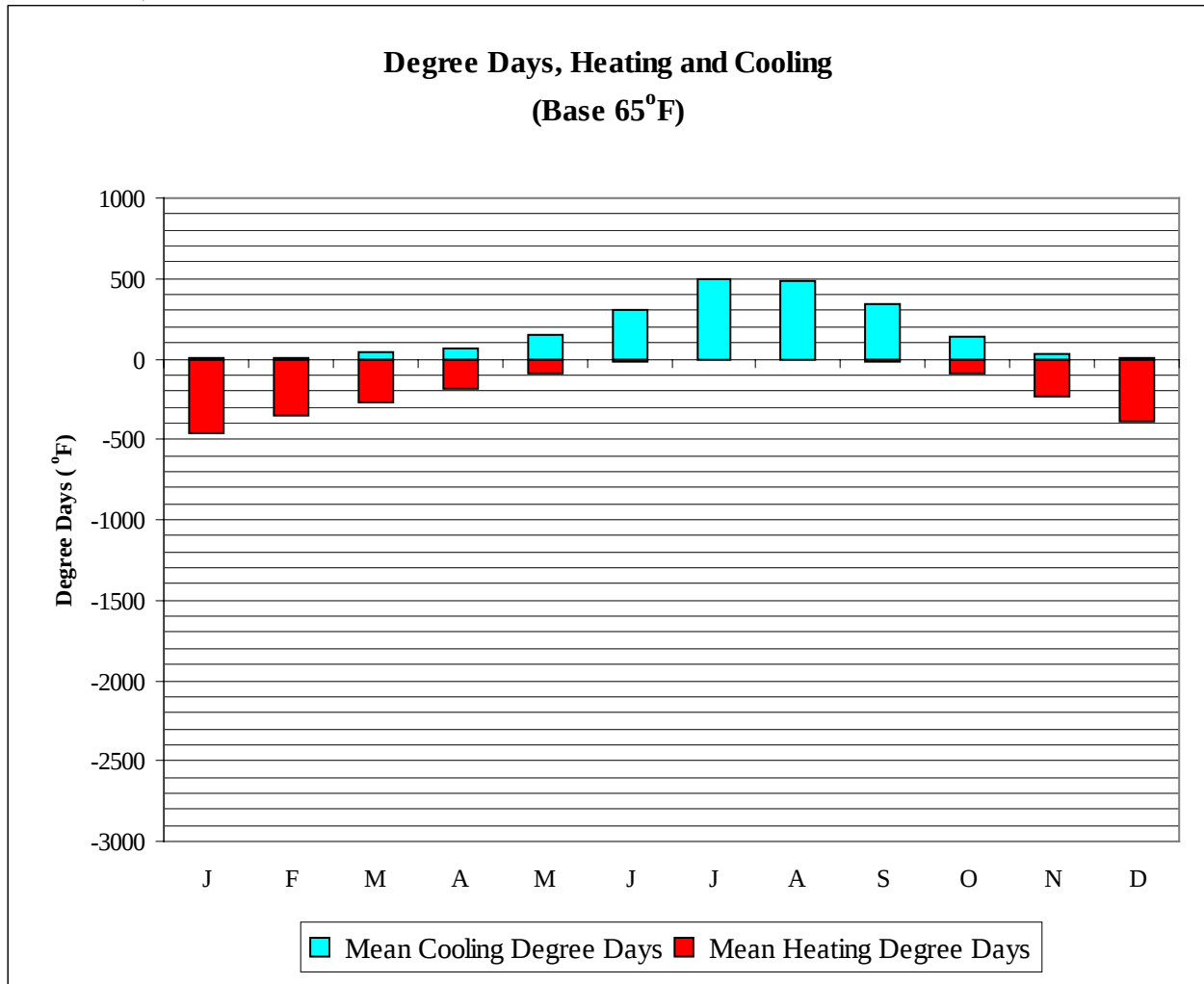
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Long Term Dry Bulb Temperature and Humidity Summary

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	56.1	61.1	41.3	34.0	74.9	61.8	51.0	33.4
14-Jan	64.0	56.3	60.0	41.7	32.0	70.0	59.3	50.0	33.3
21-Jan	66.0	55.8	60.1	41.6	32.0	71.4	60.5	49.8	33.6
28-Jan	68.0	53.8	62.0	42.1	33.0	70.7	60.2	50.6	34.0
4-Feb	68.0	55.5	62.2	43.3	35.0	74.2	62.1	53.1	35.7
11-Feb	70.0	55.4	62.9	43.5	34.0	74.9	62.3	53.4	36.2
18-Feb	70.0	57.4	62.3	43.8	34.0	74.2	60.7	52.8	35.6
25-Feb	72.0	57.5	64.1	44.7	36.0	70.7	59.2	54.0	36.8
4-Mar	77.0	61.8	65.9	45.3	36.0	74.9	64.0	54.3	36.1
11-Mar	78.0	56.0	69.4	46.5	39.0	73.5	65.2	56.5	38.1
18-Mar	79.0	60.6	69.3	45.3	39.0	70.0	63.7	53.8	35.5
25-Mar	82.0	62.1	71.2	48.4	41.0	73.5	65.1	59.2	38.7
1-Apr	81.0	60.3	70.9	48.0	41.0	74.2	63.4	57.3	37.6
8-Apr	82.0	61.1	70.4	49.0	43.0	74.9	65.4	59.1	40.0
15-Apr	84.0	63.8	72.4	50.0	43.0	75.6	66.3	60.0	39.0
22-Apr	84.0	62.6	73.5	50.7	45.0	76.3	65.4	62.0	40.2
29-Apr	86.0	65.6	72.5	50.7	45.0	79.8	78.8	63.1	42.6
6-May	88.0	64.5	76.2	53.0	48.0	80.5	67.3	66.0	43.4
13-May	90.0	65.1	78.2	53.7	48.0	80.5	74.0	68.2	45.3
20-May	93.0	67.1	79.1	55.1	49.0	84.7	70.6	70.3	47.1
27-May	93.0	67.3	81.1	56.7	50.0	86.8	71.3	71.5	47.3
3-Jun	95.0	68.9	83.9	58.5	52.0	91.0	74.9	76.4	51.2
10-Jun	97.0	70.6	85.6	60.3	55.0	92.4	77.6	79.2	54.8
17-Jun	104.0	72.5	88.5	61.8	55.0	97.3	80.2	81.2	55.3
24-Jun	99.0	72.3	88.4	62.7	57.0	100.8	84.0	85.2	59.4
1-Jul	100.0	72.6	90.3	64.1	61.0	103.6	80.7	86.8	61.0
8-Jul	102.0	73.0	93.2	65.1	61.0	102.9	85.4	87.7	58.4
15-Jul	106.0	76.0	96.5	66.5	61.0	116.9	92.0	91.4	59.8
22-Jul	108.0	75.2	97.9	67.6	63.0	124.6	94.2	93.6	59.5
29-Jul	106.0	75.4	97.1	67.9	63.0	132.3	91.0	96.0	61.5
5-Aug	106.0	75.3	96.7	67.8	62.0	121.8	95.0	95.5	61.4
12-Aug	102.0	72.9	96.5	67.5	63.0	116.9	90.4	95.6	61.1
19-Aug	106.0	77.1	96.5	67.4	63.0	124.6	88.6	97.5	62.1
26-Aug	106.0	78.0	95.1	67.2	63.0	141.4	91.5	96.0	63.3
2-Sep	100.0	73.2	92.0	65.9	59.0	112.0	84.9	93.2	61.5
9-Sep	102.0	71.2	92.6	66.4	61.0	109.9	77.0	91.5	60.6
16-Sep	102.0	72.8	91.0	64.9	57.0	116.9	81.8	89.9	59.4
23-Sep	99.0	72.2	87.5	62.8	55.0	103.6	75.2	86.4	57.3
30-Sep	97.0	70.2	85.5	60.4	54.0	102.9	74.6	81.7	52.5
7-Oct	91.0	69.0	83.0	59.2	52.0	96.6	71.0	80.8	52.2
14-Oct	90.0	66.8	78.8	57.3	50.0	96.6	72.1	77.5	52.9
21-Oct	86.0	64.5	75.8	55.6	48.0	91.7	67.6	74.3	50.6
28-Oct	84.0	65.0	75.8	54.4	46.0	91.0	68.9	71.0	49.2
4-Nov	82.0	63.6	74.2	53.4	45.0	90.3	68.4	69.0	47.8
11-Nov	77.0	61.0	70.8	52.1	45.0	91.0	68.3	67.7	47.4
18-Nov	78.0	60.0	69.0	50.3	43.0	94.5	70.0	65.1	45.3
25-Nov	75.0	61.0	67.2	47.1	37.0	90.3	68.9	59.9	41.9
2-Dec	73.0	57.3	65.2	45.1	36.0	75.6	62.3	54.9	38.0
9-Dec	68.0	56.0	62.9	45.7	32.0	80.5	62.9	57.2	39.2
16-Dec	68.0	60.1	62.9	45.9	36.0	85.4	64.6	58.0	41.2
23-Dec	68.0	57.8	61.2	44.3	34.0	80.5	63.2	55.5	38.8
31-Dec	68.0	57.3	61.3	43.9	32.0	80.5	63.0	54.1	37.1

SEVILLA, SPAIN

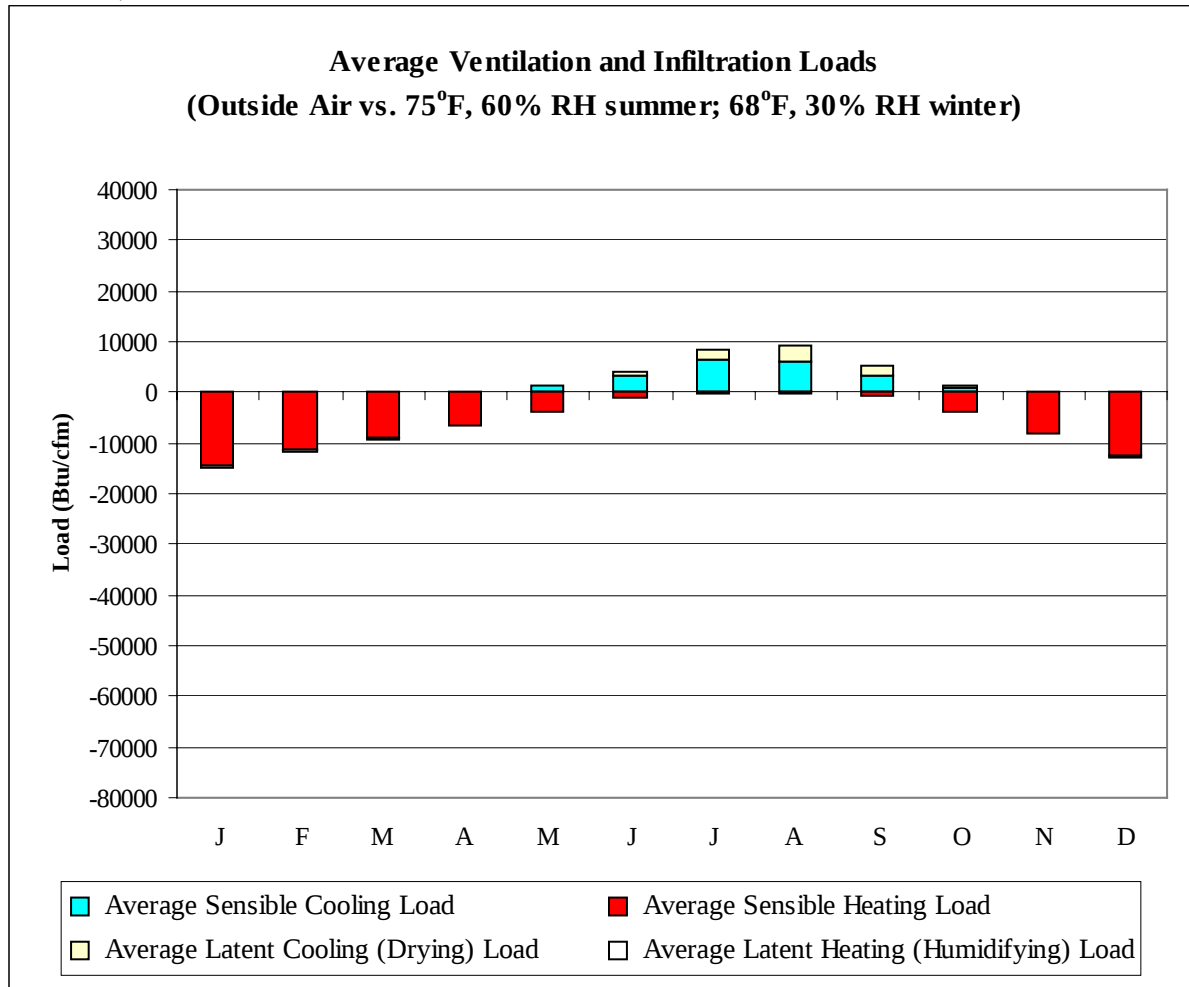
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	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	1	460
FEB	5	351
MAR	36	268
APR	62	190
MAY	154	94
JUN	306	21
JUL	500	3
AUG	489	3
SEP	338	15
OCT	132	91
NOV	29	238
DEC	3	390
ANN	2056	2124

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	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	-14318	2	-482
FEB	1	-11196	2	-321
MAR	106	-8984	5	-196
APR	276	-6673	10	-85
MAY	1119	-3714	90	-24
JUN	3098	-1144	804	-1
JUL	6379	-289	2114	-3
AUG	6004	-224	3109	-1
SEP	3461	-802	1701	-3
OCT	770	-3651	442	-24
NOV	47	-8160	135	-99
DEC	0	-12460	33	-282
ANN	21261	-71615	8447	-1521

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

No Solar Radiation
Data Available

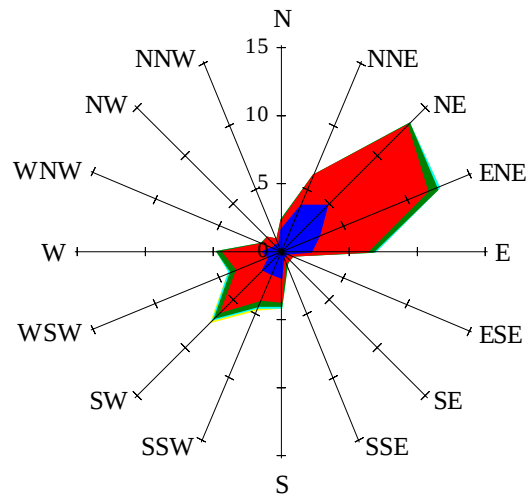


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

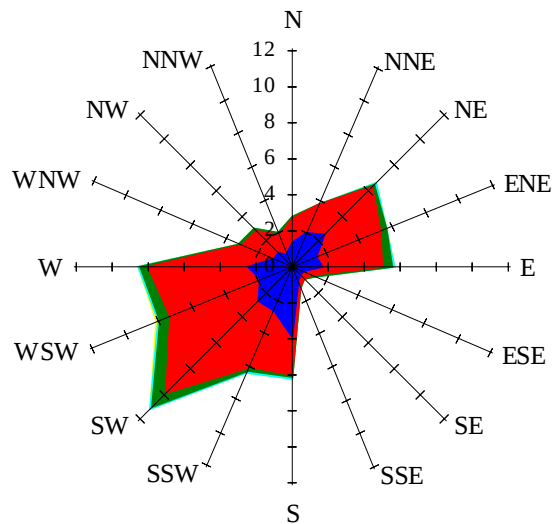
Labels of Percent Frequency on North Axis



Percent Calm = 28.47

Wind Summary - March, April, and May

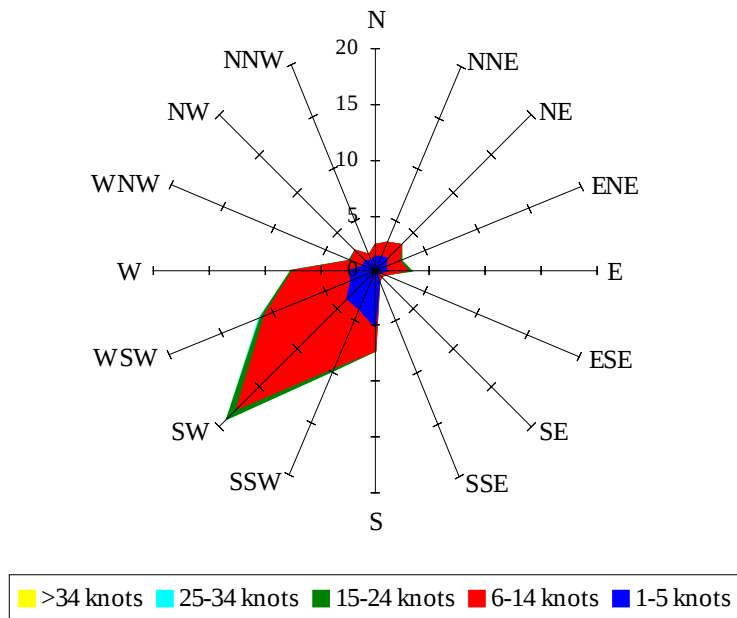
Labels of Percent Frequency on North Axis



Percent Calm = 24.16

Wind Summary - June, July, and August

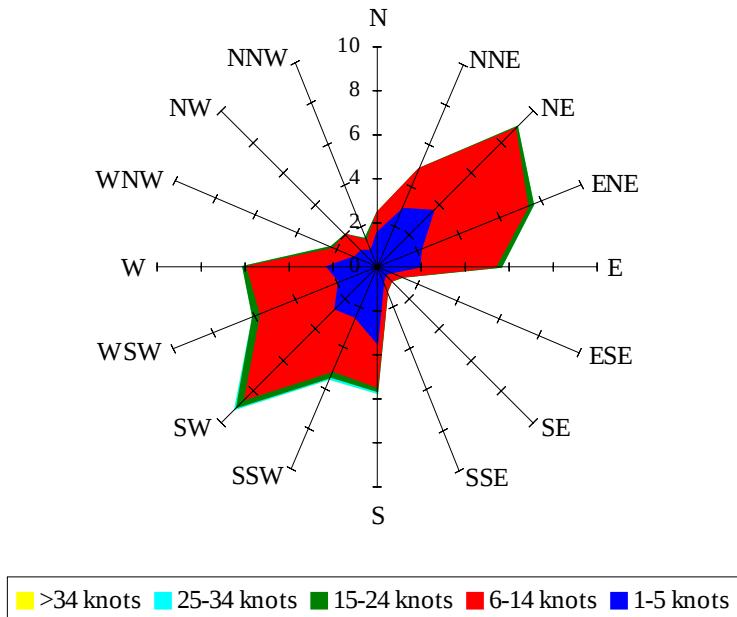
Labels of Percent Frequency on North Axis



Percent Calm = 21.66

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 28.74