

THE PAS	CN	
Latitude = 53.97 N		WMO No. 718670
Longitude = 101.10 W		Elevation = 889 feet
Period of Record = 1977 to 1996		Average Pressure = 28.97 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	90	69	74	12.2	SSE
0.4% Occurrence	83	66	71	9.8	W
1.0% Occurrence	81	65	68	9.8	W
2.0% Occurrence	77	62	63	10.0	SSE
Mean Daily Range	17	-	-	-	-
97.5% Occurrence	-22	-22	1	7.4	W
99.0% Occurrence	-27	-27	1	6.6	W
99.6% Occurrence	-31	-31	1	6.1	WNW
Median of Extreme Lows	-38	-38	1	2.2	WNW
	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	71	84	95	10.4	SSE
0.4% Occurrence	68	79	87	8.5	SSE
1.0% Occurrence	66	76	81	8.1	SSE
2.0% Occurrence	64	74	76	8.3	SSE
	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	106	76	0.69	9.8	SE
0.4% Occurrence	94	74	0.61	7.1	SE
1.0% Occurrence	88	72	0.57	6.6	SSE
2.0% Occurrence	81	69	0.52	7.8	SE
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		1	91	3	70

Other Site Data

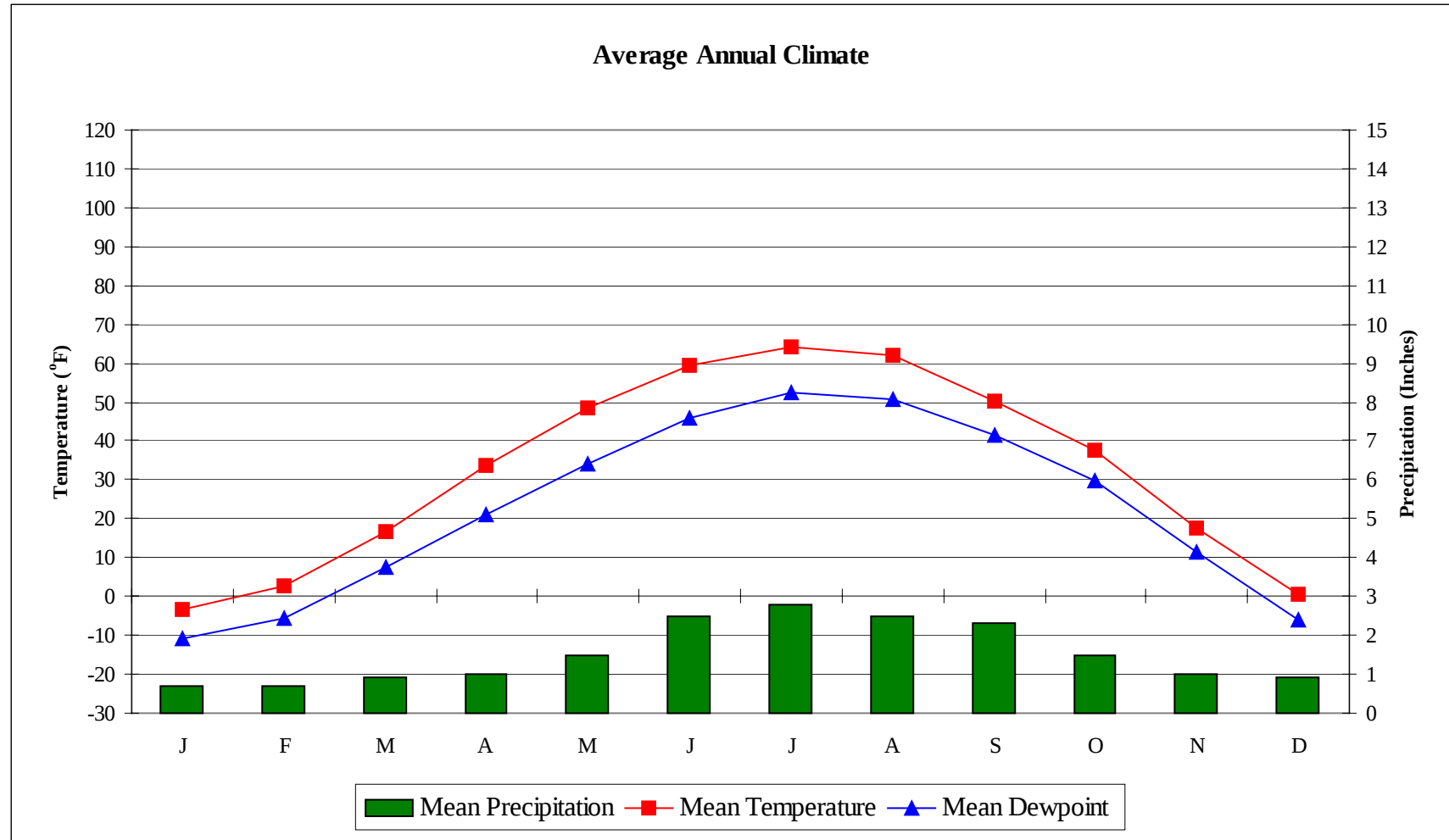
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
3	N/A	N/A	0.1 + 0.1
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft²)	Average Annual Freeze-Thaw Cycles (#)
35.2	N/A	N/A	51

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

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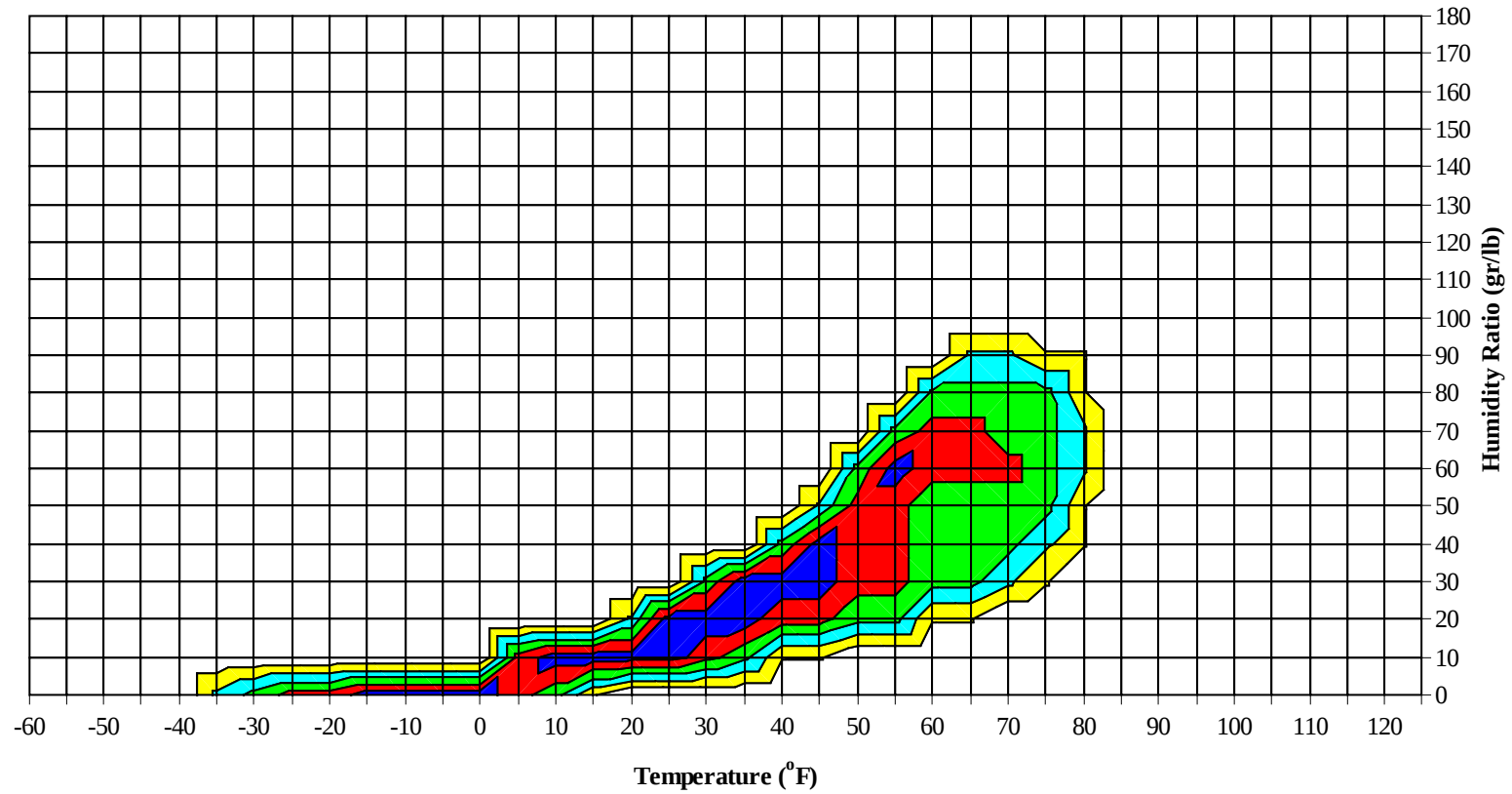


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Long Term Psychrometric Summary



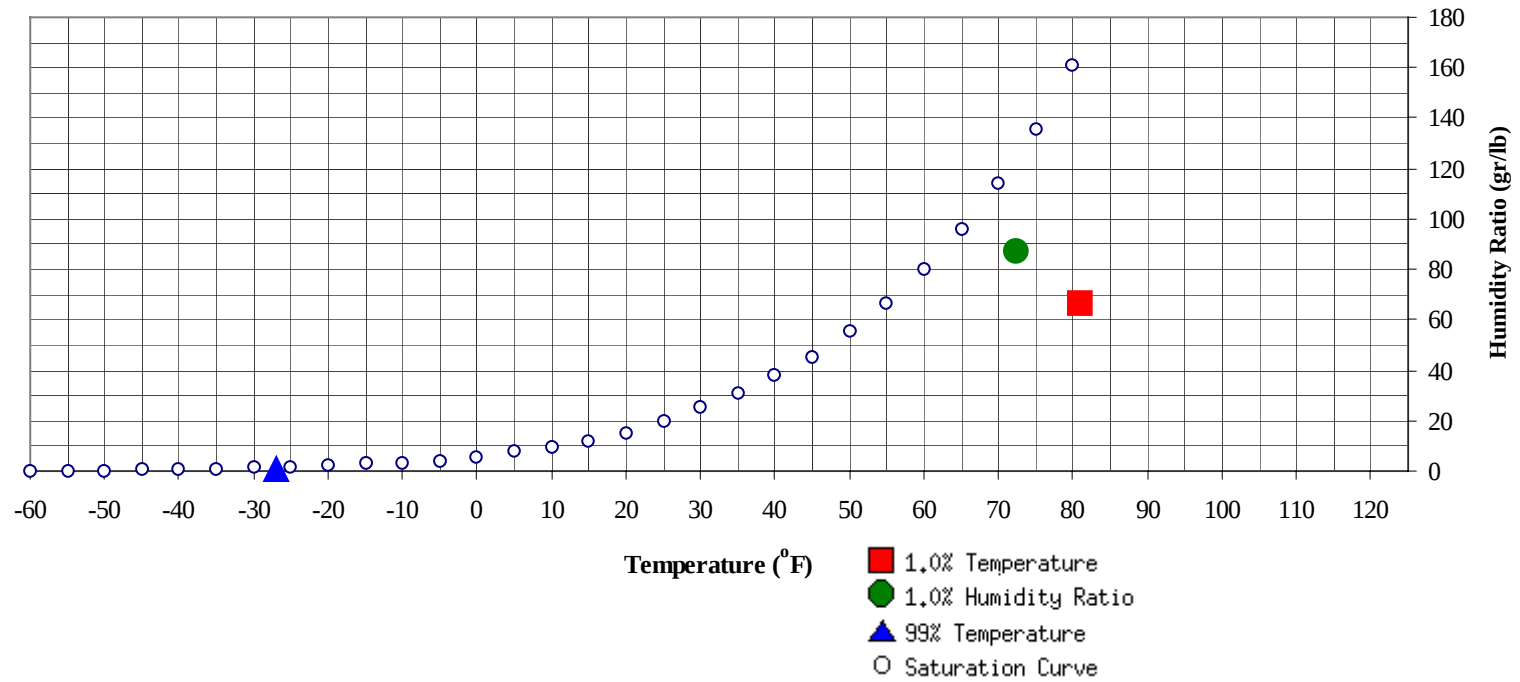
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



99% Dry Bulb	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
	-27	0.7	-6.4		87.5	72.4	65.9	62.6	31.0

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	81	67	64.3	29.9

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

Period of Record = 1977 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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69															
60 / 64															
55 / 59												1	0	1	47.0
50 / 54							0		0	37.0		2	1	3	41.7
45 / 49		0	0	0	40.5		1	0	1	37.6	0	6	4	10	38.5
40 / 44	0	0	0	0	35.9		2	1	3	36.0	1	9	7	17	35.6
35 / 39	1	2	1	4	33.6	2	5	5	12	33.2	6	24	23	53	32.8
30 / 34	1	4	4	9	28.8	4	10	8	22	28.8	27	31	34	92	29.2
25 / 29	5	9	8	22	24.5	14	14	14	42	24.5	33	32	37	102	24.3
20 / 24	10	9	10	29	20.6	11	11	12	34	20.8	18	21	22	61	20.0
15 / 19	15	17	15	47	16.3	17	17	18	52	16.1	24	33	27	84	15.4
10 / 14	18	22	21	61	11.1	15	23	23	61	10.7	28	27	30	85	10.4
5 / 9	24	23	24	71	6.0	20	28	29	77	5.4	29	22	23	74	5.5
0 / 4	24	30	28	82	0.5	25	29	31	85	0.3	21	17	18	56	0.4
-5 / -1	18	20	22	60	-3.8	18	20	18	56	-3.9	15	8	8	31	-4.0
-10 / -6	29	29	26	84	-8.3	24	24	24	72	-8.2	18	7	9	34	-8.2
-15 / -11	18	18	20	56	-12.7	18	14	14	46	-12.7	10	4	3	17	-12.8
-20 / -16	27	25	31	83	-17.1	23	14	15	52	-17.0	9	2	2	13	-16.8
-25 / -21	24	21	22	67	-22.3	16	7	9	32	-22.2	4	0	1	5	-22.1
-30 / -26	20	11	13	44	-27.4	11	4	4	19	-27.3	2	0	0	2	-27.2
-35 / -31	9	4	2	15	-31.7	3	1	1	5	-31.9	1			1	-32.2
-40 / -36	6	2	0	8	-36.1	2	0	0	2	-36.1	0			0	-35.0
-45 / -41	1	0		1	-41.5	0	0	0	0	-40.4					

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

Period of Record = 1977 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		
95 / 99												0		0	70.3
90 / 94							0	0	0	65.6		1	1	2	70.4
85 / 89							1	0	1	64.1		2	1	3	68.0
80 / 84		0	0	0	55.6		3	1	4	61.2		9	5	14	64.5
75 / 79		1	0	1	54.9	0	10	5	15	58.4	0	24	14	38	61.0
70 / 74		2	1	3	51.9	0	20	12	32	55.7	3	45	31	79	58.7
65 / 69		3	2	5	51.0	2	18	13	33	53.4	10	30	29	69	57.0
60 / 64	0	7	4	11	48.2	8	28	25	61	51.3	34	47	47	128	54.8
55 / 59	0	12	8	20	44.9	19	32	33	84	48.3	61	42	50	153	51.6
50 / 54	2	21	15	38	42.0	31	37	37	105	44.9	55	23	31	109	48.0
45 / 49	8	28	24	60	38.9	39	35	40	114	41.1	45	11	21	77	43.5
40 / 44	13	24	26	63	36.2	33	21	28	82	37.8	16	4	7	27	39.6
35 / 39	34	41	45	121	32.9	50	26	29	105	34.3	14	2	3	19	36.0
30 / 34	57	39	46	142	29.0	40	12	19	71	29.6	2		0	2	31.2
25 / 29	47	25	36	108	24.2	18	4	5	27	24.9					
20 / 24	23	14	13	50	19.9	5	0	1	6	21.0					
15 / 19	27	10	9	46	15.6	2	0	0	2	17.1					
10 / 14	11	5	5	21	10.6	0			0	12.3					
5 / 9	5	4	4	13	5.4										
0 / 4	5	1	2	8	0.5										
-5 / -1	3	1	0	4	-4.0										
-10 / -6	3	0	0	3	-7.9										
-15 / -11	1	0		1	-12.6										
-20 / -16	0			0	-15.9										
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)**Period of Record = 1977 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		
95 / 99		0	0	0	70.7		0		0	68.0					
90 / 94		1	1	2	68.3		1	1	2	68.9					
85 / 89		3	2	5	68.3		4	2	6	67.2		0		0	66.0
80 / 84	0	18	9	27	65.6		14	7	21	65.9		1	1	2	62.8
75 / 79	1	39	25	65	63.0	0	34	18	52	63.7		5	2	7	61.3
70 / 74	7	58	44	109	60.8	5	46	32	83	61.2	1	11	6	18	59.1
65 / 69	19	43	43	105	59.2	15	37	35	87	59.1	1	14	7	22	56.6
60 / 64	71	54	64	189	57.2	49	52	59	161	56.7	5	32	23	60	54.2
55 / 59	91	25	45	161	53.8	79	38	51	168	53.2	21	47	40	108	51.2
50 / 54	45	6	14	65	50.1	58	17	30	106	48.9	53	55	60	168	47.8
45 / 49	12	0	2	14	45.2	29	4	11	44	44.6	69	41	51	161	43.5
40 / 44	3		0	3	41.2	9	0	2	11	40.6	35	17	26	78	39.4
35 / 39	0			0	37.0	3		0	3	36.4	35	14	19	68	35.0
30 / 34						0			0	31.5	16	2	6	24	30.8
25 / 29											4		0	4	26.8
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															

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

Period of Record = 1977 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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74		1	0	1	56.1										
65 / 69		2	0	2	54.2										
60 / 64	0	6	2	8	50.9		0	0	0	49.5					
55 / 59	2	14	8	24	48.2		0	0	0	46.8					
50 / 54	5	27	18	50	45.4	0	1	1	2	43.3					
45 / 49	23	35	37	95	42.2	1	3	1	5	40.1					
40 / 44	30	40	37	107	38.5	1	4	2	7	36.8		1		1	35.6
35 / 39	66	50	58	174	34.9	7	17	12	36	34.0	1	1	2	4	33.0
30 / 34	62	40	49	151	30.0	29	32	36	97	29.8	3	5	4	12	29.4
25 / 29	38	19	24	81	25.0	42	41	40	123	25.2	11	16	15	42	24.9
20 / 24	10	5	5	20	20.4	27	25	28	80	20.8	15	14	15	44	21.0
15 / 19	8	5	7	20	16.2	34	30	32	96	16.4	21	24	23	68	16.5
10 / 14	3	2	2	7	11.2	26	26	27	79	11.0	24	26	25	75	11.4
5 / 9	2	0	1	3	7.1	20	21	22	63	5.9	26	26	27	79	6.0
0 / 4						19	18	17	54	0.8	28	25	26	79	0.6
-5 / -1						11	8	9	28	-3.7	18	19	17	54	-3.8
-10 / -6						11	7	9	27	-8.2	19	26	25	70	-8.2
-15 / -11						5	3	4	12	-12.6	18	15	19	52	-12.7
-20 / -16						4	2	2	8	-16.6	24	21	22	67	-17.1
-25 / -21						1	0	0	1	-21.9	20	15	19	54	-22.3
-30 / -26						0	0	0	0	-27.8	13	9	8	30	-27.3
-35 / -31						0	0		0	-30.8	5	2	3	10	-31.8
-40 / -36											3	1	0	4	-36.4
-45 / -41											0			0	-40.0

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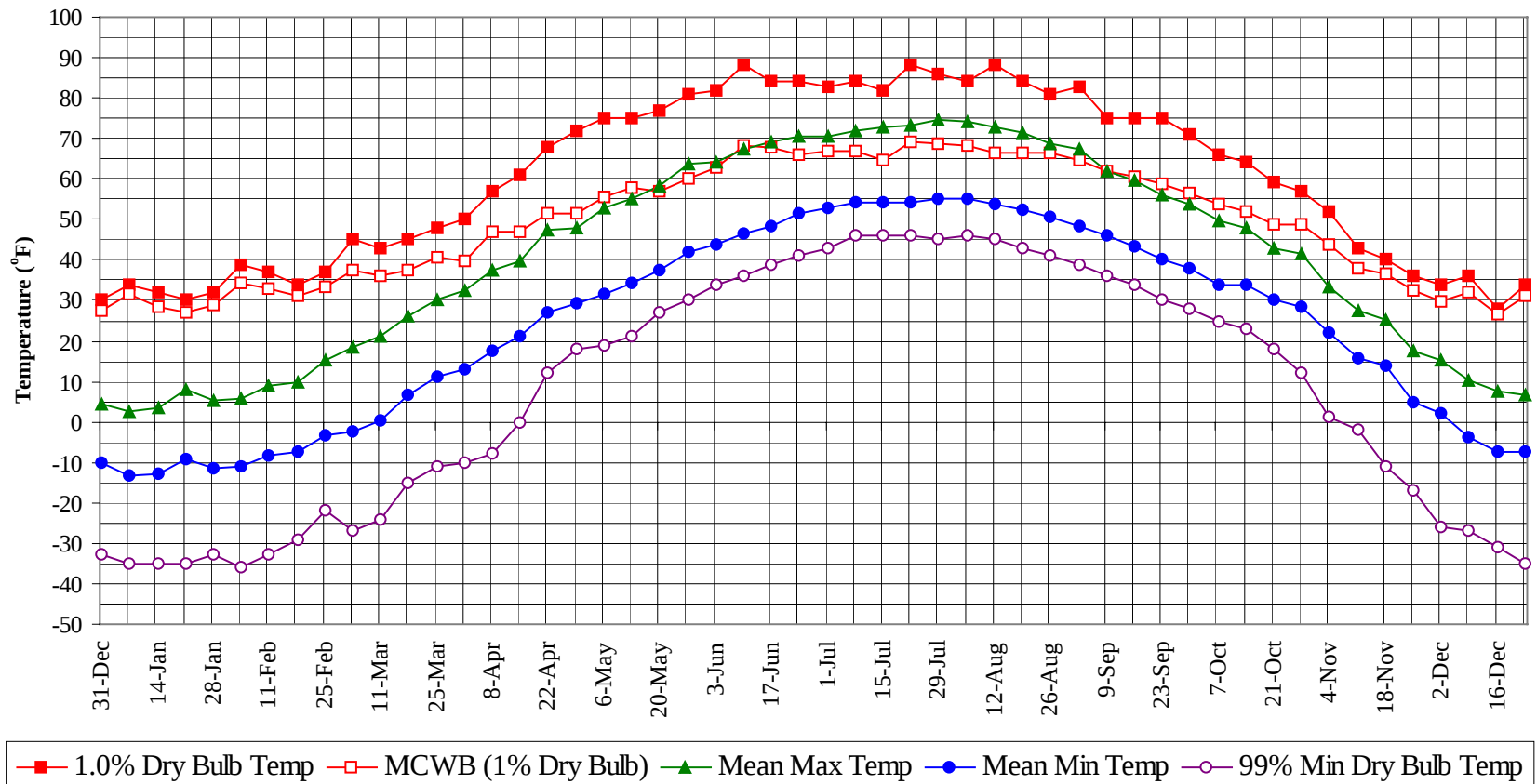
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1977 to 1996

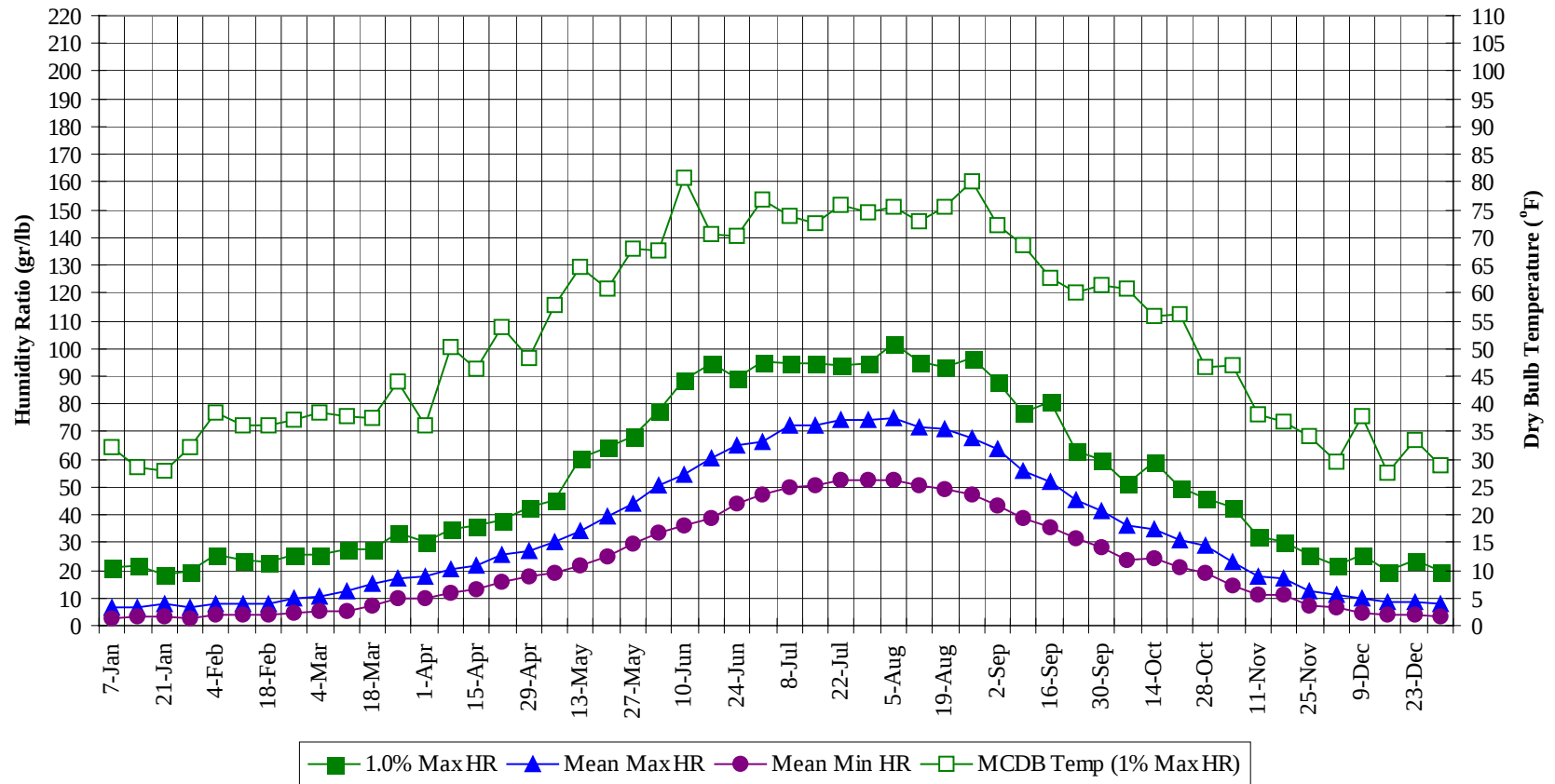
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99	0	0	0	70.3	
90 / 94	4	2	6	69.1	
85 / 89	10	5	15	67.4	
80 / 84	0	45	24	69	65.1
75 / 79	2	113	65	180	62.3
70 / 74	16	184	126	326	59.7
65 / 69	47	148	127	322	57.8
60 / 64	169	228	224	621	55.5
55 / 59	272	212	234	718	51.8
50 / 54	250	190	206	646	47.2
45 / 49	225	165	191	581	42.4
40 / 44	142	122	136	401	38.2
35 / 39	219	183	198	600	34.1
30 / 34	240	176	207	623	29.6
25 / 29	212	162	177	551	24.7
20 / 24	118	99	105	322	20.5
15 / 19	147	138	130	415	16.1
10 / 14	126	132	133	392	10.9
5 / 9	126	124	128	379	5.8
0 / 4	123	120	121	365	0.5
-5 / -1	82	75	73	230	-3.9
-10 / -6	103	93	93	289	-8.2
-15 / -11	70	54	60	184	-12.7
-20 / -16	87	64	71	222	-17.0
-25 / -21	65	44	51	160	-22.3
-30 / -26	47	24	25	96	-27.3
-35 / -31	19	7	6	32	-31.8
-40 / -36	11	3	1	15	-36.2
-45 / -41	2	0	0	2	-41.1

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



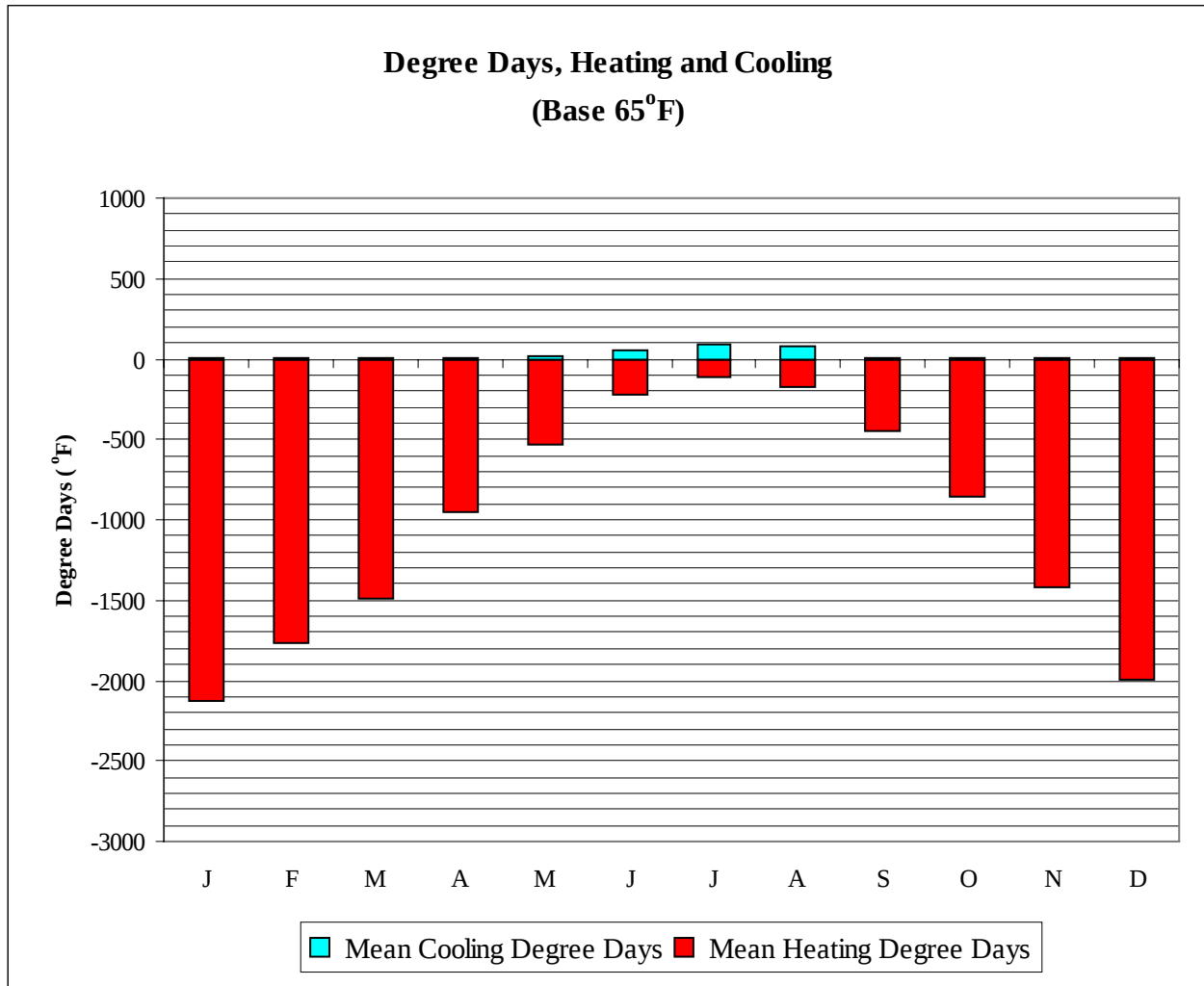
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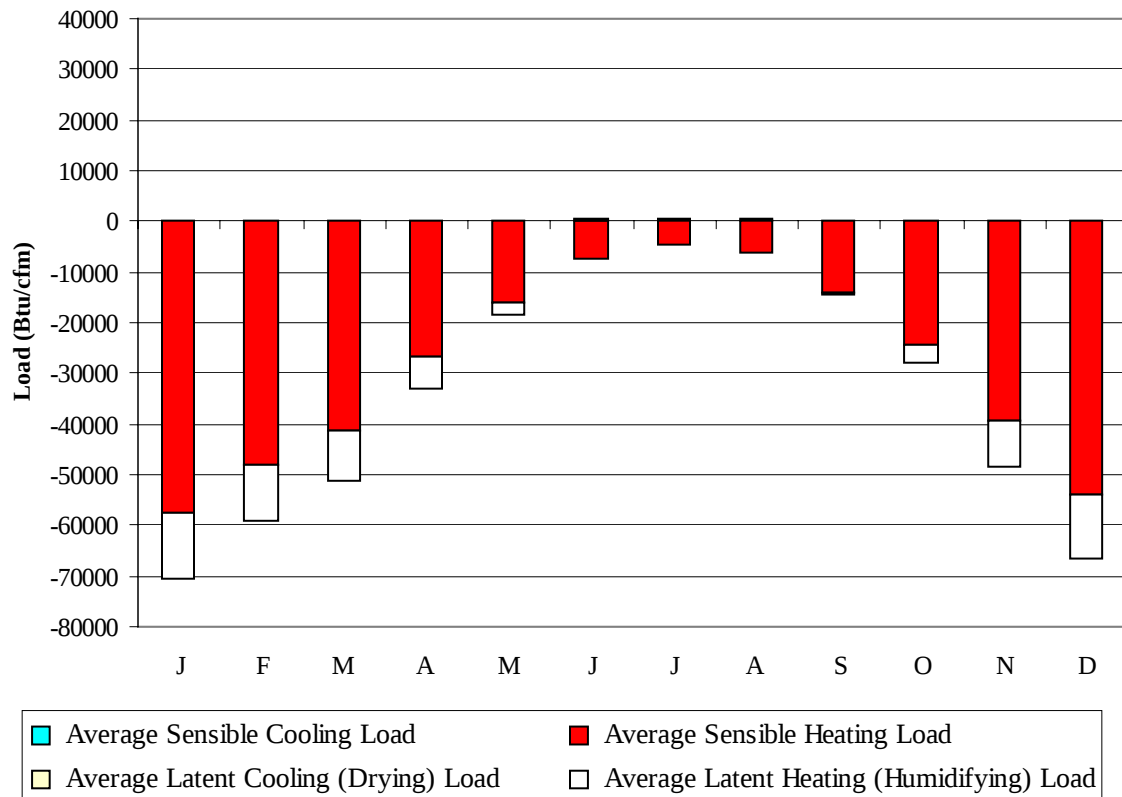
Long Term Dry Bulb Temperature and Humidity Summary

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	34.0	31.6	2.8	-13.2	-35.0	21.0	32.3	6.6	2.7
14-Jan	32.0	28.4	3.3	-12.9	-35.0	21.7	28.6	6.9	3.1
21-Jan	30.0	27.1	7.8	-9.0	-35.0	18.2	28.1	7.8	3.5
28-Jan	32.0	29.1	5.4	-11.6	-33.0	19.6	32.3	6.6	2.8
4-Feb	39.0	34.3	6.0	-11.1	-36.0	25.9	38.5	8.1	3.8
11-Feb	37.0	33.0	8.9	-8.3	-33.0	23.8	36.2	8.2	3.6
18-Feb	34.0	31.2	9.9	-7.3	-29.0	23.1	36.0	7.8	3.7
25-Feb	37.0	33.2	15.1	-3.4	-22.0	25.9	37.2	10.0	4.7
4-Mar	45.0	37.5	18.3	-2.2	-27.0	25.9	38.6	10.8	5.0
11-Mar	43.0	36.3	21.4	0.3	-24.0	27.3	37.8	12.2	5.5
18-Mar	45.0	37.3	26.1	6.7	-15.0	27.3	37.4	14.9	7.5
25-Mar	48.0	40.6	30.4	11.3	-11.0	33.6	44.0	17.1	9.6
1-Apr	50.0	39.9	32.7	13.1	-10.0	30.1	36.1	17.5	9.6
8-Apr	57.0	47.1	37.6	17.7	-8.0	35.0	50.4	20.1	11.6
15-Apr	61.0	47.2	39.7	21.0	0.0	36.4	46.4	21.9	13.1
22-Apr	68.0	51.3	47.4	27.2	12.0	37.8	53.9	25.6	15.5
29-Apr	72.0	51.6	48.0	29.2	18.0	42.7	48.4	26.9	17.4
6-May	75.0	55.4	52.9	31.4	19.0	45.5	57.8	29.9	19.3
13-May	75.0	57.9	55.0	34.2	21.0	60.2	64.8	34.0	21.5
20-May	77.0	56.9	58.4	37.4	27.0	64.4	60.8	39.4	25.1
27-May	81.0	60.2	64.0	41.8	30.0	68.6	68.1	44.2	29.4
3-Jun	82.0	62.9	64.1	43.8	34.0	77.7	67.7	50.3	33.6
10-Jun	88.0	68.2	67.3	46.3	36.0	88.9	80.9	54.2	36.0
17-Jun	84.0	67.9	69.3	48.4	39.0	94.5	70.5	60.2	38.5
24-Jun	84.0	65.9	70.6	51.3	41.0	89.6	70.4	65.2	44.0
1-Jul	83.0	67.0	70.6	52.7	43.0	95.2	76.8	66.4	47.2
8-Jul	84.0	66.8	71.8	54.1	46.0	94.5	73.9	72.2	49.9
15-Jul	82.0	64.8	73.0	54.3	46.0	94.5	72.6	72.5	50.7
22-Jul	88.0	69.0	73.2	54.4	46.0	93.8	75.8	74.2	52.2
29-Jul	86.0	68.8	74.5	55.1	45.0	94.5	74.5	74.4	52.3
5-Aug	84.0	68.2	74.3	55.2	46.0	101.5	75.7	74.6	52.4
12-Aug	88.0	66.6	72.8	53.9	45.0	95.2	73.0	71.8	50.3
19-Aug	84.0	66.6	71.5	52.6	43.0	93.1	75.4	70.6	49.5
26-Aug	81.0	66.3	68.7	50.7	41.0	96.6	80.0	67.5	47.2
2-Sep	83.0	64.5	67.3	48.3	39.0	88.2	72.3	64.0	43.3
9-Sep	75.0	61.9	61.8	46.2	36.0	77.0	68.7	55.7	38.5
16-Sep	75.0	60.4	59.8	43.2	34.0	80.5	62.8	51.8	35.4
23-Sep	75.0	58.9	56.1	40.4	30.0	63.0	60.2	45.2	31.2
30-Sep	71.0	56.7	53.7	37.8	28.0	59.5	61.6	41.7	28.2
7-Oct	66.0	53.7	49.7	34.0	25.0	51.1	60.7	36.0	23.5
14-Oct	64.0	52.0	47.8	34.0	23.0	58.8	55.7	34.8	24.3
21-Oct	59.0	49.0	43.0	30.3	18.0	49.7	56.2	31.0	20.9
28-Oct	57.0	48.8	41.4	28.5	12.0	46.2	46.7	29.0	19.3
4-Nov	52.0	43.9	33.6	22.1	1.0	42.7	46.9	22.7	14.7
11-Nov	43.0	37.9	27.4	15.7	-2.0	32.2	38.2	18.0	11.3
18-Nov	40.0	36.5	25.3	13.9	-11.0	30.1	36.7	17.3	11.0
25-Nov	36.0	32.5	17.4	4.7	-17.0	25.9	34.1	12.5	7.1
2-Dec	34.0	29.9	15.4	2.1	-26.0	21.7	29.4	11.3	6.5
9-Dec	36.0	31.9	10.2	-3.9	-27.0	25.9	37.6	9.6	4.7
16-Dec	28.0	26.4	7.6	-7.3	-31.0	19.6	27.7	8.3	3.9
23-Dec	34.0	31.1	6.7	-7.3	-35.0	23.8	33.6	8.5	4.2
31-Dec	30.0	27.5	4.5	-10.2	-33.0	19.6	28.9	7.6	3.6



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	2120
FEB	0	1761
MAR	0	1496
APR	2	947
MAY	22	535
JUN	57	219
JUL	94	117
AUG	76	175
SEP	11	451
OCT	1	851
NOV	0	1423
DEC	0	1994
ANN	263	12089

Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	-57350	0	-13219
FEB	0	-47840	0	-11386
MAR	0	-41193	0	-10184
APR	4	-26866	0	-6354
MAY	81	-16052	10	-2440
JUN	231	-7348	99	-210
JUL	412	-4565	252	-2
AUG	347	-6246	294	-34
SEP	26	-13912	5	-656
OCT	0	-24463	0	-3532
NOV	0	-39219	0	-9040
DEC	0	-54087	0	-12541
ANN	1101	-339141	660	-69598

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

No Solar Radiation
Data Available

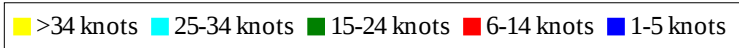
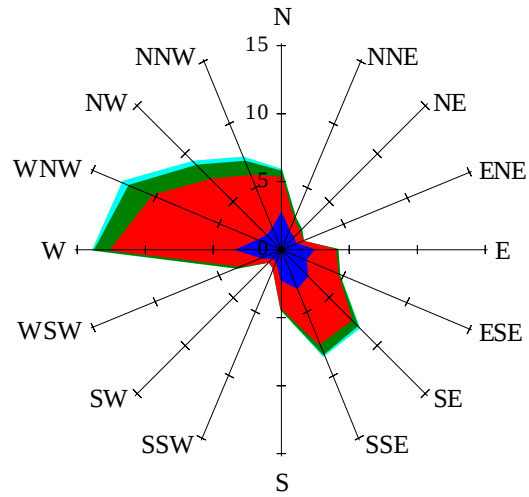


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

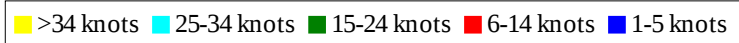
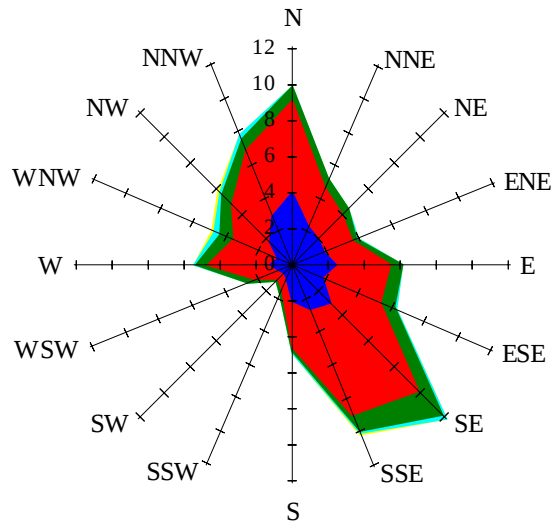
Labels of Percent Frequency on North Axis



Percent Calm = 9.73

Wind Summary - March, April, and May

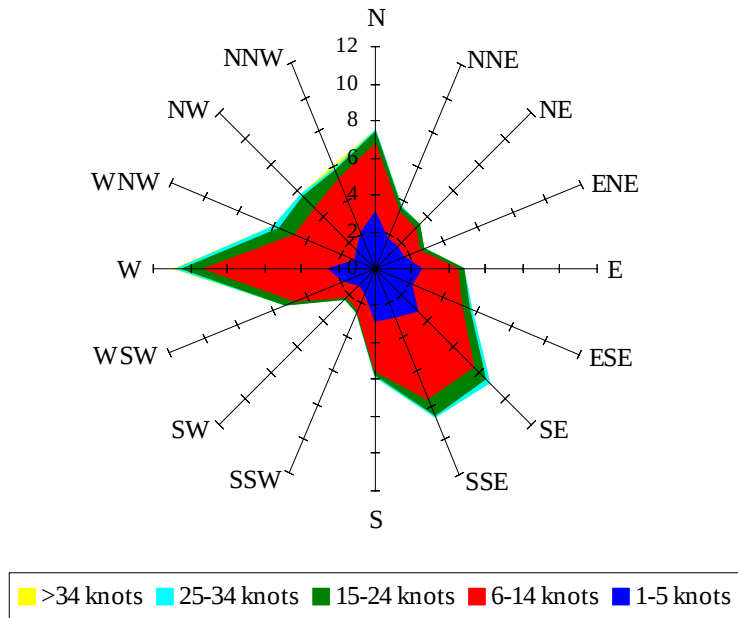
Labels of Percent Frequency on North Axis



Percent Calm = 8.40

Wind Summary - June, July, and August

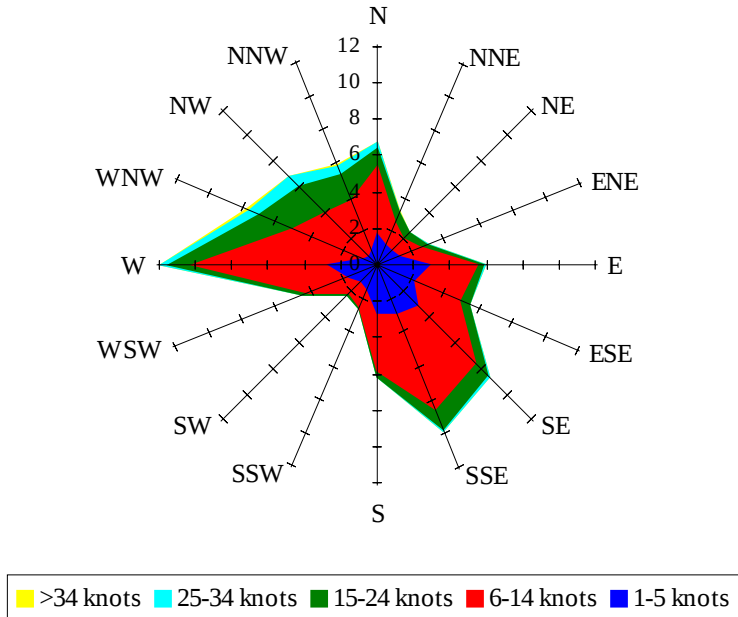
Labels of Percent Frequency on North Axis



Percent Calm = 10.69

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 7.38