

SEOUL KO

Latitude = 37.50 N

Longitude = 126.93 E

Period of Record = 1973 to 1996

WMO No. 471170

Elevation = 161 feet

Average Pressure = 29.76 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	79	129	4.2	E
0.4% Occurrence	90	78	125	4.4	E
1.0% Occurrence	88	77	121	4.3	SSW
2.0% Occurrence	86	75	117	4.5	WSW
Mean Daily Range	14	-	-	-	-
97.5% Occurrence	18	16	8	3.4	W
99.0% Occurrence	14	12	7	3.4	W
99.6% Occurrence	10	8	5	3.4	W
Median of Extreme Lows	7	5	5	2.9	NNW
	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	82	90	149	3.7	SSW
0.4% Occurrence	79	86	137	4.1	SW
1.0% Occurrence	78	84	134	4.1	SW
2.0% Occurrence	77	82	132	4.1	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	153	87	0.99	4.5	SW
0.4% Occurrence	143	83	0.94	3.8	SSW
1.0% Occurrence	136	81	0.88	5.1	SSW
2.0% Occurrence	134	81	0.88	3.9	SSW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		15	625	790	1706

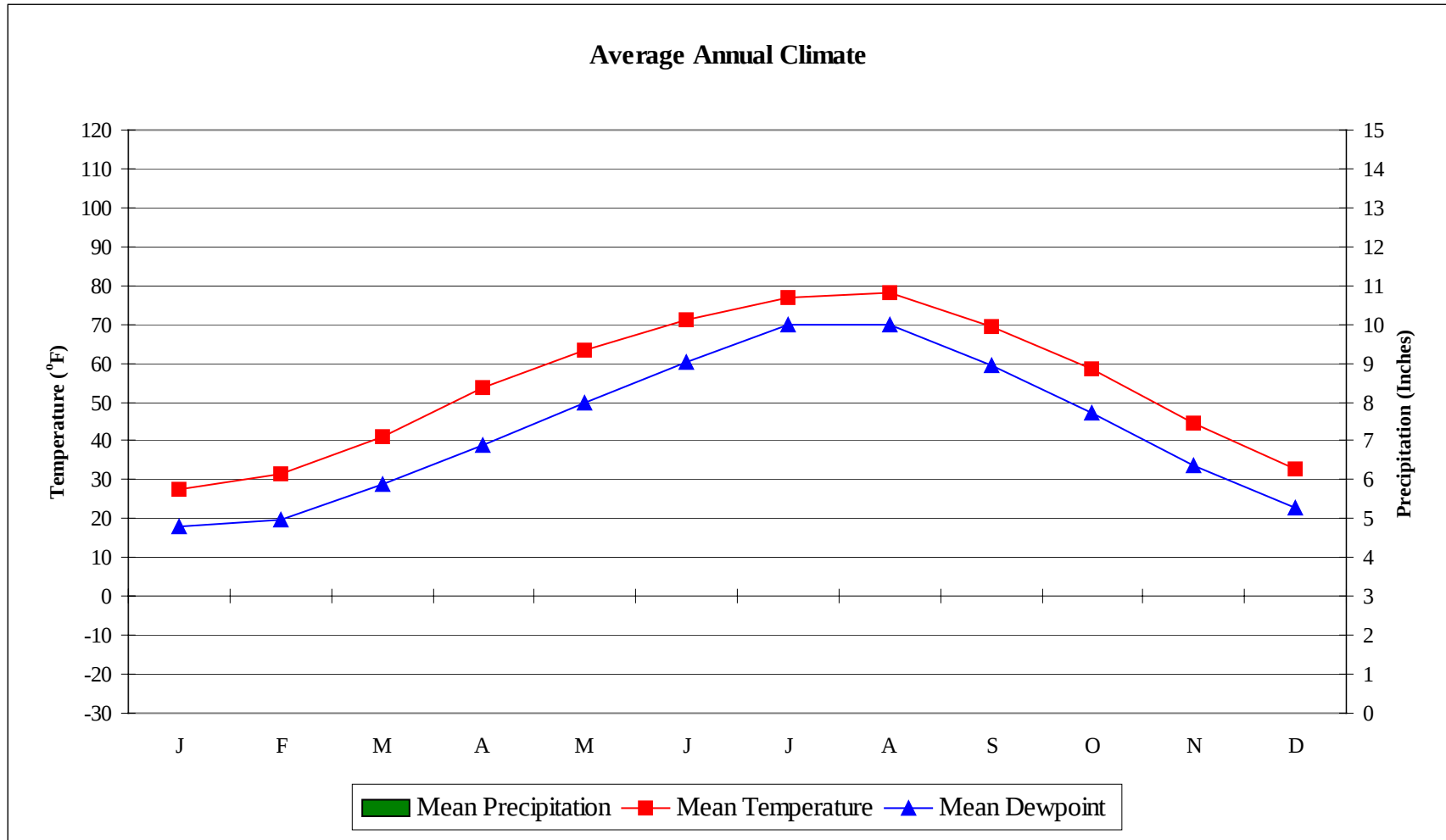
Other Site Data

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
7	N/A	N/A	2.3 + 0.6
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 (#)
57.2	N/A	N/A	48

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

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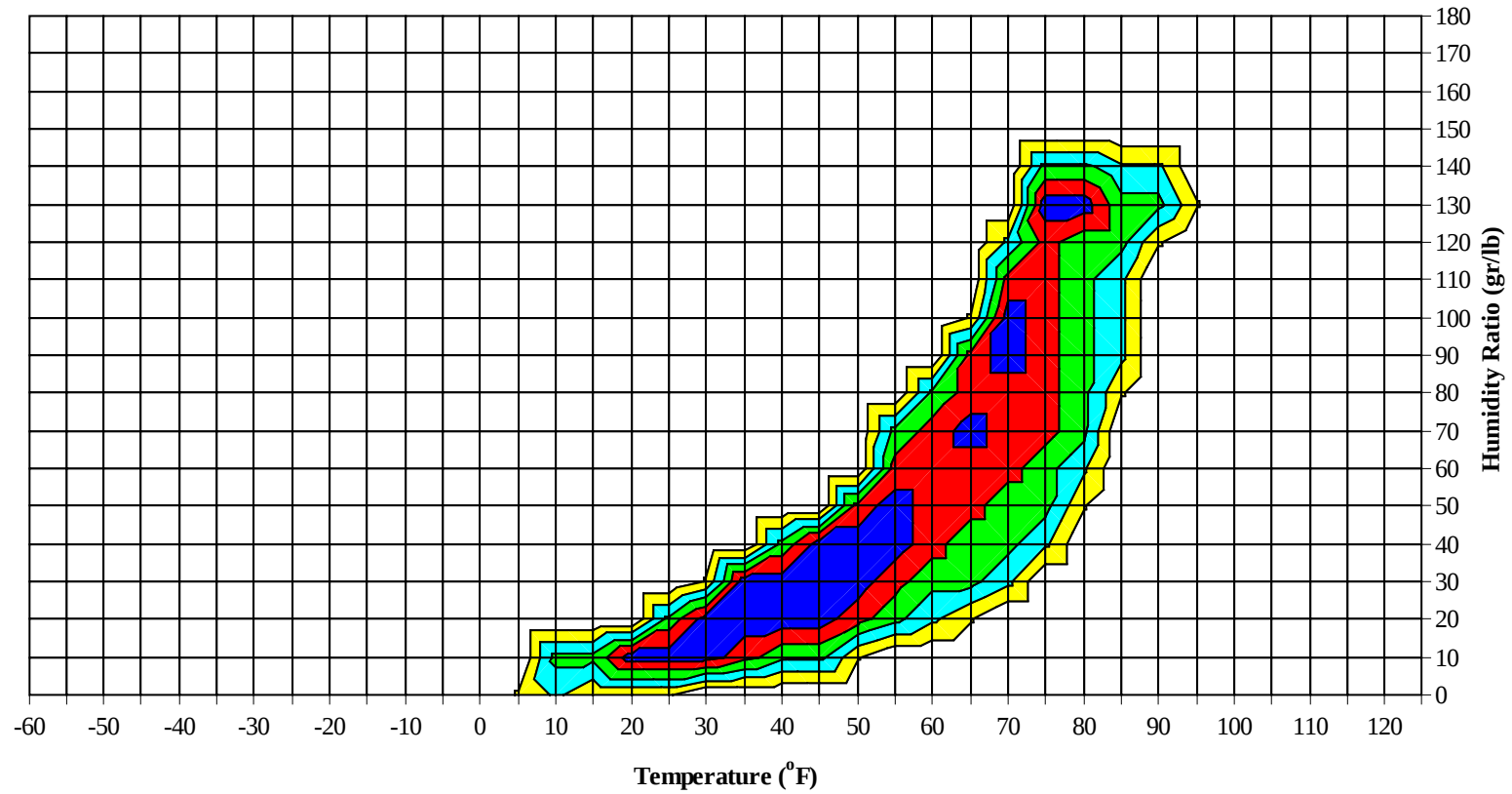
No Precipitation Data Available

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Long Term Psychrometric Summary

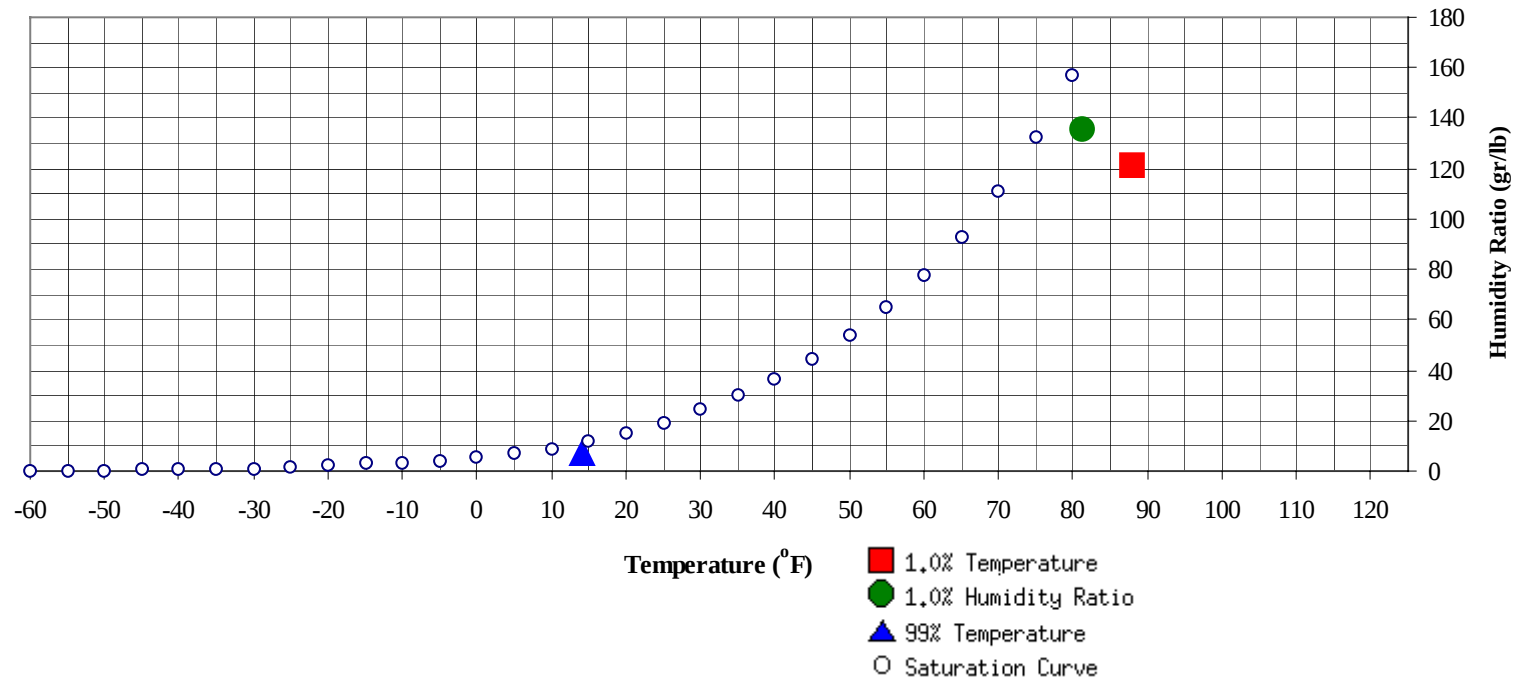


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



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)
	14	6.8	4.4		135.8	81.1	76.9	75.2	40.7

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	88	121.4	76.5	40.2

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69												1	0	1	53.0
60 / 64	0	1	0	1	50.1		0		0	53.5	0	6	3	9	49.5
55 / 59	0	0	0	0	48.1		1		1	47.7	0	23	9	32	46.5
50 / 54	0	2	1	3	45.3	0	8	4	12	43.9	5	43	30	78	43.7
45 / 49	2	9	4	15	40.8	4	23	15	42	39.5	26	62	56	143	40.3
40 / 44	5	20	12	37	37.3	5	30	23	58	36.6	38	44	55	137	37.4
35 / 39	23	50	44	117	33.5	31	51	56	137	33.3	81	46	60	187	33.7
30 / 34	40	54	57	151	28.9	56	46	53	154	28.8	63	18	27	108	29.1
25 / 29	52	49	59	160	23.9	50	31	36	117	23.8	28	5	7	39	24.0
20 / 24	36	28	29	92	19.5	23	15	17	54	19.1	6	1	1	8	19.3
15 / 19	48	24	29	101	15.6	33	14	16	63	15.4	1	0	0	1	15.1
10 / 14	30	10	11	51	10.8	17	5	5	26	10.4	1	0	0	1	11.1
5 / 9	11	2	2	15	6.1	6	1	0	7	5.9					
0 / 4	1	0		1	1.9	0			0	1.0					

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 = 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		
95 / 99															
90 / 94							0		0	67.0		1	1	2	69.2
85 / 89							1	0	1	65.7		7	3	10	69.8
80 / 84		1	0	1	60.8		12	4	16	65.1	0	50	21	71	68.6
75 / 79		5	2	7	59.5		44	17	61	62.3	6	82	57	145	67.1
70 / 74	0	21	8	29	57.2	3	63	40	107	59.7	53	65	83	201	65.3
65 / 69	1	24	15	40	54.7	16	43	46	105	58.3	83	22	45	149	63.0
60 / 64	9	51	32	92	52.1	69	49	68	185	56.0	76	13	25	114	59.7
55 / 59	29	55	56	140	49.5	84	29	51	164	52.5	21	1	4	26	55.7
50 / 54	57	49	66	172	46.1	61	8	20	89	48.6	1		0	1	48.3
45 / 49	76	26	43	146	42.0	15	0	1	16	44.3					
40 / 44	38	7	12	57	38.2	0	0	0	0	41.4					
35 / 39	25	2	5	32	34.3	0	0	0	0						
30 / 34	4	0	0	4	30.0	0	0	0	0						
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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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		
95 / 99		3	1	4	79.6		2	0	2	79.3					
90 / 94		16	7	23	78.8		21	7	28	77.9		0		0	75.5
85 / 89	1	28	15	44	76.9	0	45	22	66	76.3		3	1	4	72.6
80 / 84	14	78	60	152	74.7	21	85	69	175	74.7	0	31	10	41	70.3
75 / 79	84	76	94	254	72.7	102	62	101	266	72.9	9	80	46	135	67.6
70 / 74	110	42	60	211	69.1	99	27	43	170	68.7	42	73	83	199	65.1
65 / 69	33	5	9	47	65.3	21	6	5	32	65.1	61	32	53	146	62.5
60 / 64	5	1	1	7	60.6	4		1	5	60.9	76	18	36	130	58.9
55 / 59	1	0	1	2	56.8	0			0	56.0	41	4	9	54	53.8
50 / 54											9	0	1	10	49.2
45 / 49											1			1	44.0
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84		1	0	1	67.4										
75 / 79		14	3	17	63.4										
70 / 74	0	42	16	58	60.4		1	0	1	58.4					
65 / 69	5	45	30	80	58.6		4	1	5	56.6					
60 / 64	33	66	75	174	56.3	1	21	8	30	54.0		0		0	47.0
55 / 59	79	47	72	197	52.6	9	39	29	77	50.6	0	3	1	4	49.7
50 / 54	70	22	30	122	47.7	33	49	54	137	46.5	2	13	7	22	46.1
45 / 49	35	8	15	58	42.6	50	44	49	144	42.0	11	34	24	69	41.4
40 / 44	13	3	5	21	37.7	36	26	31	93	37.6	19	29	30	78	37.8
35 / 39	11	1	2	14	33.9	47	32	34	113	33.3	37	56	56	149	33.3
30 / 34	2	0	0	2	29.1	38	16	23	77	28.7	62	52	58	172	28.8
25 / 29						18	6	10	34	23.9	49	33	37	119	23.7
20 / 24						6	1	2	9	19.3	26	14	17	56	19.4
15 / 19						2	0	0	2	15.7	28	10	14	51	15.7
10 / 14						0			0	11.3	10	3	4	17	11.2
5 / 9											3	1	1	5	6.4
0 / 4											1	0	0	1	1.1

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 = 1973 to 1996

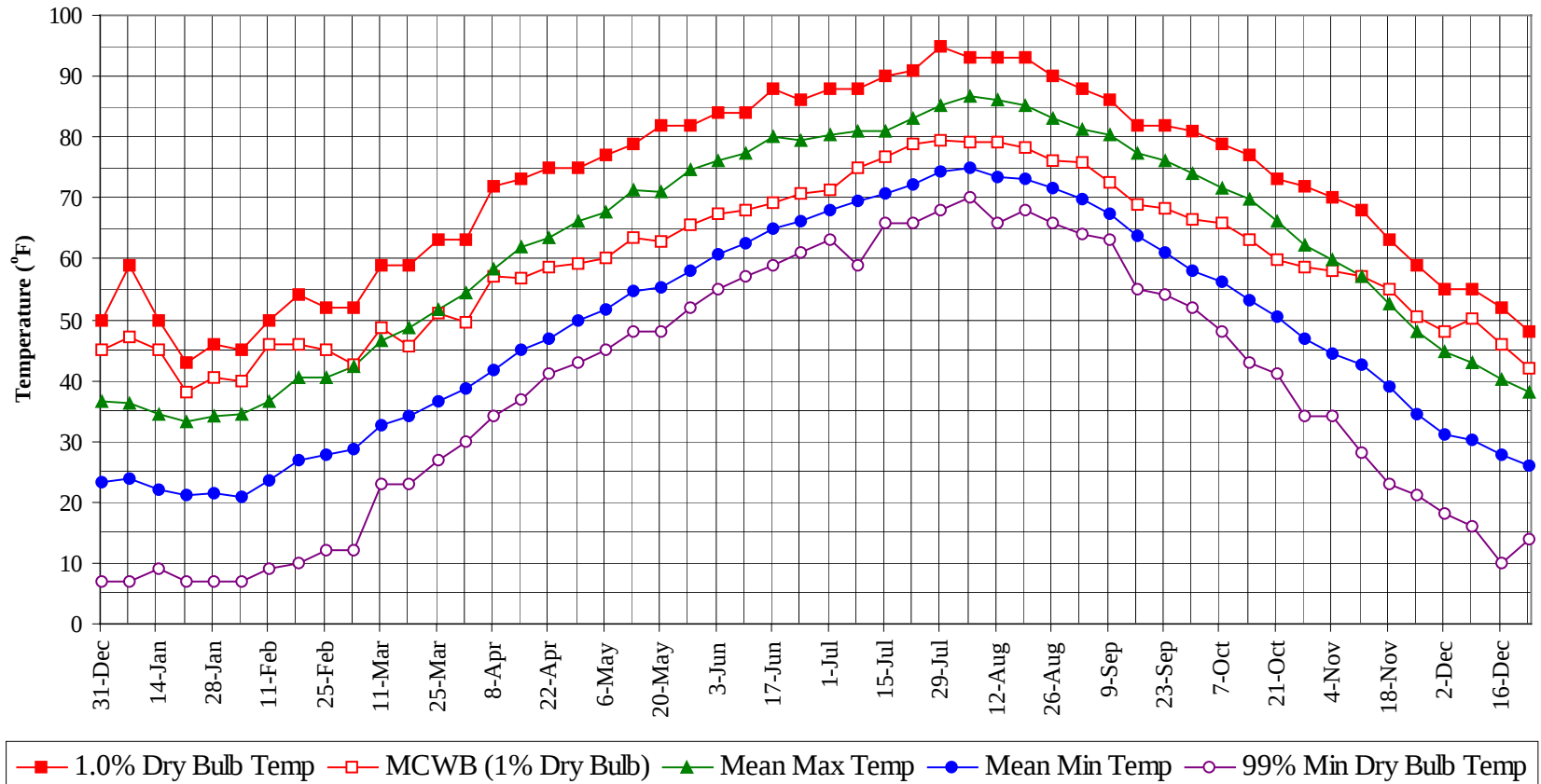
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		5	1	6	79.5
90 / 94		40	16	56	78.0
85 / 89	1	88	42	131	75.8
80 / 84	37	271	168	476	73.0
75 / 79	213	374	328	915	70.1
70 / 74	322	339	340	1001	65.6
65 / 69	225	183	207	615	61.2
60 / 64	279	225	249	753	56.6
55 / 59	272	200	234	705	51.6
50 / 54	242	192	216	650	46.6
45 / 49	222	203	206	630	41.5
40 / 44	152	155	164	470	37.5
35 / 39	248	230	252	730	33.5
30 / 34	252	178	212	642	28.9
25 / 29	186	119	142	448	23.8
20 / 24	91	54	63	209	19.4
15 / 19	105	45	57	208	15.5
10 / 14	53	17	20	89	10.7
5 / 9	18	3	4	25	6.1
0 / 4	1	0	0	1	1.5

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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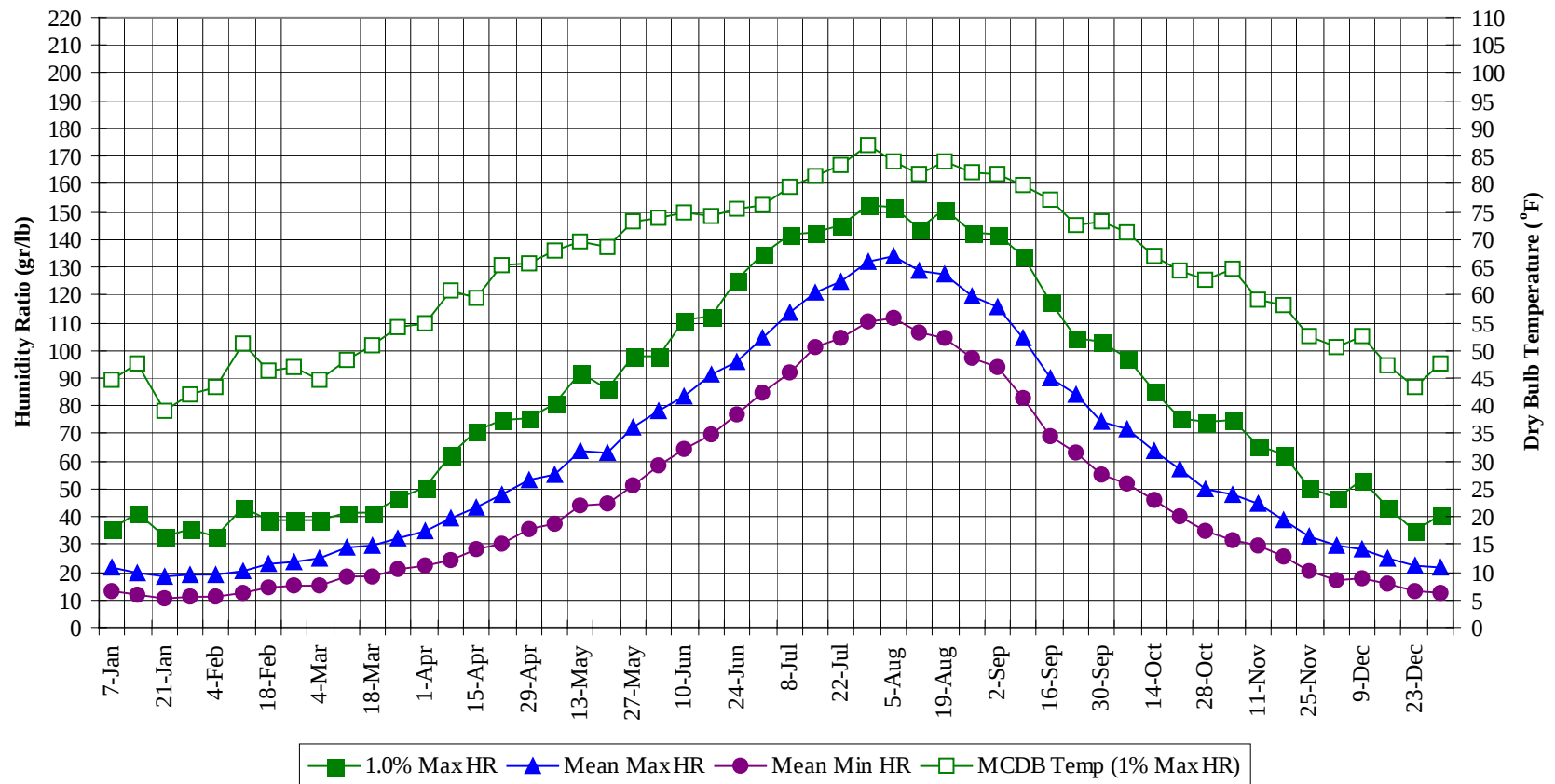
Annual Summary of Temperatures



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Long Term Humidity and Dry Bulb Temperature Summary



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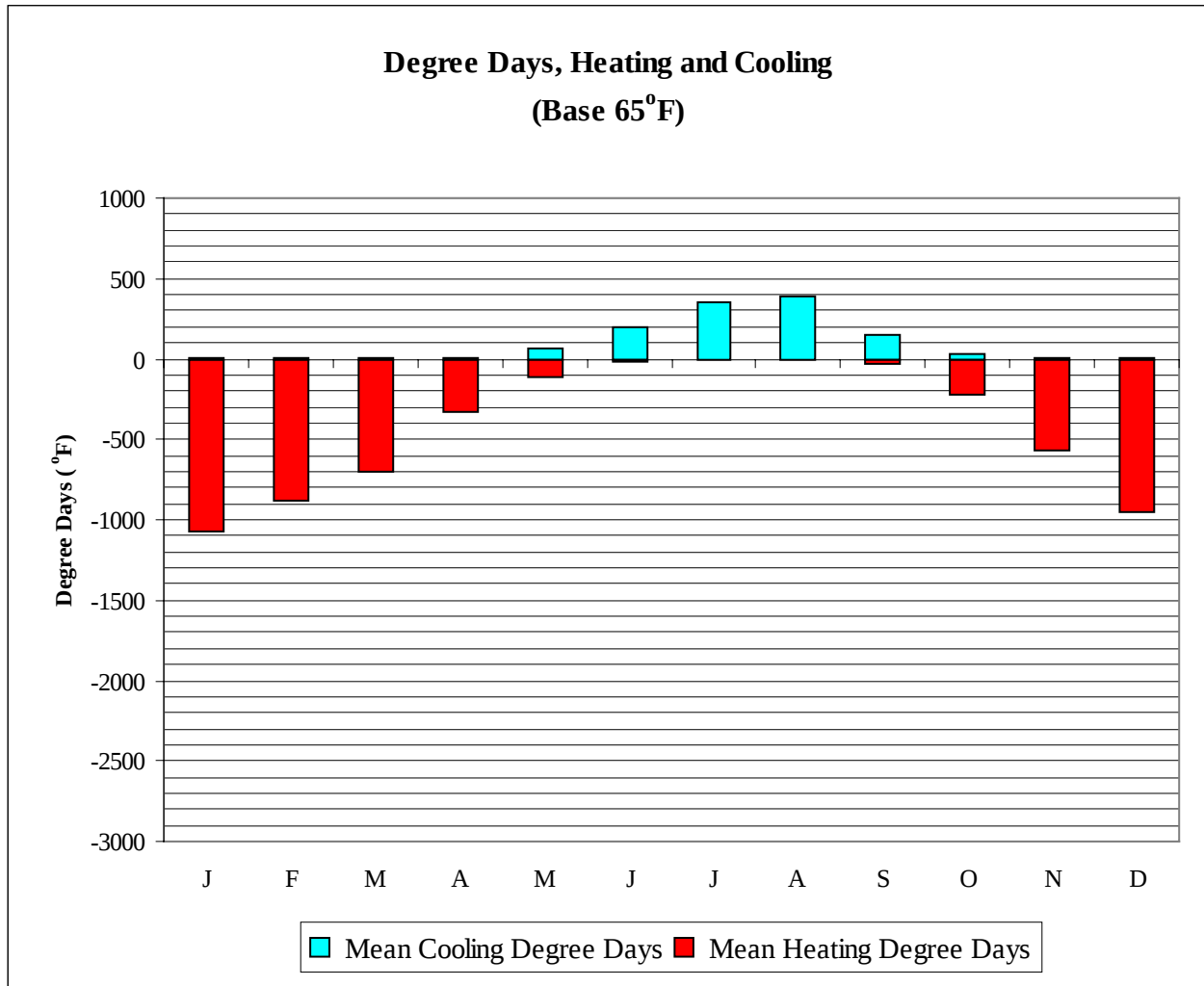
WMO No. 471170

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	59.0	47.3	36.1	23.9	7.0	35.7	44.6	21.5	13.0
14-Jan	50.0	45.0	34.4	22.0	9.0	41.3	47.6	19.9	11.6
21-Jan	43.0	38.0	33.3	21.1	7.0	32.9	39.0	18.3	10.6
28-Jan	46.0	40.6	34.2	21.5	7.0	35.7	42.0	19.2	11.3
4-Feb	45.0	39.9	34.4	21.0	7.0	32.9	43.2	19.2	11.0
11-Feb	50.0	46.1	36.5	23.6	9.0	43.4	51.1	20.5	12.6
18-Feb	54.0	45.9	40.3	27.0	10.0	38.5	46.5	22.9	14.4
25-Feb	52.0	44.9	40.6	27.8	12.0	38.5	46.8	23.9	14.9
4-Mar	52.0	42.5	42.3	28.7	12.0	38.5	44.7	24.9	15.0
11-Mar	59.0	48.6	46.7	32.7	23.0	41.3	48.3	29.1	18.5
18-Mar	59.0	45.7	48.5	34.2	23.0	41.3	50.8	29.7	18.7
25-Mar	63.0	51.0	51.7	36.6	27.0	46.9	54.3	32.0	21.0
1-Apr	63.0	49.6	54.4	38.6	30.0	50.4	55.0	34.8	22.1
8-Apr	72.0	57.2	58.4	41.7	34.0	62.3	60.6	39.1	24.6
15-Apr	73.0	56.9	62.0	45.1	37.0	70.7	59.5	43.2	28.3
22-Apr	75.0	58.7	63.4	46.9	41.0	74.9	65.5	47.9	30.5
29-Apr	75.0	59.2	66.2	49.8	43.0	75.6	65.8	53.3	35.4
6-May	77.0	60.1	67.6	51.6	45.0	80.5	68.1	55.0	37.7
13-May	79.0	63.3	71.2	54.7	48.0	91.7	69.7	63.6	44.0
20-May	82.0	62.9	71.1	55.2	48.0	86.1	68.8	63.2	44.6
27-May	82.0	65.7	74.5	58.0	52.0	98.0	73.4	72.0	50.9
3-Jun	84.0	67.5	76.1	60.6	55.0	98.0	73.9	78.0	58.8
10-Jun	84.0	67.9	77.5	62.7	57.0	111.3	75.0	83.6	64.2
17-Jun	88.0	69.2	80.0	64.8	59.0	112.0	74.3	91.1	69.9
24-Jun	86.0	70.8	79.4	66.2	61.0	125.3	75.5	95.9	77.0
1-Jul	88.0	71.4	80.3	67.8	63.0	134.4	76.1	104.5	84.8
8-Jul	88.0	74.9	81.0	69.4	59.0	142.1	79.6	113.6	91.8
15-Jul	90.0	76.8	81.0	70.8	66.0	142.8	81.5	120.5	101.3
22-Jul	91.0	79.0	83.2	72.2	66.0	144.9	83.6	124.7	104.7
29-Jul	95.0	79.3	85.1	74.2	68.0	152.6	87.0	132.1	110.2
5-Aug	93.0	79.3	86.6	74.8	70.0	151.9	84.1	133.7	111.6
12-Aug	93.0	79.2	86.0	73.6	66.0	143.5	81.6	129.0	106.6
19-Aug	93.0	78.1	85.2	73.2	68.0	151.2	84.0	127.1	104.2
26-Aug	90.0	76.3	82.9	71.6	66.0	142.8	82.2	119.5	96.9
2-Sep	88.0	75.8	81.2	69.9	64.0	142.1	81.7	115.8	94.0
9-Sep	86.0	72.4	80.2	67.5	63.0	133.7	79.7	104.6	82.9
16-Sep	82.0	68.8	77.3	63.6	55.0	117.6	77.3	89.7	69.2
23-Sep	82.0	68.2	76.3	61.0	54.0	104.3	72.6	83.9	62.7
30-Sep	81.0	66.4	74.1	58.1	52.0	102.9	73.2	74.3	54.9
7-Oct	79.0	66.0	71.5	56.1	48.0	97.3	71.4	71.6	52.0
14-Oct	77.0	63.1	69.8	53.1	43.0	85.4	67.0	63.9	46.0
21-Oct	73.0	60.0	66.2	50.5	41.0	75.6	64.4	57.4	39.9
28-Oct	72.0	58.5	62.4	47.0	34.0	74.2	62.7	50.2	34.9
4-Nov	70.0	58.1	59.7	44.5	34.0	74.9	64.6	47.8	31.8
11-Nov	68.0	57.1	57.1	42.7	28.0	65.8	59.1	45.0	29.6
18-Nov	63.0	55.0	52.5	39.1	23.0	62.3	58.1	38.8	25.7
25-Nov	59.0	50.3	48.1	34.6	21.0	50.4	52.5	32.9	20.1
2-Dec	55.0	47.9	44.6	31.0	18.0	46.9	50.7	29.4	17.4
9-Dec	55.0	50.1	42.9	30.4	16.0	53.2	52.6	28.4	17.8
16-Dec	52.0	45.9	40.1	27.9	10.0	43.4	47.2	25.0	15.9
23-Dec	48.0	42.0	38.1	26.0	14.0	35.0	43.4	22.5	13.2
31-Dec	50.0	44.9	36.6	23.4	7.0	40.6	47.8	21.9	12.4

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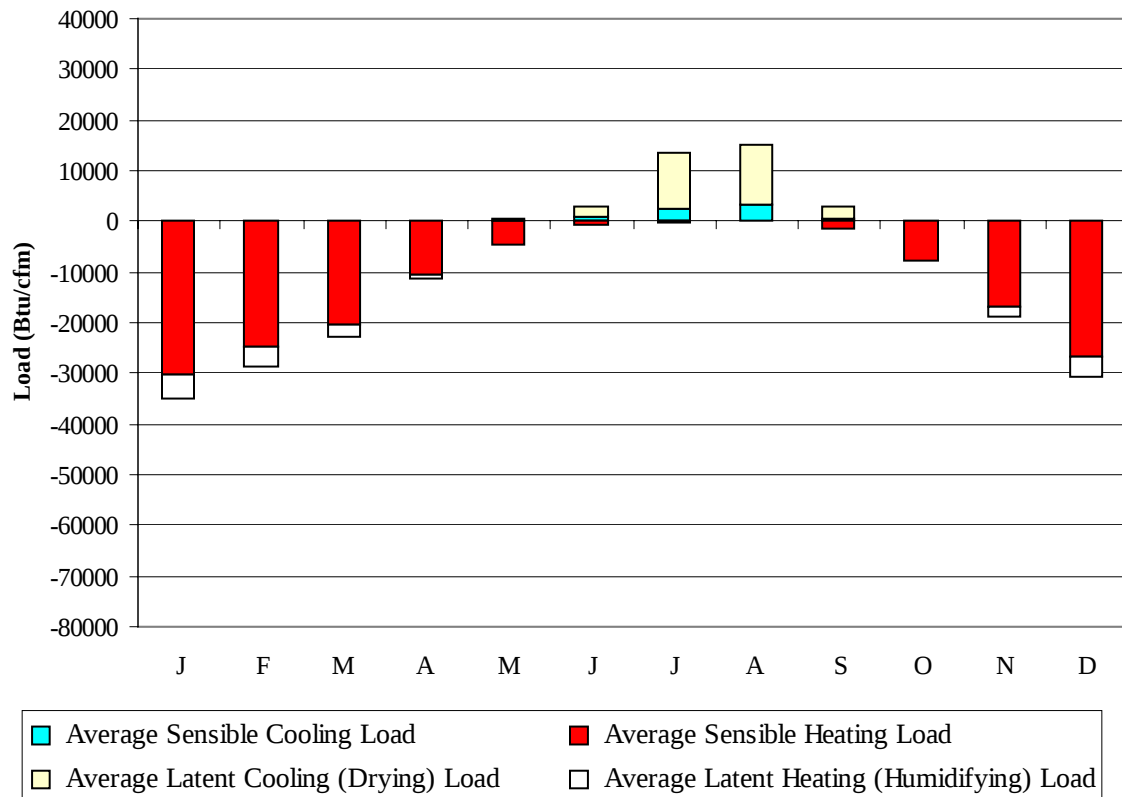


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1076
FEB	0	877
MAR	0	697
APR	11	333
MAY	71	119
JUN	193	13
JUL	353	1
AUG	386	0
SEP	154	27
OCT	24	220
NOV	1	571
DEC	0	948
ANN	1194	4882

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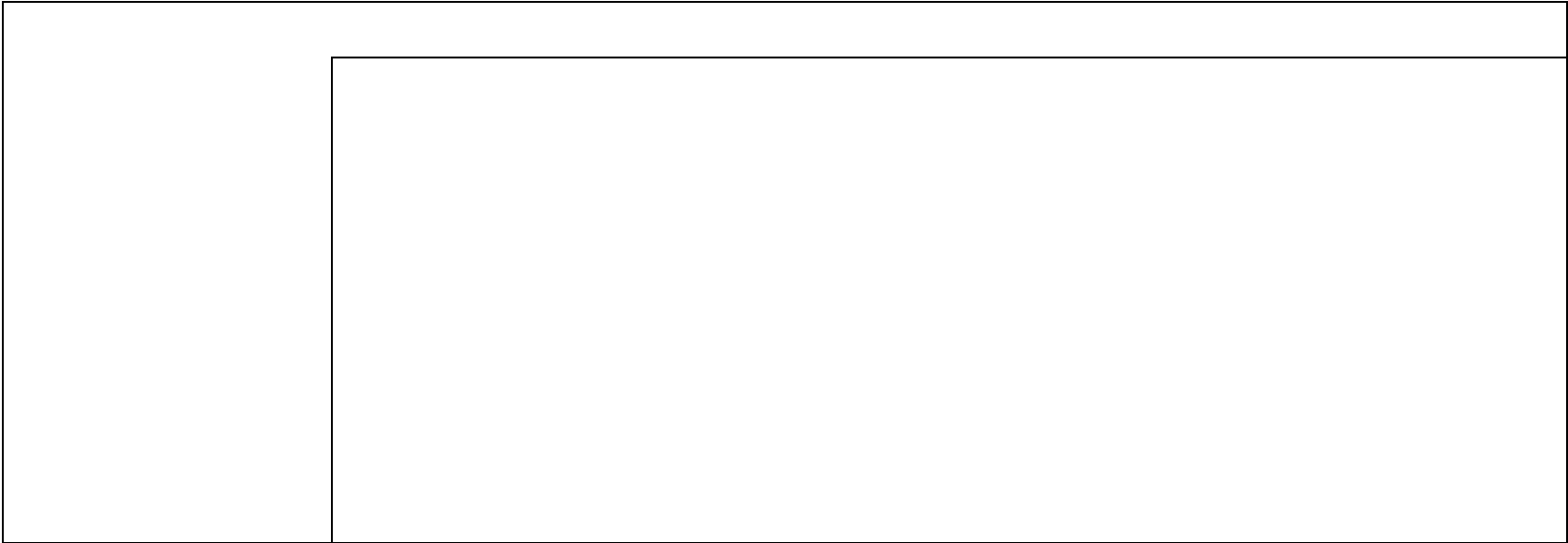
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	-30119	0	-4823
FEB	0	-24765	0	-3967
MAR	0	-20369	0	-2483
APR	13	-10685	2	-733
MAY	201	-4621	162	-40
JUN	763	-790	2190	0
JUL	2498	-66	11170	0
AUG	3115	-32	11830	0
SEP	489	-1383	2497	-3
OCT	27	-7640	95	-227
NOV	0	-16980	2	-1810
DEC	0	-26858	0	-3928
ANN	7106	-144308	27948	-18014

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

No Solar Radiation
Data Available

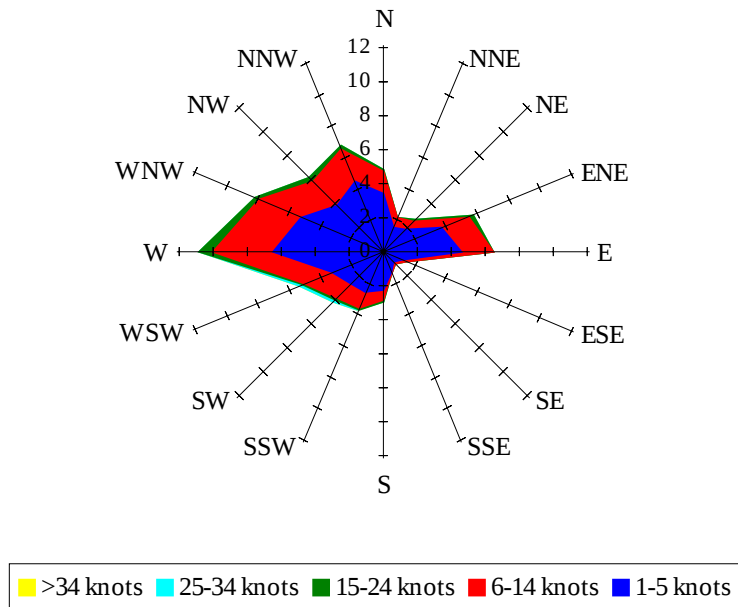


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

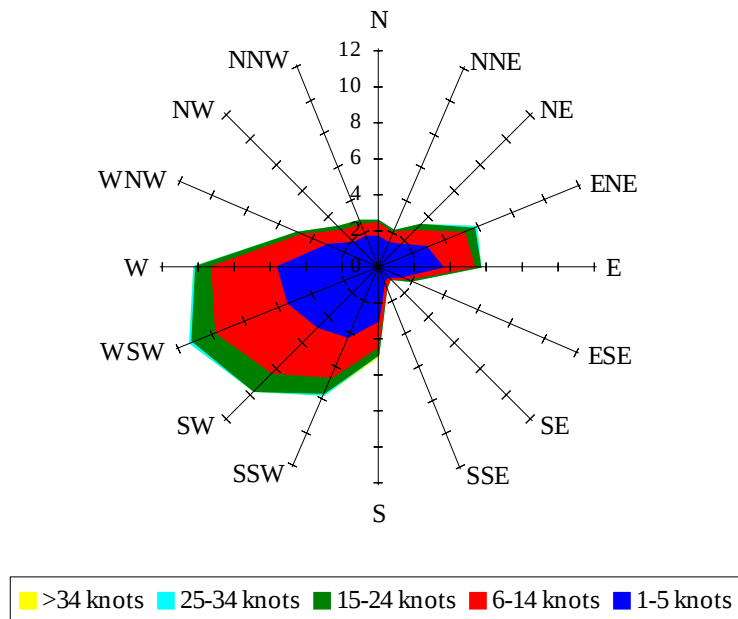
Labels of Percent Frequency on North Axis



Percent Calm = 27.08

Wind Summary - March, April, and May

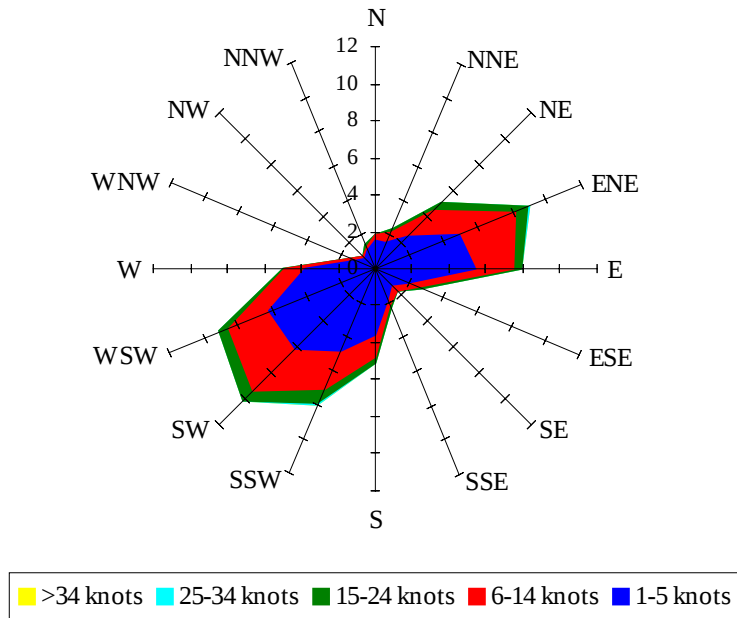
Labels of Percent Frequency on North Axis



Percent Calm = 22.20

Wind Summary - June, July, and August

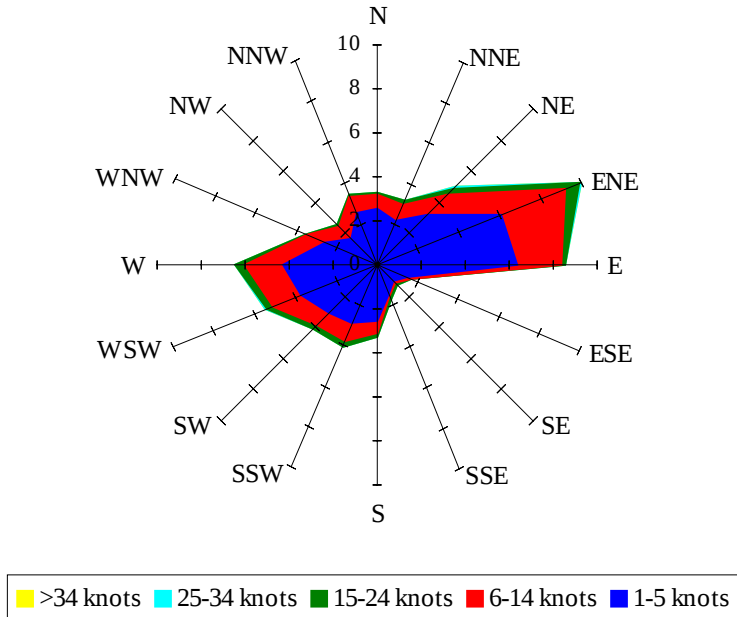
Labels of Percent Frequency on North Axis



Percent Calm = 25.92

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 32.58