

NORTH BAY, CA	
Latitude = 46.36 N	Station ID = ICAO_CYYB
Longitude = 79.42 W	Elevation = 1215 Feet
Period of Record = 1988 To 2017	Average Pressure = 28.66 inches Hg

Design Criteria Data

	Mean Coincident (Average) Values				
Dry Bulb Temperature (T)	Design Value (°F)	Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	88	72	96	12.3	WSW
0.4% Occurrence	82	68	84	10.7	WSW
1.0% Occurrence	79	66	81	10.1	SW
2.0% Occurrence	77	65	78	9.6	WSW
Mean Daily Range	16	-	-	-	N
97.5% Occurrence	-6	-7	3	7	N
99.0% Occurrence	-13	-14	2	5.6	N
99.6% Occurrence	-18	-18	1	5.9	N
Median of Extreme Lows	-26	-27	1	4.2	NNW

	Design Value (°F)	Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T _{wb})					
Median of Extreme Highs	75	83	120	11.7	SW
0.4% Occurrence	71	78	106	9.9	WSW
1.0% Occurrence	69	75	101	9.1	SW
2.0% Occurrence	68	74	97	8.8	SW

	Design Value (gr/lb)	Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)					
Median of Extreme Highs	123	78	0.78	9.7	SW
0.4% Occurrence	111	74	0.71	9.7	WSW
1.0% Occurrence	106	74	0.69	8	SW
2.0% Occurrence	97	72	0.62	8.7	WSW

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	3	85	20	261

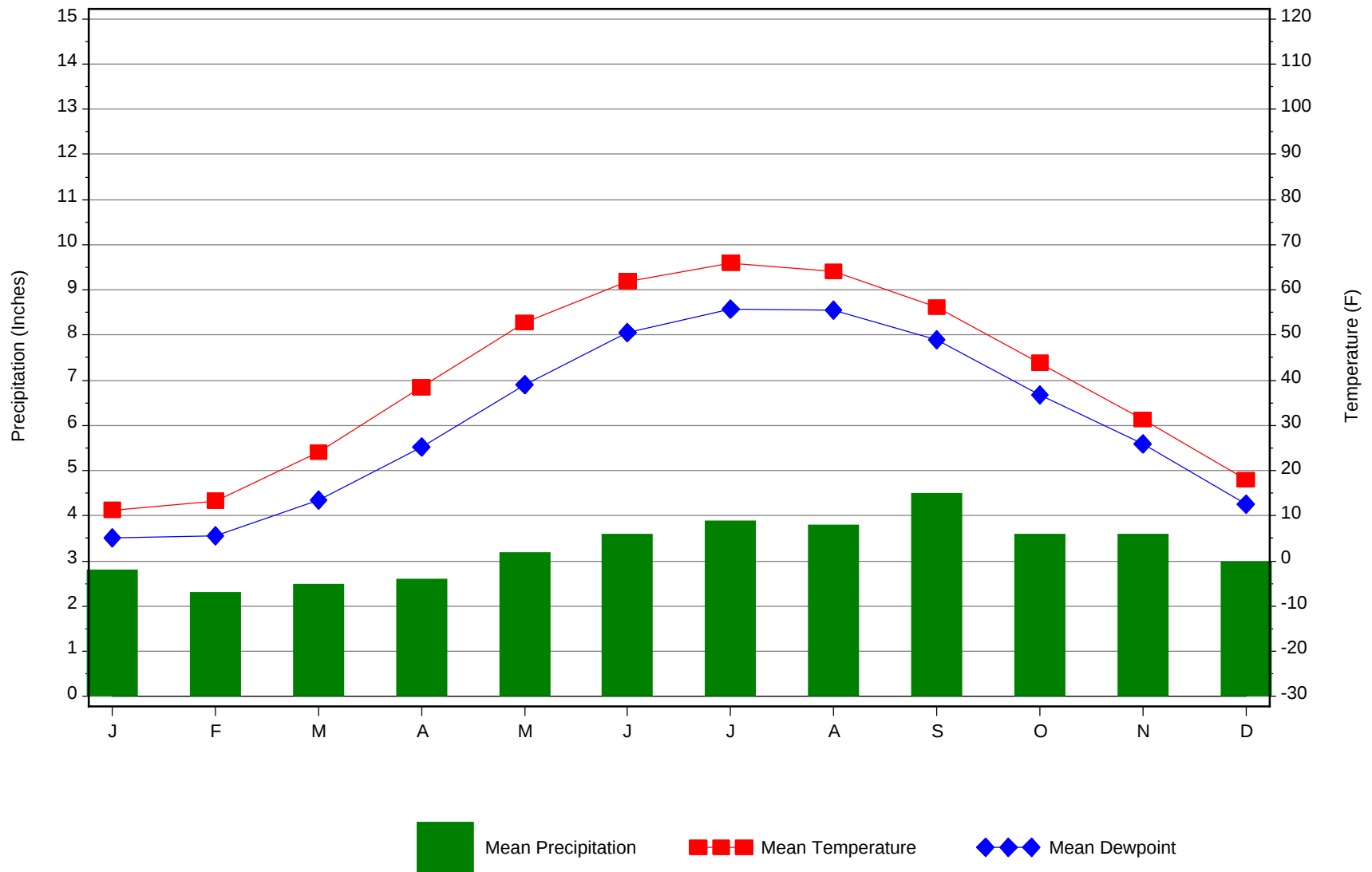
Other Site Data

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
4	N/A	N/A	0.4 + 0.1
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 (#)
42.7	N/A	N/A	50

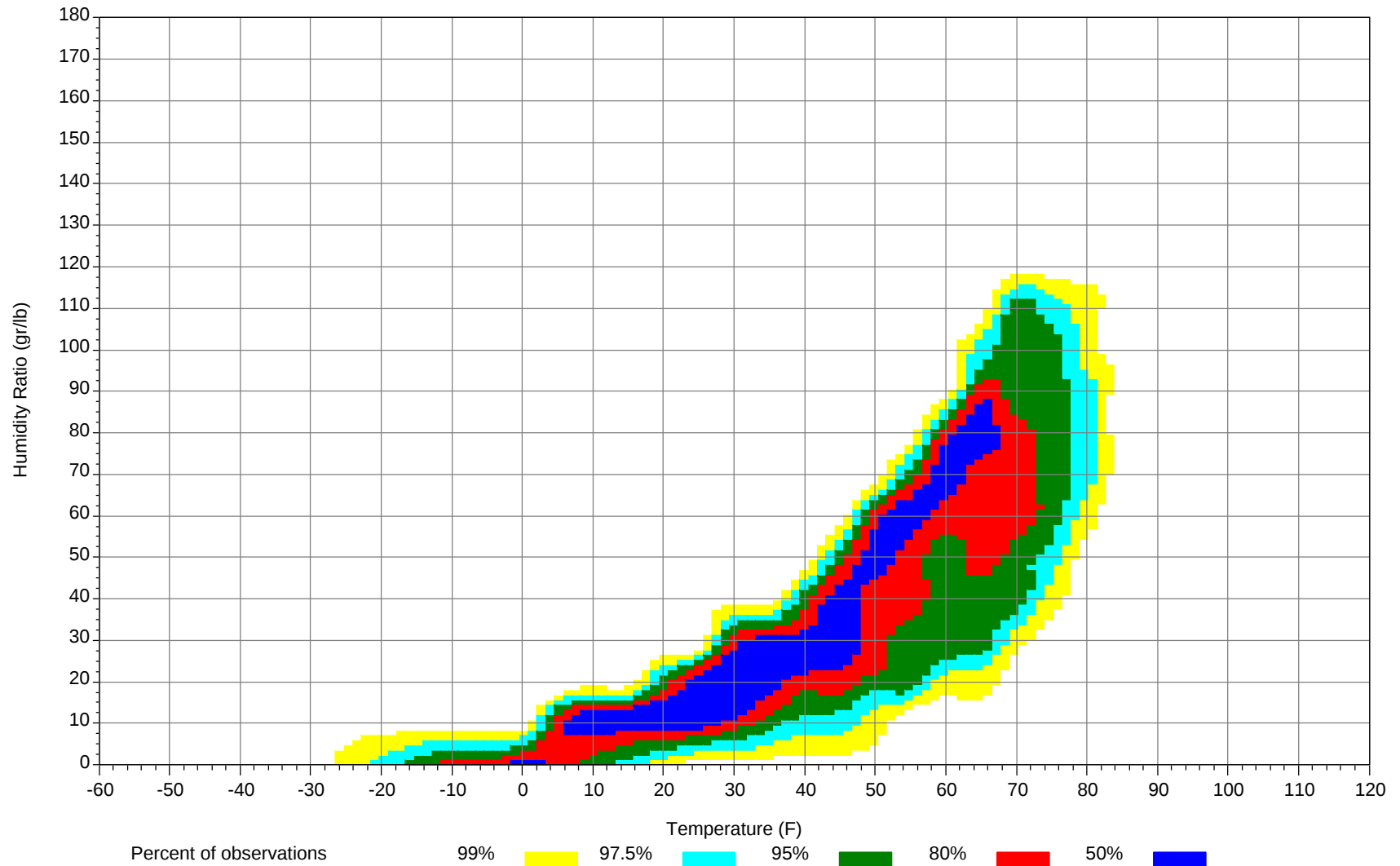
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



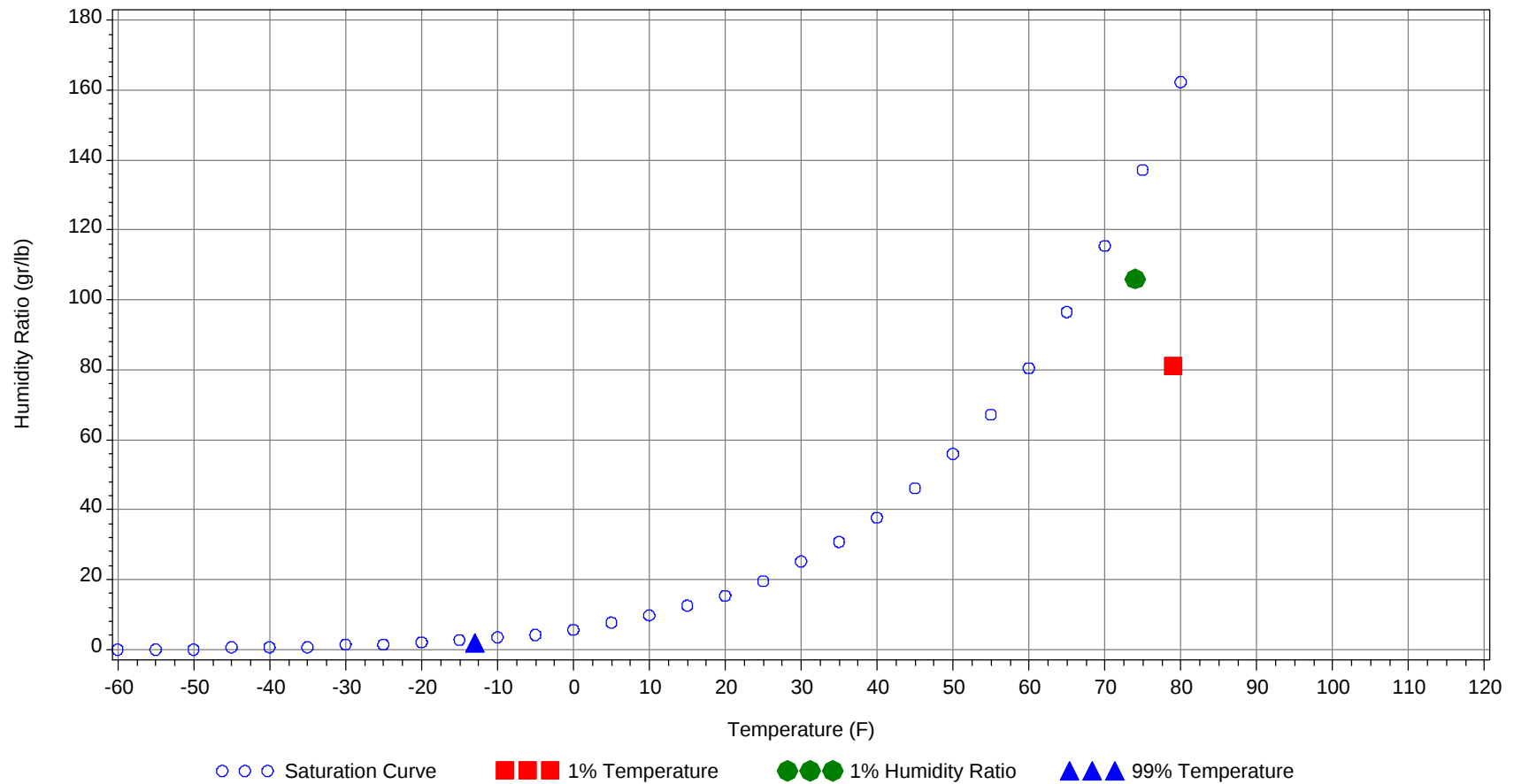
Average Annual Climate



Long Term Psychrometric Summary



Psychrometric Summary of Peak Design Values



	(° F) / (gr/lb)	MCDB (° F)	MCWB (° F)	MCDP (° F)	MCHR (gr/lb)	Enthalpy (btu/lb)
1.0% Dry Bulb	79.0		66		81.0	31.6
99.0% Dry Bulb	-13.0				2.0	-2.9
1.0% Humidity Ratio	106.0	74.0	69.9	67.9		34.4

Dry-Bulb Temperature Hours For An Average Year

Temperature Range (°F)	January					February					March				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
95/ 99															
90/ 94															
85/ 89															
80/ 84															
75/ 79												0	0	0	63
70/ 74												0	0	0	60.6
65/ 69												0	0	0	58.3
60/ 64											0	1	0	1	52.3
55/ 59											1	3	2	6	48.4
50/ 54	0		0	0	49.3	0	0	0	0	46.1	1	6	4	11	44.5
45/ 49	1	1	1	3	45.3	0	1	1	2	42	3	13	11	27	40.2
40/ 44	2	2	1	5	41.1	1	3	2	6	38.5	7	16	12	35	36.7
35/ 39	5	7	6	18	35.5	4	8	9	21	34	18	31	30	79	33
30/ 34	18	23	24	65	30.5	14	20	18	52	29.8	36	42	45	123	29
25/ 29	26	28	29	83	25.3	21	28	26	75	24.9	33	41	40	114	23.8
20/ 24	22	23	21	66	20.9	18	23	22	63	20.3	26	24	25	75	19.4
15/ 19	24	33	31	88	16.3	26	36	34	96	15.8	34	27	30	91	15.3
10/ 14	27	33	31	91	11	30	33	35	98	10.6	28	19	21	68	10.3
5/ 9	28	27	30	85	5.9	30	28	29	87	5.7	24	13	15	52	5.3
0/ 4	25	23	26	74	0.6	27	19	23	69	0.5	15	8	9	32	0.4
-5/ -1	15	13	14	42	-3.8	15	10	11	36	-3.9	10	3	3	16	-3.8
-10/ -6	20	16	16	52	-8.2	19	9	10	38	-8.2	8	1	1	10	-7.9
-15/-11	13	9	10	32	-12.8	9	3	3	15	-12.7	2	0	0	2	-12.5
-20/-16	11	6	7	24	-16.8	6	2	1	9	-16.9	1	0	0	1	-16.6
-25/-21	7	2	2	11	-22.1	2	0	0	2	-22	0	0	0	0	-21.7
-30/-26	3	1	0	4	-27.1	1	0	0	1	-27.2	0			0	-25.8
-35/-31	1	0	0	1	-31.2	0			0	-31.7					
-40/-36	0	0	0	0	-35.2	0			0	-35					

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.

Dry-Bulb Temperature Hours For An Average Year

	April					May					June				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
95/ 99															
90/ 94												0	0	0	71.5
85/ 89							0	0	0	69.3		2	0	2	70.4
80/ 84		0	0	0	62.1		3	1	4	65.4		14	6	20	67.6
75/ 79		1	0	1	61.7		11	5	16	61.2	1	29	16	46	64.5
70/ 74		3	2	5	56.8	1	23	14	38	57.9	9	49	36	94	61.6
65/ 69	0	4	2	6	53.8	4	24	18	46	56	23	41	39	103	59.5
60/ 64	1	10	6	17	50.3	18	40	35	93	53.5	52	50	58	160	56.8
55/ 59	5	15	12	32	47.3	35	45	45	125	49.7	63	34	48	145	52.7
50/ 54	9	30	21	60	42.8	52	42	47	141	46.2	53	15	26	94	48.5
45/ 49	18	36	34	88	39.7	44	31	40	115	41.5	25	5	9	39	43.7
40/ 44	23	31	32	86	36.7	34	15	21	70	38.2	9	1	2	12	39.9
35/ 39	48	49	51	148	33.3	37	10	16	63	34.5	5	1	2	8	36
30/ 34	58	34	46	138	29.1	21	3	5	29	30.3	1	0	0	1	32.6
25/ 29	43	17	22	82	24.1	3	0	1	4	25.9					
20/ 24	15	6	6	27	19.6	0			0	23					
15/ 19	12	4	4	20	15.5										
10/ 14	5	1	1	7	10.5										
5/ 9	2	0	1	3	6										
0/ 4	1		0	1	1.8										
-5/ -1															
-10/ -6															
-15/-11															
-20/-16															
-25/-21															
-30/-26															
-35/-31															
-40/-36															

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Dry-Bulb Temperature Hours For An Average Year

	July					August					September				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
95/ 99		0		0	73										
90/ 94		1	0	1	72.5		0	0	0	71.6					
85/ 89		4	1	5	70.6		3	0	3	72		0	0	0	67.7
80/ 84		19	8	27	68.1		13	5	18	68.7		3	1	4	68
75/ 79	1	49	27	77	65.4	1	38	18	57	66	0	11	4	15	66.4
70/ 74	16	73	58	147	63.3	12	63	45	120	63.9	2	28	15	45	63.5
65/ 69	45	47	52	144	61.3	35	53	47	135	61.8	12	32	24	68	61.5
60/ 64	81	38	59	178	58.3	74	52	69	195	58.6	33	51	46	130	58
55/ 59	64	14	33	111	54.2	66	20	44	130	54.3	47	52	53	152	53.5
50/ 54	33	2	9	44	50	41	5	16	62	50	56	34	45	135	49.2
45/ 49	7	0	1	8	45.5	17	1	4	22	45.2	44	18	30	92	44.4
40/ 44	1		0	1	41.2	2	0	0	2	41.3	22	7	11	40	40.2
35/ 39	0		0	0	38	0			0	39	17	3	9	29	36.1
30/ 34			0	0	34						7	0	2	9	31.6
25/ 29											1		0	1	26.1
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															

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.

Dry-Bulb Temperature Hours For An Average Year

Temperature Range (°F)	October					November					December				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
95/ 99															
90/ 94															
85/ 89															
80/ 84															
75/ 79		1	0	1	64.8										
70/ 74		5	1	6	60.7		0		0	58.5					
65/ 69	1	7	3	11	59.1		0	0	0	59.6					
60/ 64	5	16	12	33	56	0	1	0	1	54.3					
55/ 59	15	25	20	60	52.6	2	3	2	7	51.1	0			0	52.7
50/ 54	26	38	34	98	48.2	5	10	8	23	48.2	0	0	1	1	50
45/ 49	40	53	46	139	43.5	12	20	17	49	43.8	1	2	1	4	44.5
40/ 44	37	37	38	112	39.3	16	21	16	53	39.6	3	5	2	10	40.1
35/ 39	52	40	50	142	35	35	46	43	124	35.1	11	17	16	44	35.7
30/ 34	46	21	32	99	30.3	59	57	58	174	30.4	36	40	37	113	30.7
25/ 29	22	5	11	38	25.6	46	38	45	129	25.2	35	36	39	110	25.5
20/ 24	4	0	1	5	21.3	23	18	17	58	20.7	24	27	24	75	20.8
15/ 19	1		0	1	18.1	20	14	17	51	16.4	34	38	36	108	16.3
10/ 14						12	7	10	29	11.4	27	28	30	85	11.2
5/ 9						6	2	4	12	6.5	25	21	24	70	5.9
0/ 4						3	1	2	6	1.4	20	17	16	53	0.7
-5/ -1						1	0	0	1	-3.5	9	7	9	25	-3.7
-10/ -6						0	0	0	0	-8.5	11	6	8	25	-7.9
-15/-11						0			0	-10	6	3	3	12	-12.7
-20/-16											3	1	1	5	-16.7
-25/-21											1	0	1	2	-22.1
-30/-26											1	0	0	1	-27.2
-35/-31											0			0	-30.5
-40/-36															

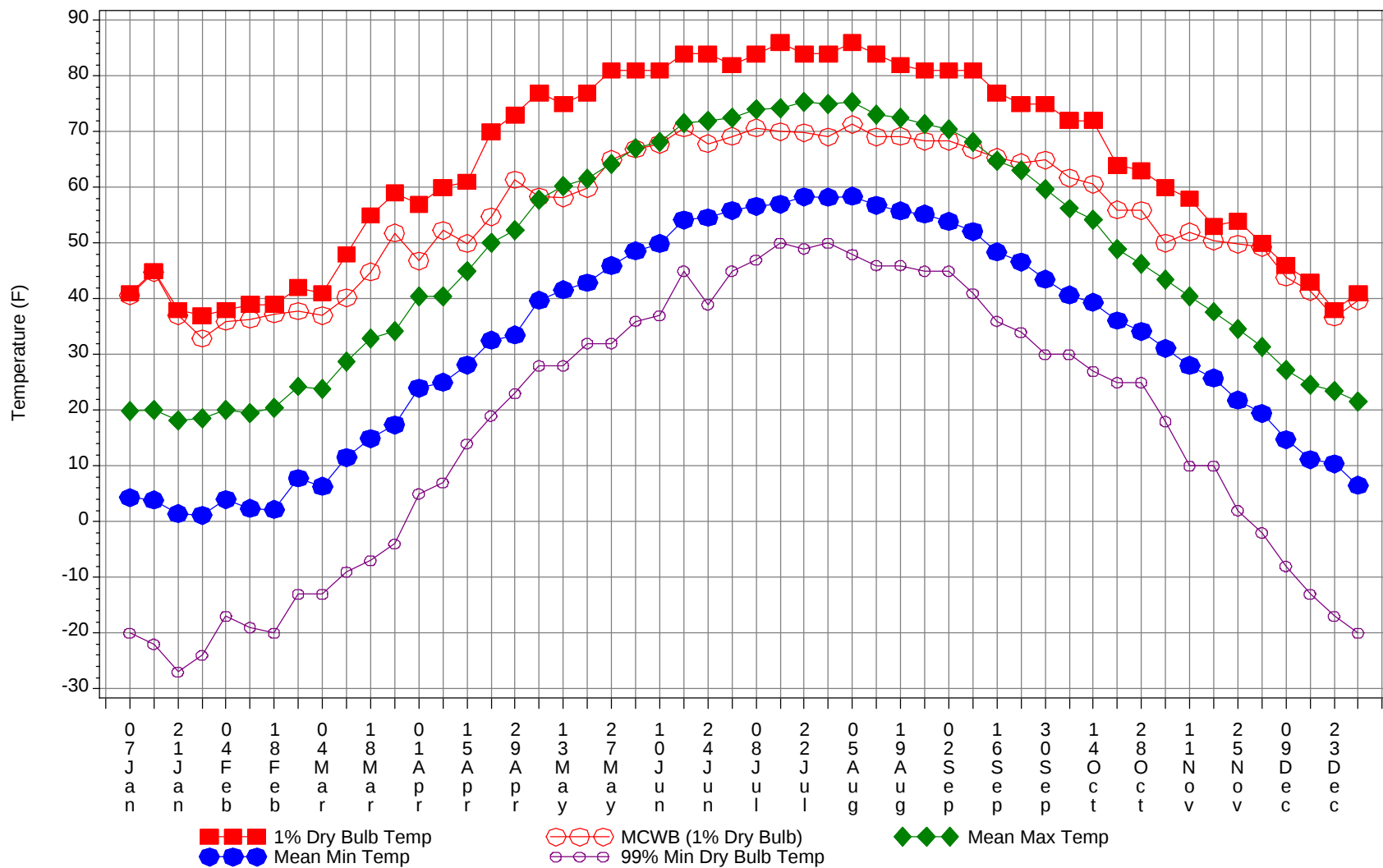
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Dry-Bulb Temperature Hours For An Average Year

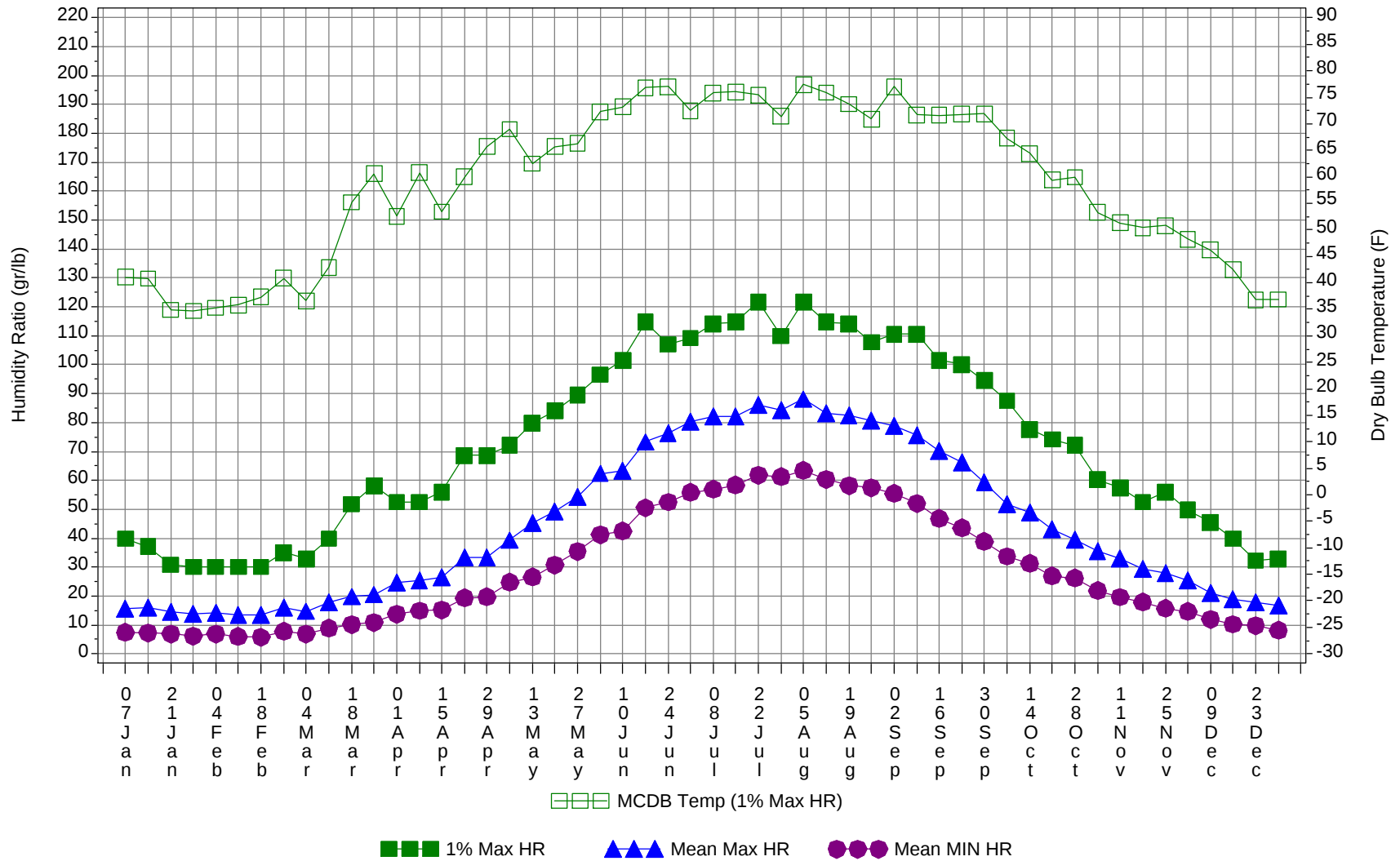
Temperature Range (° F)	Annual				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)
95/ 99		0		0	73
90/ 94		1	0	1	72.2
85/ 89		9	2	11	70.8
80/ 84		52	19	71	67.9
75/ 79	3	140	70	213	65.1
70/ 74	40	245	170	455	62.6
65/ 69	119	208	185	512	60.5
60/ 64	265	259	285	809	57.2
55/ 59	296	211	259	766	52.6
50/ 54	277	182	210	669	47.7
45/ 49	212	179	195	586	42.7
40/ 44	156	138	138	432	38.6
35/ 39	232	213	230	675	34.5
30/ 34	294	241	267	802	30
25/ 29	230	193	212	635	24.8
20/ 24	132	121	117	370	20.4
15/ 19	151	152	151	454	16
10/ 14	129	120	128	377	10.8
5/ 9	116	92	103	311	5.8
0/ 4	91	69	76	236	0.6
-5/ -1	50	32	37	119	-3.8
-10/ -6	59	33	35	127	-8.1
-15/-11	29	15	15	59	-12.7
-20/-16	22	9	10	41	-16.8
-25/-21	10	3	3	16	-22.1
-30/-26	5	1	1	7	-27.1
-35/-31	1	0	0	1	-31.1
-40/-36	0	0	0	0	-35.1

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Annual Summary of Temperatures



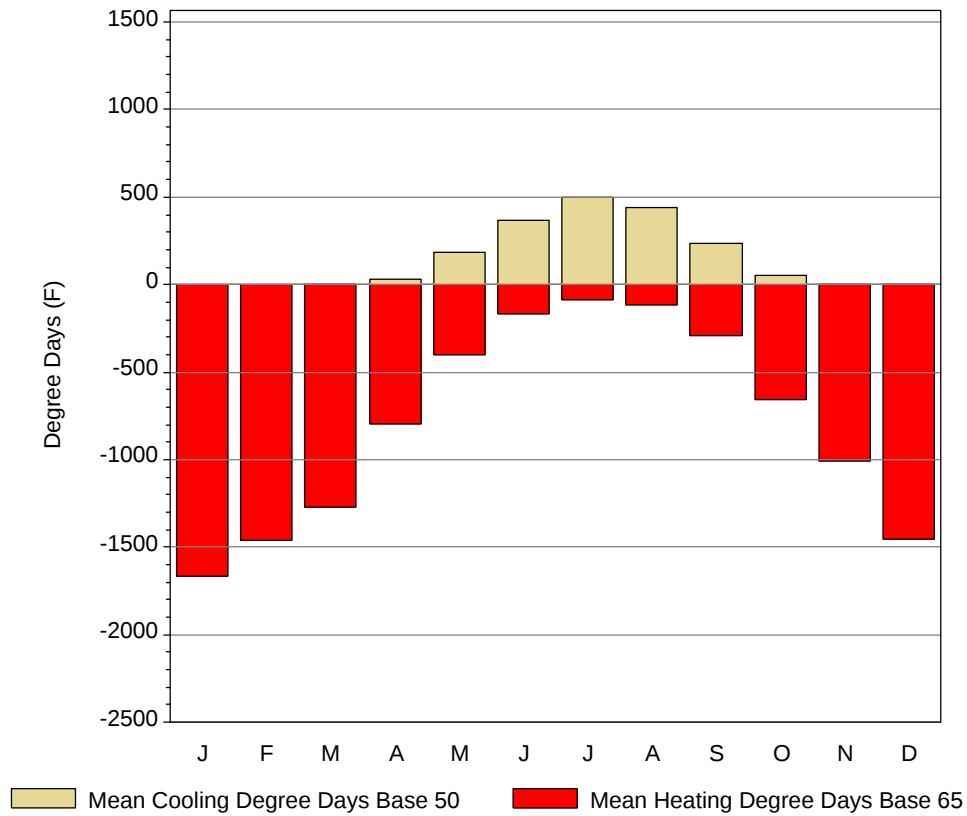
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

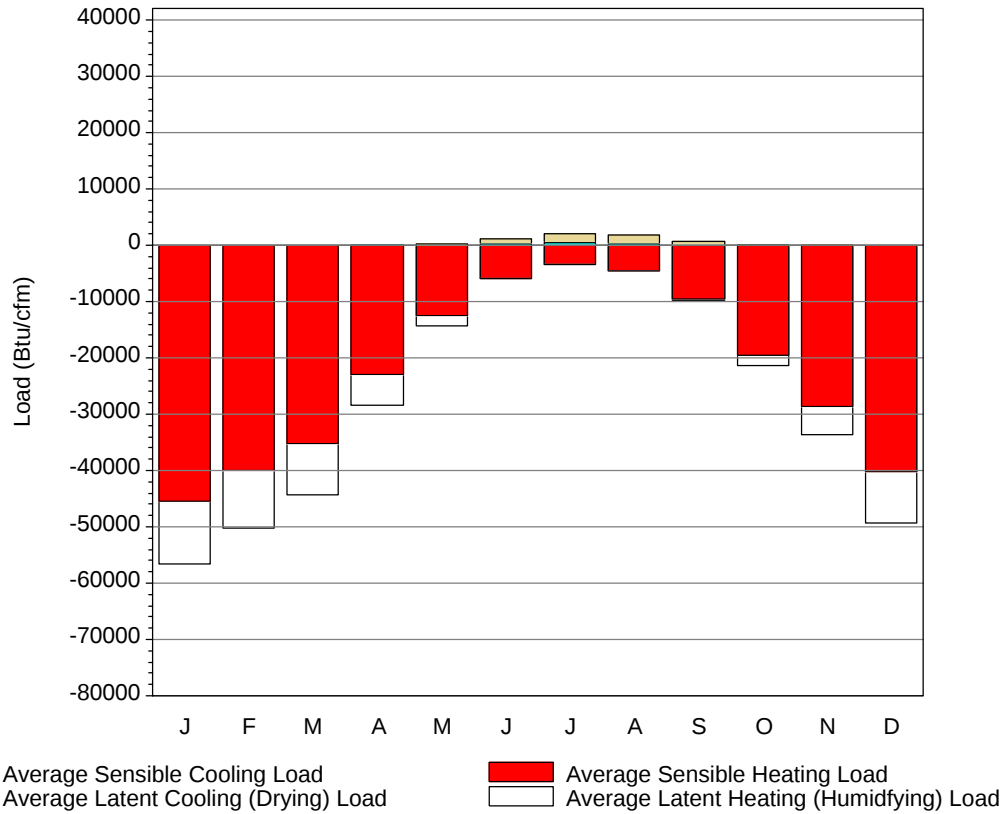
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	41	40.6	19.8	4.3	-20	39.9	41.1	15.5	7.4
14-Jan	45	44.7	20.1	3.9	-22	37.1	40.8	15.9	7.3
21-Jan	38	37	18.2	1.4	-27	30.8	34.9	14.5	6.8
28-Jan	37	32.9	18.6	1.1	-24	30.1	34.7	13.7	6.2
4-Feb	38	36	20.1	4	-17	30.1	35.3	14.2	6.8
11-Feb	39	36.3	19.4	2.4	-19	30.1	35.8	13.4	6
18-Feb	39	37.3	20.4	2.2	-20	30.1	37.3	13.6	5.7
25-Feb	42	37.8	24.3	7.8	-13	35	40.9	16	7.7
4-Mar	41	37	23.8	6.3	-13	32.9	36.6	14.7	6.8
11-Mar	48	40.2	28.7	11.5	-9	39.9	42.9	17.9	8.9
18-Mar	55	44.8	32.8	14.9	-7	51.8	55.2	19.8	10.1
25-Mar	59	51.8	34.3	17.4	-4	58.1	60.6	20.5	10.9
1-Apr	57	46.8	40.4	24	5	52.5	52.6	24.7	13.8
8-Apr	60	52.3	40.4	25	7	52.5	60.8	25.4	14.9
15-Apr	61	49.9	44.9	28.1	14	56	53.4	26.6	15.2
22-Apr	70	54.7	50	32.6	19	68.6	60	33.4	19.3
29-Apr	73	61.4	52.3	33.5	23	68.6	65.7	33.3	19.7
6-May	77	58.3	57.8	39.7	28	72.1	69	39.3	24.8
13-May	75	58.1	60.2	41.6	28	79.8	62.5	45.2	26.5
20-May	77	59.8	61.5	42.9	32	84	65.7	49.3	30.7
27-May	81	65	64.3	46	32	89.6	66.3	54.4	35.4
4-Jun	81	66.9	67.1	48.6	36	96.6	72.3	62.4	41.2
10-Jun	81	67.8	68.1	49.9	37	101.5	73.2	63.3	42.4
17-Jun	84	70.7	71.6	54.2	45	114.8	76.8	73.3	50.5
24-Jun	84	67.9	72	54.6	39	107.1	77	76.3	52.5
1-Jul	82	69.2	72.6	55.9	45	109.2	72.5	80.2	55.9
8-Jul	84	70.7	74	56.6	47	114.1	75.8	82	56.9
15-Jul	86	70	74.3	57	50	114.8	76	82.2	58.3
22-Jul	84	69.8	75.3	58.3	49	121.8	75.4	86	61.8
29-Jul	84	69.1	75	58.2	50	109.9	71.4	84.3	61.2
5-Aug	86	71.3	75.3	58.4	48	121.8	77.4	88.1	63.4
12-Aug	84	69.1	73.1	56.8	46	114.8	75.9	83.3	60.3
19-Aug	82	69.2	72.5	55.8	46	114.1	73.7	82.4	58.2
26-Aug	81	68.3	71.4	55.2	45	107.8	70.9	80.8	57.4
2-Sep	81	68.3	70.5	53.9	45	110.6	77	78.9	55.4
9-Sep	81	66.8	68.1	52.1	41	110.6	71.7	75.6	52
16-Sep	77	65.4	64.7	48.4	36	101.5	71.6	70.2	46.8
23-Sep	75	64.5	63.1	46.6	34	100.1	71.8	66.3	43.6
30-Sep	75	64.9	59.6	43.5	30	94.5	71.9	59.3	38.9
7-Oct	72	61.7	56.2	40.7	30	87.5	67.3	51.9	33.7
14-Oct	72	60.6	54.3	39.4	27	77.7	64.4	49	31.2
21-Oct	64	56	48.9	36.1	25	74.2	59.4	43.1	26.9
28-Oct	63	55.9	46.3	34.2	25	72.1	59.9	39.6	26.2
4-Nov	60	50	43.4	31.1	18	60.2	53.3	35.5	21.9
11-Nov	58	52	40.4	28	10	57.4	51.3	33	19.6
18-Nov	53	50.4	37.7	25.8	10	52.5	50.4	29.5	17.9
25-Nov	54	49.8	34.6	21.8	2	56	50.8	27.8	15.7
2-Dec	50	49.3	31.3	19.4	-2	49.7	48.2	25.4	14.6
9-Dec	46	43.9	27.3	14.7	-8	45.5	46.2	21	11.9
16-Dec	43	41.3	24.6	11.1	-13	39.9	42.5	19	10.2
23-Dec	38	36.7	23.4	10.4	-17	32.2	36.8	17.8	9.7
31-Dec	41	39.6	21.6	6.5	-20	32.9	36.9	16.8	8.2

Degree Days, Heating and Cooling (Base 65 F) & Cooling (Base 50F)



Month	Mean Cooling Degree Days (°F) Base 50	Mean Cooling Degree Days (°F) Base 65	Mean Heating Degree Days (°F) Base 65
JAN	0	0	1664.3
FEB	0	0	1461.4
MAR	3.7	0.3	1267.3
APR	32.3	2.8	799.1
MAY	185.3	25	402
JUN	370.3	71.4	164.4
JUL	497	114.4	83.8
AUG	441.4	86.3	113.5
SEP	232.6	27.6	293.4
OCT	55.6	2.9	659.8
NOV	4.5	0	1011
DEC	0.1	0	1457.3
ANN	1822.8	330.7	9377.3

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



Month	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	0	-45548	0	-10926
FEB	0	-40077	0	-10156
MAR	0	-35254	0	-9116
APR	6	-23013	0	-5356
MAY	64	-12546	87	-1647
JUN	256	-5860	872	-118
JUL	420	-3438	1690	-2
AUG	273	-4423	1650	-1
SEP	57	-9594	590	-188
OCT	1	-19467	15	-1905
NOV	0	-28538	1	-5067
DEC	0	-40183	0	-9157
ANN	1077	-267941	4905	-53639

Station Information		Shading Geometry in Dimensionless Units	
City, State, WBAN	N/A	N/A	N/A
Lat, Lon, Elev	N/A	N/A	N/A
Press Stn Type	N/A	N/A	N/A

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Global													
	Std.Dev.													
	Minimum													
	Maximum													
	Diffuse													
Clear Day	Global													
NORTH	Global													
	Diffuse													
Clear Day	Global													
EAST	Global													
	Diffuse													
Clear Day	Global													
SOUTH	Global													
	Diffuse													
Clear Day	Global													
WEST	Global													
	Diffuse													
Clear Day	Global													

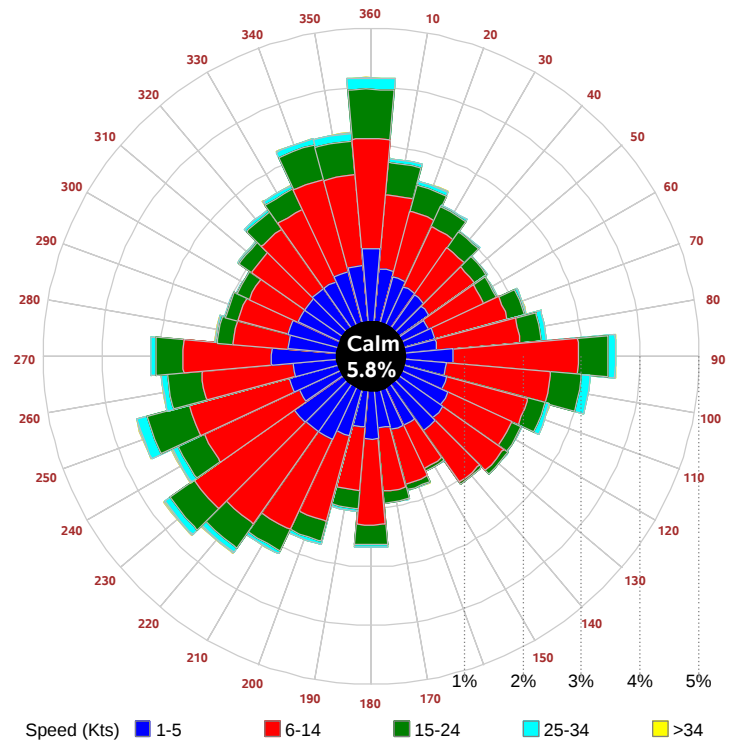
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Unshaded													
NORTH	Unshaded													
	Shaded													
EAST	Unshaded													
	Shaded													
SOUTH	Unshaded													
	Shaded													
WEST	Unshaded													
	Shaded													

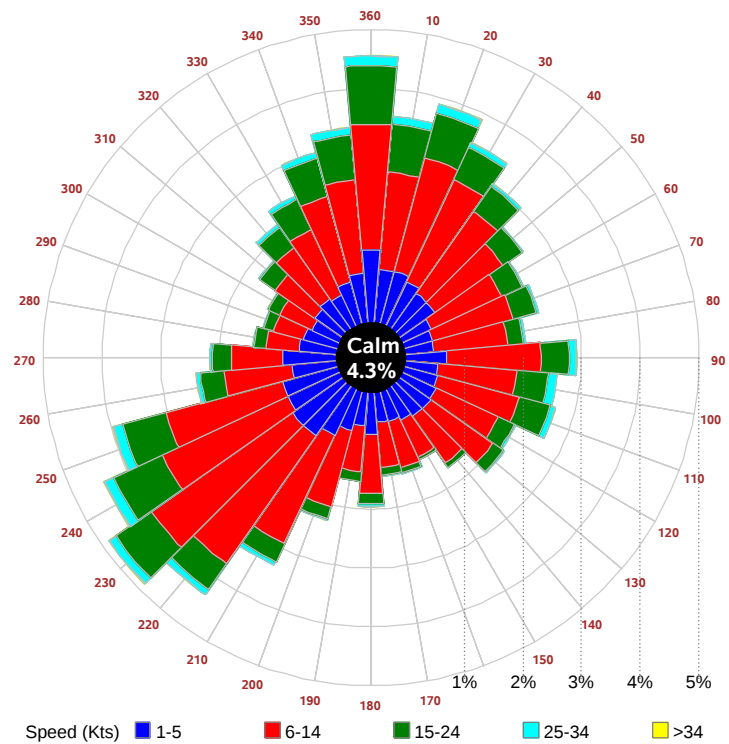
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9												
		March						June				
		9am	11am	1pm	3pm	5pm		9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear											
	M.Cloudy											
SOUTH	M.Clear											
	M.Cloudy											
WEST	M.Clear											
	M.Cloudy											
M.Clear	(% hrs)											

		Sept						Dec				
		9am	11am	1pm	3pm	5pm		9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear											
	M.Cloudy											
SOUTH	M.Clear											
	M.Cloudy											
WEST	M.Clear											
	M.Cloudy											
M.Clear	(% hrs)											

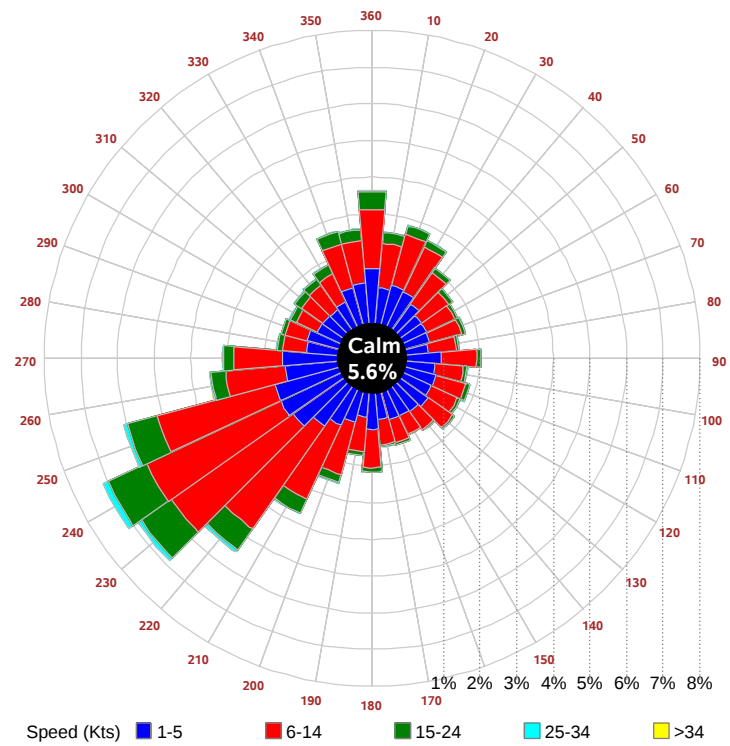
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

