

CHARLO AUTO NB, CA

Latitude = 47.98 N

Longitude = 66.33 W

Period of Record = 1988 To 2017

Station ID = ICAO_CYCL

Elevation = 138 Feet

Average Pressure = 29.79 inches Hg

Design Criteria Data

Dry Bulb Temperature (T)	Mean Coincident (Average) Values				
	Design Value (°F)	Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	90	71	82	9.4	W
0.4% Occurrence	82	67	76	8.4	W
1.0% Occurrence	79	66	74	8.1	W
2.0% Occurrence	76	64	72	7.8	W
Mean Daily Range	16	-	-	-	W
97.5% Occurrence	-3	-4	3	8.3	W
99.0% Occurrence	-9	-9	2	7.7	W
99.6% Occurrence	-13	-14	2	8.1	W
Median of Extreme Lows	-18	-18	1	7.2	W

Wet Bulb Temperature (T _{wb})	Design Value (°F)	Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	73	83	104	7.6	W
0.4% Occurrence	70	78	95	6.6	W
1.0% Occurrence	68	75	90	6.3	W
2.0% Occurrence	66	72	85	6.1	W

Humidity Ratio (HR)	Design Value (gr/lb)	Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	112	78	0.74	5.9	W
0.4% Occurrence	100	74	0.67	5.7	WSW
1.0% Occurrence	94	72	0.62	6.1	W
2.0% Occurrence	89	71	0.6	5.3	E

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	3	82	11	167

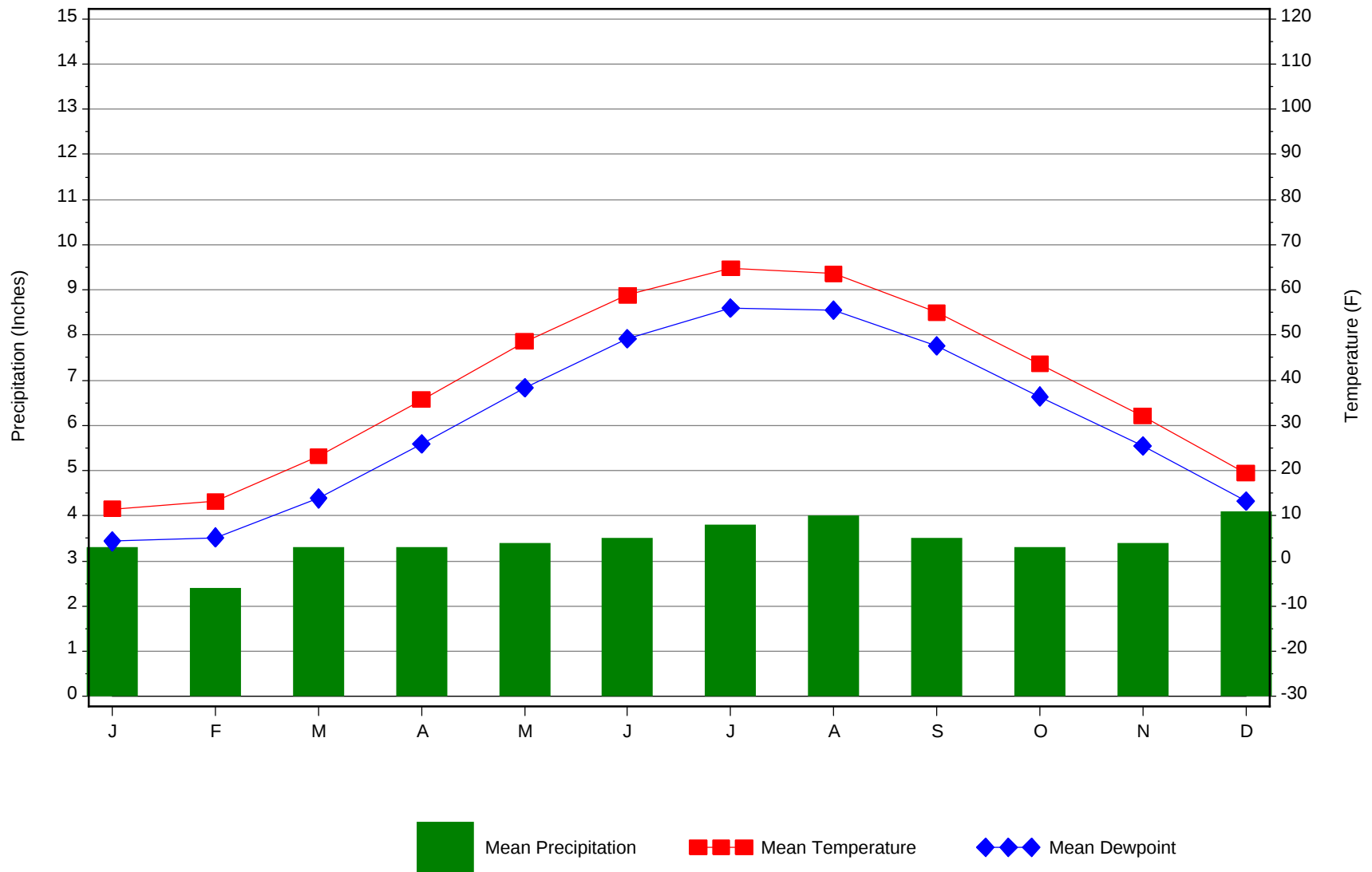
Other Site Data

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	0.2 + 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 (#)
41.6	N/A	N/A	54

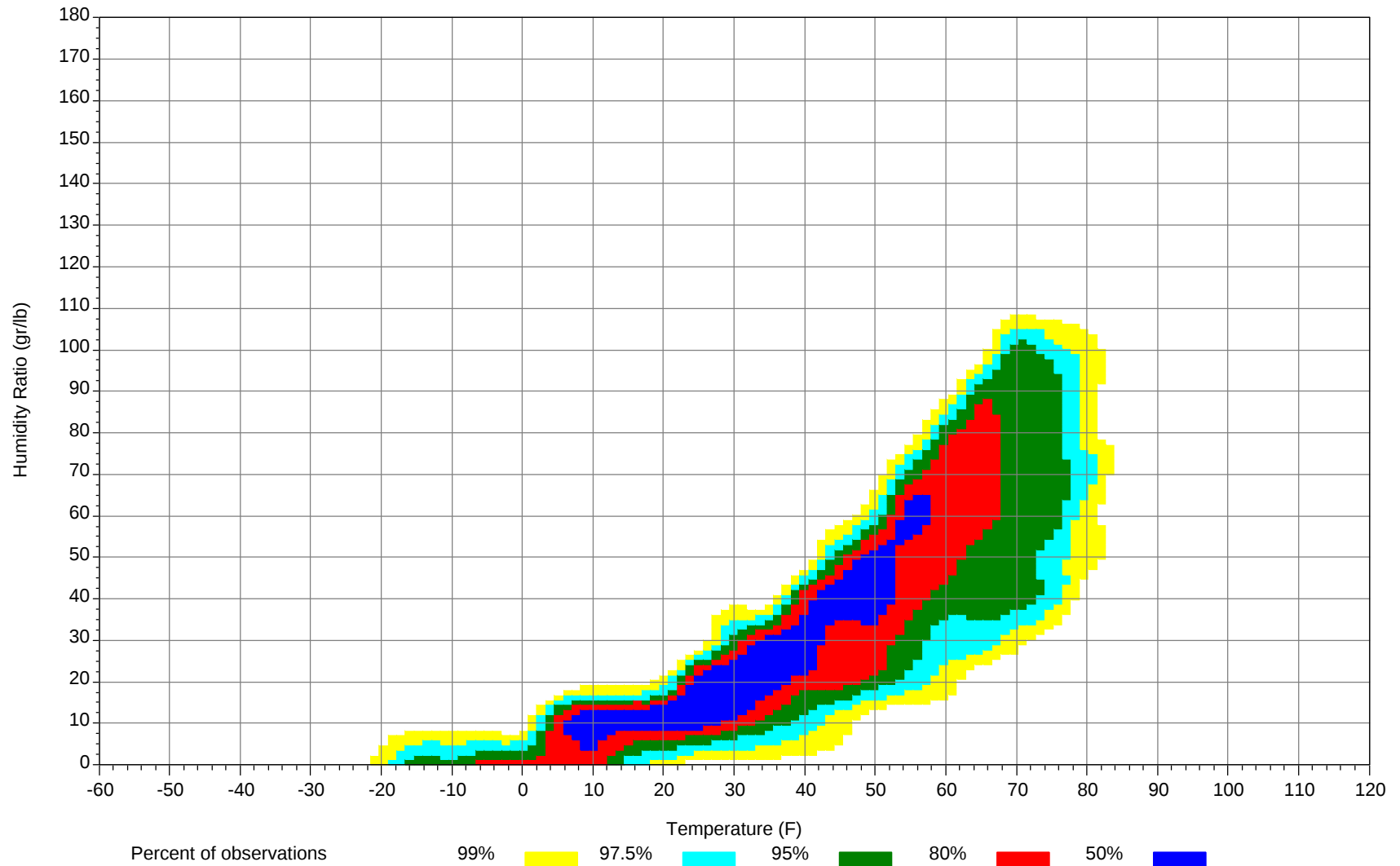
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



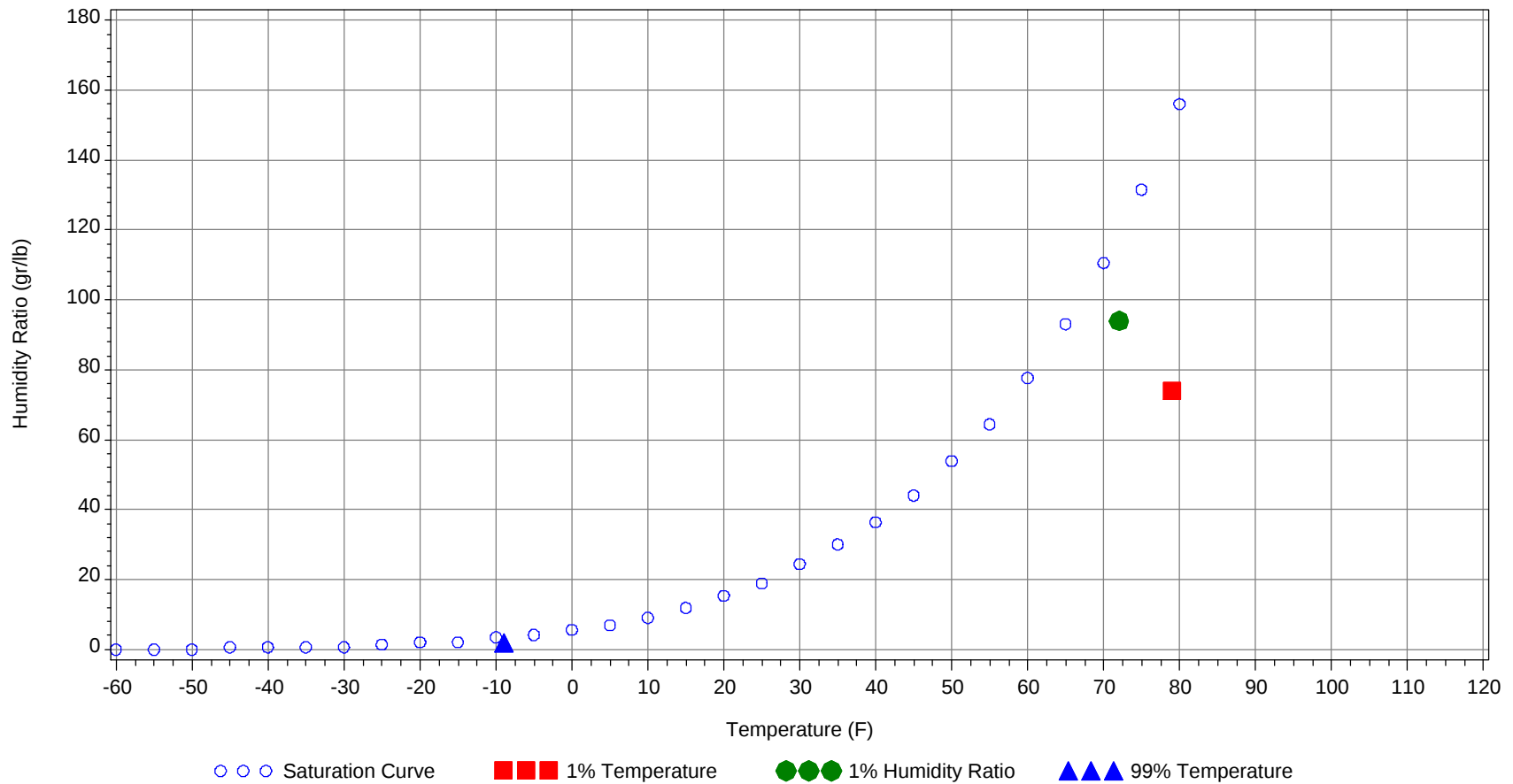
Average Annual Climate



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		74.0	30.5
99.0% Dry Bulb	-9.0				2.0	-1.9
1.0% Humidity Ratio	94.0	72.0	67.3	65.0		32.0

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															
70/ 74												0		0	57
65/ 69												0	0	0	54
60/ 64												1	0	1	51
55/ 59		0		0	46.7						0	0	1	1	47.2
50/ 54		0		0	45	0	0	0	0	43.3	0	2	1	3	43.4
45/ 49	0	0	0	0	45.4	1	0	1	2	40	0	3	3	6	38.7
40/ 44	1	1	0	2	39	1	2	1	4	38.2	2	12	6	20	35.5
35/ 39	4	5	5	14	34.8	4	7	5	16	34.4	11	33	24	68	32.8
30/ 34	15	17	17	49	30.2	12	20	18	50	29.8	35	56	57	148	29.3
25/ 29	19	25	23	67	25.1	18	28	25	71	24.8	48	44	53	145	24.4
20/ 24	22	27	26	75	20.4	17	25	25	67	20.1	30	30	31	91	19.7
15/ 19	26	39	34	99	15.8	26	37	36	99	15.5	36	30	31	97	15.3
10/ 14	28	40	36	104	10.6	32	36	36	104	10.5	30	19	22	71	10.4
5/ 9	37	35	37	109	5.7	31	31	35	97	5.5	24	11	11	46	5.4
0/ 4	34	27	32	93	0.5	29	21	21	71	0.5	16	5	6	27	0.6
-5/ -1	20	13	15	48	-3.8	19	8	11	38	-3.8	8	1	2	11	-3.7
-10/ -6	22	11	14	47	-8	20	7	8	35	-8	5	1	1	7	-7.8
-15/-11	12	4	5	21	-12.7	10	2	2	14	-12.5	2	0	0	2	-12.4
-20/-16	6	2	3	11	-16.8	4	1	1	6	-16.6	1			1	-16.4
-25/-21	2	1	0	3	-21.7	1	0		1	-22.3	0			0	-21

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	64.7		1	0	1	71.1
85/ 89							0	0	0	64.3		2	1	3	67.5
80/ 84							2	1	3	60.6		10	5	15	64.9
75/ 79		0	0	0	56.9	0	4	3	7	59.6	0	18	9	27	63
70/ 74		1	0	1	53.8	0	10	5	15	56.3	3	32	19	54	60.4
65/ 69		1	0	1	51.2	2	12	7	21	54.7	10	35	26	71	58.8
60/ 64		3	1	4	47.8	4	25	16	45	52.2	30	52	47	129	56.5
55/ 59	0	6	4	10	45.3	10	43	28	81	49.1	53	50	58	161	53.2
50/ 54	0	15	8	23	42	24	62	49	135	46.6	69	31	48	148	49.5
45/ 49	4	31	18	53	39	60	56	69	185	43.4	48	7	22	77	44.9
40/ 44	12	40	28	80	36.6	64	21	40	125	39.6	18	0	3	21	40.4
35/ 39	52	74	80	206	33.8	55	11	24	90	35.6	6		0	6	36.4
30/ 34	94	54	75	223	30	24	2	6	32	30.7	1		0	1	30.9
25/ 29	52	12	21	85	24.8	5		0	5	27					
20/ 24	15	3	3	21	20										
15/ 19	7	1	1	9	15.3										
10/ 14	2	1	1	4	10.6										
5/ 9	1	0	0	1	5.6										
0/ 4	0			0	0.5										
-5/ -1	0			0	-4										
-10/ -6															
-15/-11															
-20/-16															
-25/-21															

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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	71										
90/ 94		1	0	1	71.1		1	0	1	69.5		0	0	0	74.1
85/ 89		4	1	5	69.9		4	2	6	70.2		1	0	1	71.3
80/ 84	0	17	8	25	68		12	5	17	68.3		2	1	3	68.1
75/ 79	2	44	22	68	64.9	1	32	16	49	65.5	1	8	3	12	65.5
70/ 74	10	61	37	108	63.4	6	61	33	100	63.2	2	19	8	29	62.3
65/ 69	26	52	52	130	61.7	23	57	48	128	61.6	5	28	17	50	59.9
60/ 64	74	47	75	196	59	67	57	79	203	59	19	52	35	106	56.9
55/ 59	84	19	42	145	54.9	78	21	49	148	54.8	43	65	63	171	53.3
50/ 54	42	2	10	54	50.3	50	2	14	66	50	58	46	57	161	49.1
45/ 49	10		1	11	46	18	0	3	21	45.4	53	16	37	106	44.3
40/ 44	1			1	41.3	4		0	4	41.2	32	2	13	47	40.1
35/ 39						0			0	36.4	23	0	5	28	36.1
30/ 34											5		0	5	31.6
25/ 29											0		0	0	26.8
20/ 24															
15/ 19															
10/ 14															
5/ 9															
0/ 4															
-5/ -1															
-10/ -6															
-15/-11															
-20/-16															
-25/-21															

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

	October					November					December				
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															
85/ 89															
80/ 84		0	0	0	64.5										
75/ 79	0	1	0	1	63.3										
70/ 74	0	2	1	3	59.5		0		0	57					
65/ 69	0	3	1	4	57.9	0	0	0	0	60.1					
60/ 64	2	10	4	16	54.9	0	1	1	2	57.6					
55/ 59	6	23	13	42	51.4	0	2	1	3	50.7					
50/ 54	21	50	35	106	47.9	2	7	2	11	47.4					
45/ 49	44	73	62	179	43.4	7	19	12	38	43.4	0	0	0	0	42.5
40/ 44	53	46	51	150	39.1	20	32	24	76	39.1	2	5	2	9	39.3
35/ 39	56	30	49	135	34.7	42	57	50	149	34.6	13	17	14	44	34.6
30/ 34	43	10	26	79	29.9	63	57	67	187	29.8	33	41	41	115	30.4
25/ 29	19	1	6	26	25.7	43	38	43	124	24.6	37	46	41	124	25.1
20/ 24	3		0	3	21.4	28	16	18	62	20.1	29	30	30	89	20.4
15/ 19	0			0	18.6	18	10	15	43	16	38	35	38	111	16
10/ 14						10	2	4	16	11.3	30	31	30	91	10.8
5/ 9						4	1	2	7	6.7	26	23	26	75	5.7
0/ 4						1	0	0	1	1.7	21	12	15	48	0.7
-5/ -1						0			0	-3.6	8	4	7	19	-3.6
-10/ -6											8	2	3	13	-7.9
-15/-11											2	1	1	4	-12.3
-20/-16											1	0	1	2	-16.8
-25/-21															

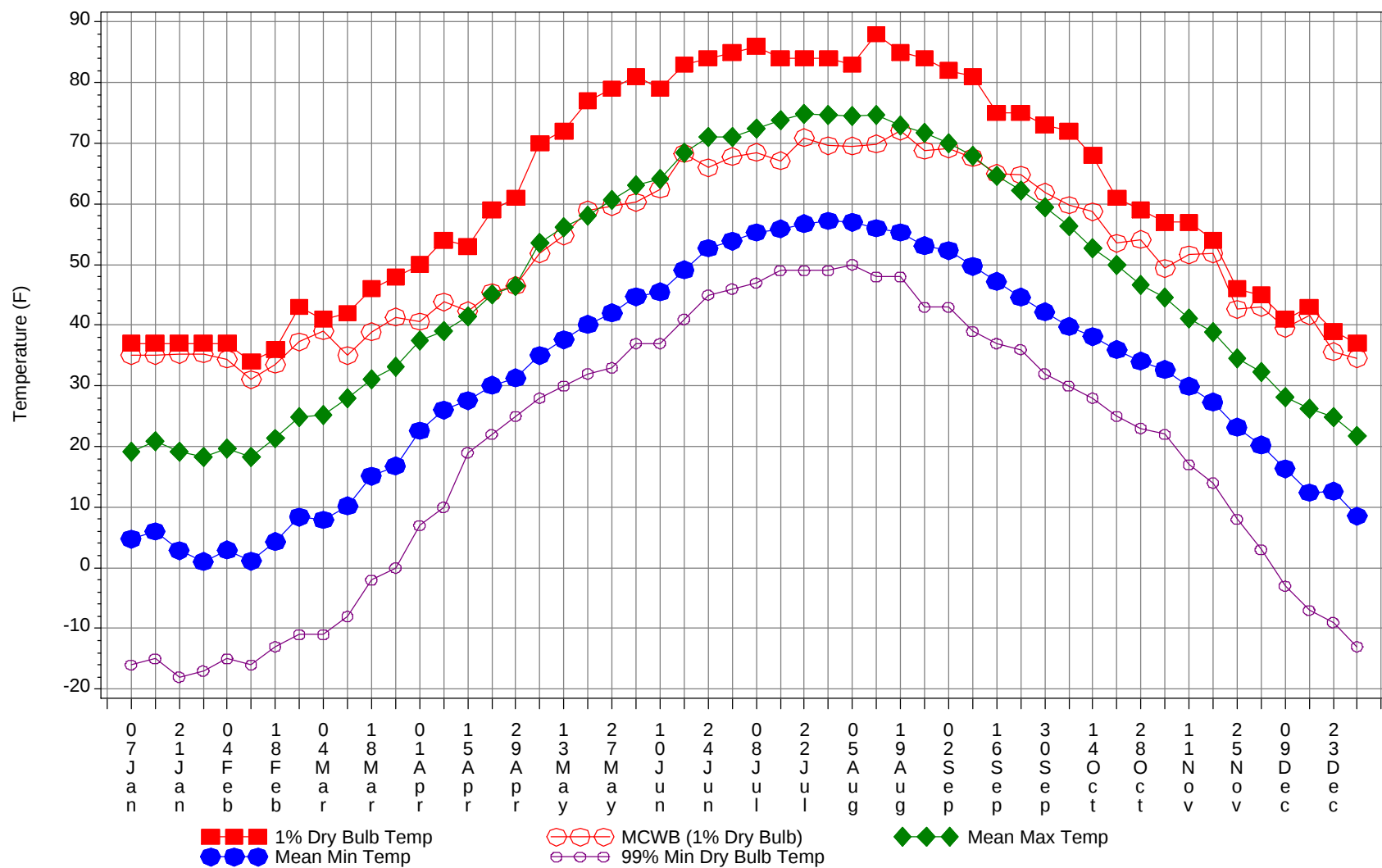
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Dry-Bulb Temperature Hours For An Average Year

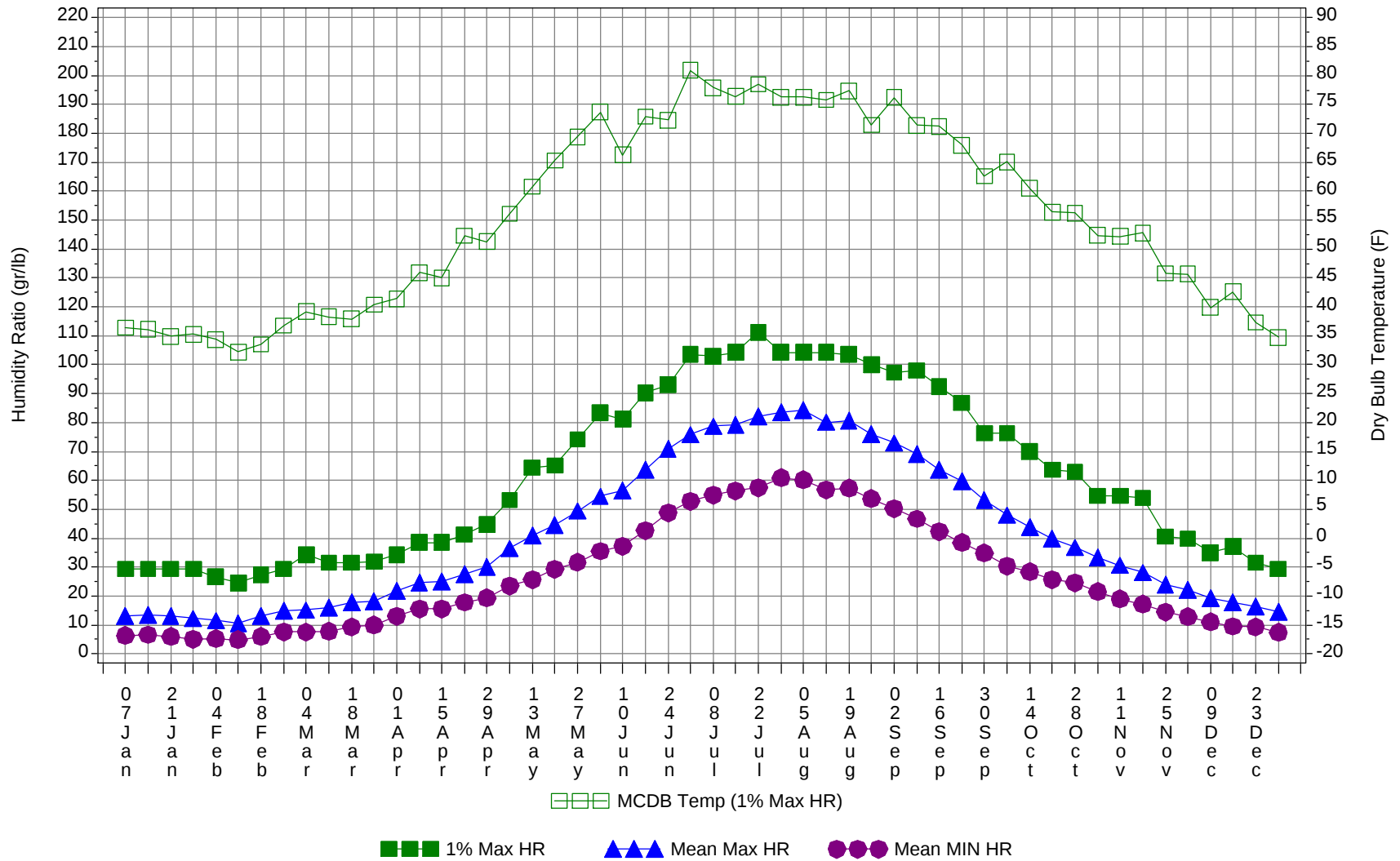
Temperature Range (° F)	Annual				
	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (° F)
95/ 99		0		0	71
90/ 94		3	1	4	70.4
85/ 89		12	5	17	69.4
80/ 84	0	43	19	62	66.9
75/ 79	4	106	52	162	64.6
70/ 74	21	185	101	307	62.3
65/ 69	66	187	150	403	60.5
60/ 64	194	245	256	695	57.6
55/ 59	272	227	256	755	53.2
50/ 54	265	216	224	705	48.4
45/ 49	245	207	227	679	43.4
40/ 44	208	160	167	535	38.9
35/ 39	266	235	255	756	34.4
30/ 34	324	258	308	890	29.9
25/ 29	241	194	212	647	24.8
20/ 24	146	132	136	414	20.1
15/ 19	152	153	157	462	15.7
10/ 14	133	131	130	394	10.6
5/ 9	124	102	113	339	5.6
0/ 4	103	65	75	243	0.6
-5/ -1	56	28	36	120	-3.7
-10/ -6	57	21	26	104	-8
-15/-11	27	8	8	43	-12.6
-20/-16	12	3	4	19	-16.7
-25/-21	3	1	0	4	-21.8

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Annual Summary of Temperatures



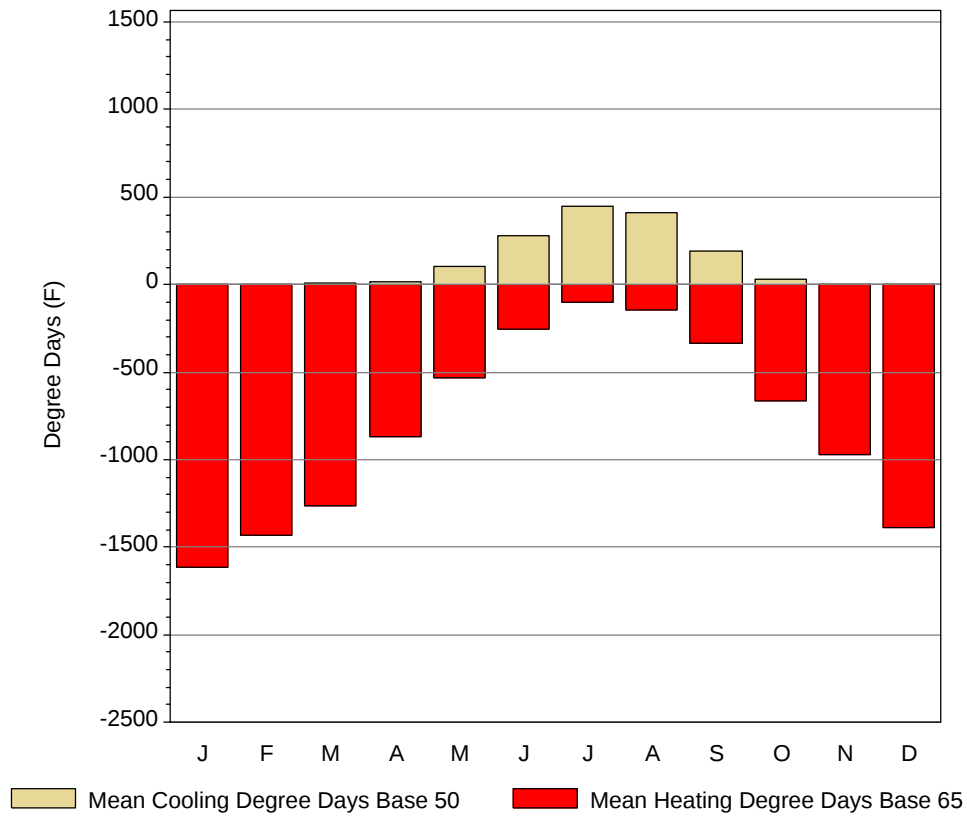
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

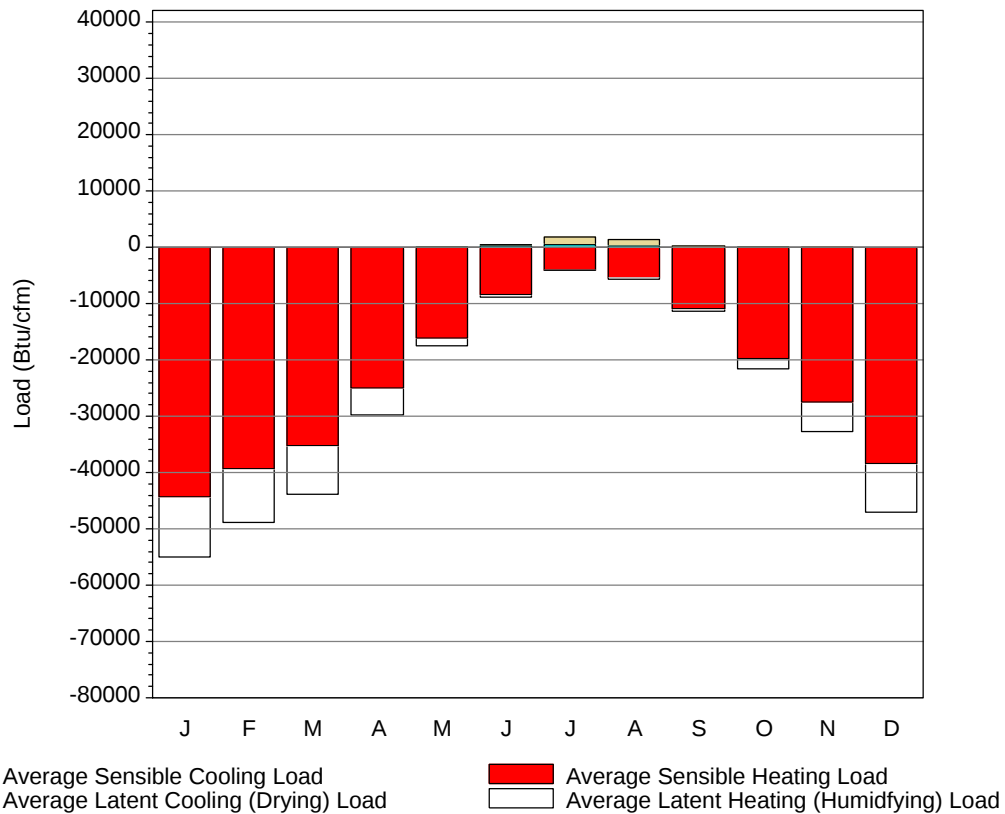
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	37	35	19.2	4.7	-16	29.4	36.4	13	6.3
14-Jan	37	35	20.8	6	-15	29.4	36.1	13.5	6.6
21-Jan	37	35.2	19.1	2.8	-18	29.4	34.9	13.1	5.9
28-Jan	37	35.3	18.3	1	-17	29.4	35.3	12.2	5
4-Feb	37	34.4	19.7	2.9	-15	26.6	34.4	11.5	5.3
11-Feb	34	31	18.3	1.1	-16	24.5	32.2	10.6	4.9
18-Feb	36	33.5	21.3	4.3	-13	27.3	33.5	13	6
25-Feb	43	37.3	24.9	8.4	-11	29.4	36.8	15	7.6
4-Mar	41	39.1	25.2	7.9	-11	34.3	39.2	15.1	7.5
11-Mar	42	35	27.9	10.2	-8	31.5	38.3	15.9	7.7
18-Mar	46	38.9	31.1	15.1	-2	31.5	37.9	17.9	9.3
25-Mar	48	41.3	33.1	16.8	0	31.9	40.4	18.3	10
1-Apr	50	40.6	37.5	22.6	7	34.3	41.4	21.8	13
8-Apr	54	43.8	39.1	26	10	38.5	45.9	24.6	15.5
15-Apr	53	42.4	41.4	27.6	19	38.5	45	24.9	15.6
22-Apr	59	45.4	45.1	30.1	22	41.3	52.3	27.7	17.8
29-Apr	61	46.5	46.4	31.3	25	44.8	51.3	30.2	19.3
6-May	70	51.8	53.5	35	28	53.2	56.1	36.4	23.5
13-May	72	54.7	56.2	37.6	30	64.4	60.8	40.9	25.7
20-May	77	59	58	40.1	32	65.1	65.3	44.5	29.2
27-May	79	59.6	60.6	42	33	74.2	69.4	49.4	31.7
4-Jun	81	60.3	63	44.7	37	83.3	73.7	54.5	35.5
10-Jun	79	62.4	64.1	45.5	37	81.2	66.3	56.4	37.3
17-Jun	83	68.3	68.5	49.1	41	90.3	72.9	63.8	42.7
24-Jun	84	66	71	52.7	45	93.1	72.3	70.9	48.8
1-Jul	85	67.8	71.1	53.9	46	103.6	80.9	75.8	52.7
8-Jul	86	68.5	72.4	55.3	47	102.9	77.9	78.7	55
15-Jul	84	67.1	73.8	55.9	49	104.3	76.4	79.1	56.4
22-Jul	84	70.9	74.9	56.7	49	111.3	78.5	82.2	57.4
29-Jul	84	69.6	74.6	57.2	49	104.3	76.3	83.7	60.9
5-Aug	83	69.5	74.5	57	50	104.3	76.3	84.3	60.2
12-Aug	88	69.9	74.6	56	48	104.3	75.8	80.1	56.8
19-Aug	85	72	73	55.3	48	103.6	77.4	80.7	57.3
26-Aug	84	68.8	71.7	53.1	43	100.1	71.5	76	53.6
2-Sep	82	69.1	70	52.3	43	97.3	76.2	72.9	50.3
9-Sep	81	67.6	68	49.7	39	98	71.4	69.2	46.7
16-Sep	75	65	64.7	47.2	37	92.4	71.2	63.8	42.2
23-Sep	75	64.8	62.3	44.6	36	86.8	68	59.8	38.5
30-Sep	73	61.9	59.5	42.2	32	76.3	62.6	53.1	34.9
7-Oct	72	59.8	56.4	39.8	30	76.3	65.1	48	30.4
14-Oct	68	58.7	52.7	38.1	28	70	60.5	43.7	28.3
21-Oct	61	53.5	49.9	36	25	63.7	56.4	39.9	25.6
28-Oct	59	54.1	46.7	34.1	23	63	56.2	36.8	24.5
4-Nov	57	49.4	44.5	32.7	22	54.6	52.4	33.4	21.5
11-Nov	57	51.6	41.1	29.9	17	54.6	52.2	30.6	19
18-Nov	54	51.8	38.9	27.3	14	53.9	52.8	28.1	17.2
25-Nov	46	42.6	34.6	23.2	8	40.6	45.8	23.9	14.4
2-Dec	45	43	32.2	20.2	3	39.9	45.7	22.2	12.9
9-Dec	41	39.5	28.2	16.3	-3	35	39.9	19.3	11.1
16-Dec	43	41.6	26.2	12.4	-7	37.1	42.6	17.7	9.5
23-Dec	39	35.6	24.9	12.6	-9	31.5	37.3	16.4	9.3
31-Dec	37	34.5	21.7	8.5	-13	29.4	34.7	14.5	7.4

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	1.8	0	1617.2
FEB	0.1	0	1431.1
MAR	6.5	0	1262.9
APR	15.5	0.4	871.1
MAY	101.7	12	531.8
JUN	279.1	47.9	254.2
JUL	449	96	101
AUG	411	77.4	146.8
SEP	189.5	19.4	337.9
OCT	32.5	1.7	666.9
NOV	2.8	0.1	972.9
DEC	0.2	0	1384.9
ANN	1489.7	254.9	9578.7

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	-44328	0	-10727
FEB	0	-39291	0	-9650
MAR	0	-35145	0	-8635
APR	0	-24905	0	-4881
MAY	45	-16063	11	-1490
JUN	216	-8455	240	-446
JUL	396	-4067	1375	-1
AUG	300	-5431	1035	-302
SEP	50	-10859	211	-414
OCT	2	-19673	6	-1959
NOV	0	-27550	1	-5109
DEC	0	-38306	0	-8806
ANN	1009	-274073	2879	-52420

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													

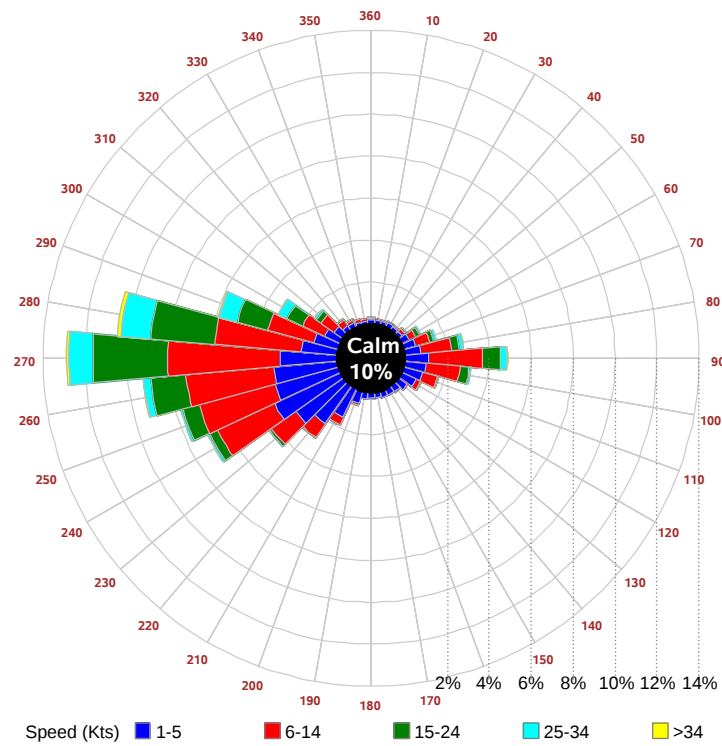
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

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													

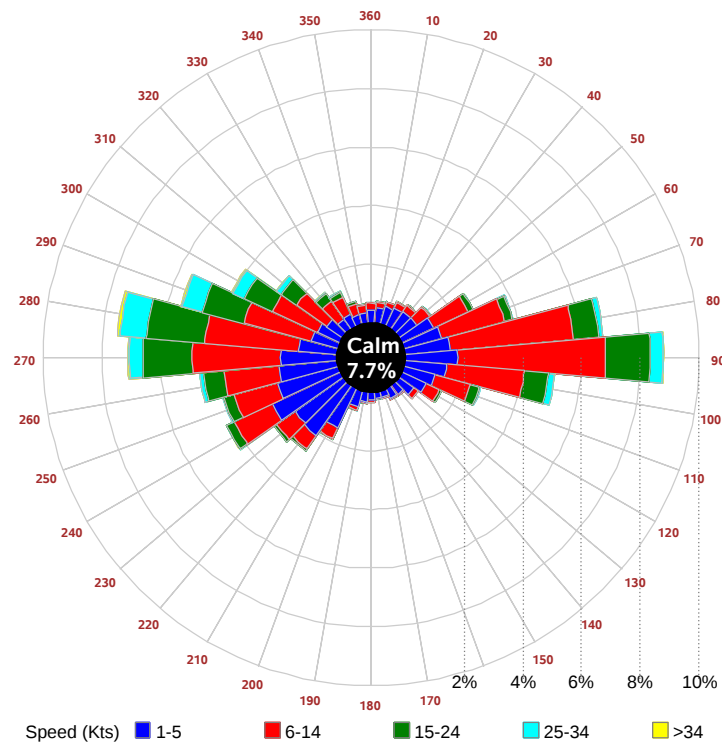
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9												
				March						June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm	
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear			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

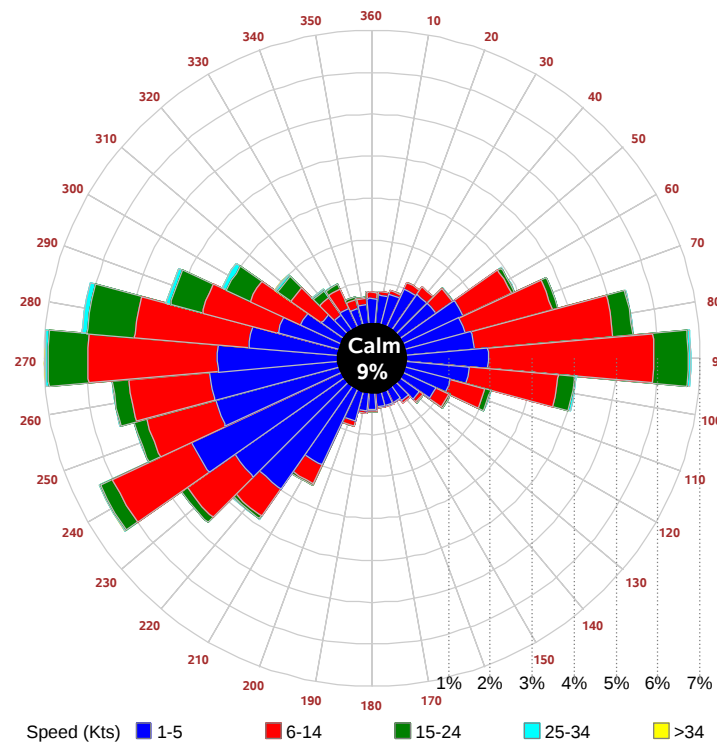
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

