

PANAMA PACIFICO, PM

Latitude = 8.92 N

Longitude = 79.60 W

Period of Record = 1988 To 2017

Station ID = ICAO_MPHO

Elevation = 43 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	95	78	115	11.6	N
0.4% Occurrence	95	78	115	11.6	N
1.0% Occurrence	93	77	115	11.5	N
2.0% Occurrence	91	77	119	10.4	N
Mean Daily Range	12	-	-	-	N
97.5% Occurrence	73	71	108	3.1	N
99.0% Occurrence	71	69	104	2.4	N
99.6% Occurrence	70	68	100	2	N
Median of Extreme Lows	70	68	100	2	N

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	83	89	154	6.9	NNW
0.4% Occurrence	82	89	150	6.8	NNW
1.0% Occurrence	81	88	146	6.8	NNW
2.0% Occurrence	80	87	141	7.1	NNW

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	160	87	1.05	5.8	S
0.4% Occurrence	151	85	0.99	5.5	NNW
1.0% Occurrence	151	85	0.99	5.5	NNW
2.0% Occurrence	150	85	0.99	5.4	NNW

Air Conditioning/ Humid Area Criteria	Threshold	T ≥ 93 °F	T ≥ 80 °F	Twb ≥ 73 °F	Twb ≥ 67 °F
	# of Hours	136	2768	4233	5056

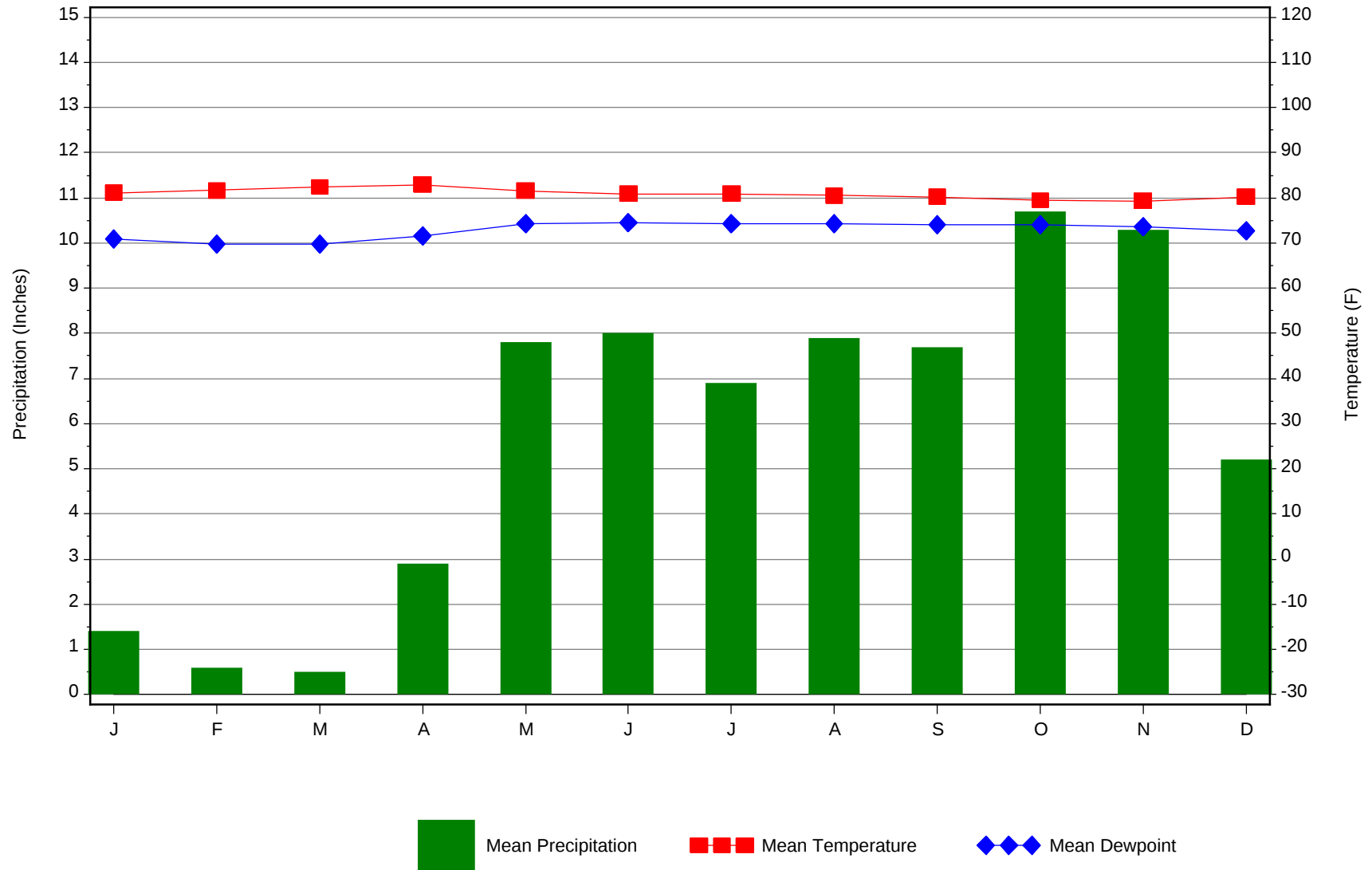
Other Site Data

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
10	N/A	N/A	22.1 + 4.5
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 (#)
83.5	N/A	N/A	0

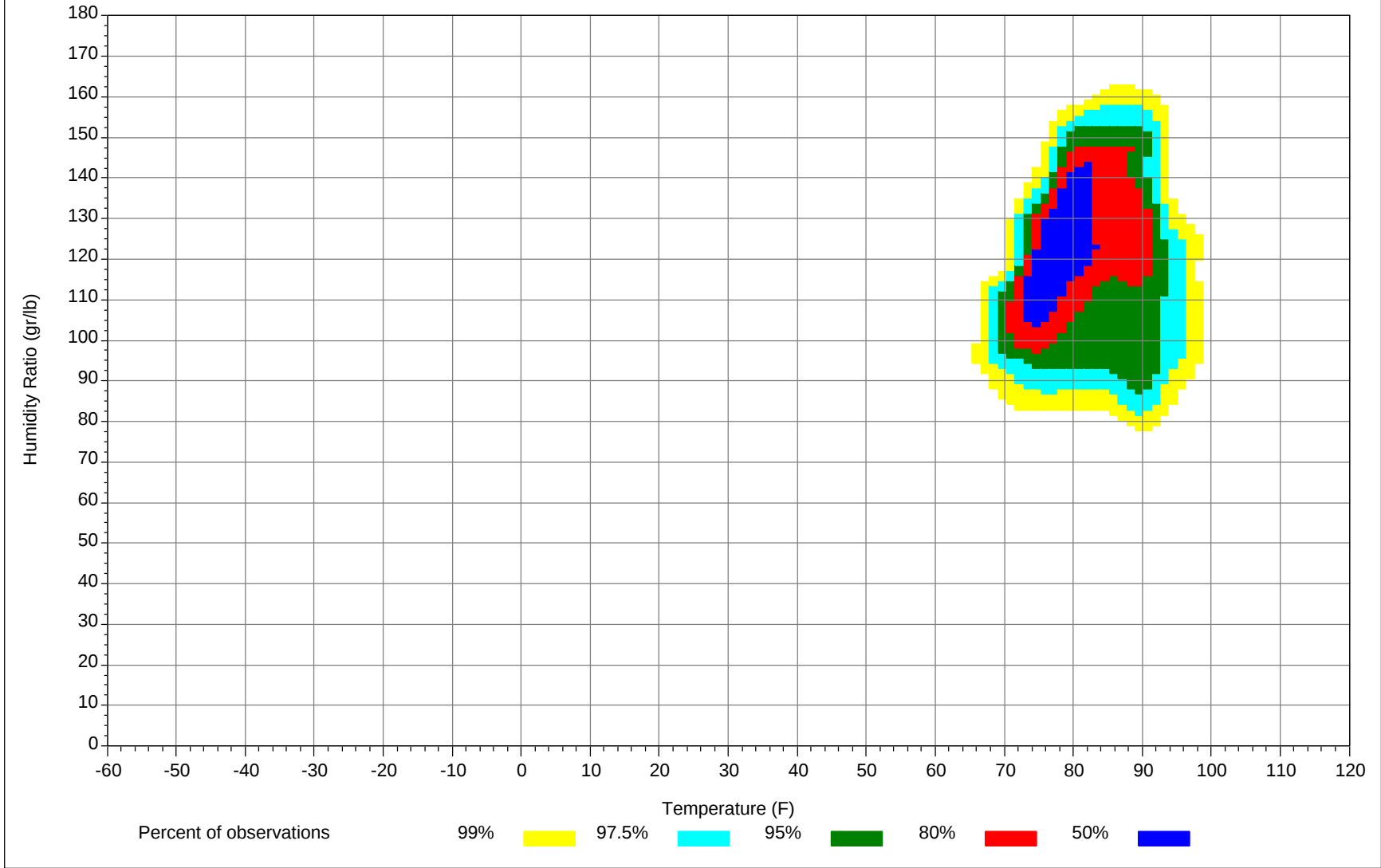
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.



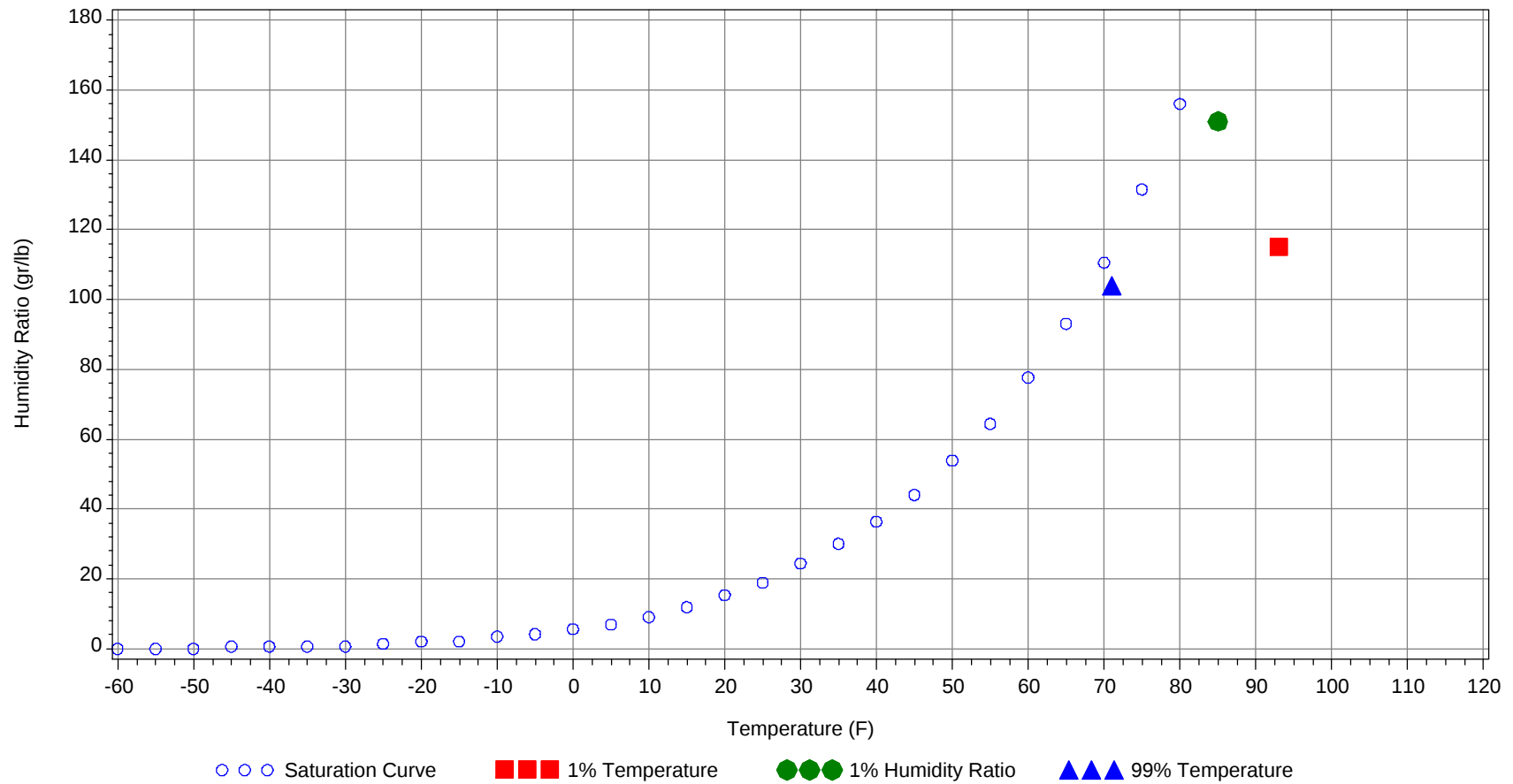
Average Annual Climate



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	93.0		77		115.0	40.5
99.0% Dry Bulb	71.0				104.0	32.9
1.0% Humidity Ratio	151.0	85.0	80.5	78.8		44.1

Dry-Bulb Temperature Hours For An Average Year

	January					February					March				
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)
100/104															
95/ 99		0		0	78.7		4		4	77.6		14		14	77.1
90/ 94		71	2	73	76.5		95	5	100	75.7		122	9	131	75.7
85/ 89		96	20	116	75.6		72	23	95	74.7	1	68	29	98	74.7
80/ 84	23	70	80	173	74.6	26	45	78	149	74	47	35	98	180	74
75/ 79	182	11	132	325	72.9	161	8	108	277	72.4	163	8	101	272	72.3
70/ 74	42	0	14	56	69.5	36	1	9	46	69.1	34	1	10	45	68.5
65/ 69	1	0	0	1	65.5	2	0	1	3	65.5	4		1	5	65.2

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)
100/104		0		0	79										
95/ 99		16	0	16	77.4		3		3	79.9		0		0	82.8
90/ 94	0	109	11	120	76.8		53	2	55	79.2	0	24	1	25	80.2
85/ 89	3	72	28	103	76.1	2	87	17	106	78.1	1	87	9	97	78.9
80/ 84	56	37	116	209	75.2	75	84	126	285	76.9	67	104	120	291	77.3
75/ 79	158	6	82	246	73.6	151	21	92	264	74.9	147	23	98	268	74.8
70/ 74	23	0	3	26	70.1	20	1	10	31	70.8	23	2	11	36	70.9
65/ 69								0	0	66	2	0	1	3	67

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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)
100/104															
95/ 99		0		0	82.8										
90/ 94	0	31	1	32	80		20		20	80.1		18	0	18	79.9
85/ 89	1	85	11	97	78.8	0	88	7	95	78.6	0	78	6	84	78.8
80/ 84	62	102	120	284	77	44	108	109	261	77	48	114	101	263	76.9
75/ 79	158	27	106	291	74.5	175	30	121	326	74.6	151	28	113	292	74.7
70/ 74	26	3	10	39	70.6	28	3	12	43	71.2	40	3	20	63	70.7
65/ 69	0	0	0	0	67.4	0	0		0	67.6	1	0	1	2	66.8

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)
100/104															
95/ 99												0		0	84
90/ 94		11	0	11	80		6	0	6	79.4		35	0	35	78
85/ 89	0	70	2	72	78.7		67	1	68	78.4	0	96	10	106	77.1
80/ 84	34	131	84	249	77	25	119	66	210	76.8	20	92	72	184	76
75/ 79	162	32	137	331	74.8	174	41	148	363	74.5	187	22	151	360	73.9
70/ 74	50	3	24	77	71	41	5	25	71	70.5	39	2	14	55	70.3
65/ 69	2	0	1	3	67.4	1		0	1	68.1	1	0	2	3	66.8

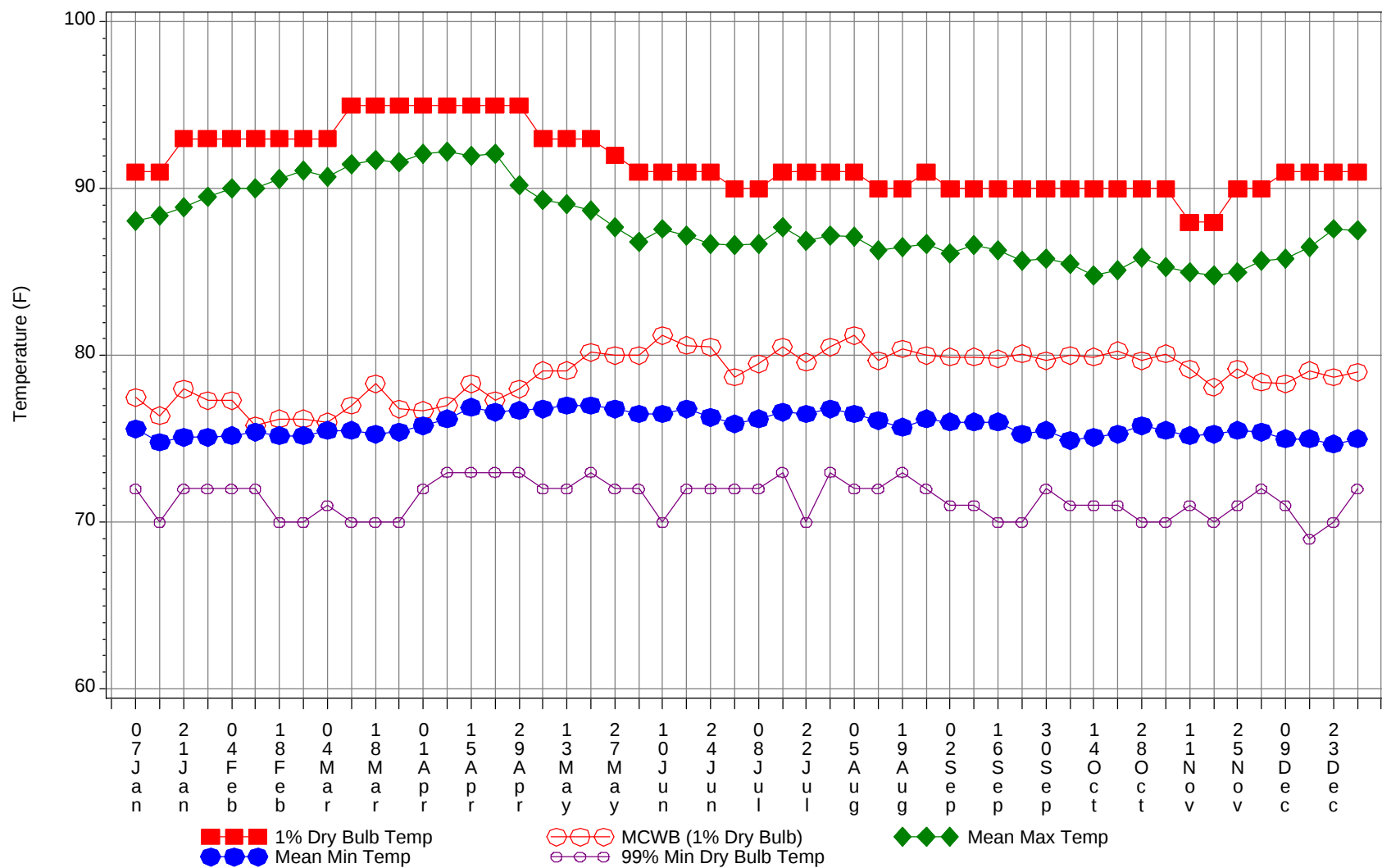
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

Dry-Bulb Temperature Hours For An Average Year

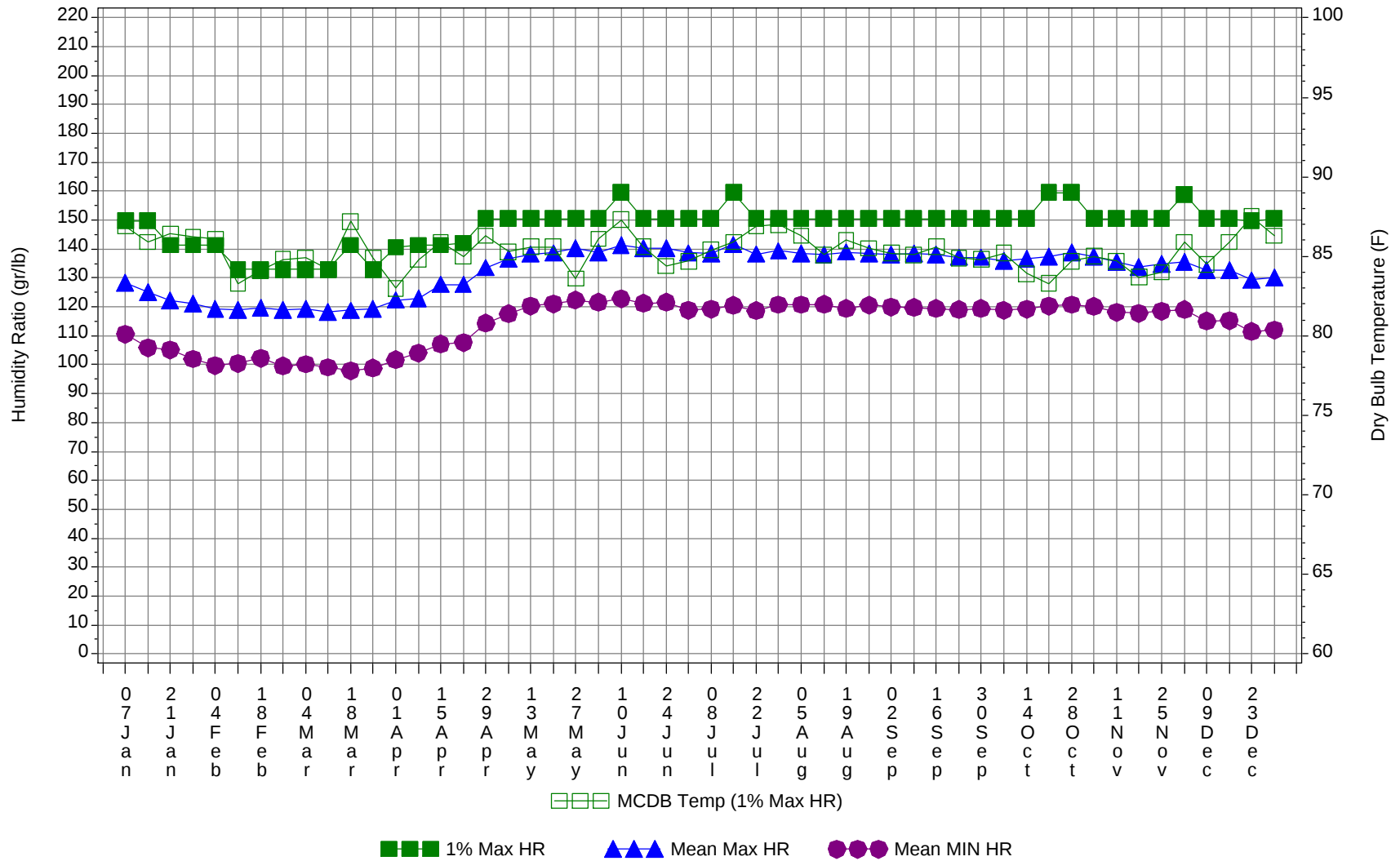
	Annual				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	M C W B (°F)
100/104		0		0	79
95/ 99		39	0	39	77.6
90/ 94	0	610	32	642	77.1
85/ 89	8	967	167	1142	77.2
80/ 84	529	1026	1171	2726	76.2
75/ 79	1968	252	1383	3603	74
70/ 74	401	25	159	585	70.3
65/ 69	14	1	7	22	66.4

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.

Annual Summary of Temperatures



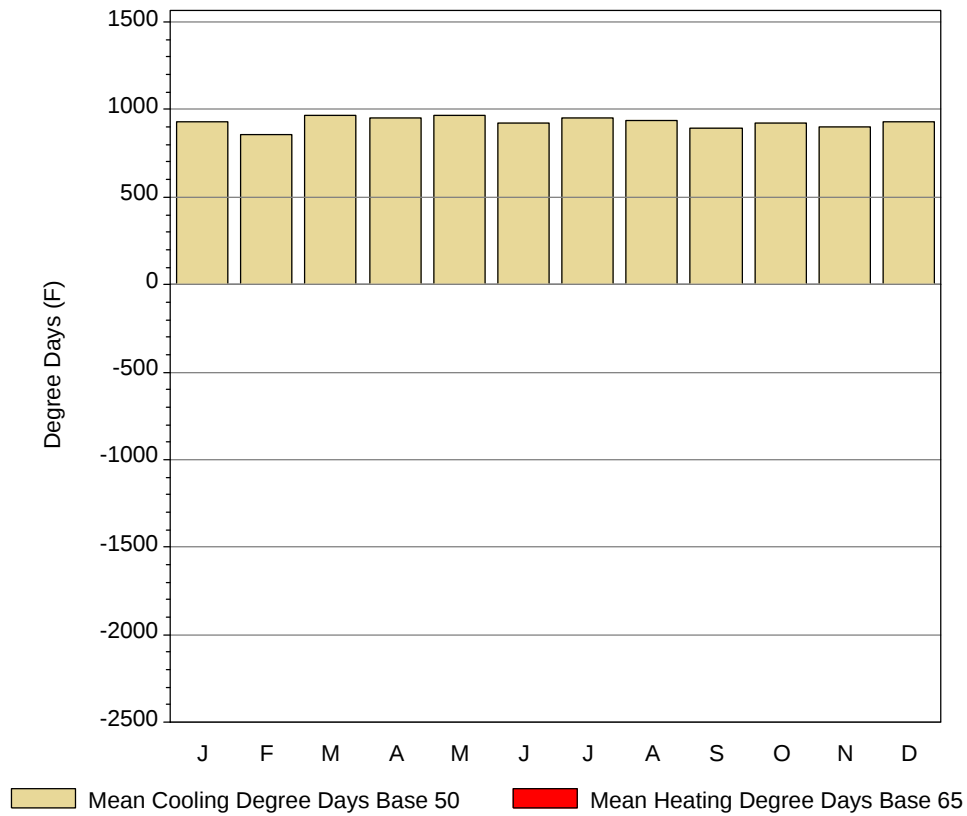
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

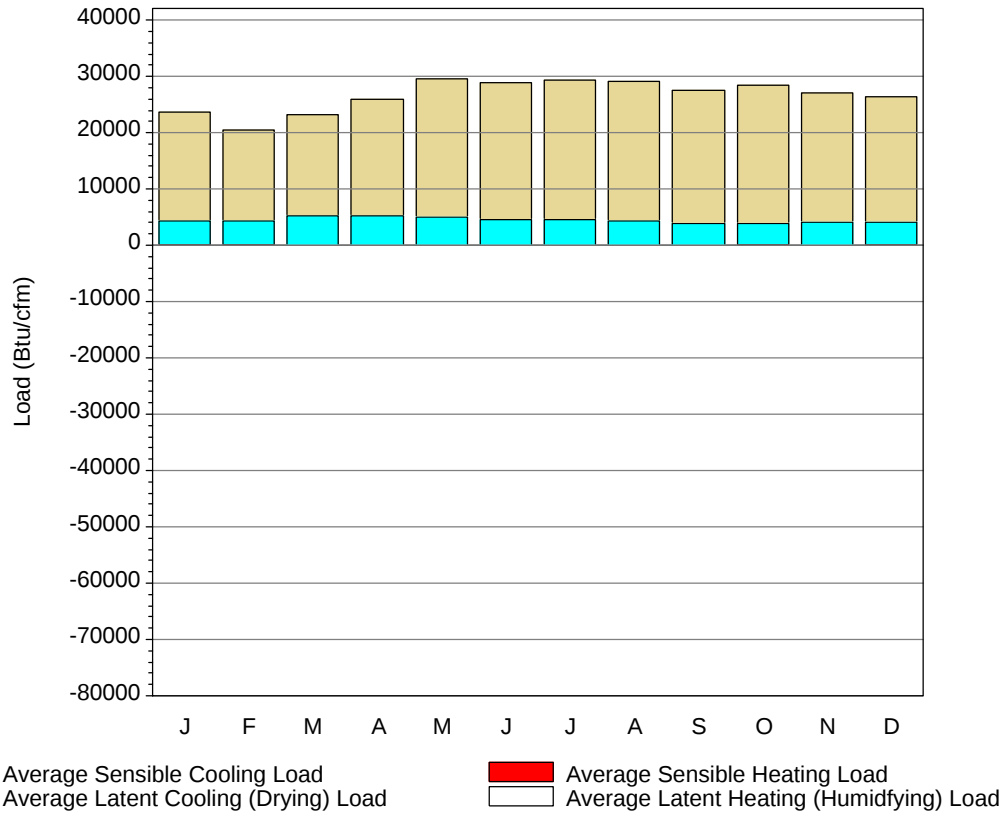
Week Ending	1.0% Temp (° F)	MCWB@ 1% Temp (° F)	Mean Max Temp (° F)	Mean Min Temp (° F)	99% Temp (° F)	1.0% HR (gr/lb)	MCDB@ 1% HR (° F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	91	77.5	88.1	75.6	72	149.8	86.9	128.3	110.6
14-Jan	91	76.4	88.4	74.8	70	149.8	85.9	125	105.8
21-Jan	93	78	88.9	75.1	72	141.4	86.4	122.2	105.1
28-Jan	93	77.3	89.5	75.1	72	141.4	86.2	121.1	102
4-Feb	93	77.3	90	75.2	72	141.4	86.1	119.3	99.7
11-Feb	93	75.8	90	75.4	72	133	83.3	118.9	100.5
18-Feb	93	76.2	90.6	75.2	70	133	84.1	119.6	102.2
25-Feb	93	76.2	91.1	75.2	70	133	84.8	119.1	99.5
4-Mar	93	76	90.7	75.5	71	133	84.9	119.3	100.2
11-Mar	95	77	91.5	75.5	70	133	84.2	118.2	99.1
18-Mar	95	78.3	91.7	75.3	70	141.4	87.2	118.8	97.9
25-Mar	95	76.8	91.6	75.4	70	133	84.9	119.3	98.8
1-Apr	95	76.7	92.1	75.8	72	140.7	83	122.4	101.7
8-Apr	95	77	92.2	76.2	73	141.4	84.8	122.9	104
15-Apr	95	78.3	92	76.9	73	141.4	85.9	127.8	107.1
22-Apr	95	77.3	92.1	76.6	73	142.1	85	127.8	107.7
29-Apr	95	78	90.2	76.7	73	150.5	86.3	133.6	114.4
6-May	93	79.1	89.3	76.8	72	150.5	85.3	136.6	117.7
13-May	93	79.1	89.1	77	72	150.5	85.6	138.3	120.3
20-May	93	80.2	88.7	77	73	150.5	85.6	138.7	121.1
27-May	92	80	87.7	76.8	72	150.5	83.6	140.2	122.4
4-Jun	91	80	86.8	76.5	72	150.5	86.1	138.9	121.6
10-Jun	91	81.2	87.6	76.5	70	159.6	87.3	141.4	122.8
17-Jun	91	80.6	87.2	76.8	72	150.5	85.6	140.3	121.3
24-Jun	91	80.5	86.7	76.3	72	150.5	84.4	140.4	121.6
1-Jul	90	78.7	86.6	75.9	72	150.5	84.7	138.7	118.9
8-Jul	90	79.5	86.7	76.2	72	150.5	85.4	138.4	119.3
15-Jul	91	80.5	87.7	76.6	73	159.6	85.9	141.6	120.5
22-Jul	91	79.6	86.9	76.5	70	150.5	86.9	138.3	118.7
29-Jul	91	80.5	87.2	76.8	73	150.5	87	139.4	120.8
5-Aug	91	81.2	87.1	76.5	72	150.5	86.3	138.5	120.8
12-Aug	90	79.7	86.3	76.1	72	150.5	85.1	138.2	120.9
19-Aug	90	80.4	86.5	75.7	73	150.5	86	139	119.5
26-Aug	91	80	86.7	76.2	72	150.5	85.5	138.6	120.6
2-Sep	90	79.9	86.1	76	71	150.5	85.2	138	119.9
9-Sep	90	79.9	86.6	76	71	150.5	85.1	138.5	119.8
16-Sep	90	79.8	86.3	76	70	150.5	85.6	138.1	119.5
23-Sep	90	80.1	85.7	75.3	70	150.5	84.9	137.2	119
30-Sep	90	79.7	85.8	75.5	72	150.5	84.8	137.2	119.5
7-Oct	90	80	85.5	74.9	71	150.5	85.2	136.1	118.8
14-Oct	90	79.9	84.8	75.1	71	150.5	83.9	136.8	119.3
21-Oct	90	80.3	85.1	75.3	71	159.6	83.3	137.3	120.4
28-Oct	90	79.7	85.9	75.8	70	159.6	84.7	138.8	120.8
4-Nov	90	80.1	85.3	75.5	70	150.5	85	137.5	120.2
11-Nov	88	79.2	85	75.2	71	150.5	84.7	135.7	118.2
18-Nov	88	78.1	84.8	75.3	70	150.5	83.7	133.8	117.8
25-Nov	90	79.2	85	75.5	71	150.5	84	134.9	118.6
2-Dec	90	78.4	85.7	75.4	72	158.9	85.9	135.7	119
9-Dec	91	78.3	85.8	75	71	150.5	84.5	132.7	115.1
16-Dec	91	79.1	86.5	75	69	150.5	85.9	132.6	115.2
23-Dec	91	78.7	87.6	74.7	70	149.8	87.5	129.3	111.5
31-Dec	91	79	87.5	75	72	150.5	86.3	130.3	112

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



	Mean Cooling Degree Days (°F) Base 50	Mean Cooling Degree Days (°F) Base 65	Mean Heating Degree Days (°F) Base 65
Month			
JAN	931.3	466.3	0
FEB	859.7	435.7	0
MAR	967.7	502.7	0
APR	951.5	501.5	0
MAY	968.6	503.6	0
JUN	923.5	473.5	0
JUL	950.5	485.5	0
AUG	937	472	0
SEP	896	446	0
OCT	921.5	456.5	0
NOV	900.1	450.1	0
DEC	928.3	463.3	0
ANN	11135.7	5656.7	0

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	4291	-1	19326	0
FEB	4261	-3	16202	0
MAR	5209	0	17931	0
APR	5332	0	20538	0
MAY	5068	0	24560	0
JUN	4572	0	24338	0
JUL	4638	0	24699	0
AUG	4285	0	24805	0
SEP	3943	0	23475	0
OCT	3984	-3	24365	0
NOV	4036	0	22997	0
DEC	4166	-2	22176	0
ANN	53785	-9	265412	0

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													

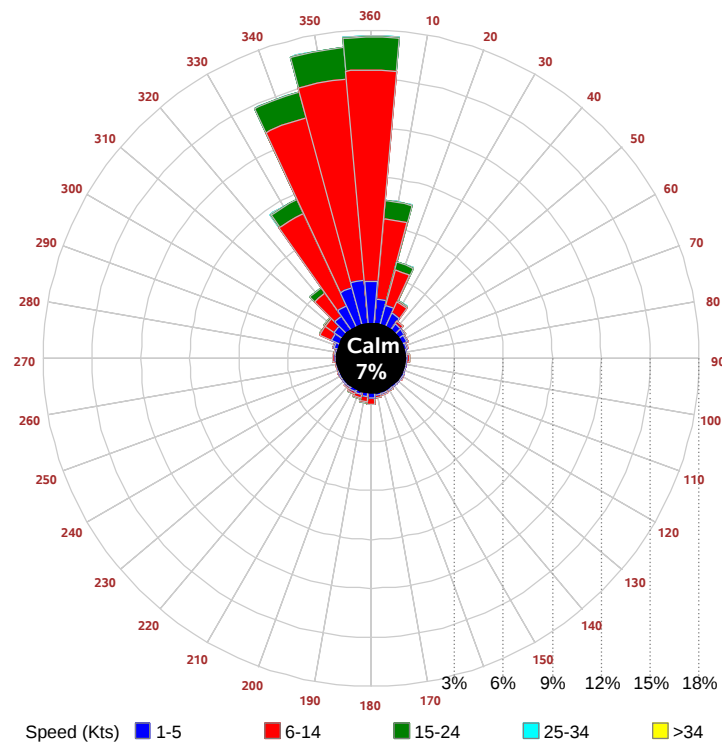
Average Annual Solar Radiation - Nearest Available Site Source: National Renewable Energy Laboratory, Golden CO, 1995

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													

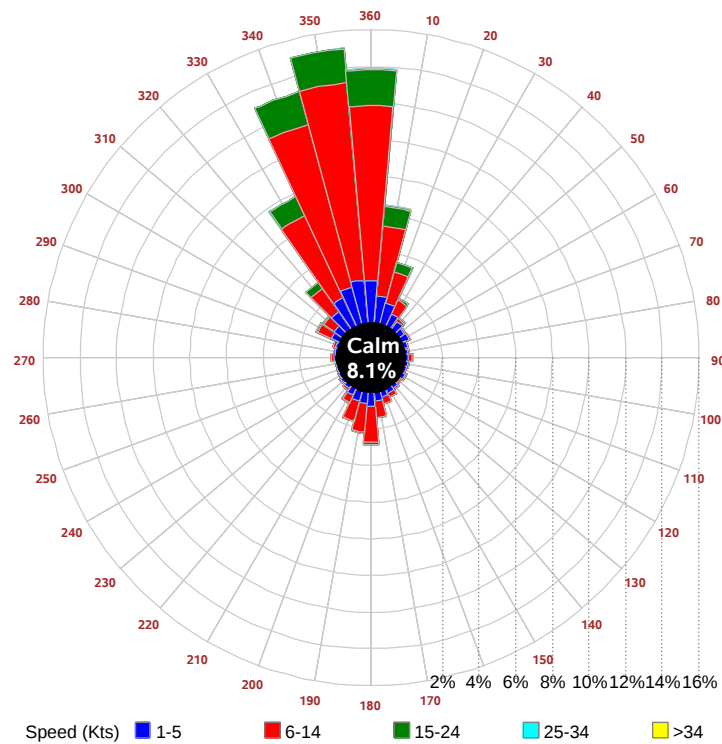
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9												
		March						June				
		9am	11am	1pm	3pm	5pm		9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear											
	M.Cloudy											
NORTH	M.Clear											
	M.Cloudy											
EAST	M.Clear			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

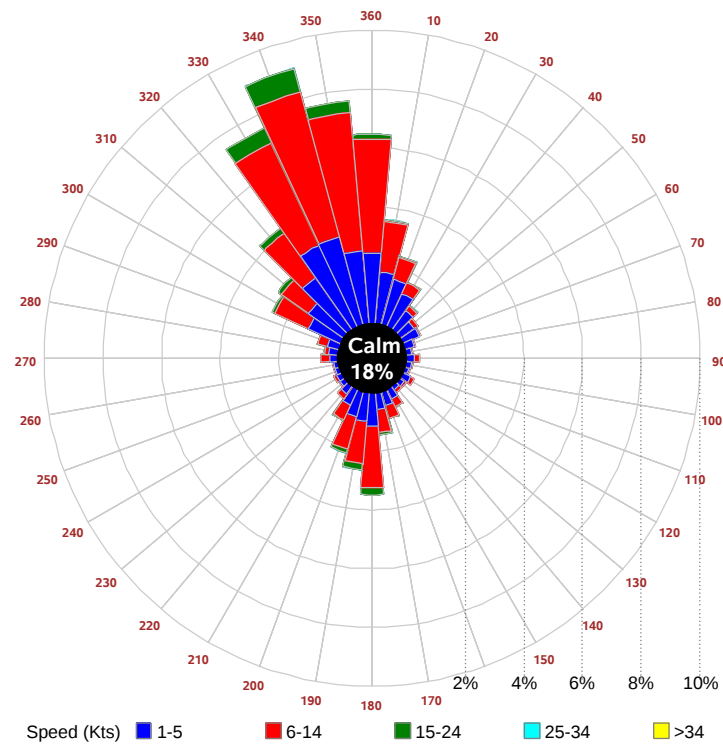
Wind Summary - December, January, and February



Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November

