

MUSKEGON MI

Latitude = 43.17 N

WMO No. 726360

Longitude = 86.25 W

Elevation = 633 feet

Period of Record = 1973 to 1996

Average Pressure = 29.30 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	89	74	104	12.5	S
0.4% Occurrence	86	72	99	12.1	S
1.0% Occurrence	83	70	94	11.7	S
2.0% Occurrence	81	69	92	11.4	S
Mean Daily Range	15	-	-	-	-
97.5% Occurrence	12	11	8	10.7	WNW
99.0% Occurrence	7	6	6	10.9	WNW
99.6% Occurrence	3	2	5	10.1	SE
Median of Extreme Lows	-6	-6	3	8.6	ESE
	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	77	85	129	13.0	SSW
0.4% Occurrence	75	82	121	11.8	S
1.0% Occurrence	74	81	118	11.9	S
2.0% Occurrence	72	78	110	11.2	SSW
	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	135	81	0.88	12.6	S
0.4% Occurrence	125	80	0.82	10.0	SW
1.0% Occurrence	118	78	0.77	11.6	SSW
2.0% Occurrence	113	76	0.74	9.6	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		1	268	135	771

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
5	2.5	90	1.1 + 0.2
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 (#)
49.9	N/A	51	60

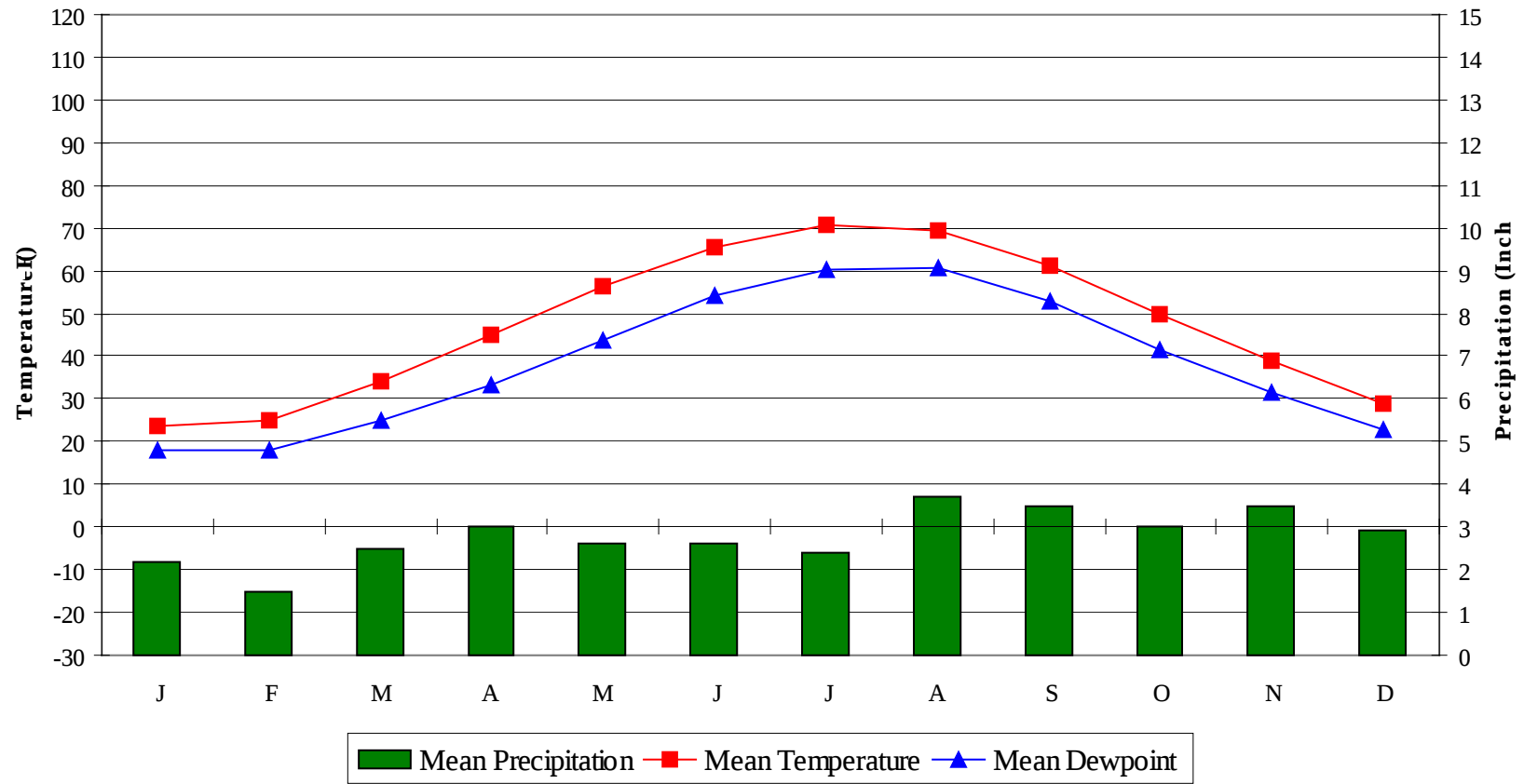
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

MUSKEGON

MI

WMO No. 726360

Average Annual Climate

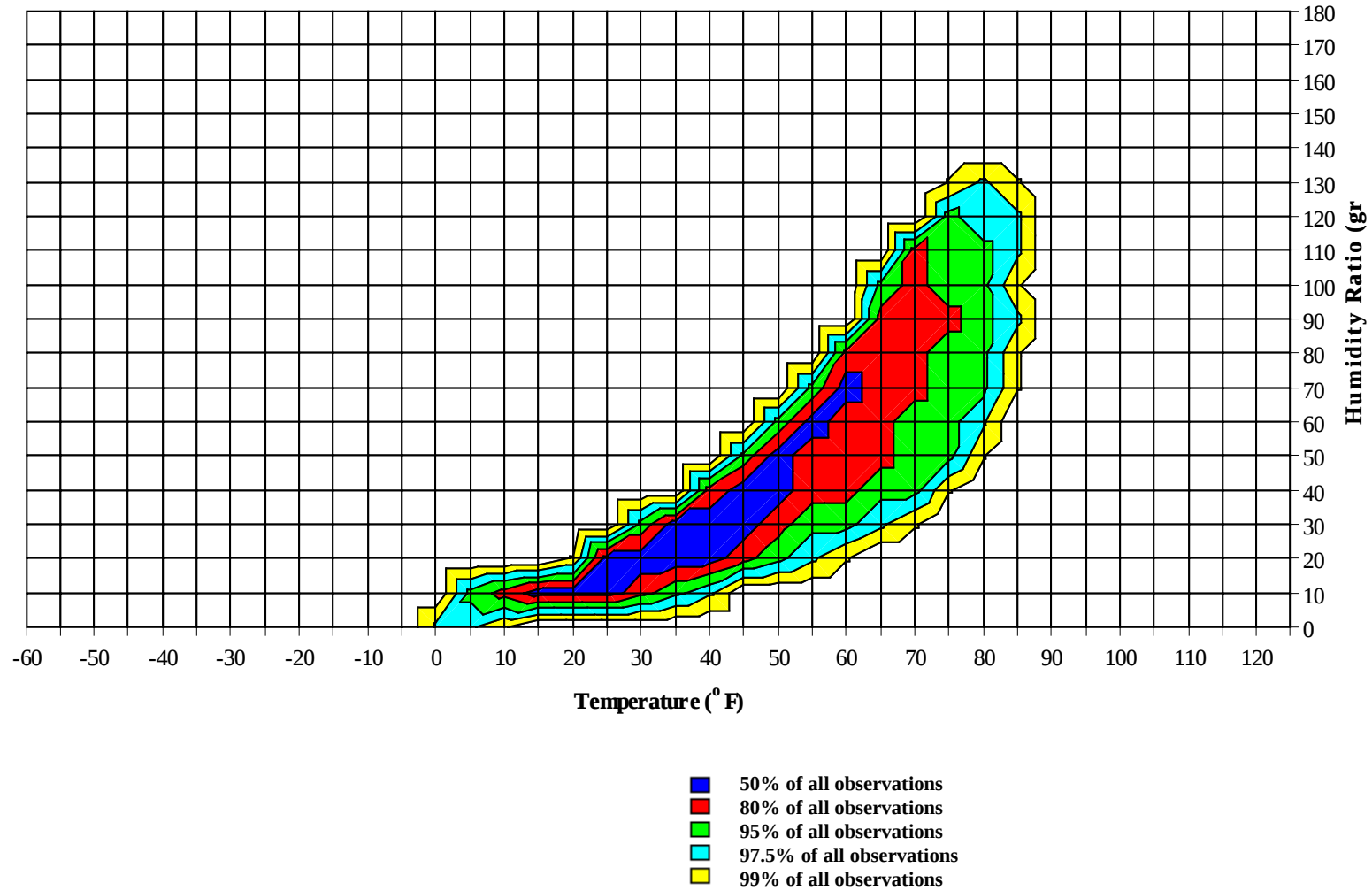


MUSKEGON

MI

WMO No. 726360

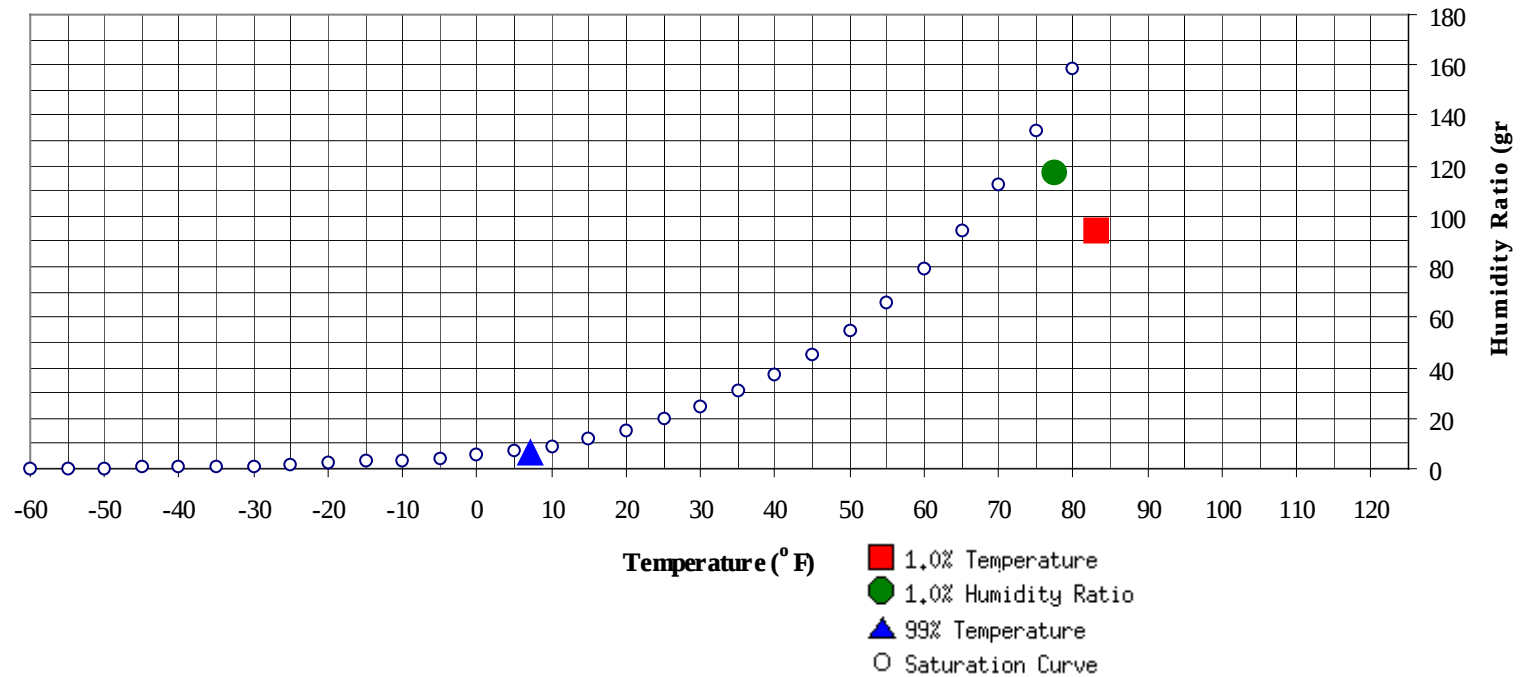
Long Term Psychrometric Summary



MUSKEGON

MI

WMO No. 726360

Psychrometric Summary of Peak Design Values

	(°F)	MCHR	Enthalpy	1.0% Humidity	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	7	6	2.6	Ratio	117.6	77.6	73	71.1	37.0

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	83	94.4	70.4	34.7

MUSKEGON

MI

WMO No. 726360

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												0	0	0	58.7
70 / 74												1	0	1	56.8
65 / 69												0	3	2	55.8
60 / 64		0		0	53.5							1	5	4	53.5
55 / 59		0	0	1	53.6	0	0	0	1	46.3	3	9	6	19	49.6
50 / 54	0	0	1	1	49.1	1	2	1	3	45.6	7	14	11	32	45.4
45 / 49	2	1	2	5	44.7	1	3	3	7	41.4	9	22	18	48	41.6
40 / 44	4	8	6	17	38.9	6	13	10	29	37.9	19	37	29	86	37.7
35 / 39	23	29	25	77	34.5	23	37	30	90	34.1	40	54	49	142	33.7
30 / 34	43	49	49	140	29.9	41	41	45	127	30.0	60	49	59	168	29.6
25 / 29	43	40	46	129	25.2	33	36	37	106	24.6	41	28	33	102	24.6
20 / 24	38	47	41	126	20.2	35	38	38	111	20.0	30	15	21	66	20.0
15 / 19	38	34	37	109	15.7	34	26	30	91	15.7	19	7	10	36	15.5
10 / 14	31	21	27	79	11.1	25	16	19	60	11.0	11	3	4	18	10.8
5 / 9	16	11	11	37	6.5	13	7	7	28	6.3	5	1	1	7	6.4
0 / 4	6	4	5	15	1.8	7	3	3	12	1.6	3		0	3	1.8
-5 / -1	2	1	1	4	-2.4	3	1	1	5	-3.0	0			0	-2.8
-10 / -6	1	1	1	2	-7.1	3	0	0	3	-7.1	0			0	-6.0
-15 / -11			0	0	-10.0	1	0	0	1	-11.6					
-20 / -16						0			0	-17.0					

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.

MUSKEGON

MI

WMO No. 726360

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												0	0	0	76.0
90 / 94								0	0			1	0	1	72.5
85 / 89							1	1	2	66.8		7	4	10	70.2
80 / 84		1	0	1	64.1		9	5	13	66.1	0	27	15	42	67.6
75 / 79		3	2	5	62.7	0	18	9	28	63.9	4	45	27	76	65.2
70 / 74	1	7	5	12	59.0	4	29	19	52	60.4	17	56	45	118	63.0
65 / 69	4	11	8	23	56.3	13	39	30	82	57.4	41	51	49	142	60.5
60 / 64	8	19	14	42	53.0	29	44	38	111	54.4	58	36	47	141	57.4
55 / 59	10	27	20	58	49.0	36	46	43	125	50.7	54	14	29	97	53.6
50 / 54	19	40	34	93	45.1	47	36	44	127	47.0	36	6	17	58	49.1
45 / 49	32	45	42	119	41.6	52	18	34	103	42.9	20	0	4	24	44.8
40 / 44	48	42	42	131	37.8	38	7	19	65	38.9	8		1	9	40.6
35 / 39	50	27	39	116	33.8	22	1	6	29	34.8	1			1	35.8
30 / 34	40	13	22	74	29.3	7		1	8	30.6	0			0	33.0
25 / 29	20	3	8	31	24.9	1			1	27.5					
20 / 24	8	1	2	11	20.3										
15 / 19	1	0	0	2	16.5										
10 / 14	0		0	0	12.8										
5 / 9	0			0	7.5										
0 / 4	0			0	2.3										
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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.

MUSKEGON

MI

WMO No. 726360

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		0		0	67.0										
90 / 94		2	1	3	73.2		2	1	2	76.9					
85 / 89		17	7	24	72.5		10	4	13	74.5		1	1	2	72.6
80 / 84	1	54	27	82	70.3	2	40	18	60	71.1		10	3	13	70.2
75 / 79	15	77	54	146	67.6	11	77	45	133	68.5	2	26	12	41	67.7
70 / 74	48	63	67	178	65.6	45	69	68	181	66.3	17	49	30	96	65.3
65 / 69	65	26	49	140	62.7	63	38	57	158	63.0	29	50	43	122	61.6
60 / 64	58	9	31	99	59.0	53	11	36	100	59.1	41	51	48	140	57.3
55 / 59	38	1	10	49	54.9	42	3	14	59	55.0	44	33	46	123	53.5
50 / 54	16	0	2	18	50.5	22	0	5	27	50.6	42	17	33	92	49.1
45 / 49	5		0	5	46.0	7		1	7	46.2	30	5	17	52	44.9
40 / 44	0			0	43.0	2		0	2	42.3	20	0	6	27	41.0
35 / 39						0			0	38.0	8		2	9	36.6
30 / 34											2		0	2	31.5
25 / 29											1			1	27.8
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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.

MUSKEGON

MI

WMO No. 726360

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		0		0	62.0										
75 / 79		2	1	3	64.1										
70 / 74	1	8	5	14	61.6		0		0	61.0					
65 / 69	5	18	12	35	58.9	0	1	1	2	58.6					
60 / 64	17	36	26	80	56.2	2	7	4	14	56.4	0	0	0	1	59.9
55 / 59	29	49	34	112	51.9	10	14	12	36	53.5	1	1	1	3	54.6
50 / 54	39	51	48	139	47.5	15	22	19	56	48.2	2	3	3	8	50.5
45 / 49	44	47	51	141	43.3	21	35	24	79	43.1	5	7	6	18	43.8
40 / 44	44	26	38	108	39.2	37	46	44	127	38.4	9	18	14	40	38.8
35 / 39	36	10	24	70	35.1	48	47	57	152	33.8	37	51	40	128	34.2
30 / 34	22	2	8	32	31.2	53	42	49	144	29.5	59	60	66	185	30.0
25 / 29	8	0	2	9	26.6	36	20	24	81	25.1	49	42	47	138	25.1
20 / 24	1		0	1	22.0	12	4	6	21	21.0	33	30	33	96	20.5
15 / 19						2	1	1	5	15.8	23	21	22	66	15.9
10 / 14						1	1	0	2	11.4	17	10	11	38	11.5
5 / 9						0			0	6.7	6	5	6	17	6.6
0 / 4											3	2	1	6	1.7
-5 / -1											0	0	0	1	-2.9
-10 / -6											0	0	0	0	-6.8
-15 / -11											0			0	-13.3
-20 / -16															

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.

MUSKEGON**MI****WMO No. 726360****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		0	0	0	73.0
90 / 94		4	2	6	74.5
85 / 89		35	16	51	72.3
80 / 84	4	138	69	211	69.7
75 / 79	32	247	149	428	67.1
70 / 74	130	278	238	646	64.7
65 / 69	218	236	248	702	61.1
60 / 64	265	217	249	731	56.9
55 / 59	265	197	215	677	52.5
50 / 54	244	191	216	651	47.6
45 / 49	225	183	201	609	43.0
40 / 44	236	199	209	644	38.5
35 / 39	288	258	273	819	34.1
30 / 34	330	257	302	889	29.8
25 / 29	233	171	199	604	25.0
20 / 24	157	138	142	436	20.2
15 / 19	120	90	102	313	15.7
10 / 14	86	51	62	200	11.1
5 / 9	42	23	25	90	6.4
0 / 4	19	8	9	36	1.7
-5 / -1	6	2	2	10	-2.8
-10 / -6	4	1	1	6	-7.1
-15 / -11	1	0	0	1	-11.8
-20 / -16	0			0	-17.0

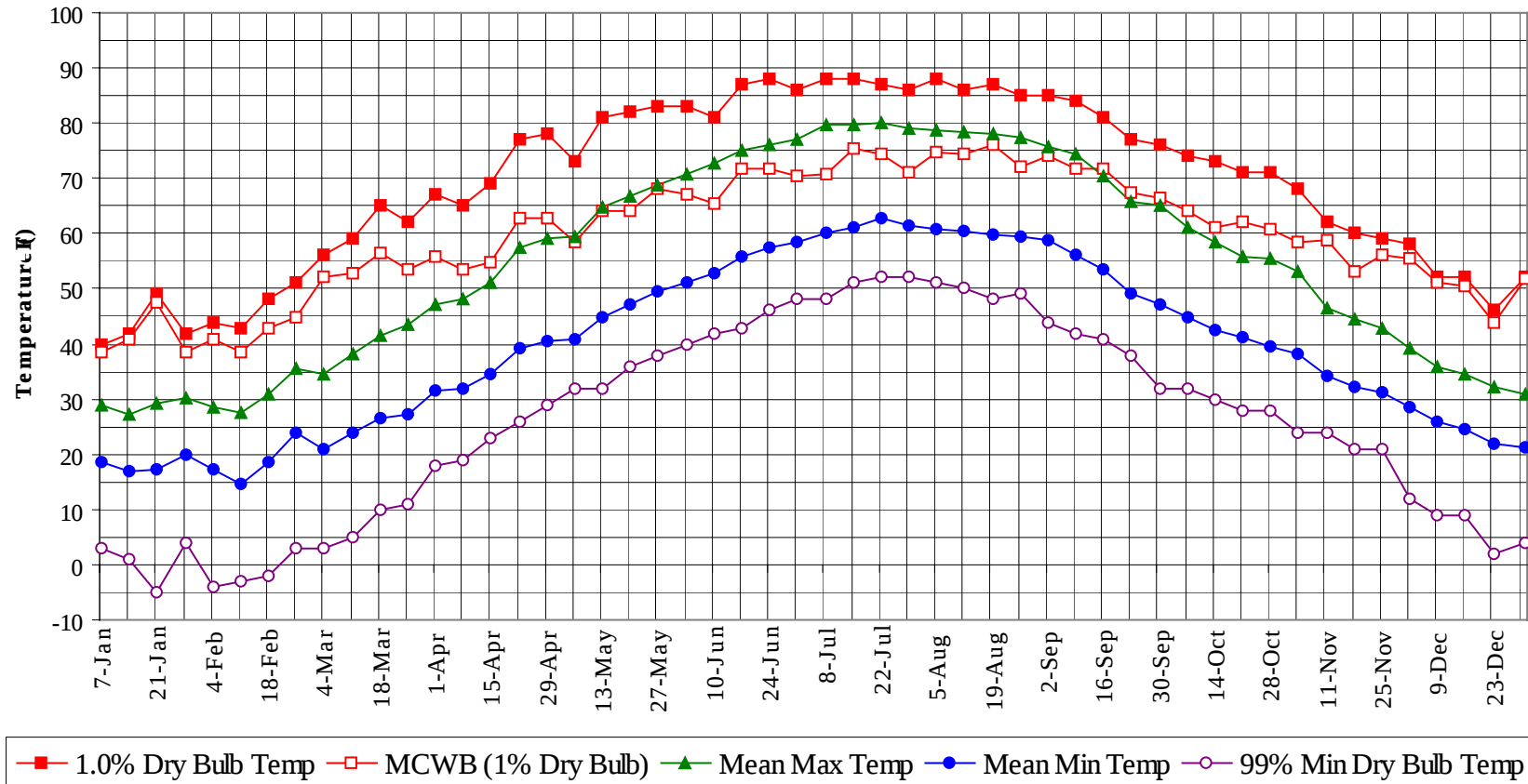
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

MUSKEGON

MI

WMO No. 726360

Annual Summary of Temperatures

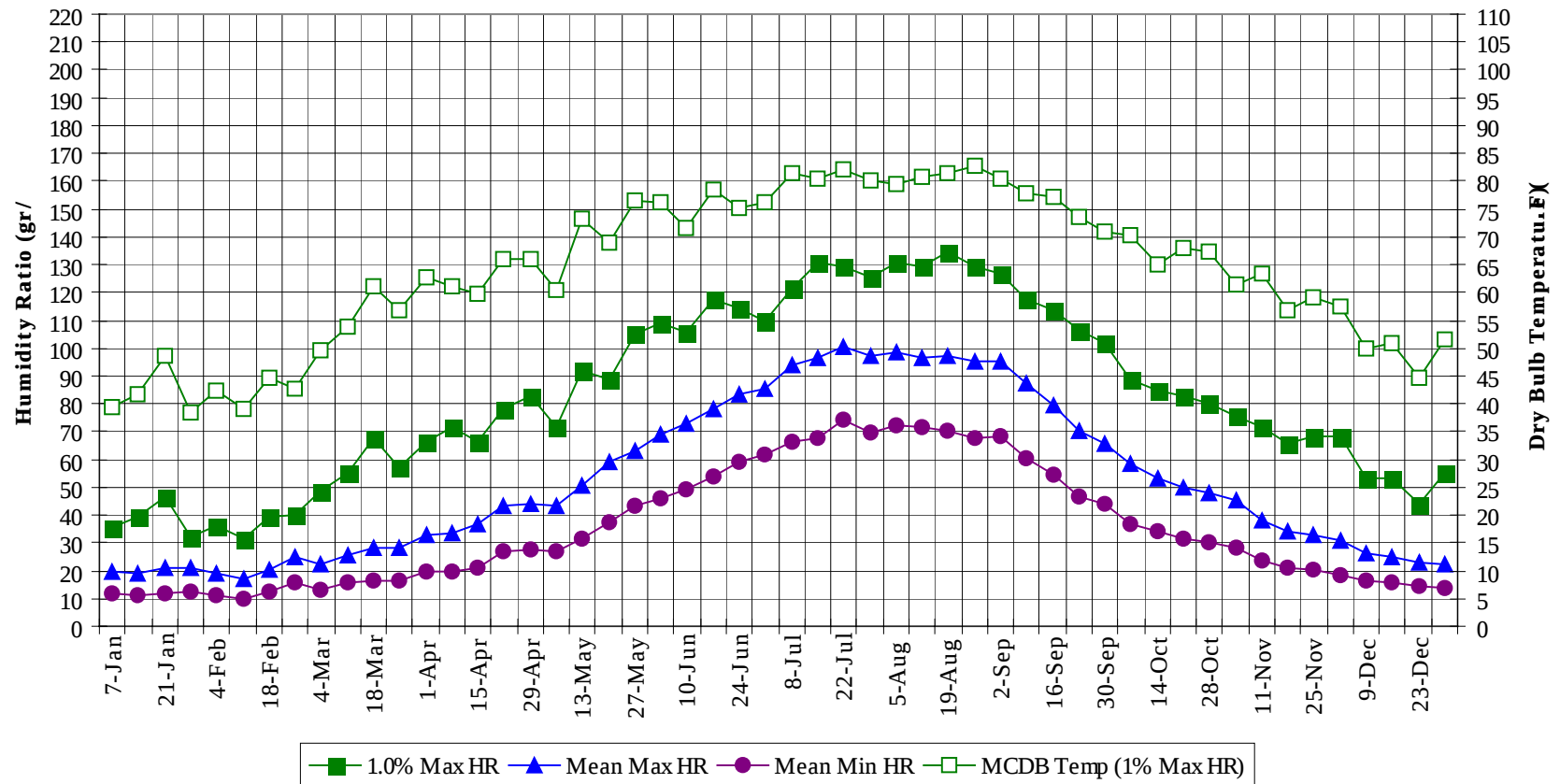


MUSKEGON

MI

WMO No. 726360

Long Term Humidity and Dry Bulb Temperature Summary



MUSKEGON**MI****WMO No. 726360****Long Term Dry Bulb Temperature and Humidity Summary**

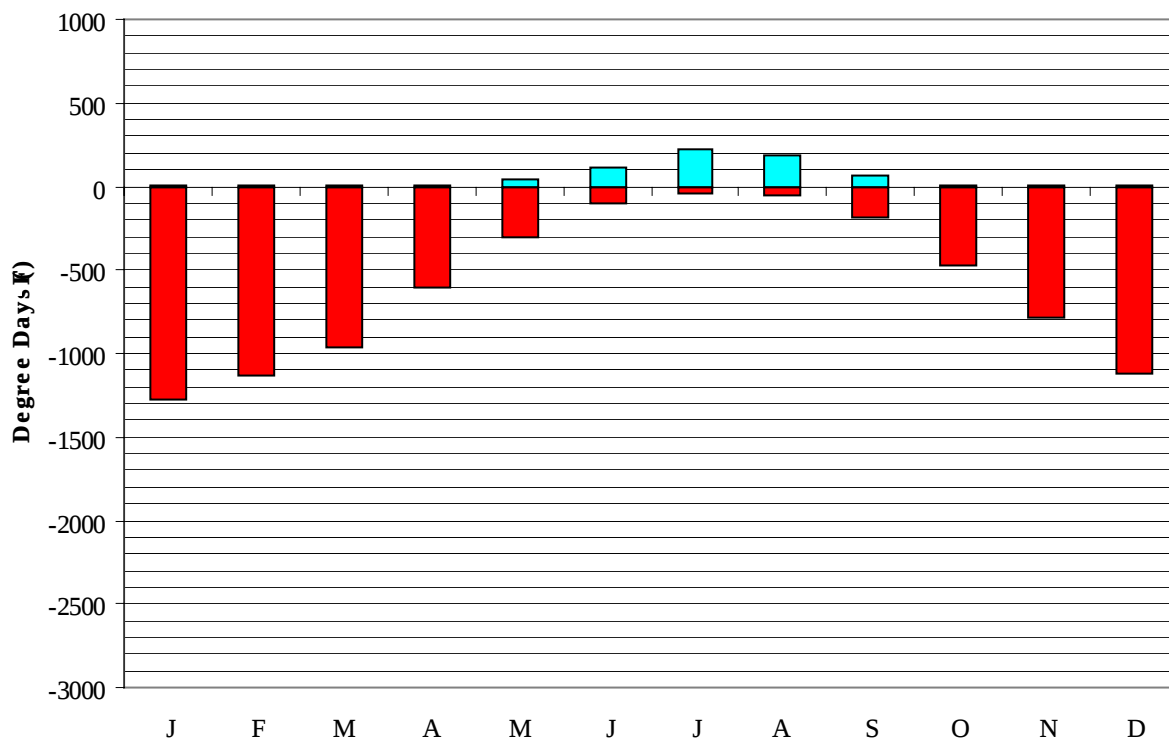
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	40.0	38.4	28.7	18.4	3.0	35.7	39.4	19.8	11.8
14-Jan	42.0	40.9	27.3	17.0	1.0	39.2	41.6	19.2	11.1
21-Jan	49.0	47.4	29.2	17.4	-5.0	46.9	48.8	20.7	11.9
28-Jan	42.0	38.4	30.3	19.9	4.0	32.2	38.3	21.0	12.6
4-Feb	44.0	40.7	28.4	17.2	-4.0	36.4	42.2	18.9	11.3
11-Feb	43.0	38.5	27.4	14.5	-3.0	31.5	39.2	17.1	9.7
18-Feb	48.0	43.0	30.8	18.7	-2.0	39.2	44.6	20.6	12.2
25-Feb	51.0	44.9	35.7	23.8	3.0	39.9	42.8	24.8	15.7
4-Mar	56.0	52.0	34.5	20.9	3.0	48.3	49.7	22.2	13.2
11-Mar	59.0	52.7	38.2	24.0	5.0	55.3	54.0	25.8	15.6
18-Mar	65.0	56.4	41.6	26.6	10.0	67.9	61.1	27.9	16.6
25-Mar	62.0	53.4	43.6	27.3	11.0	57.4	56.8	28.1	16.6
1-Apr	67.0	55.7	47.2	31.4	18.0	66.5	62.6	32.7	19.8
8-Apr	65.0	53.3	48.1	31.8	19.0	71.4	61.2	33.3	19.4
15-Apr	69.0	54.8	51.2	34.5	23.0	66.5	59.8	36.6	20.8
22-Apr	77.0	62.9	57.3	39.0	26.0	78.4	66.1	43.5	26.8
29-Apr	78.0	62.8	59.2	40.5	29.0	82.6	66.1	44.3	27.7
6-May	73.0	58.3	59.4	40.9	32.0	71.4	60.5	43.5	27.0
13-May	81.0	64.0	64.6	44.7	32.0	91.7	73.2	50.7	31.8
20-May	82.0	64.2	66.6	47.1	36.0	88.9	69.0	59.1	37.4
27-May	83.0	68.1	68.9	49.4	38.0	105.0	76.4	62.9	43.3
3-Jun	83.0	67.1	70.7	51.0	40.0	109.2	76.1	69.1	46.1
10-Jun	81.0	65.5	72.6	52.9	42.0	105.7	71.4	72.6	49.1
17-Jun	87.0	71.7	75.0	55.8	43.0	117.6	78.5	78.4	54.2
24-Jun	88.0	71.9	76.0	57.3	46.0	114.1	75.3	83.7	59.4
1-Jul	86.0	70.6	77.2	58.4	48.0	109.9	76.3	85.1	61.6
8-Jul	88.0	70.7	79.7	60.0	48.0	121.8	81.4	93.9	66.5
15-Jul	88.0	75.3	79.6	61.2	51.0	130.9	80.4	96.7	67.9
22-Jul	87.0	74.3	80.2	62.8	52.0	129.5	82.0	100.3	74.4
29-Jul	86.0	71.2	79.1	61.5	52.0	125.3	80.0	97.0	69.9
5-Aug	88.0	74.9	78.7	60.9	51.0	130.9	79.4	98.5	72.5
12-Aug	86.0	74.6	78.3	60.5	50.0	129.5	80.8	96.4	71.4
19-Aug	87.0	76.1	78.0	59.9	48.0	134.4	81.6	97.2	70.1
26-Aug	85.0	72.2	77.4	59.3	49.0	129.5	82.8	95.1	67.7
2-Sep	85.0	74.1	75.7	58.9	44.0	126.7	80.3	95.0	68.1
9-Sep	84.0	71.7	74.4	56.0	42.0	117.6	77.7	87.3	60.3
16-Sep	81.0	71.7	70.3	53.4	41.0	113.4	77.2	79.5	54.3
23-Sep	77.0	67.5	65.8	49.2	38.0	106.4	73.5	70.6	46.9
30-Sep	76.0	66.3	65.1	47.1	32.0	101.5	71.0	65.8	44.1
7-Oct	74.0	64.0	61.3	44.7	32.0	88.9	70.2	58.2	37.1
14-Oct	73.0	61.0	58.6	42.5	30.0	84.7	65.0	53.0	34.2
21-Oct	71.0	62.1	55.9	41.1	28.0	82.6	68.1	49.8	31.7
28-Oct	71.0	60.6	55.6	39.5	28.0	79.8	67.2	47.8	30.4
4-Nov	68.0	58.4	53.0	38.4	24.0	75.6	61.6	45.6	28.6
11-Nov	62.0	58.7	46.6	34.4	24.0	71.4	63.4	38.1	23.5
18-Nov	60.0	53.0	44.6	32.3	21.0	65.8	57.0	34.0	20.9
25-Nov	59.0	56.2	42.8	31.3	21.0	68.6	59.1	32.6	20.2
2-Dec	58.0	55.4	39.1	28.5	12.0	68.6	57.4	30.5	18.2
9-Dec	52.0	51.0	35.8	26.0	9.0	53.2	50.0	26.2	16.2
16-Dec	52.0	50.4	34.4	24.5	9.0	53.2	51.0	24.7	15.7
23-Dec	46.0	44.0	32.2	21.8	2.0	44.1	44.6	23.3	14.4
31-Dec	52.0	51.7	31.0	21.3	4.0	55.3	51.7	22.2	13.7

MUSKEGON

MI

WMO No. 726360

Degree Days, Heating and Cooling
(Base 65°F)



■ Mean Cooling Degree Days ■ Mean Heating Degree Days

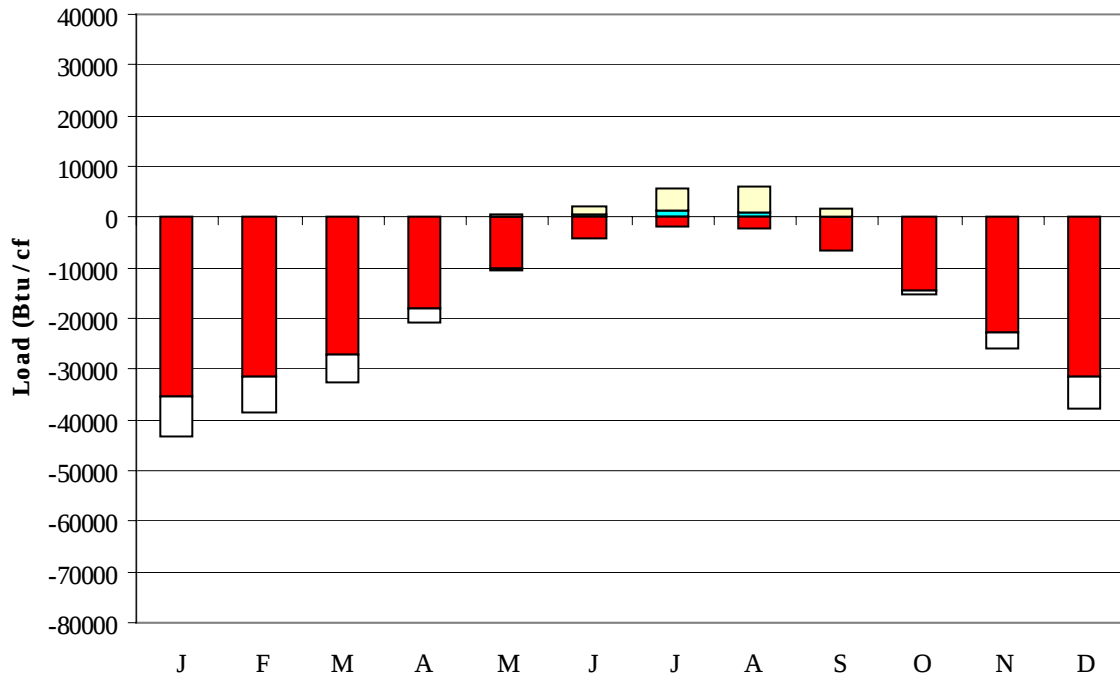
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1278
FEB	0	1130
MAR	1	959
APR	9	603
MAY	44	307
JUN	118	107
JUL	216	39
AUG	185	51
SEP	66	186
OCT	7	474
NOV	0	781
DEC	0	1124
ANN	646	7039

MUSKEGON

MI

WMO No. 726360

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 (Drying) Load	■ Average Latent Heating (Humidifying) Load

	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	-35540	0	-7787
FEB	0	-31475	0	-6984
MAR	1	-27247	0	-5428
APR	18	-17858	10	-2791
MAY	164	-9936	292	-683
JUN	565	-4030	1407	-35
JUL	1192	-1724	4566	0
AUG	849	-2155	5081	-1
SEP	173	-6437	1591	-65
OCT	4	-14580	45	-823
NOV	0	-22572	0	-3356
DEC	0	-31538	2	-6208
ANN	2966	-205092	12994	-34161

Average Annual Solar Radiation – Nearest Available Site

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

City: MUSKEGON
 State: MI
 WBAN No: 14840
 Lat(N): 43.17
 Long(W): 86.25
 Elev(ft): 627

Stn Type: Secondary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS

Window: 1
 Overhang: 0.625
 Vert Gap: 0.33

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	490	760	1100	1500	1860	2040	2030	1730	1300	850	500	390	1210
	Std Dev	37	57	74	91	156	132	90	125	106	56	41	27	36
	Minimum	400	650	990	1270	1540	1790	1840	1540	1090	750	420	330	1150
	Maximum	560	900	1260	1700	2170	2340	2190	2030	1510	950	590	450	1270
	Diffuse	390	510	610	700	780	830	790	710	590	450	340	320	580
Clear Day	Global	770	1130	1620	2130	2490	2620	2520	2210	1740	1220	810	650	1660
NORTH	Global	200	270	350	430	550	620	590	480	370	270	190	160	370
	Diffuse	200	270	350	430	500	540	520	450	360	270	190	160	350
Clear Day	Global	170	240	320	420	580	680	630	470	350	250	170	150	370
EAST	Global	300	470	670	880	1040	1100	1110	990	780	520	310	240	700
	Diffuse	240	340	430	520	600	630	620	560	450	320	220	190	430
Clear Day	Global	610	830	1100	1330	1450	1490	1460	1340	1130	860	620	530	1060
SOUTH	Global	590	860	1000	1000	930	880	930	1020	1070	960	620	490	860
	Diffuse	370	460	500	540	570	590	580	560	500	410	310	290	470
Clear Day	Global	1800	1930	1850	1520	1210	1050	1100	1350	1660	1820	1760	1690	1560
WEST	Global	300	480	690	900	1070	1150	1170	1040	820	560	310	250	730
	Diffuse	240	340	430	520	600	640	630	560	460	330	220	200	430
Clear Day	Global	610	830	1100	1330	1450	1490	1460	1340	1130	860	620	530	1060

Average Annual Solar Heat and Illumination – Nearest Available Site

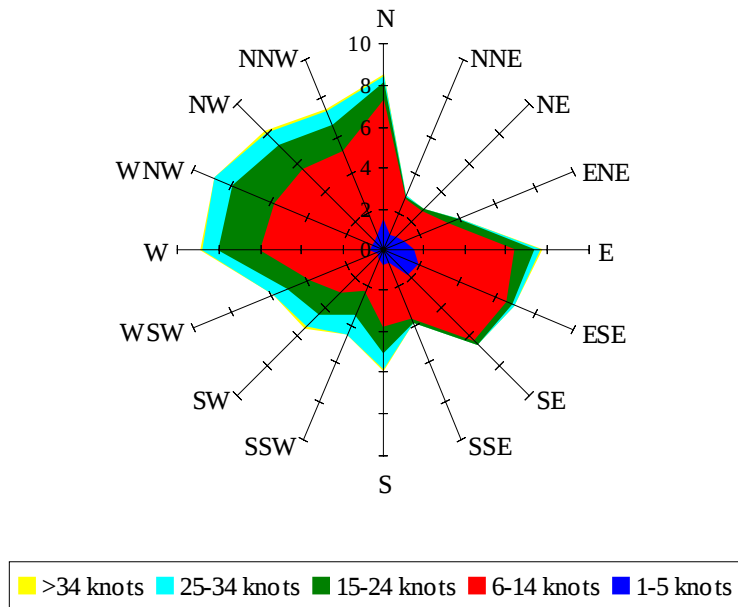
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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	330	520	770	1070	1350	1480	1470	1250	920	580	330	260	860
NORTH	Unshaded	140	190	240	300	360	410	390	320	250	190	130	110	250
	Shaded	110	160	210	260	310	350	340	280	220	160	110	91	220
EAST	Unshaded	210	330	470	620	740	780	790	700	550	370	210	160	500
	Shaded	170	270	390	520	600	640	640	580	460	310	180	140	410
SOUTH	Unshaded	440	630	710	660	590	540	570	660	740	690	460	360	590
	Shaded	410	560	540	400	350	350	350	370	500	590	430	340	430
WEST	Unshaded	210	340	480	640	760	820	830	740	580	390	220	170	520
	Shaded	180	290	410	530	620	660	680	610	490	330	180	140	430

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	22	58	76	68	38	34	72	96	99	80
	M.Cloudy	13	36	45	43	24	21	44	66	69	55
NORTH	M.Clear	7	12	15	14	10	20	15	17	17	16
	M.Cloudy	6	14	17	16	10	12	15	19	19	17
EAST	M.Clear	59	66	25	14	10	67	79	48	17	16
	M.Cloudy	17	29	20	16	10	26	39	35	19	17
SOUTH	M.Clear	24	65	85	76	41	10	27	49	52	34
	M.Cloudy	9	29	37	36	18	8	20	35	38	26
WEST	M.Clear	7	12	15	53	70	10	15	17	36	74
	M.Cloudy	6	14	17	28	26	8	15	19	29	45
M.Clear	(% hrs)	24	24	26	24	26	40	42	42	43	43

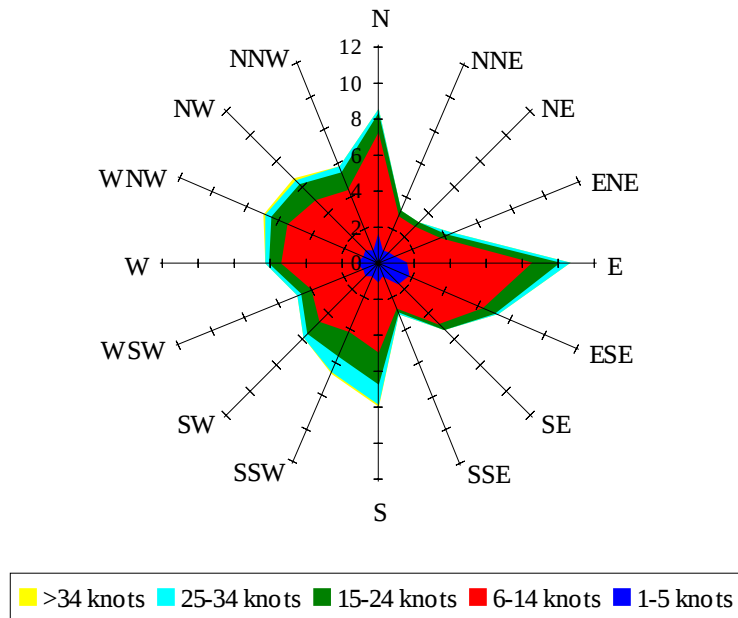
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	13	51	76	78	57	3	27	40	30	6
	M.Cloudy	8	30	49	50	35	2	16	23	18	4
NORTH	M.Clear	5	12	15	15	13	2	8	10	9	3
	M.Cloudy	4	12	16	17	13	1	7	10	8	2
EAST	M.Clear	39	73	44	15	13	10	40	13	9	3
	M.Cloudy	12	29	28	17	13	2	12	11	8	2
SOUTH	M.Clear	9	46	73	76	53	8	61	83	66	17
	M.Cloudy	5	21	40	41	26	2	16	22	18	4
WEST	M.Clear	5	12	15	36	71	2	8	10	37	20
	M.Cloudy	4	12	16	25	32	1	7	10	13	5
M.Clear	(% hrs)	35	38	35	37	39	8	9	9	10	11

Wind Summary - December, January, and February **Labels of Percent Frequency on North Axis**



Percent Calm = 2.92

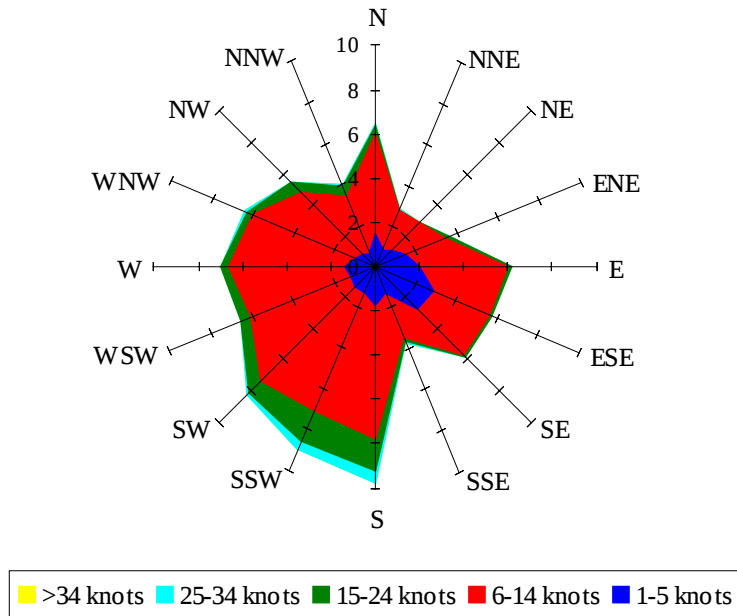
Wind Summary - March, April, and May **Labels of Percent Frequency on North Axis**



Percent Calm = 5.04

Wind Summary - June, July, and August

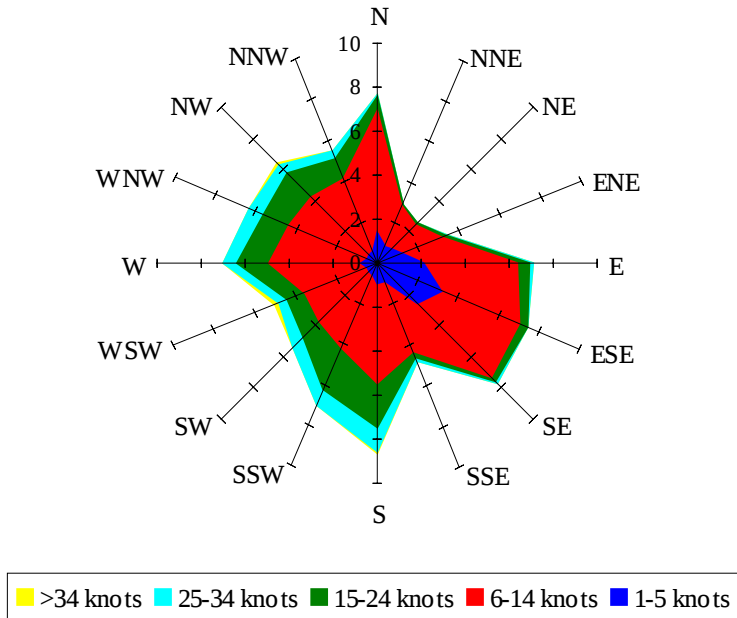
Labels of Percent Frequency on North Axis



Percent Calm = 7.36

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 5.11