

GRAND RAPIDS MI

Latitude = 42.88 N

Longitude = 85.52 W

Period of Record = 1973 to 1992

WMO No. 726350

Elevation = 804 feet

Average Pressure = 29.12 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	75	103	13.6	WSW
0.4% Occurrence	90	73	101	12.7	WSW
1.0% Occurrence	87	72	97	11.7	WSW
2.0% Occurrence	84	70	93	11.0	WSW
Mean Daily Range	17	-	-	-	-
97.5% Occurrence	11	10	7	9.3	W
99.0% Occurrence	5	4	5	7.9	S
99.6% Occurrence	0	-1	4	7.6	S
Median of Extreme Lows	-12	-12	2	4.1	S
	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	79	88	134	12.4	WSW
0.4% Occurrence	76	85	123	11.4	WSW
1.0% Occurrence	75	83	119	10.8	WSW
2.0% Occurrence	73	81	112	10.1	WSW
	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	140	84	0.90	11.0	SW
0.4% Occurrence	127	81	0.82	10.2	WSW
1.0% Occurrence	122	80	0.79	10.1	WSW
2.0% Occurrence	114	77	0.74	9.2	WSW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		8	433	202	873

Other Site Data

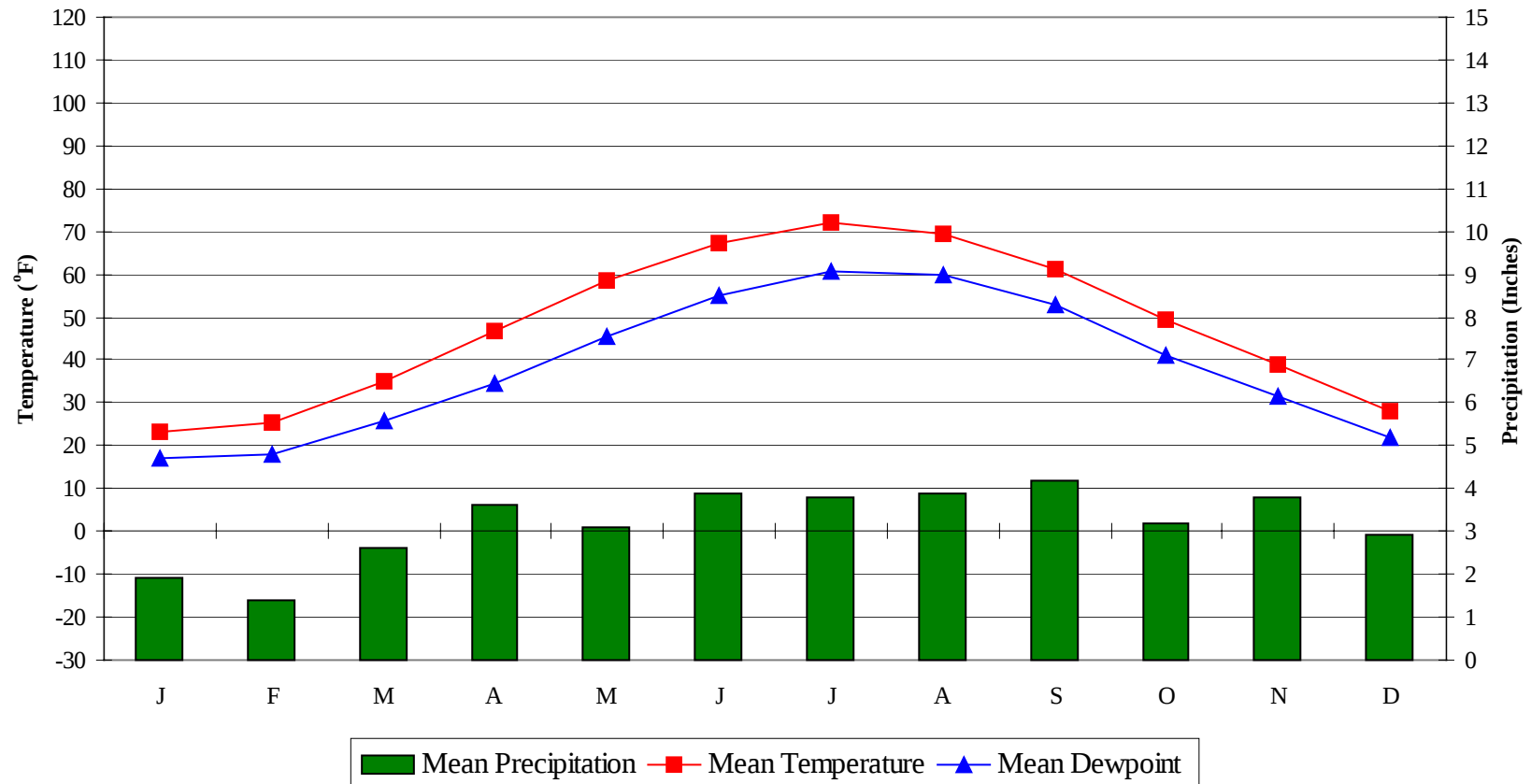
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
5	2.8	90	1.2 + 0.4
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
50.6	N/A	36	60

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

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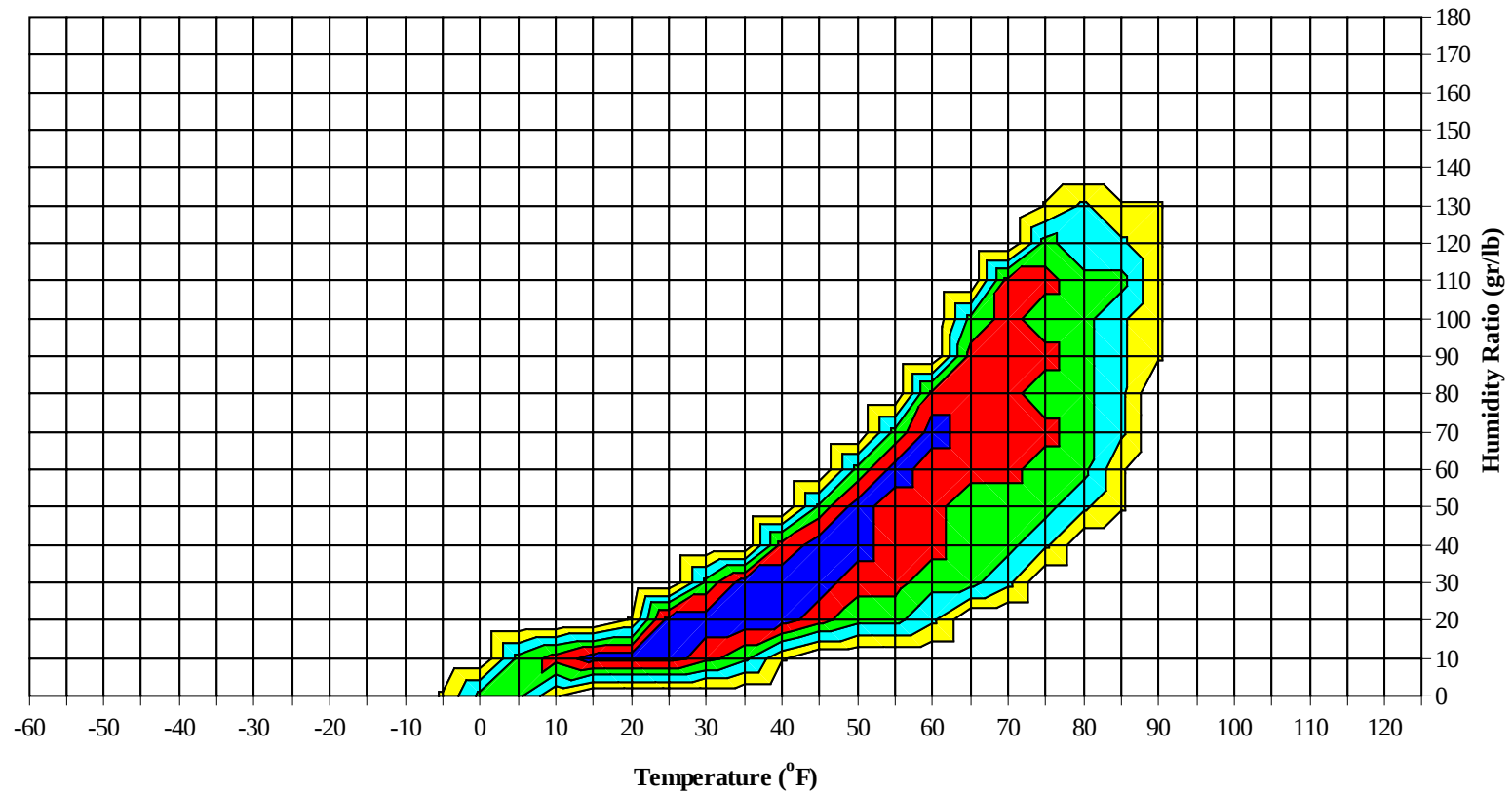
Average Annual Climate



GRAND RAPIDS MI

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Long Term Psychrometric Summary

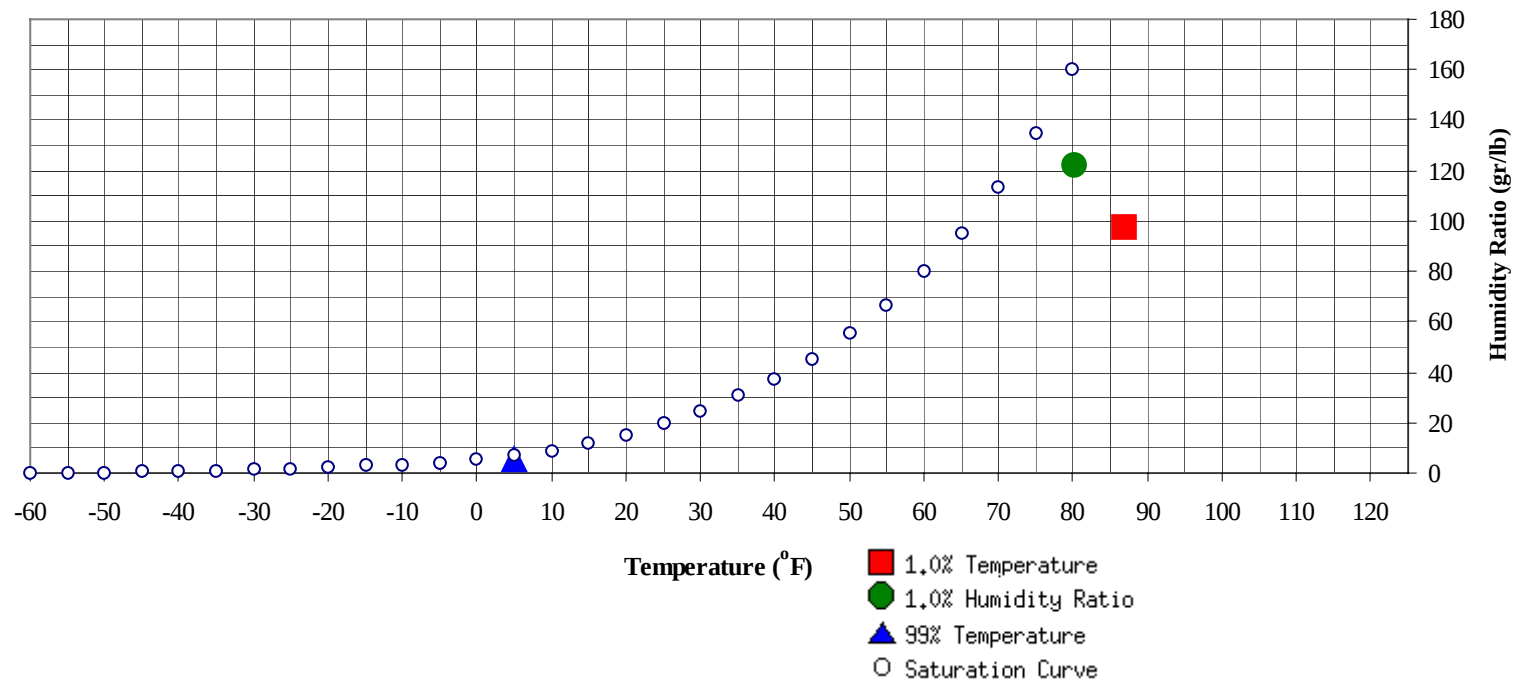


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	5	5.3	2.0		121.8	80.2	74.3	72	38.3

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	87	97.9	72.1	36.3

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Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1992

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	1	1	60.3
70 / 74											0	2	1	3	59.3
65 / 69								0	0	51.0	1	6	3	10	56.1
60 / 64							0	0	0	49.4	3	6	5	14	54.7
55 / 59		0	0	0	50.5		1	1	2	48.6	4	9	8	21	50.1
50 / 54	1	1	1	3	48.7	1	2	2	5	46.5	8	16	13	37	45.8
45 / 49	2	3	3	8	43.8	2	6	3	11	42.4	11	23	21	55	42.2
40 / 44	3	8	6	17	38.3	7	17	13	37	37.8	17	35	28	80	37.8
35 / 39	19	28	20	67	34.2	20	32	29	81	34.1	37	51	50	138	33.7
30 / 34	43	48	49	140	29.9	38	41	42	121	30.0	54	45	51	150	29.5
25 / 29	39	44	43	126	25.1	32	35	36	103	24.6	45	29	32	106	24.5
20 / 24	39	46	41	126	20.2	34	40	39	113	20.0	29	16	23	68	20.0
15 / 19	38	34	38	110	15.7	32	26	29	87	15.6	21	7	9	37	15.6
10 / 14	30	20	23	73	11.0	25	13	18	56	11.0	11	2	3	16	11.0
5 / 9	19	9	14	42	6.3	15	6	9	30	6.3	4	0	1	5	6.5
0 / 4	8	4	7	19	1.6	10	3	3	16	1.6	2	0	0	2	1.8
-5 / -1	4	2	1	7	-3.0	4	1	1	6	-3.1	1		0	1	-2.8
-10 / -6	2	1	1	4	-7.2	3	0	0	3	-6.9	0			0	-6.0
-15 / -11	1	0	0	1	-11.7	1	0		1	-11.7					
-20 / -16	1	0	0	1	-16.5	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.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1992

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	74.4
90 / 94							1	0	1	69.4		4	1	5	70.9
85 / 89		0	0	0	64.0		7	3	10	69.0	0	18	8	26	70.0
80 / 84		4	2	6	64.6		18	8	26	66.8	1	36	21	58	67.5
75 / 79		7	4	11	63.1	1	27	16	44	64.1	7	54	39	100	65.4
70 / 74	0	10	8	18	60.0	8	32	25	65	61.0	22	53	47	122	63.0
65 / 69	5	16	11	32	56.6	18	38	35	91	58.3	44	37	47	128	60.9
60 / 64	13	25	19	57	53.2	32	42	41	115	54.8	56	22	40	118	57.2
55 / 59	14	30	24	68	49.2	34	35	40	109	51.2	49	11	22	82	53.6
50 / 54	18	32	32	82	45.6	43	25	34	102	47.0	35	4	12	51	49.1
45 / 49	27	38	38	103	42.0	45	14	26	85	43.2	19	1	3	23	45.1
40 / 44	44	35	42	121	38.3	35	6	15	56	38.9	8		0	8	40.7
35 / 39	47	24	31	102	33.9	21	2	6	29	35.1	1			1	36.6
30 / 34	38	13	19	70	29.5	9		1	10	30.2					
25 / 29	21	4	8	33	24.8	2			2	26.0					
20 / 24	10	1	3	14	20.4										
15 / 19	2	0	0	2	16.5										
10 / 14	0			0	10.8										
5 / 9	0			0	6.8										
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WMO No. 726350

Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1992

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		1	0	1	69.0		1	0	1	76.4					
90 / 94		12	5	17	74.6		6	2	8	75.3		1	0	1	73.6
85 / 89	0	34	17	51	72.6	0	17	8	25	73.4		5	2	7	72.2
80 / 84	2	60	40	102	69.6	1	44	23	68	70.2		16	5	21	69.9
75 / 79	17	67	55	139	67.6	9	68	45	123	67.7	3	33	17	53	67.5
70 / 74	44	43	54	141	65.9	33	59	55	147	65.9	13	43	29	85	65.0
65 / 69	62	20	43	125	63.0	62	36	55	153	63.0	29	45	39	113	61.7
60 / 64	64	8	26	98	59.0	60	13	38	110	59.0	40	44	48	132	57.4
55 / 59	39	2	8	49	55.0	49	3	17	69	55.0	44	31	41	116	53.3
50 / 54	15	0	1	16	50.7	24	0	4	28	50.5	42	16	31	89	49.1
45 / 49	4		0	4	46.1	9	0	1	10	46.1	37	6	19	62	44.8
40 / 44	0			0	41.3	2			2	41.3	22	1	8	31	40.5
35 / 39											8		2	10	36.3
30 / 34											2		0	2	31.3
25 / 29											0			0	28.4
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WMO No. 726350

Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1992

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	65.8										
75 / 79	0	6	2	8	65.0		0		0	65.0					
70 / 74	1	12	6	19	61.7		2	0	2	60.3					
65 / 69	4	23	12	39	58.7	1	4	1	6	58.4		0	0	0	62.4
60 / 64	16	32	26	74	55.4	4	10	6	20	56.2	1	2	1	4	58.7
55 / 59	23	42	32	96	51.5	11	15	14	40	52.7	1	2	3	6	53.8
50 / 54	34	46	39	118	47.5	13	21	16	50	48.1	3	4	3	10	49.4
45 / 49	40	45	52	136	43.5	18	27	22	67	43.0	4	5	5	14	44.0
40 / 44	46	27	40	113	39.0	30	43	38	110	38.4	6	14	9	29	38.9
35 / 39	48	12	28	88	35.1	48	54	56	157	34.2	26	39	30	95	34.3
30 / 34	24	2	10	36	31.0	57	41	51	148	29.9	63	64	69	196	30.2
25 / 29	10	0	2	12	26.3	37	16	26	79	25.1	51	47	47	145	25.1
20 / 24	3	0	0	3	21.3	16	6	8	30	21.0	37	31	37	105	20.4
15 / 19	0	0		0	18.5	4	1	2	7	16.1	22	23	21	66	15.8
10 / 14						2	0	1	3	11.5	15	10	13	38	11.1
5 / 9						0		0	0	7.0	10	4	7	21	6.5
0 / 4											7	2	3	12	1.8
-5 / -1											2	0	1	3	-3.1
-10 / -6											1	0	0	1	-7.3
-15 / -11											0	0	0	0	-11.6
-20 / -16											0			0	-16.0

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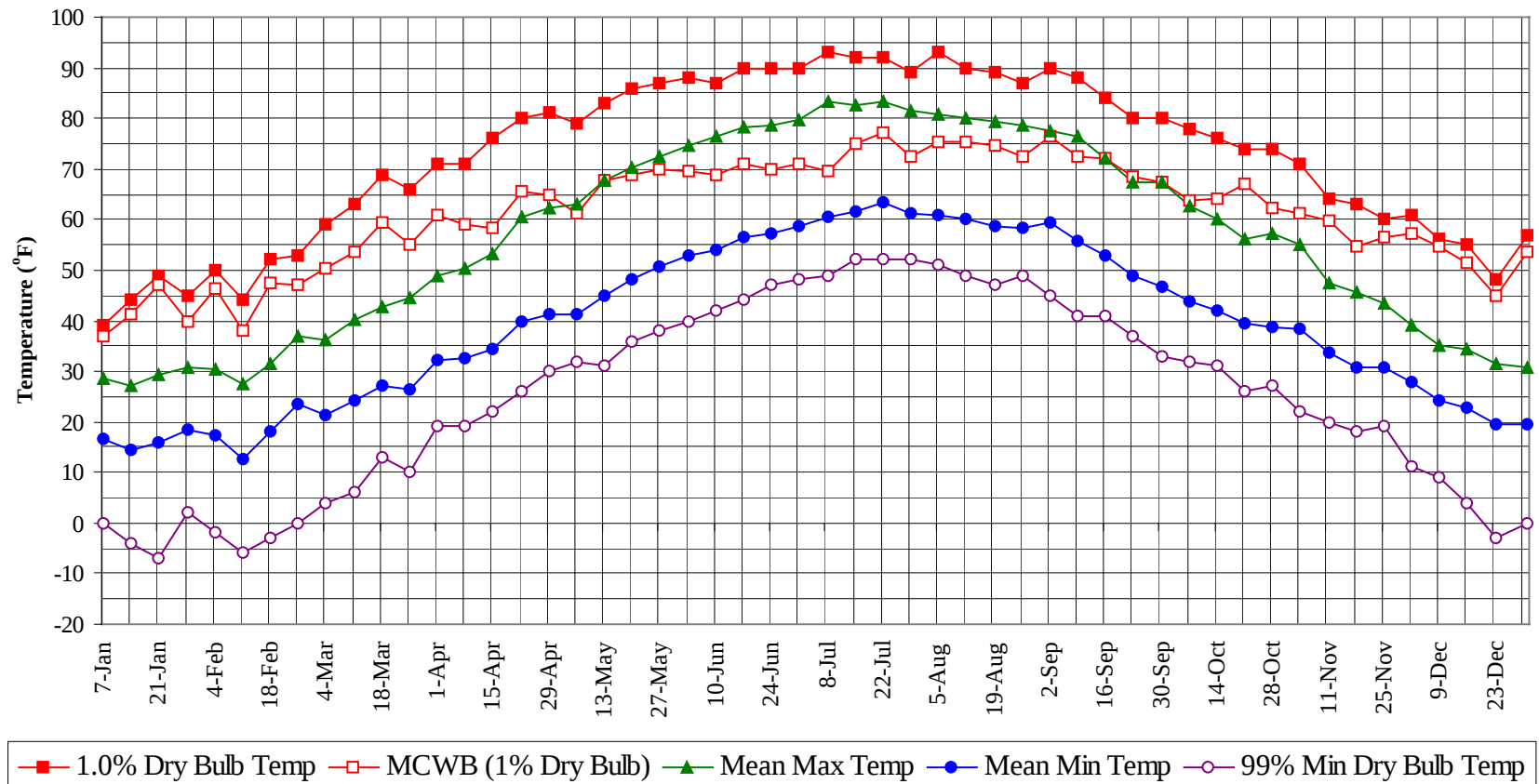
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1992

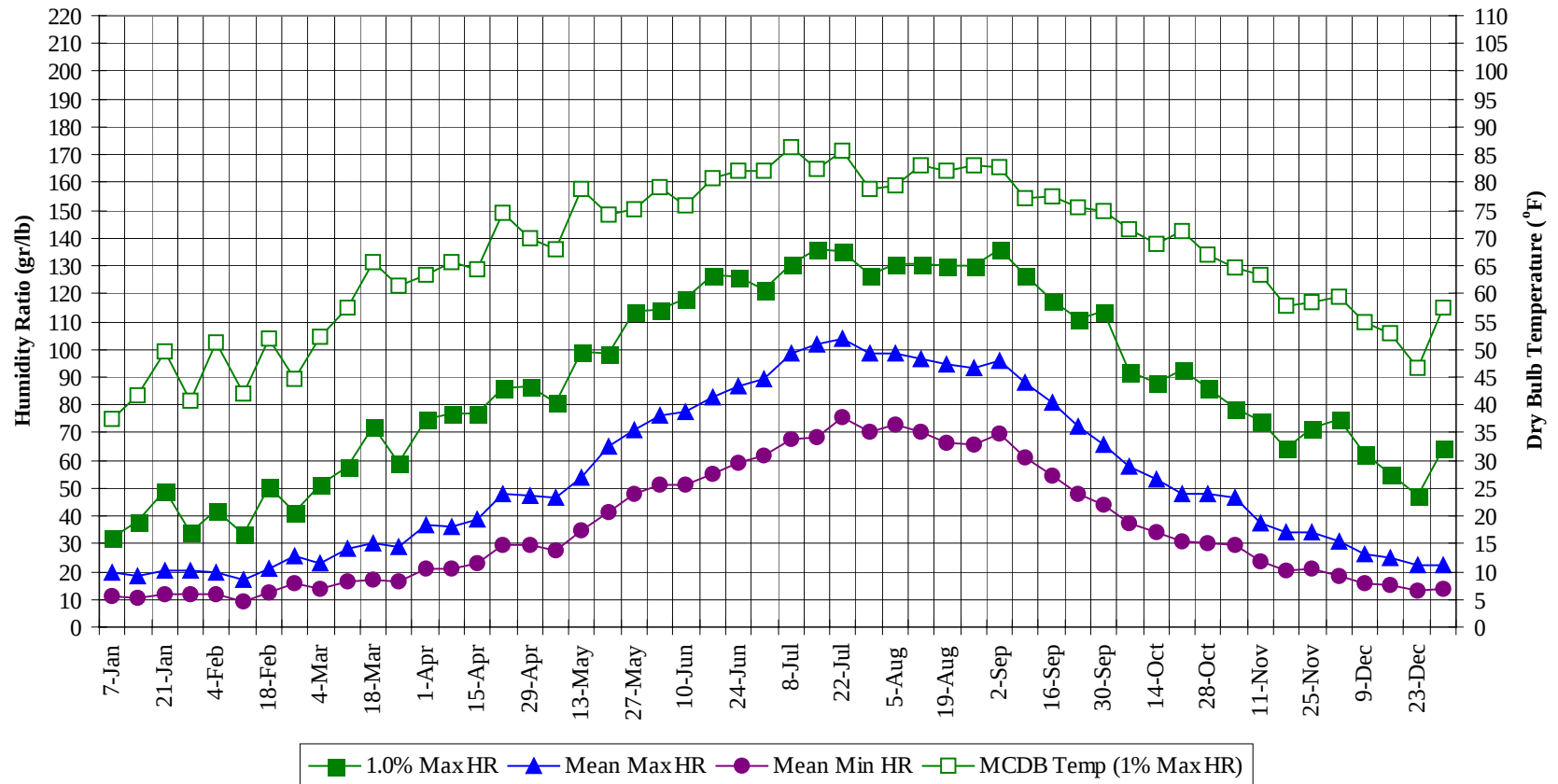
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		2	1	3	72.7
90 / 94		24	9	33	74.0
85 / 89	0	82	38	120	71.8
80 / 84	4	180	99	282	69.0
75 / 79	36	265	177	479	66.7
70 / 74	121	257	226	604	64.3
65 / 69	227	225	247	699	61.1
60 / 64	289	205	249	743	56.8
55 / 59	268	182	209	659	52.5
50 / 54	236	169	187	592	47.7
45 / 49	218	167	192	577	43.3
40 / 44	220	186	197	603	38.6
35 / 39	276	242	249	767	34.2
30 / 34	327	254	290	871	29.9
25 / 29	236	176	193	605	24.9
20 / 24	168	138	150	455	20.2
15 / 19	119	90	99	308	15.7
10 / 14	83	45	57	185	11.0
5 / 9	48	19	32	99	6.4
0 / 4	27	9	13	49	1.7
-5 / -1	10	3	3	16	-3.0
-10 / -6	6	1	1	8	-7.1
-15 / -11	3	0	0	3	-11.7
-20 / -16	1	0	0	1	-16.5
			</		

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



GRAND RAPIDS MI

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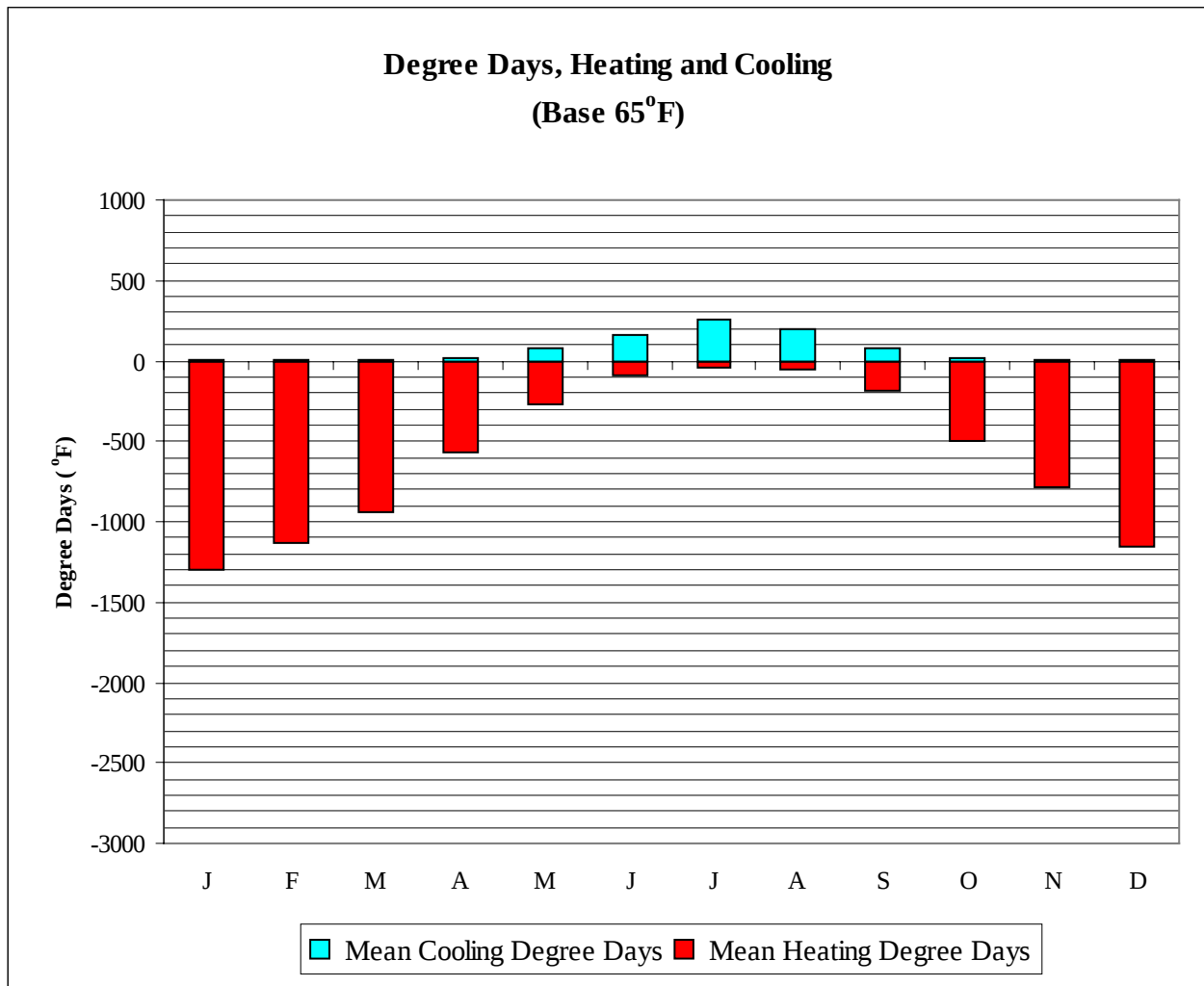
Long Term Dry Bulb Temperature and Humidity Summary

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	39.0	36.8	28.7	16.6	0.0	32.2	37.5	19.4	11.4
14-Jan	44.0	41.4	27.0	14.6	-4.0	37.8	41.9	18.4	10.3
21-Jan	49.0	47.1	29.4	15.9	-7.0	49.0	49.4	20.4	11.7
28-Jan	45.0	39.8	30.6	18.5	2.0	34.3	40.9	20.6	12.0
4-Feb	50.0	46.4	30.2	17.2	-2.0	42.0	51.1	19.6	11.5
11-Feb	44.0	38.0	27.4	12.8	-6.0	33.6	42.0	16.9	9.4
18-Feb	52.0	47.4	31.5	18.2	-3.0	50.4	51.8	21.3	12.4
25-Feb	53.0	47.0	37.0	23.4	0.0	41.3	44.5	25.6	15.9
4-Mar	59.0	50.5	36.0	21.4	4.0	51.1	52.3	22.9	13.6
11-Mar	63.0	53.5	40.3	24.3	6.0	58.1	57.5	28.1	16.4
18-Mar	69.0	59.4	42.6	27.1	13.0	72.1	65.8	29.9	17.1
25-Mar	66.0	55.0	44.5	26.5	10.0	58.8	61.6	28.7	16.7
1-Apr	71.0	60.8	49.0	32.4	19.0	74.9	63.4	36.5	21.1
8-Apr	71.0	59.2	50.4	32.6	19.0	77.0	65.8	36.3	21.2
15-Apr	76.0	58.3	53.1	34.4	22.0	77.0	64.5	38.8	22.9
22-Apr	80.0	65.4	60.6	40.0	26.0	86.1	74.6	47.8	29.5
29-Apr	81.0	64.8	62.1	41.4	30.0	86.8	70.0	47.4	29.6
6-May	79.0	61.4	63.2	41.1	32.0	80.5	67.9	46.9	27.7
13-May	83.0	67.6	67.7	45.0	31.0	99.4	78.7	53.6	34.8
20-May	86.0	69.0	70.3	48.3	36.0	98.7	74.3	65.3	41.2
27-May	87.0	70.0	72.5	50.6	38.0	113.4	75.3	70.9	47.9
3-Jun	88.0	69.7	74.7	52.9	40.0	114.1	79.2	76.5	51.4
10-Jun	87.0	68.7	76.6	54.1	42.0	118.3	75.7	77.5	51.5
17-Jun	90.0	71.1	78.1	56.3	44.0	126.7	80.8	82.5	55.2
24-Jun	90.0	70.0	78.5	57.3	47.0	126.0	82.1	86.5	59.0
1-Jul	90.0	71.0	79.8	58.6	48.0	121.8	82.0	89.0	61.7
8-Jul	93.0	69.4	83.2	60.5	49.0	130.9	86.5	98.2	67.6
15-Jul	92.0	75.0	82.7	61.6	52.0	135.8	82.5	101.6	68.4
22-Jul	92.0	77.2	83.2	63.3	52.0	135.1	85.7	103.6	75.8
29-Jul	89.0	72.4	81.4	61.1	52.0	126.7	78.7	98.7	70.0
5-Aug	93.0	75.2	80.9	60.9	51.0	130.9	79.4	98.3	72.7
12-Aug	90.0	75.5	79.9	60.1	49.0	130.9	83.0	96.6	70.6
19-Aug	89.0	74.7	79.3	58.7	47.0	130.2	82.2	94.7	66.3
26-Aug	87.0	72.5	78.5	58.3	49.0	130.2	83.0	93.5	65.9
2-Sep	90.0	76.4	77.5	59.2	45.0	135.8	82.9	96.1	69.6
9-Sep	88.0	72.6	76.5	55.6	41.0	126.7	77.3	88.2	61.4
16-Sep	84.0	72.1	72.1	52.9	41.0	117.6	77.5	80.5	54.3
23-Sep	80.0	68.4	67.4	49.0	37.0	111.3	75.6	72.4	47.8
30-Sep	80.0	67.2	67.3	46.7	33.0	113.4	74.8	65.8	44.0
7-Oct	78.0	63.9	62.8	43.8	32.0	91.7	71.6	58.0	37.3
14-Oct	76.0	64.2	60.0	41.8	31.0	88.2	68.9	52.9	34.2
21-Oct	74.0	66.9	56.3	39.3	26.0	92.4	71.4	48.0	30.6
28-Oct	74.0	62.2	57.1	38.6	27.0	86.1	66.9	47.6	30.2
4-Nov	71.0	61.1	55.2	38.2	22.0	79.1	64.6	46.5	29.4
11-Nov	64.0	59.7	47.4	33.5	20.0	74.2	63.2	37.7	23.7
18-Nov	63.0	54.5	45.8	30.7	18.0	64.4	57.9	34.2	20.3
25-Nov	60.0	56.6	43.6	30.8	19.0	71.4	58.5	34.4	20.8
2-Dec	61.0	57.4	39.1	27.8	11.0	74.9	59.3	31.0	18.7
9-Dec	56.0	54.7	35.2	24.1	9.0	62.3	54.7	26.1	15.6
16-Dec	55.0	51.3	34.3	22.9	4.0	55.3	53.0	25.0	15.3
23-Dec	48.0	45.0	31.6	19.6	-3.0	47.6	46.8	22.5	13.4
31-Dec	57.0	53.5	30.9	19.6	0.0	64.4	57.5	22.4	13.7

GRAND RAPIDS

MI

WMO No. 726350

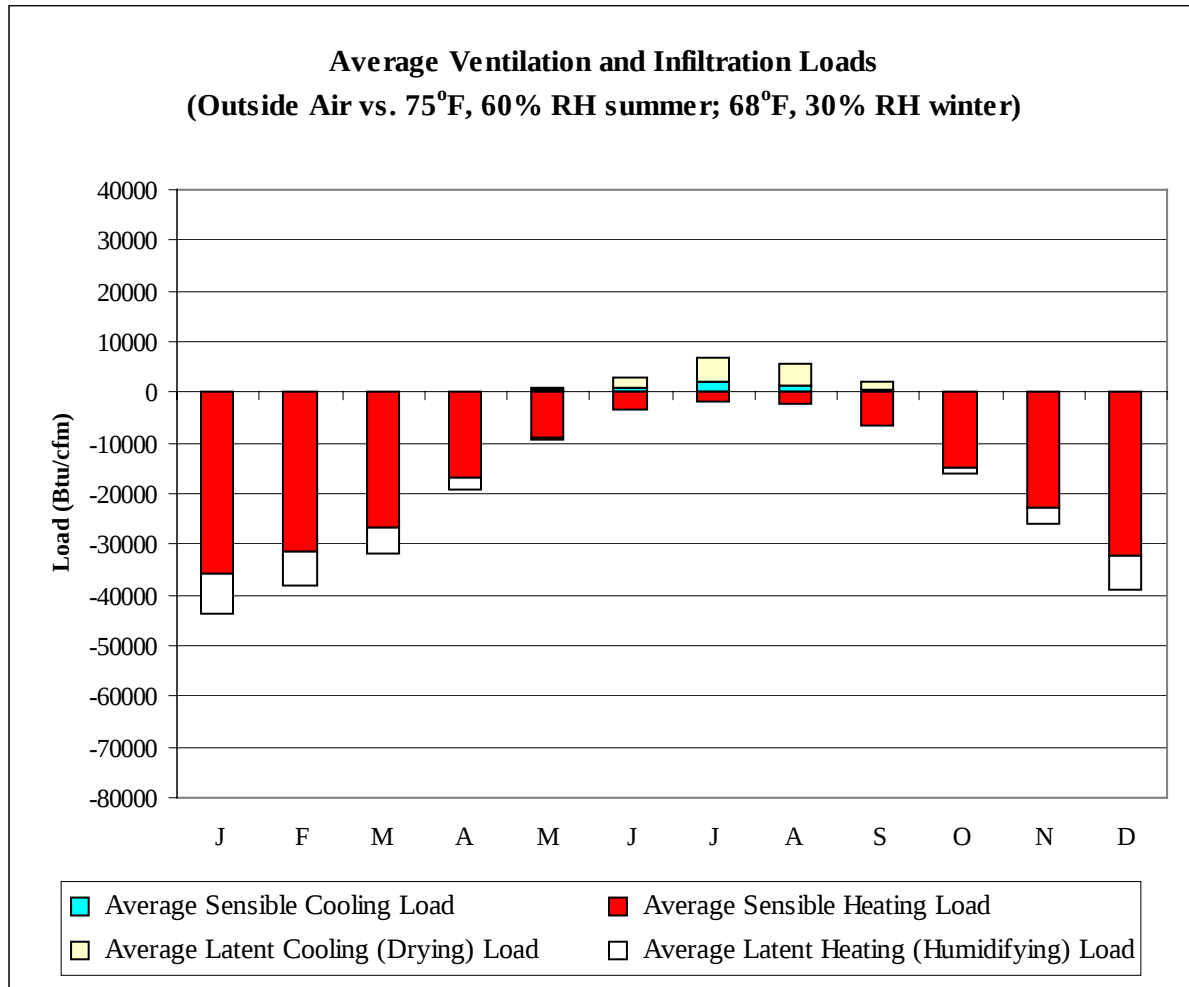


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1295
FEB	0	1126
MAR	2	935
APR	17	563
MAY	74	271
JUN	162	93
JUL	257	38
AUG	195	58
SEP	79	191
OCT	12	494
NOV	1	787
DEC	0	1156
ANN	800	7007

GRAND RAPIDS

MI

WMO No. 726350



	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	-35973	0	-7855
FEB	0	-31392	0	-6885
MAR	1	-26610	0	-5199
APR	61	-16738	27	-2524
MAY	413	-8797	664	-631
JUN	1008	-3496	2015	-16
JUL	1942	-1665	5094	0
AUG	1171	-2395	4558	0
SEP	330	-6545	1864	-75
OCT	24	-15058	96	-960
NOV	0	-22719	1	-3350
DEC	0	-32373	0	-6482
ANN	4950	-203761	14319	-33977

Average Annual Solar Radiation – Nearest Available Site

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

City: GRAND RAPIDS
 State: MI
 WBAN No: 94860
 Lat(N): 42.88
 Long(W): 85.52
 Elev(ft): 804

Stn Type: Secondary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS
 Window: 1
 Overhang: 0.617
 Vert Gap: 0.329

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	510	780	1100	1480	1810	2010	1960	1690	1290	860	520	410	1200
	Std Dev	36	47	65	96	150	142	95	121	107	59	43	30	35
	Minimum	430	690	980	1270	1410	1740	1770	1500	1050	750	430	350	1140
	Maximum	580	910	1220	1660	2140	2340	2130	1940	1520	1010	640	470	1260
	Diffuse	370	490	610	720	810	840	840	740	600	450	340	310	590
Clear Day	Global	770	1130	1630	2140	2490	2620	2530	2220	1750	1230	820	660	1670
NORTH	Global	200	270	350	440	550	630	600	480	370	270	190	160	380
	Diffuse	200	270	350	430	500	540	530	460	370	270	190	160	360
Clear Day	Global	170	240	320	420	580	680	630	470	350	250	180	150	370
EAST	Global	330	500	680	880	1040	1120	1110	1000	790	550	330	260	720
	Diffuse	240	330	430	520	600	640	630	560	450	330	230	190	430
Clear Day	Global	610	830	1100	1330	1450	1490	1460	1340	1140	870	620	530	1060
SOUTH	Global	710	930	1000	970	900	860	890	990	1050	980	680	560	880
	Diffuse	360	450	500	550	580	590	600	570	510	420	320	290	480
Clear Day	Global	1790	1920	1840	1510	1200	1040	1090	1340	1660	1830	1750	1690	1550
WEST	Global	330	500	680	870	1030	1130	1130	1010	800	560	340	260	720
	Diffuse	240	330	430	530	610	650	650	570	460	340	230	200	440
Clear Day	Global	610	830	1100	1330	1450	1490	1460	1340	1140	870	620	530	1060

Average Annual Solar Heat and Illumination – Nearest Available Site

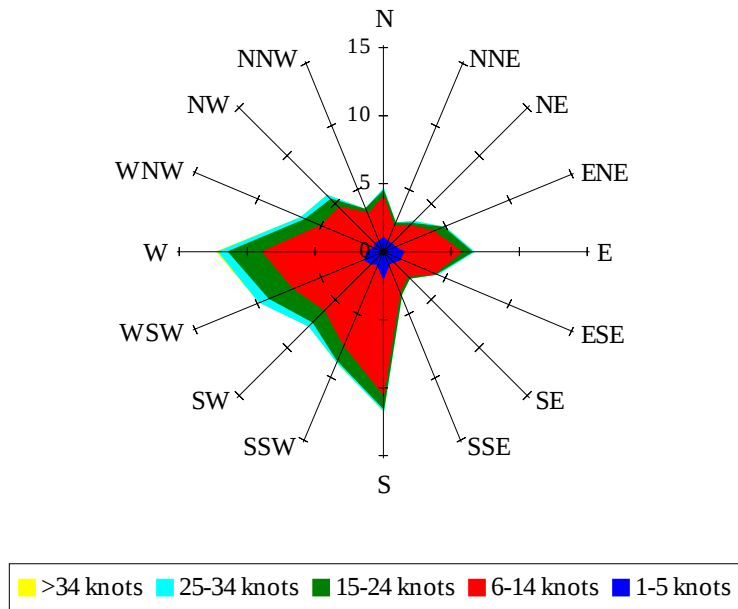
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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	340	530	770	1050	1310	1460	1420	1210	910	590	340	270	850
NORTH	Unshaded	140	190	240	300	360	410	390	320	260	190	130	110	250
	Shaded	110	160	200	260	320	360	340	280	220	160	110	92	220
EAST	Unshaded	230	350	480	630	740	800	790	710	560	390	230	180	510
	Shaded	190	300	400	520	610	650	650	590	470	330	190	150	420
SOUTH	Unshaded	530	680	700	640	570	530	550	640	720	710	510	420	600
	Shaded	500	610	540	400	350	360	360	380	500	610	480	390	450
WEST	Unshaded	220	350	480	620	740	810	800	720	570	400	230	180	510
	Shaded	190	300	410	520	610	660	660	600	480	340	200	150	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	24	59	76	68	37	35	73	96	98	78
	M.Cloudy	14	36	46	43	23	23	48	66	71	54
NORTH	M.Clear	7	13	15	14	10	20	15	17	17	16
	M.Cloudy	6	14	17	15	9	13	16	19	19	17
EAST	M.Clear	60	65	24	14	10	69	79	47	17	16
	M.Cloudy	18	29	20	15	9	30	44	34	19	17
SOUTH	M.Clear	25	65	85	75	40	10	27	49	51	33
	M.Cloudy	10	29	39	36	18	9	21	36	38	25
WEST	M.Clear	7	13	15	54	69	10	15	17	37	74
	M.Cloudy	6	14	17	29	27	9	16	19	30	46
M.Clear	(% hrs)	23	22	22	22	23	39	39	36	33	35
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	14	52	77	77	56	3	27	40	30	5
	M.Cloudy	8	30	49	52	36	2	16	23	18	4
NORTH	M.Clear	6	12	15	15	13	2	8	10	8	3
	M.Cloudy	4	12	16	17	13	1	7	10	8	2
EAST	M.Clear	41	72	43	15	13	11	40	12	8	3
	M.Cloudy	12	29	28	17	13	3	13	10	8	2
SOUTH	M.Clear	10	47	73	74	51	9	61	82	66	15
	M.Cloudy	5	21	40	43	27	2	17	24	20	4
WEST	M.Clear	6	12	15	37	70	2	8	10	39	18
	M.Cloudy	4	12	16	26	34	1	7	10	14	5
M.Clear	(% hrs)	40	38	30	30	34	13	13	12	12	14

Wind Summary - December, January, and February

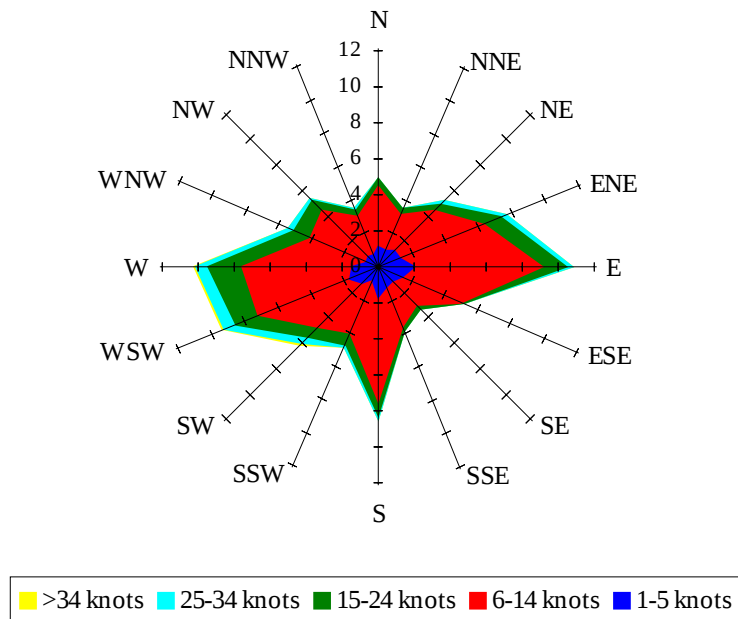
Labels of Percent Frequency on North Axis



Percent Calm = 3.62

Wind Summary - March, April, and May

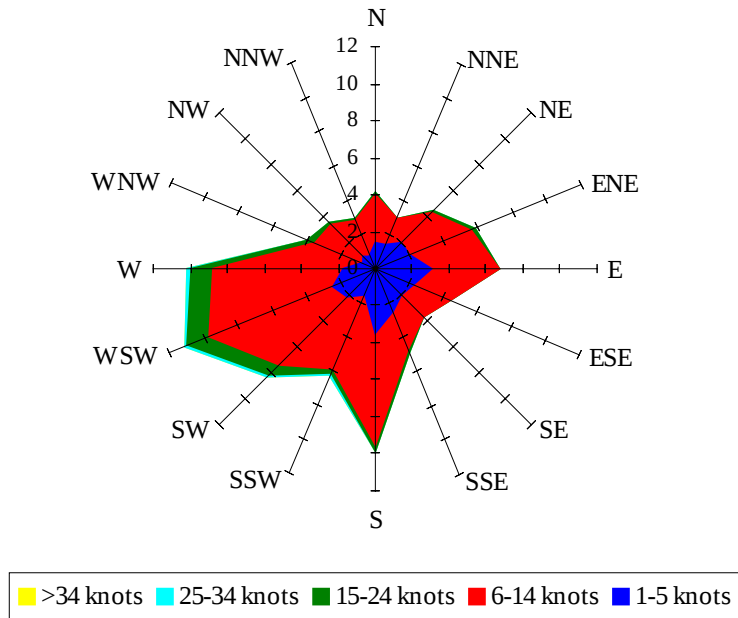
Labels of Percent Frequency on North Axis



Percent Calm = 3.62

Wind Summary - June, July, and August

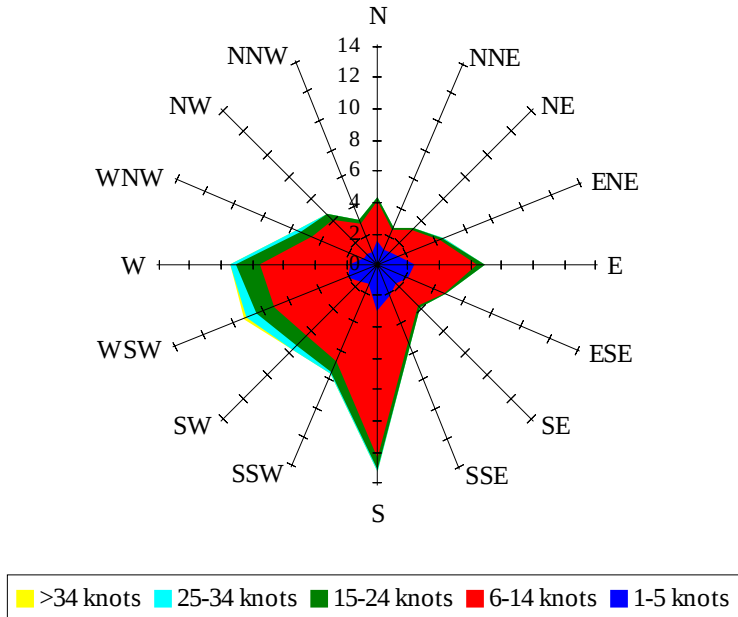
Labels of Percent Frequency on North Axis



Percent Calm = 6.76

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 5.20