

CEDAR RAPIDS IA

Latitude = 41.88 N

Longitude = 91.70 W

Period of Record = 1973 to 1996

WMO No. 725450

Elevation = 869 feet

Average Pressure = 29.05 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	94	76	113	10.4	S
0.4% Occurrence	92	76	112	10.9	S
1.0% Occurrence	89	74	107	11.4	S
2.0% Occurrence	86	73	103	10.9	S
Mean Daily Range	19	-	-	-	-
97.5% Occurrence	3	2	4	11.2	WNW
99.0% Occurrence	-5	-6	3	10.8	WNW
99.6% Occurrence	-11	-12	2	10.9	WNW
Median of Extreme Lows	-15	-15	2	11.4	WNW
	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	81	90	148	9.9	S
0.4% Occurrence	78	88	132	9.7	S
1.0% Occurrence	76	85	123	9.8	S
2.0% Occurrence	75	84	119	9.8	S
	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	152	86	0.97	8.9	S
0.4% Occurrence	137	85	0.88	11.3	S
1.0% Occurrence	128	82	0.82	9.5	S
2.0% Occurrence	122	80	0.79	8.4	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		29	578	355	1124

Other Site Data

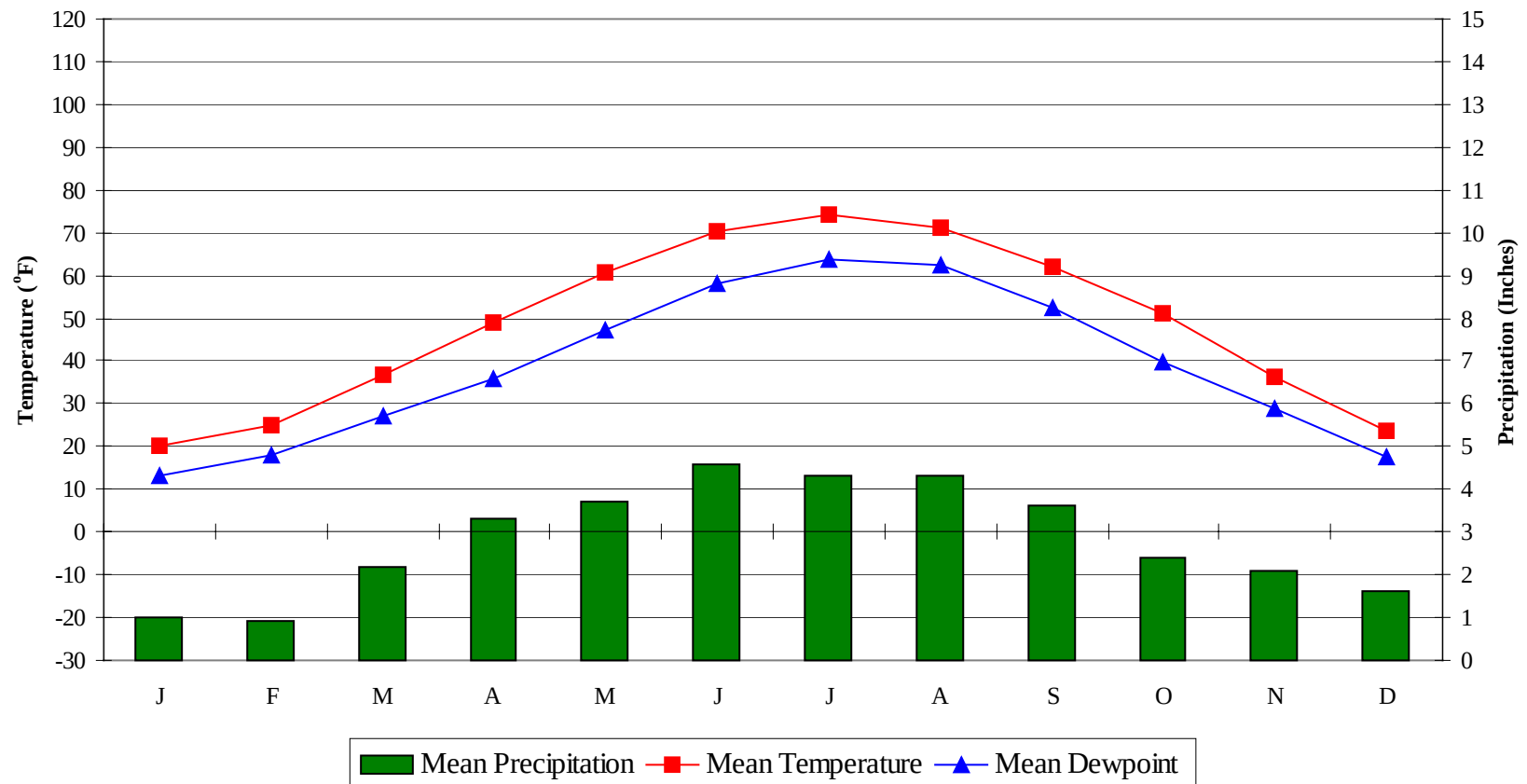
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
6	3.3	90	1.6 + 0.5
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
50.7	79	35	54

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

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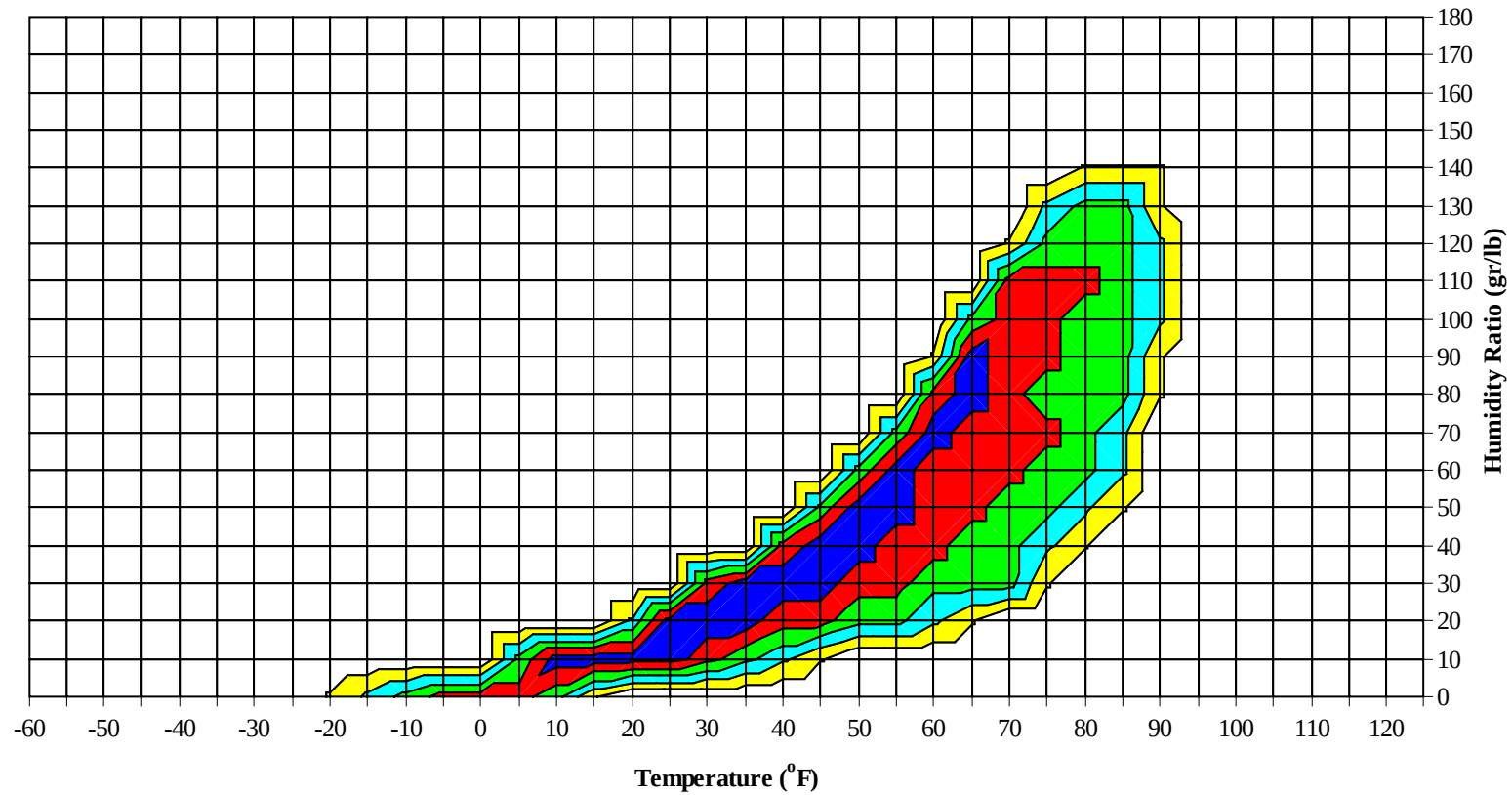
Average Annual Climate



CEDAR RAPIDS IA

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Long Term Psychrometric Summary

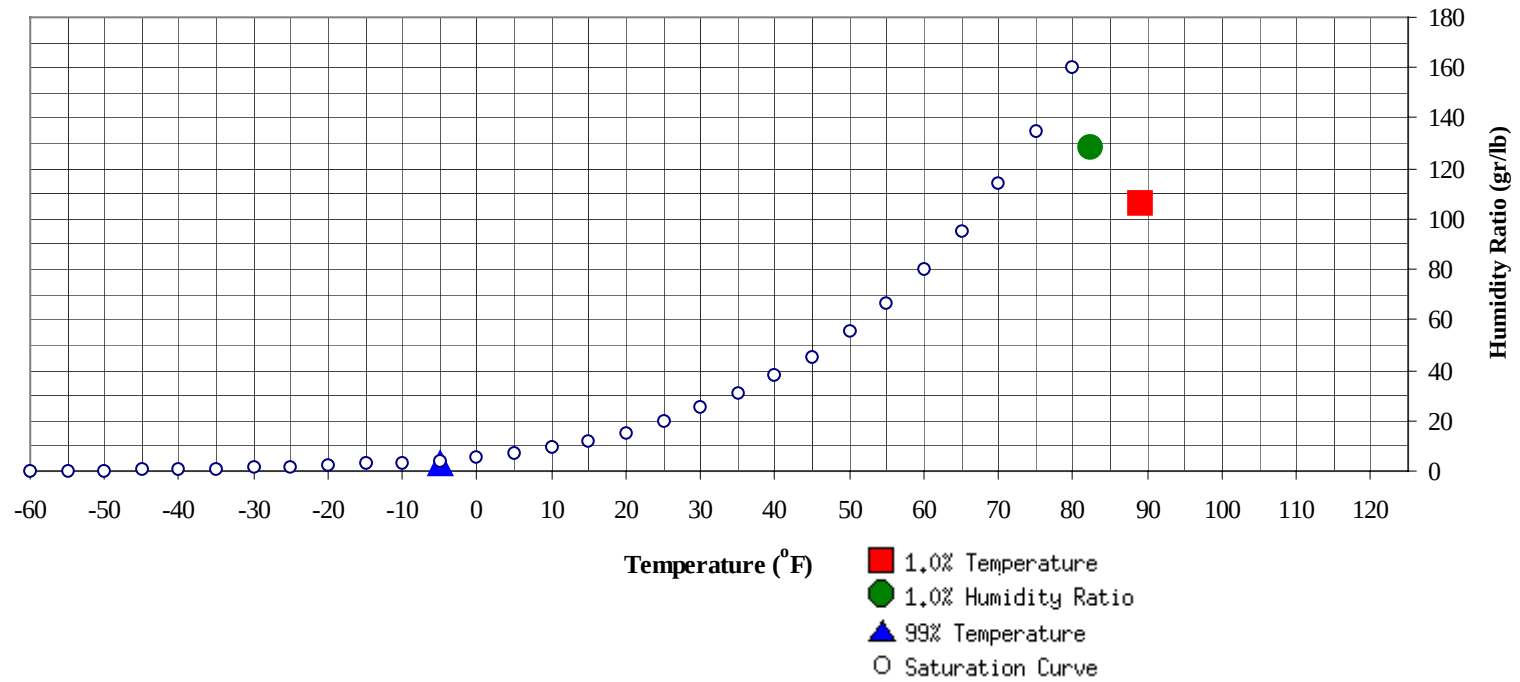


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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	2.9	-0.8		128.1	82.2	75.6	73.1	39.8

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	89	106.1	73.9	38.0

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89												0		0	61.0
80 / 84												0	0	0	61.5
75 / 79												1	1	2	60.6
70 / 74												3	1	4	57.5
65 / 69		0		0	48.0		0		0	52.5		6	2	8	55.8
60 / 64		0		0	46.7		1	0	1	50.2	1	11	6	18	53.0
55 / 59	0	1	0	1	48.1		4	1	5	48.1	6	15	11	32	49.6
50 / 54	0	2	1	3	47.0	1	7	2	10	44.7	7	21	16	44	45.3
45 / 49	1	5	2	8	42.1	1	11	5	17	41.2	13	31	23	67	41.7
40 / 44	2	11	6	19	37.3	6	21	15	42	37.6	18	40	35	93	37.8
35 / 39	12	25	19	56	33.7	21	33	33	87	33.9	47	44	47	138	33.8
30 / 34	38	41	47	126	30.2	50	42	49	140	30.1	60	34	48	142	29.9
25 / 29	34	42	38	114	25.1	36	27	30	93	25.2	39	19	26	84	24.8
20 / 24	39	35	37	111	20.5	28	22	24	74	20.3	25	12	15	52	20.1
15 / 19	26	22	24	72	15.6	19	19	20	58	15.6	14	6	9	29	15.5
10 / 14	24	20	19	63	10.7	18	14	15	47	10.6	7	3	5	15	10.8
5 / 9	21	15	18	54	6.0	14	10	10	34	6.0	5	1	2	8	5.8
0 / 4	18	12	17	47	1.0	11	7	9	27	1.1	4	0	1	5	1.3
-5 / -1	12	8	8	28	-3.3	8	3	5	16	-3.1	1		0	1	-2.9
-10 / -6	11	5	7	23	-7.7	6	2	3	11	-7.1	0			0	-5.5
-15 / -11	7	3	3	13	-12.3	4	1	1	6	-12.1					
-20 / -16	3	1	2	6	-17.1	2	0	0	2	-16.6					
-25 / -21	1	0	1	2	-21.3	0	0	0	0	-21.8					
-30 / -26	0			0	-25.5	0			0	-25.0					

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.

CEDAR RAPIDS IA

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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		
100 / 104															
95 / 99												1	0	1	73.6
90 / 94		0	0	0	64.3		1	0	1	70.5		11	3	14	73.6
85 / 89		2	0	2	65.5		6	2	8	68.7	0	29	11	40	71.2
80 / 84		5	2	7	64.3	0	18	7	25	65.8	2	51	26	79	68.6
75 / 79		8	4	12	61.6	1	32	15	48	62.7	12	52	40	104	66.6
70 / 74	1	15	8	24	58.5	5	37	27	69	60.6	41	47	54	142	64.6
65 / 69	4	21	14	39	56.0	20	42	41	103	58.3	58	28	48	134	61.8
60 / 64	11	31	21	63	52.9	40	45	49	134	55.7	59	13	38	110	57.8
55 / 59	14	35	31	80	49.1	50	36	47	133	51.8	40	6	15	61	53.5
50 / 54	27	37	40	104	45.8	54	22	36	112	47.6	21	2	5	28	49.3
45 / 49	41	32	40	113	42.2	44	6	16	66	43.4	6	0	1	7	45.3
40 / 44	46	24	33	103	38.1	23	2	7	32	39.3	0			0	42.4
35 / 39	42	18	24	84	33.8	9	0	1	10	34.7					
30 / 34	29	8	14	51	29.4	2	0	0	2	29.8					
25 / 29	16	3	7	26	24.8										
20 / 24	7	1	1	9	20.7										
15 / 19	1	0	0	1	15.7										
10 / 14	1	0	0	1	11.3										
5 / 9	0	0		0	5.5										
0 / 4	0			0	1.5										
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															

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WMO No. 725450

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		
100 / 104		0		0	77.5		0		0	75.6					
95 / 99		5	1	6	77.7		4	1	5	76.4		0		0	74.0
90 / 94	0	22	7	29	75.7	0	14	4	18	76.6		4	0	4	74.6
85 / 89	0	45	18	63	74.0	0	28	9	37	74.6		11	2	13	72.3
80 / 84	6	69	40	115	71.1	3	56	24	83	71.5	0	24	7	31	69.2
75 / 79	26	54	52	132	69.3	16	61	42	119	69.2	2	32	16	50	66.7
70 / 74	64	35	64	163	67.2	46	49	61	156	67.0	18	42	29	89	64.7
65 / 69	70	14	43	127	63.9	64	25	51	140	63.6	25	44	39	108	60.8
60 / 64	56	4	20	80	59.7	61	9	37	107	59.7	42	40	45	127	57.3
55 / 59	20	0	4	24	55.4	37	1	16	54	55.2	43	23	43	109	53.3
50 / 54	5		0	5	50.7	18	0	2	20	50.8	46	15	32	93	48.7
45 / 49	0			0	46.7	3		0	3	46.3	33	4	18	55	44.7
40 / 44						0		0	0	41.5	18	1	7	26	40.0
35 / 39											10		2	12	35.6
30 / 34											4		0	4	31.3
25 / 29											0			0	27.3
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															

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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		
100 / 104															
95 / 99															
90 / 94		0		0	62.0										
85 / 89		2	0	2	66.9										
80 / 84		4	0	4	64.6										
75 / 79		10	2	12	62.3										
70 / 74	1	21	6	28	59.8		1	0	1	59.3					
65 / 69	6	30	14	50	57.9	0	3	1	4	58.2		0	0	0	61.4
60 / 64	15	39	29	83	54.9	2	9	4	15	56.0		1	1	2	57.9
55 / 59	24	40	36	100	50.8	6	16	10	32	52.0	1	1	1	3	53.8
50 / 54	39	42	43	124	46.7	13	25	18	56	47.3	2	4	2	8	47.5
45 / 49	42	29	44	115	42.7	14	31	20	65	42.6	3	6	3	12	43.1
40 / 44	42	18	34	94	38.5	22	34	34	90	38.4	4	12	8	24	38.4
35 / 39	36	9	25	70	34.4	41	43	45	129	34.2	13	35	22	70	34.0
30 / 34	29	3	10	42	30.0	52	36	47	135	29.8	48	57	58	163	30.3
25 / 29	12	1	3	16	25.8	37	22	28	87	25.0	47	40	44	131	25.4
20 / 24	3		1	4	21.0	24	11	17	52	20.5	40	28	34	102	20.6
15 / 19	0		0	0	17.9	15	6	9	30	15.9	26	20	22	68	15.7
10 / 14						8	2	5	15	11.2	18	16	18	52	10.7
5 / 9						3	1	3	7	6.5	15	11	13	39	6.1
0 / 4						2	0	0	2	2.3	11	9	10	30	1.3
-5 / -1						0	0	0	0	-3.7	7	4	5	16	-3.2
-10 / -6						1		0	1	-7.2	8	3	4	15	-7.3
-15 / -11											3	2	3	8	-12.4
-20 / -16											2	0	1	3	-16.9
-25 / -21											0			0	-20.3
-30 / -26															

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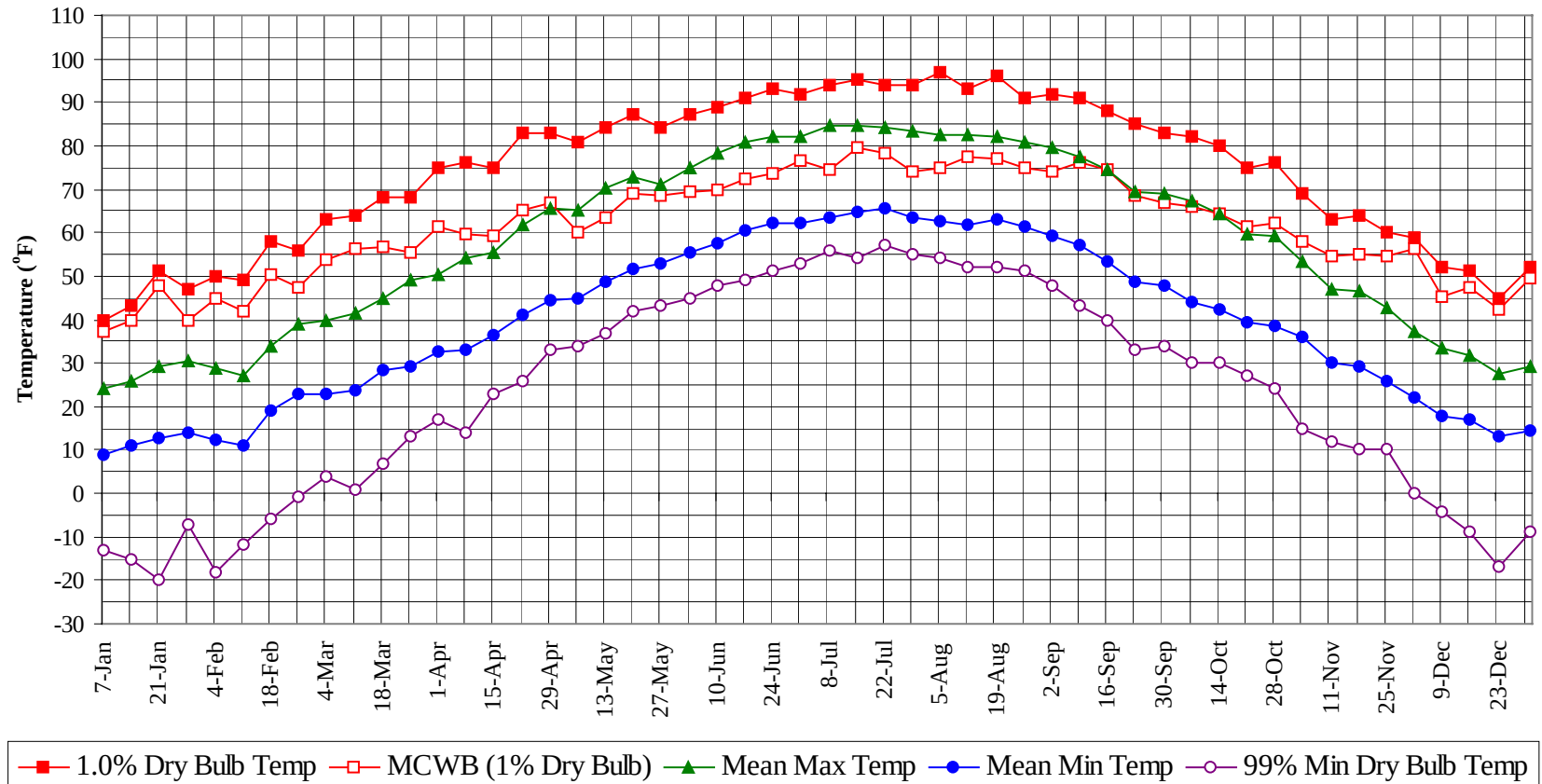
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

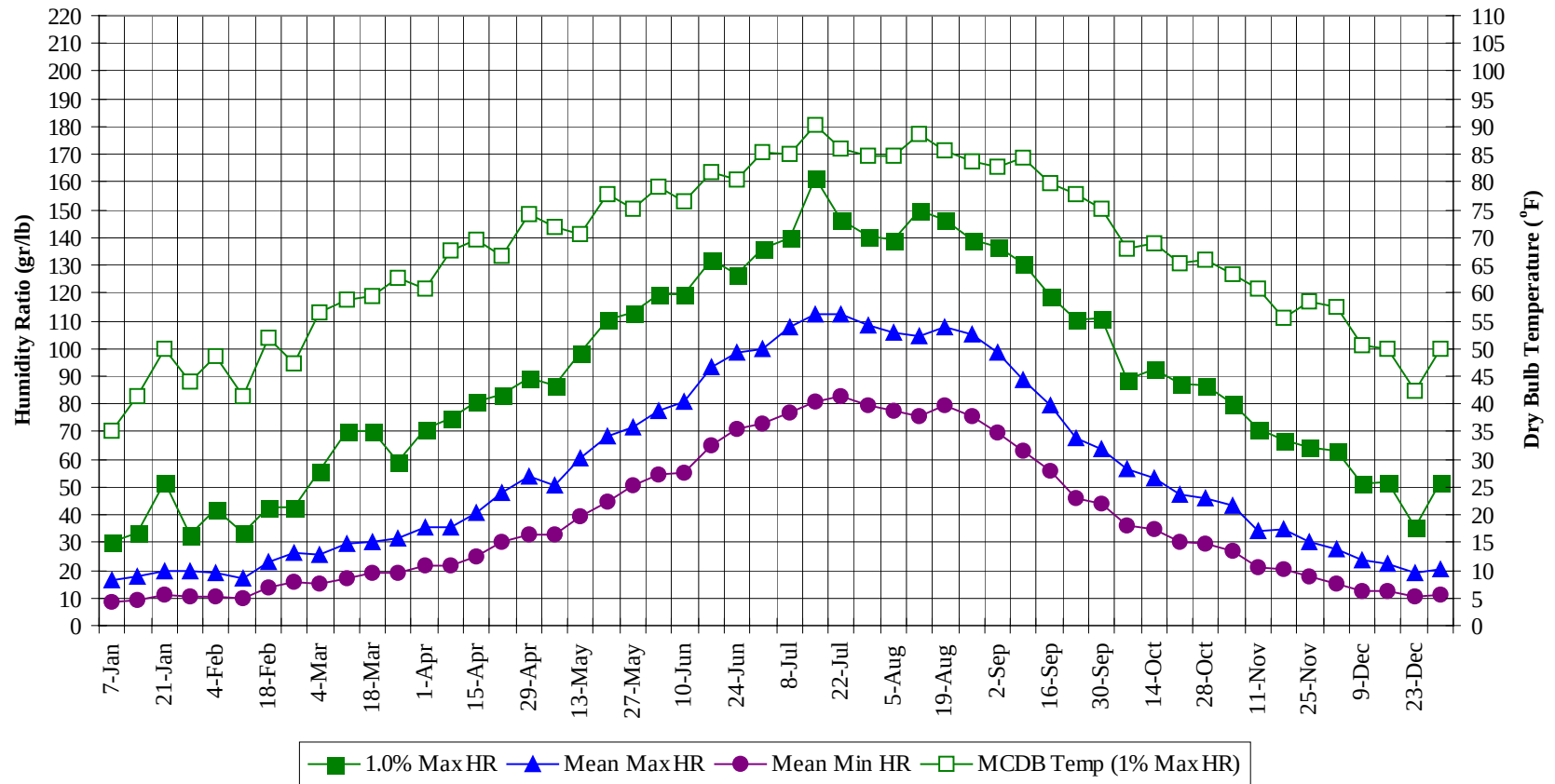
Annual Totals						
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	
	01 To 08	09 To 16	17 To 00			
100 / 104	1			1	76.3	
95 / 99	11			3	14	76.6
90 / 94	0	51	14	65	75.3	
85 / 89	1	120	41	162	72.9	
80 / 84	11	224	104	339	69.8	
75 / 79	56	247	167	470	67.3	
70 / 74	172	246	247	665	64.9	
65 / 69	243	213	251	707	61.2	
60 / 64	283	205	247	735	56.9	
55 / 59	239	179	215	633	52.0	
50 / 54	234	177	198	609	47.3	
45 / 49	202	157	173	532	42.7	
40 / 44	183	162	182	527	38.3	
35 / 39	230	209	219	658	34.0	
30 / 34	314	224	277	815	30.0	
25 / 29	222	154	178	554	25.1	
20 / 24	168	108	130	406	20.5	
15 / 19	103	74	84	261	15.7	
10 / 14	76	56	63	195	10.7	
5 / 9	59	38	47	144	6.0	
0 / 4	47	28	38	113	1.2	
-5 / -1	28	15	18	61	-3.2	
-10 / -6	26	9	14	49	-7.4	
-15 / -11	14	5	7	26	-12.3	
-20 / -16	7	2	3	12	-16.9	
-25 / -21	2	0	1	3	-21.3	
-30 / -26	0			0	-25.2	

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

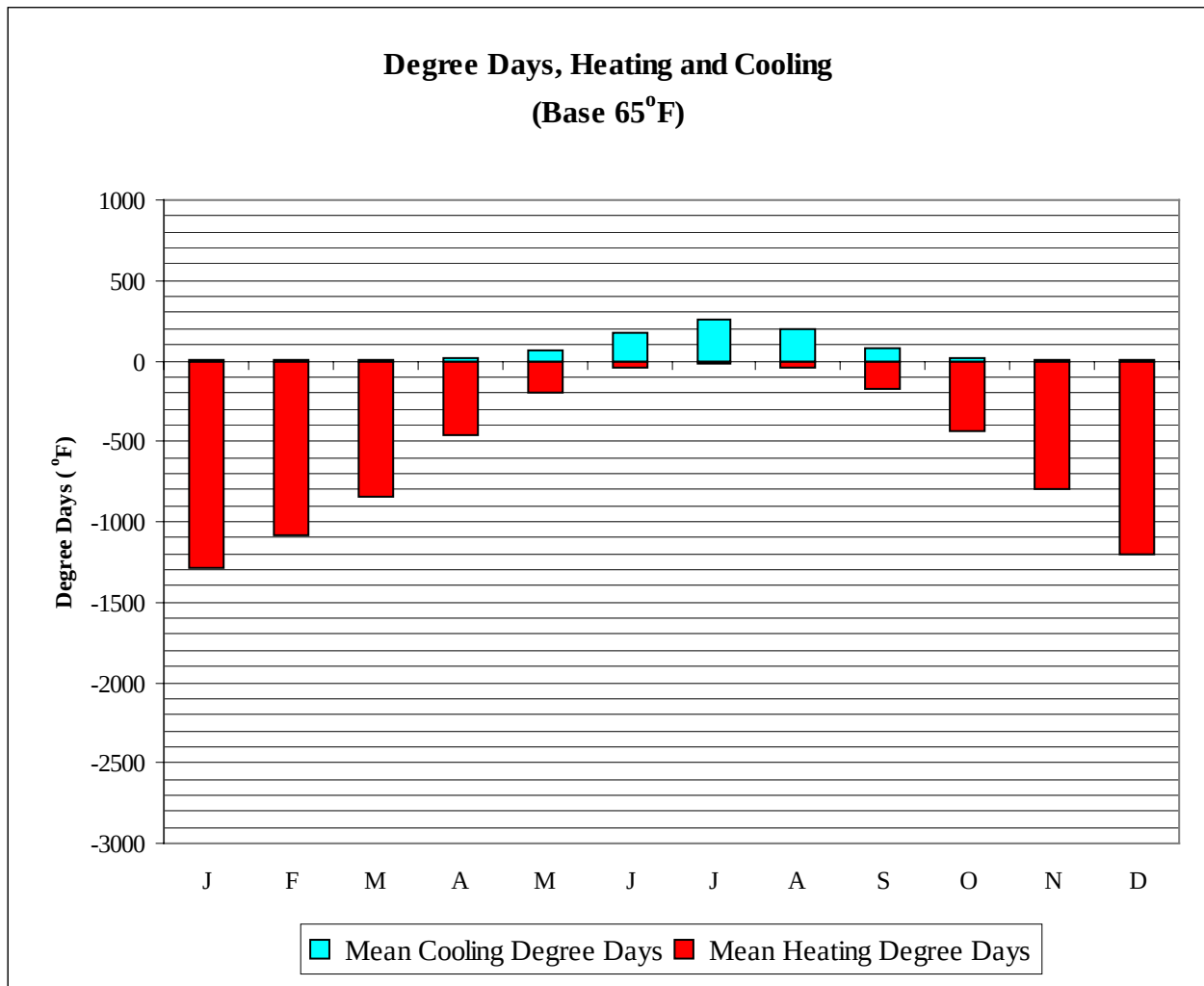


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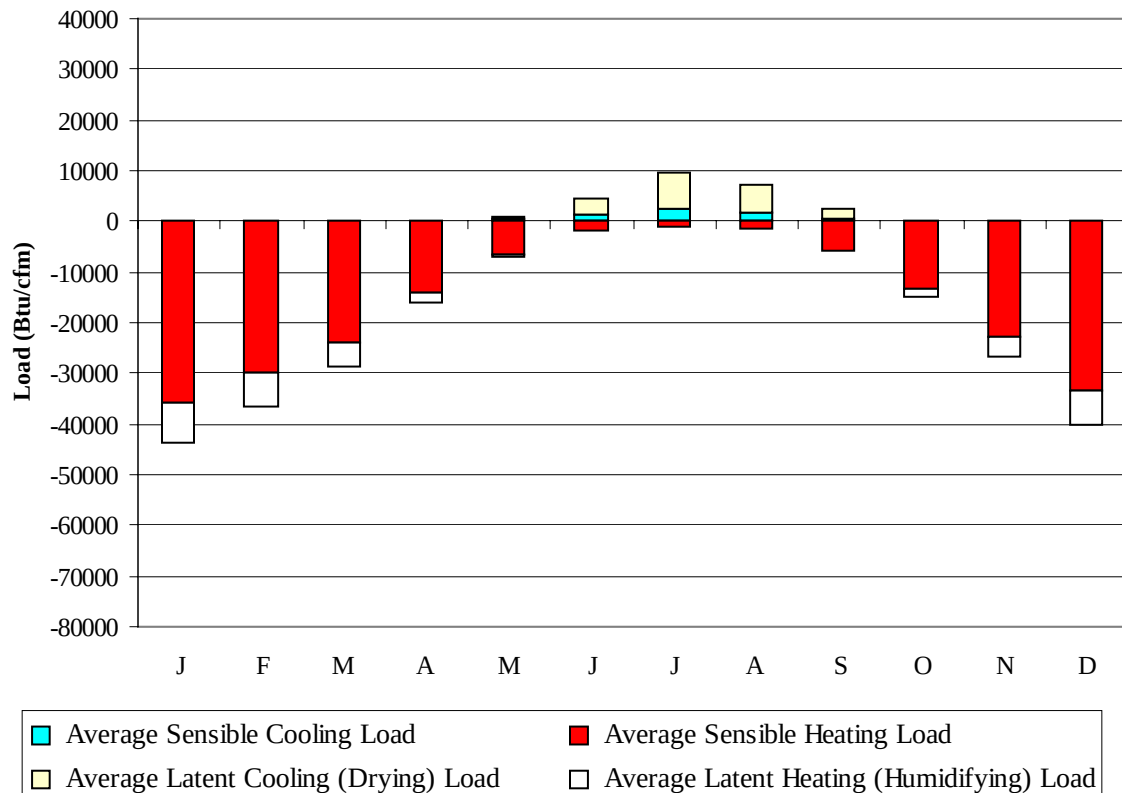
Long Term Dry Bulb Temperature and Humidity Summary

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	40.0	37.1	24.3	8.7	-13.0	30.1	35.0	16.2	8.7
14-Jan	43.0	39.9	26.0	11.0	-15.0	33.6	41.3	17.4	9.5
21-Jan	51.0	48.0	29.2	12.5	-20.0	51.8	49.8	20.0	11.0
28-Jan	47.0	40.0	30.6	14.1	-7.0	32.9	43.9	19.4	10.2
4-Feb	50.0	45.0	28.8	12.4	-18.0	42.0	48.5	19.3	10.6
11-Feb	49.0	41.9	27.2	10.8	-12.0	33.6	41.4	17.2	9.8
18-Feb	58.0	50.3	34.0	18.9	-6.0	42.7	52.0	22.8	13.5
25-Feb	56.0	47.4	38.8	22.9	-1.0	42.7	47.3	26.3	15.5
4-Mar	63.0	53.9	39.8	23.0	4.0	56.0	56.4	25.8	15.2
11-Mar	64.0	56.2	41.7	23.9	1.0	70.0	58.8	29.3	16.8
18-Mar	68.0	56.5	44.7	28.2	7.0	70.0	59.5	30.3	19.0
25-Mar	68.0	55.4	49.1	29.4	13.0	58.8	62.8	31.8	18.8
1-Apr	75.0	61.3	50.5	32.7	17.0	70.7	60.7	35.5	21.8
8-Apr	76.0	59.8	54.1	33.1	14.0	74.9	67.8	35.4	21.5
15-Apr	75.0	59.1	55.5	36.3	23.0	80.5	69.5	40.9	24.7
22-Apr	83.0	65.1	61.7	41.0	26.0	83.3	66.5	48.2	30.0
29-Apr	83.0	67.0	65.8	44.3	33.0	89.6	74.1	53.9	33.1
6-May	81.0	60.1	65.2	44.9	34.0	86.8	72.0	50.7	33.0
13-May	84.0	63.5	70.1	48.8	37.0	98.7	70.7	60.1	39.3
20-May	87.0	68.8	72.7	51.5	42.0	110.6	77.8	68.3	44.6
27-May	84.0	68.5	71.1	52.8	43.0	112.7	75.2	71.6	50.3
3-Jun	87.0	69.4	74.9	55.4	45.0	119.7	79.2	77.5	54.3
10-Jun	89.0	69.8	78.1	57.5	48.0	119.7	76.4	81.0	55.0
17-Jun	91.0	72.5	81.0	60.5	49.0	132.3	81.8	93.2	65.3
24-Jun	93.0	73.7	82.0	62.2	51.0	126.7	80.5	98.2	70.8
1-Jul	92.0	76.5	82.3	62.3	53.0	135.8	85.5	99.9	72.8
8-Jul	94.0	74.7	84.7	63.6	56.0	140.0	84.9	107.9	76.6
15-Jul	95.0	79.5	84.4	64.8	54.0	161.7	90.4	112.0	80.8
22-Jul	94.0	78.2	84.2	65.5	57.0	146.3	85.9	112.5	82.9
29-Jul	94.0	74.1	83.5	63.3	55.0	140.7	84.6	108.3	79.7
5-Aug	97.0	74.7	82.7	62.5	54.0	139.3	84.6	105.9	77.3
12-Aug	93.0	77.6	82.3	61.7	52.0	149.8	88.8	104.3	75.4
19-Aug	96.0	77.1	82.0	62.9	52.0	146.3	85.7	107.9	79.4
26-Aug	91.0	74.8	80.8	61.3	51.0	139.3	83.9	104.9	75.2
2-Sep	92.0	74.2	79.5	59.5	48.0	136.5	82.9	98.2	69.6
9-Sep	91.0	76.0	77.4	56.9	43.0	130.9	84.5	88.3	63.1
16-Sep	88.0	74.3	74.3	53.4	40.0	119.0	79.8	79.7	55.8
23-Sep	85.0	68.4	69.3	48.7	33.0	110.6	77.9	68.0	46.1
30-Sep	83.0	66.9	69.0	47.8	34.0	111.3	75.2	63.4	43.9
7-Oct	82.0	65.9	67.1	44.0	30.0	88.9	68.0	56.3	36.0
14-Oct	80.0	64.5	64.2	42.3	30.0	92.4	69.0	53.0	34.5
21-Oct	75.0	61.4	59.5	39.3	27.0	87.5	65.4	47.0	30.0
28-Oct	76.0	62.3	59.4	38.7	24.0	86.8	66.0	46.1	29.4
4-Nov	69.0	58.1	53.1	35.8	15.0	79.8	63.3	43.5	27.1
11-Nov	63.0	54.4	47.1	30.1	12.0	70.7	60.9	34.1	21.3
18-Nov	64.0	54.9	46.4	29.1	10.0	67.2	55.6	34.5	20.5
25-Nov	60.0	54.5	42.7	25.9	10.0	64.4	58.5	30.3	17.6
2-Dec	59.0	56.2	37.3	22.0	0.0	63.0	57.4	27.5	15.0
9-Dec	52.0	45.5	33.6	17.8	-4.0	51.1	50.6	23.6	12.8
16-Dec	51.0	47.4	31.9	17.0	-9.0	51.8	49.8	22.4	12.7
23-Dec	45.0	42.5	27.6	13.1	-17.0	35.7	42.5	18.9	10.7
31-Dec	52.0	49.5	29.2	14.5	-9.0	51.8	50.0	20.5	11.2



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1292
FEB	0	1078
MAR	3	843
APR	19	463
MAY	64	196
JUN	178	47
JUL	252	18
AUG	198	37
SEP	83	170
OCT	19	437
NOV	1	794
DEC	0	1198
ANN	815	6573

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 Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-35711	0	-8039
FEB	0	-30031	0	-6402
MAR	7	-24124	2	-4503
APR	95	-13938	31	-2004
MAY	355	-6667	670	-371
JUN	1360	-1943	3219	-4
JUL	2316	-932	7319	0
AUG	1537	-1613	5817	-1
SEP	547	-5830	1796	-125
OCT	69	-13424	79	-1328
NOV	0	-22708	1	-3860
DEC	0	-33291	0	-7013
ANN	6286	-190212	18934	-33650

Average Annual Solar Radiation – Nearest Available Site

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

City: WATERLOO
 State: IA
 WBAN No: 94910
 Lat(N): 42.55
 Long(W): 92.4
 Elev(ft): 869

Stn Type: Secondary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS
 Window: 1
 Overhang: 0.607
 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	600	860	1150	1490	1810	2010	1990	1740	1350	960	590	480	1250
	Std Dev	49	51	93	121	121	116	123	102	117	82	46	40	40
	Minimum	490	740	940	1290	1540	1810	1740	1480	1090	770	470	410	1180
	Maximum	680	960	1350	1760	2060	2330	2230	1930	1630	1130	670	580	1380
	Diffuse	310	440	590	710	810	850	800	710	570	420	320	270	570
Clear Day	Global	810	1170	1660	2170	2510	2640	2550	2240	1780	1260	850	690	1700
NORTH	Global	190	260	350	440	550	630	600	480	370	270	190	160	370
	Diffuse	190	260	350	430	500	540	520	450	370	270	190	160	350
Clear Day	Global	160	230	310	420	570	690	630	470	340	250	170	150	370
EAST	Global	420	570	720	890	1040	1120	1120	1000	820	630	390	340	760
	Diffuse	230	330	430	520	600	640	630	560	450	340	240	200	430
Clear Day	Global	640	860	1130	1350	1470	1510	1470	1360	1170	900	670	560	1090
SOUTH	Global	1030	1130	1070	980	900	860	900	1010	1110	1140	880	860	990
	Diffuse	350	440	500	540	580	600	590	560	510	420	330	300	480
Clear Day	Global	1880	2000	1870	1500	1170	1030	1080	1340	1670	1870	1850	1780	1580
WEST	Global	420	560	710	880	1030	1130	1150	1040	860	630	400	340	760
	Diffuse	240	330	430	520	610	660	640	570	460	340	240	200	440
Clear Day	Global	640	860	1130	1350	1470	1510	1470	1360	1170	900	670	560	1090

Average Annual Solar Heat and Illumination – Nearest Available Site

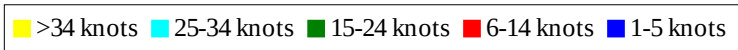
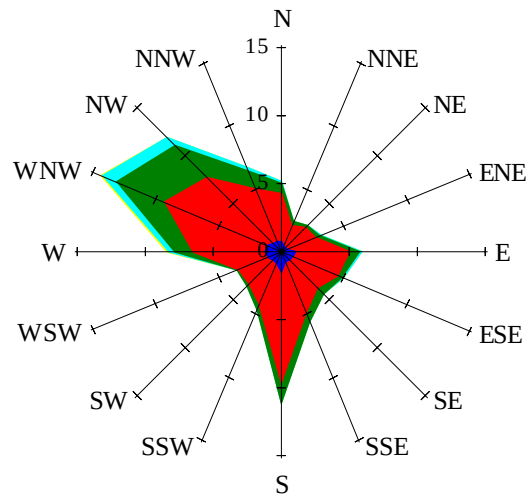
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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	380	580	810	1070	1300	1460	1450	1250	960	660	390	300	880
NORTH	Unshaded	130	180	240	300	360	410	390	320	250	190	140	110	250
	Shaded	110	160	210	260	320	360	340	280	220	160	110	96	220
EAST	Unshaded	290	400	510	640	740	800	800	710	580	440	270	230	540
	Shaded	250	350	430	530	610	660	660	590	500	380	240	200	450
SOUTH	Unshaded	780	830	750	650	570	530	550	650	760	830	660	650	680
	Shaded	750	760	580	400	350	360	360	380	530	720	630	630	540
WEST	Unshaded	290	390	510	620	730	810	820	740	610	440	280	230	540
	Shaded	250	340	430	520	610	670	680	620	520	380	240	200	460

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	34	66	77	62	27	46	81	98	94	69
	M.Cloudy	21	42	50	39	17	30	57	71	71	51
NORTH	M.Clear	9	13	14	13	8	17	16	17	17	15
	M.Cloudy	9	15	17	14	7	14	17	19	19	16
EAST	M.Clear	71	57	14	13	8	77	73	34	17	15
	M.Cloudy	24	30	17	14	7	38	47	29	19	16
SOUTH	M.Clear	38	74	86	70	30	12	34	51	47	25
	M.Cloudy	16	35	43	33	13	11	27	39	37	21
WEST	M.Clear	9	13	19	64	65	12	16	17	49	78
	M.Cloudy	9	15	19	31	23	11	17	19	39	51
M.Clear	(% hrs)	28	27	26	26	27	36	35	32	29	32
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	25	62	81	75	47	10	35	41	26	1
	M.Cloudy	14	37	50	49	31	6	21	26	16	1
NORTH	M.Clear	8	13	15	15	11	4	9	10	7	1
	M.Cloudy	6	14	17	16	12	3	9	10	7	1
EAST	M.Clear	61	70	30	15	11	32	38	10	7	1
	M.Cloudy	19	32	23	16	12	8	16	10	7	1
SOUTH	M.Clear	19	57	78	72	42	29	77	87	62	3
	M.Cloudy	9	28	41	40	23	8	25	31	20	1
WEST	M.Clear	8	13	15	50	73	4	9	18	45	4
	M.Cloudy	6	14	17	31	35	3	9	13	16	1
M.Clear	(% hrs)	41	40	38	38	42	27	28	27	28	30

Wind Summary - December, January, and February

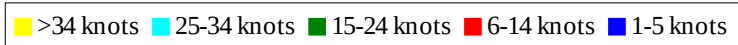
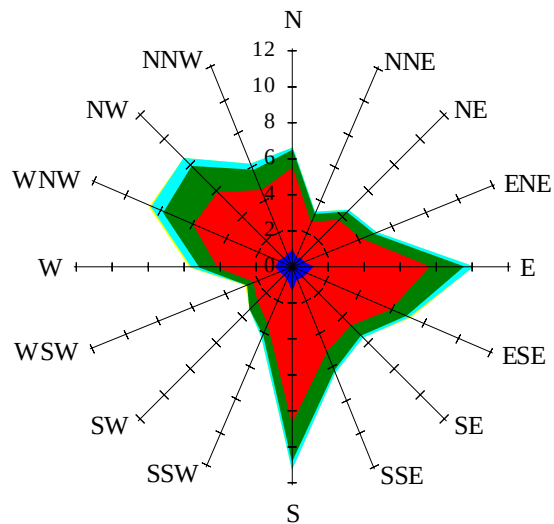
Labels of Percent Frequency on North Axis



Percent Calm = 2.66

Wind Summary - March, April, and May

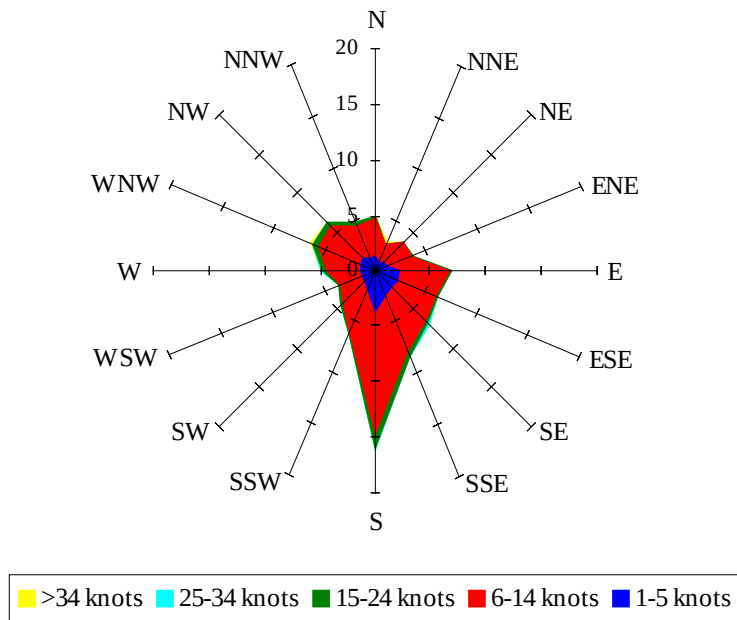
Labels of Percent Frequency on North Axis



Percent Calm = 2.64

Wind Summary - June, July, and August

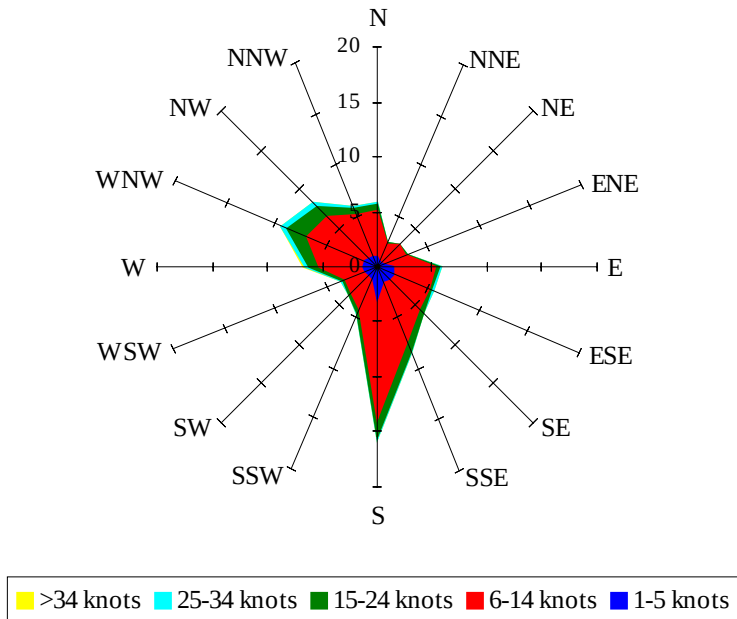
Labels of Percent Frequency on North Axis



Percent Calm = 5.46

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 3.26