

INTERNATIONAL FALLS MN

Latitude = 48.57 N

WMO No. 727470

Longitude = 93.38 W

Elevation = 1184 feet

Period of Record = 1973 to 1996

Average Pressure = 28.67 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	72	91	11.5	S
0.4% Occurrence	87	69	85	10.7	S
1.0% Occurrence	83	67	79	10.5	S
2.0% Occurrence	80	66	76	10.1	S
Mean Daily Range	20	-	-	-	-
97.5% Occurrence	-16	-16	2	6.6	W
99.0% Occurrence	-23	-23	1	5.9	W
99.6% Occurrence	-28	-28	1	5.3	W
Median of Extreme Lows	-37	-36	1	4.0	WSW
	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	86	128	10.6	S
0.4% Occurrence	73	83	110	10.3	S
1.0% Occurrence	70	79	100	9.1	S
2.0% Occurrence	68	76	93	8.9	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	138	83	0.88	9.2	SSE
0.4% Occurrence	113	78	0.72	8.8	S
1.0% Occurrence	104	76	0.67	8.6	S
2.0% Occurrence	97	73	0.62	8.4	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		4	206	36	285

Other Site Data

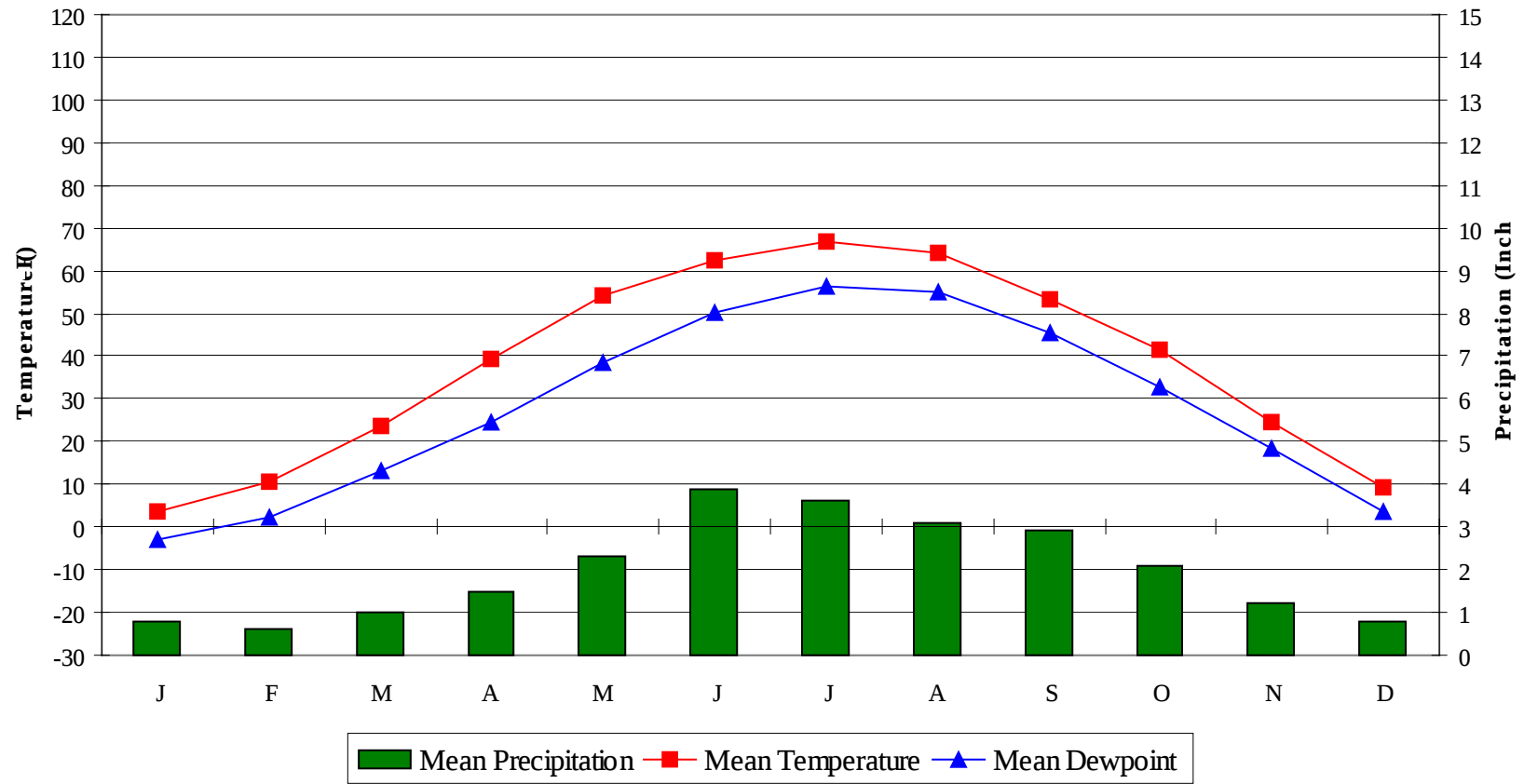
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
4	2.8	90	0.3 + 0.2
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
40.3	N/A	44	63

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

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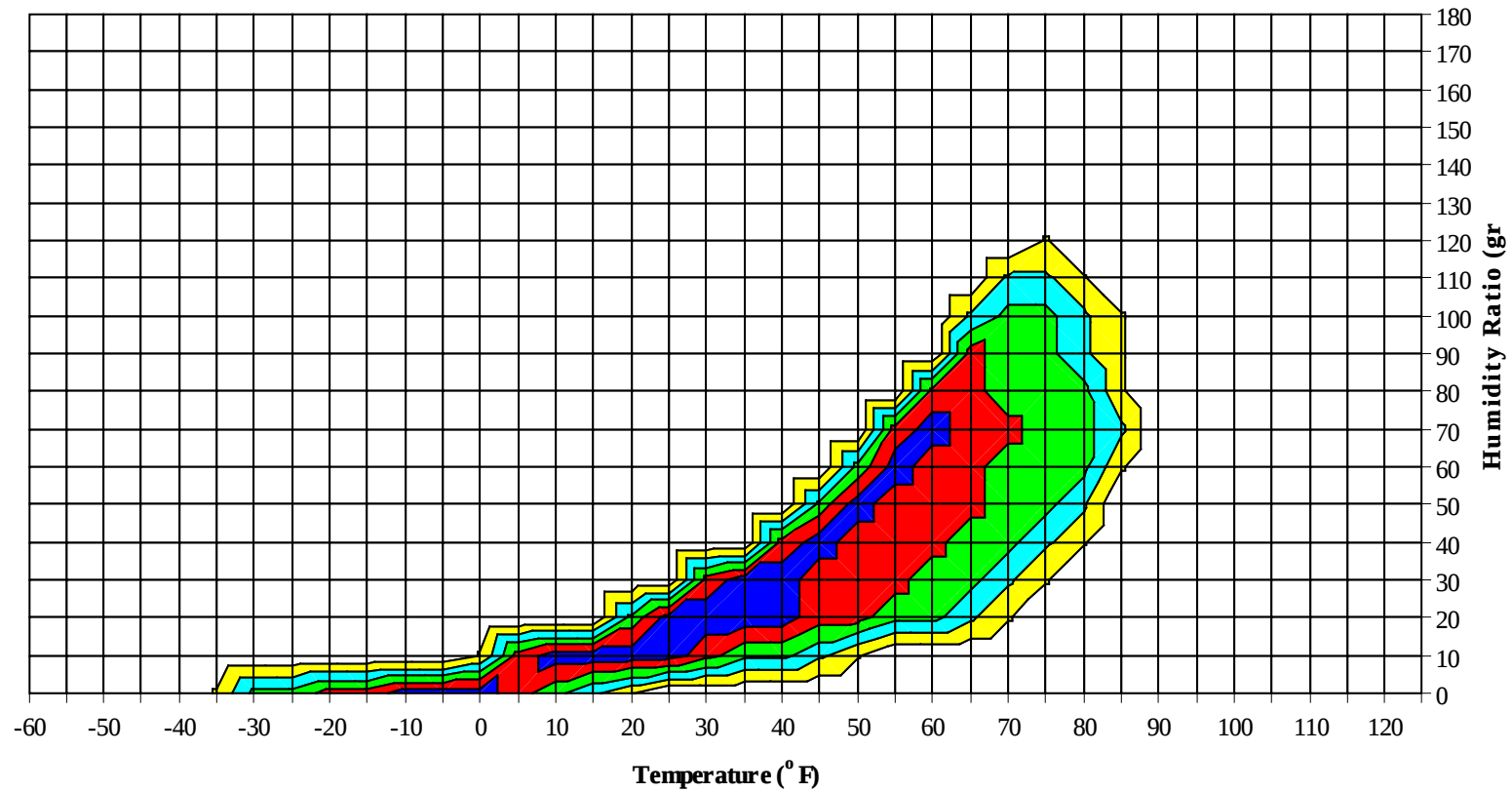
Average Annual Climate



INTERNATIONAL FALLS MN

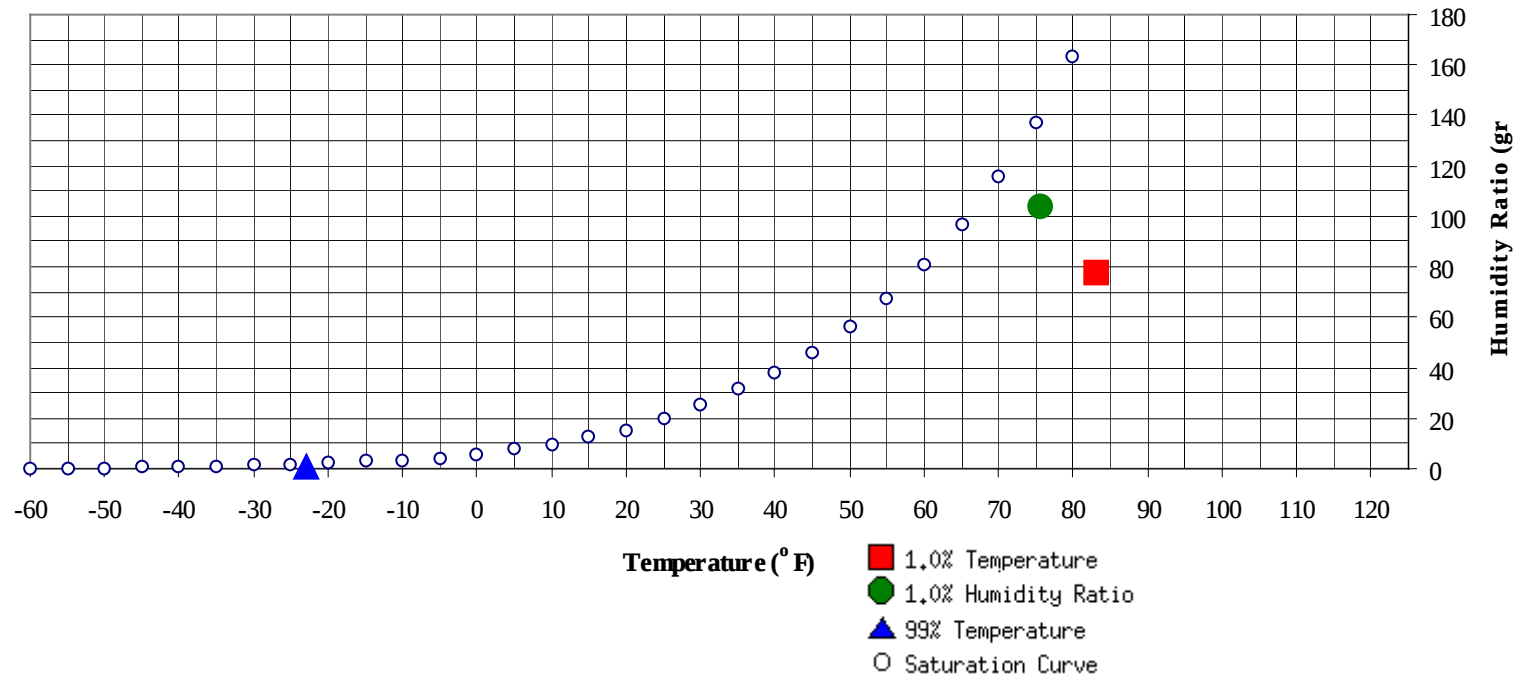
WMO No. 727470

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

Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
99% Dry Bulb	-23	1.1	-5.4		103.6	75.6	69.6	66.9	34.3

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	83	78.1	66.9	32.2

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69															
60 / 64												0	0	0	46.7
55 / 59												2	1	3	45.3
50 / 54							0	0	0	40.3		6	2	9	41.5
45 / 49		0		0	38.0	0	1	1	2	38.7	0	11	8	19	38.7
40 / 44	0	1	0	2	35.6	0	6	3	9	35.8	2	23	16	41	35.8
35 / 39	1	3	2	7	33.1	3	9	8	20	32.8	21	41	37	99	32.9
30 / 34	7	11	10	27	29.6	14	20	22	56	29.7	36	40	45	121	29.0
25 / 29	13	18	19	50	25.3	20	24	26	70	24.9	42	34	39	116	24.1
20 / 24	19	22	20	62	20.5	22	28	23	73	20.1	30	28	28	87	19.4
15 / 19	23	27	25	74	15.8	21	26	23	69	15.2	22	21	23	66	14.8
10 / 14	23	26	25	74	10.9	17	27	27	71	10.3	25	16	19	60	10.2
5 / 9	21	28	27	76	5.9	23	20	23	66	5.7	22	11	12	45	5.7
0 / 4	22	26	25	74	1.0	20	21	21	62	0.9	14	6	9	29	0.9
-5 / -1	17	18	18	53	-3.3	15	12	13	40	-3.4	10	3	4	17	-3.4
-10 / -6	24	22	23	69	-7.7	20	12	14	46	-7.7	9	2	3	14	-7.7
-15 / -11	18	17	19	54	-12.2	15	8	9	32	-12.2	8	1	2	10	-12.4
-20 / -16	17	13	16	46	-17.0	13	5	6	25	-16.9	4	0	1	5	-16.6
-25 / -21	16	8	11	34	-21.8	10	3	4	17	-21.7	2			2	-22.2
-30 / -26	14	5	7	26	-26.7	7	1	2	10	-26.7	0			0	-26.1
-35 / -31	10	2	1	13	-31.5	3	1	0	4	-31.2					
-40 / -36	2	0	0	3	-35.4	1	0	0	1	-35.0					
-45 / -41	0	0	0	1	-41.0	0	0		0						
-50 / -46	0			0		0			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.

INTERNATIONAL FALLS MN

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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		
95 / 99												0	0	1	71.2
90 / 94		0		0	62.0		0	0	0	65.4		3	1	3	69.8
85 / 89		0	0	0	60.3		5	2	7	64.4		8	3	11	68.3
80 / 84		1	0	2	60.2		11	5	16	62.3	0	20	9	30	65.4
75 / 79		3	1	4	56.8	0	16	8	25	59.8	2	31	17	50	63.3
70 / 74	0	5	3	8	54.1	1	27	16	45	56.7	6	44	30	80	60.7
65 / 69	0	9	5	14	51.6	7	32	24	64	54.5	21	49	41	111	58.6
60 / 64	1	13	8	22	48.7	18	38	33	89	52.2	45	42	51	138	56.2
55 / 59	3	19	12	34	45.7	25	36	39	100	49.0	56	26	46	128	52.8
50 / 54	8	31	22	61	42.5	41	36	42	120	46.0	53	11	27	91	48.8
45 / 49	13	36	31	80	39.3	45	21	31	96	42.2	34	4	12	50	44.6
40 / 44	25	39	39	103	36.2	45	14	26	85	38.2	15	0	3	19	40.4
35 / 39	44	36	45	124	32.8	35	7	15	56	33.9	7	0	1	7	36.3
30 / 34	60	26	40	126	28.8	23	2	6	31	29.6	1		0	1	31.3
25 / 29	40	13	20	72	24.2	8	0	0	9	25.7	0			0	26.0
20 / 24	22	5	7	34	19.9	1	0	0	1	20.9					
15 / 19	12	2	3	17	15.2	0	0		0	18.0					
10 / 14	5	1	2	8	10.6										
5 / 9	2	1	1	3	5.9										
0 / 4	1	0	0	2	1.1										
-5 / -1	1		0	1	-3.3										
-10 / -6	1			1	-7.2										
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															
-50 / -46															

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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	1	74.1		0		0	69.0		0		0	68.0
90 / 94		5	1	6	73.4		3	0	3	71.7		0		0	69.3
85 / 89		14	5	19	70.6		8	3	11	70.8		1	0	1	72.8
80 / 84	1	37	17	54	67.6	0	26	10	36	67.9		5	1	7	67.2
75 / 79	5	57	31	93	65.1	1	44	21	66	65.5	0	11	4	14	64.7
70 / 74	15	61	45	120	63.2	10	58	38	106	63.3	1	19	8	29	61.4
65 / 69	39	42	54	135	61.3	32	47	47	125	61.4	6	27	16	49	59.2
60 / 64	67	24	53	144	58.5	53	37	57	147	58.0	17	45	33	95	55.9
55 / 59	69	6	29	104	54.8	62	18	39	118	54.4	27	47	41	115	52.5
50 / 54	37	1	11	49	50.7	51	5	24	79	50.5	48	43	53	145	48.9
45 / 49	14		2	16	46.1	28	1	9	37	46.1	49	23	40	112	44.7
40 / 44	3		0	3	42.3	10		2	12	41.6	42	12	25	79	40.3
35 / 39	0			0	38.2	3		0	4	37.3	29	3	14	47	35.9
30 / 34						0			0	32.4	16	0	5	21	31.4
25 / 29											4		0	5	27.0
20 / 24											0			0	23.3
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															
-50 / -46															

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84		1	0	1	60.2										
75 / 79		1	0	1	59.3										
70 / 74		3	1	5	57.7		0		0	54.7					
65 / 69	0	9	3	12	54.8		0		0	51.9					
60 / 64	2	17	6	25	52.4		2	0	2	50.9					
55 / 59	7	24	14	45	49.5	0	2	1	3	48.2					
50 / 54	15	35	24	74	45.8	1	6	2	10	45.4					
45 / 49	28	40	41	109	42.7	4	9	6	19	42.0		0	0	1	41.6
40 / 44	42	45	47	134	38.6	8	16	12	36	37.9	0	2	1	3	36.3
35 / 39	49	38	50	137	34.3	16	24	20	60	33.7	3	5	3	10	32.9
30 / 34	56	24	41	122	30.1	37	44	44	126	29.8	12	19	16	47	29.7
25 / 29	30	6	16	51	25.7	49	43	48	140	25.2	23	28	27	79	25.3
20 / 24	14	2	5	20	21.1	34	34	35	103	20.6	29	31	32	91	20.8
15 / 19	5	0	2	7	16.7	28	23	27	77	15.9	28	29	30	87	16.1
10 / 14	1	0	0	2	12.1	23	15	18	57	11.2	25	29	25	79	11.1
5 / 9	0		0	0	7.0	14	9	12	35	6.4	24	21	24	70	6.1
0 / 4	0			0	3.0	9	5	8	22	1.4	20	24	22	66	1.2
-5 / -1						4	2	4	10	-2.8	15	15	15	45	-3.1
-10 / -6						5	2	3	11	-7.1	19	18	20	57	-7.5
-15 / -11						3	1	1	5	-11.6	16	11	16	43	-12.2
-20 / -16						2	0	1	3	-16.7	14	8	10	33	-16.9
-25 / -21						1	0	0	1	-21.5	10	4	6	19	-21.7
-30 / -26						0	0	0	0	-25.7	7	1	2	11	-26.8
-35 / -31											2	1	0	3	-31.5
-40 / -36											1	0		1	-36.0
-45 / -41											0			0	
-50 / -46															

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INTERNATIONAL FALLS MN

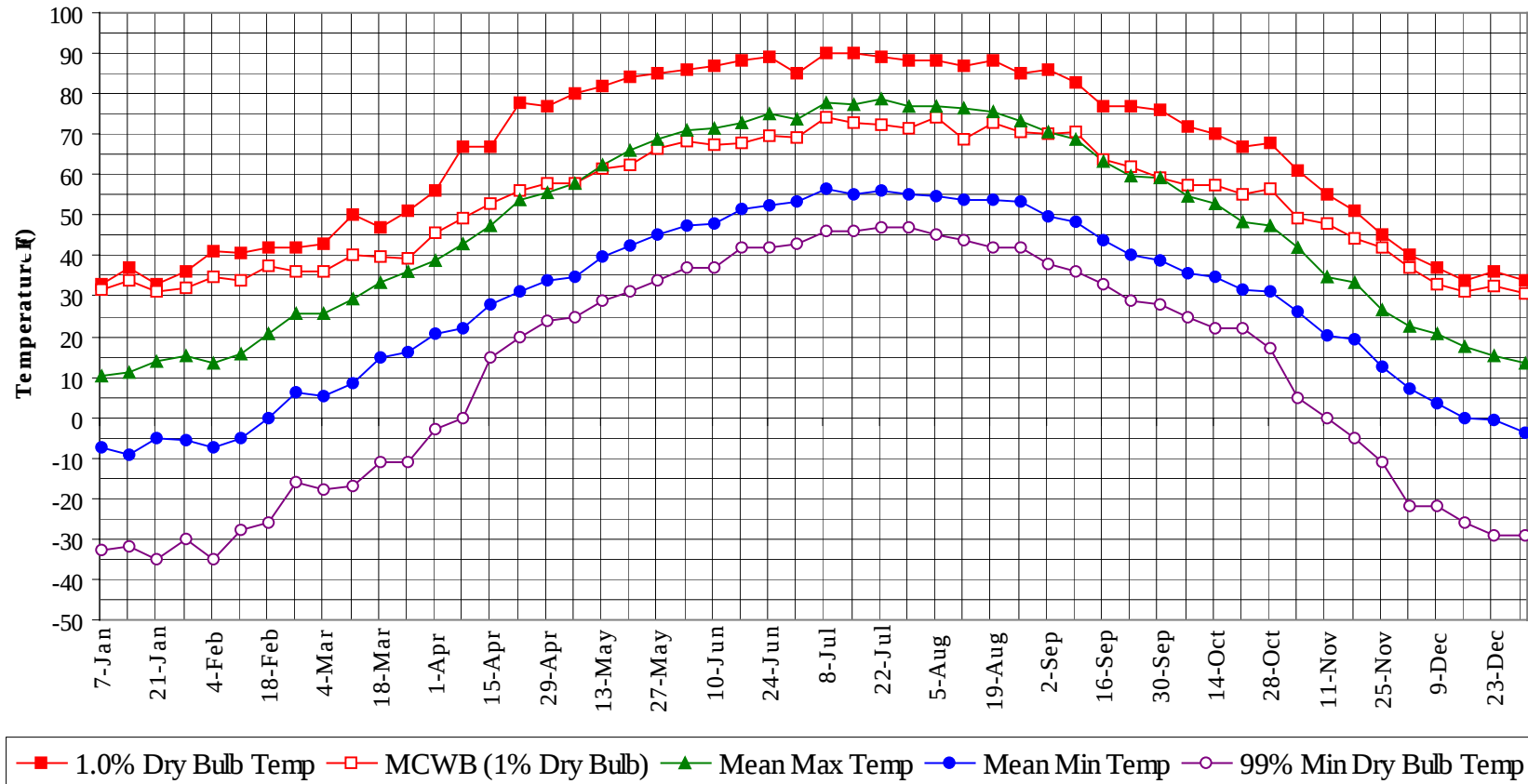
WMO No. 727470

Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)
Period of Record = 1973 to 1996

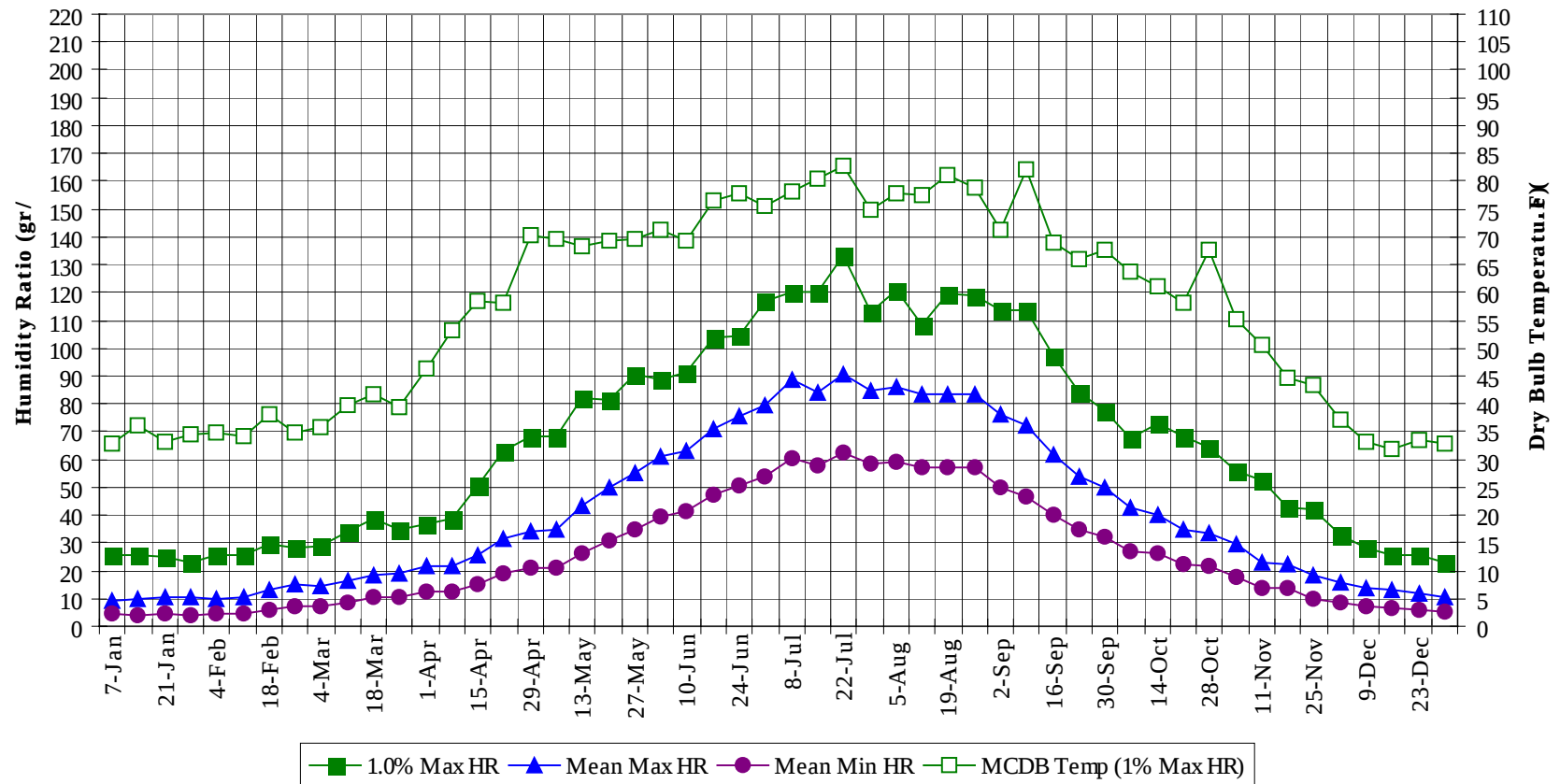
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		1	0	1	72.4
90 / 94		11	3	13	71.8
85 / 89		36	13	49	69.3
80 / 84	1	101	42	144	66.5
75 / 79	8	164	82	253	64.1
70 / 74	34	218	139	391	61.6
65 / 69	104	215	190	509	59.3
60 / 64	203	217	241	661	56.1
55 / 59	248	178	221	647	52.1
50 / 54	254	175	207	636	47.6
45 / 49	213	145	180	538	42.8
40 / 44	192	157	173	523	38.1
35 / 39	210	166	193	569	33.7
30 / 34	261	188	229	678	29.5
25 / 29	229	167	196	592	24.9
20 / 24	172	151	150	474	20.3
15 / 19	139	129	133	400	15.6
10 / 14	121	116	117	354	10.7
5 / 9	107	91	100	298	5.9
0 / 4	87	83	87	257	1.0
-5 / -1	63	50	55	168	-3.2
-10 / -6	78	57	65	200	-7.6
-15 / -11	61	38	47	145	-12.2
-20 / -16	52	27	34	113	-16.9
-25 / -21	39	14	21	74	-21.8
-30 / -26	29	8	11	48	-26.7
-35 / -31	16	3	2	20	-31.4
-40 / -36	4	1	0	5	-35.4
-45 / -41	1	0	0	1	-41.0
-50 / -46	0			0	

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



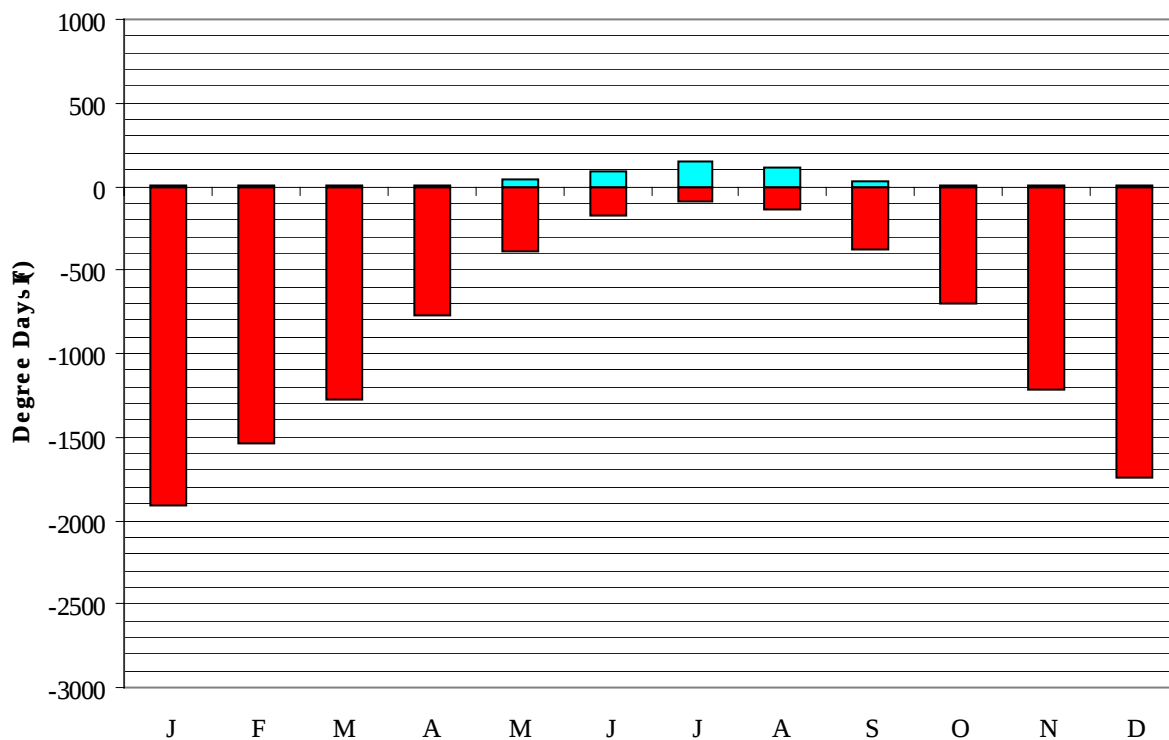
INTERNATIONAL FALLS MN

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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	33.0	31.4	10.4	-7.5	-33.0	25.9	32.7	9.4	4.4
14-Jan	37.0	33.8	11.1	-9.4	-32.0	25.9	36.1	9.8	4.2
21-Jan	33.0	31.1	13.9	-5.3	-35.0	25.2	33.2	10.7	4.9
28-Jan	36.0	32.0	15.2	-5.4	-30.0	23.1	34.6	10.4	4.1
4-Feb	41.0	34.9	13.4	-7.5	-35.0	25.9	35.0	9.9	4.5
11-Feb	40.5	33.8	15.7	-5.0	-28.0	25.9	34.2	10.4	4.7
18-Feb	42.0	37.7	20.6	0.0	-26.0	29.4	38.0	12.8	6.2
25-Feb	42.0	35.9	25.8	6.1	-16.0	28.0	34.8	15.2	7.6
4-Mar	43.0	36.0	25.5	5.5	-18.0	28.7	36.0	14.2	7.1
11-Mar	50.0	40.0	29.5	8.3	-17.0	34.3	39.7	16.1	8.2
18-Mar	47.0	39.8	33.4	14.6	-11.0	38.5	41.5	18.6	10.4
25-Mar	51.0	39.4	35.9	16.0	-11.0	35.0	39.5	19.2	10.2
1-Apr	56.0	45.5	38.8	20.6	-3.0	37.1	46.4	21.9	12.7
8-Apr	67.0	49.2	43.0	22.0	0.0	38.5	53.3	21.6	12.4
15-Apr	67.0	53.0	47.6	27.7	15.0	50.4	58.5	25.7	15.0
22-Apr	78.0	56.3	53.6	31.3	20.0	63.0	58.2	31.7	19.0
29-Apr	77.0	57.7	55.8	33.9	24.0	68.6	70.3	33.9	20.8
6-May	80.0	57.9	58.0	34.6	25.0	68.6	69.6	34.6	21.0
13-May	82.0	61.5	62.5	39.5	29.0	81.9	68.4	43.5	26.3
20-May	84.0	62.4	66.1	42.4	31.0	81.2	69.2	50.1	30.9
27-May	85.0	66.3	68.9	45.2	34.0	90.3	69.6	55.1	35.0
3-Jun	86.0	68.1	70.9	47.4	37.0	88.9	71.3	60.9	39.6
10-Jun	87.0	67.6	71.5	48.0	37.0	91.0	69.2	63.0	41.6
17-Jun	88.0	67.8	72.7	51.6	42.0	103.6	76.5	70.9	47.2
24-Jun	89.0	69.7	75.0	52.6	42.0	104.3	78.0	75.7	50.4
1-Jul	85.0	69.1	73.8	53.2	43.0	116.9	75.5	79.5	54.0
8-Jul	90.0	74.1	77.9	56.4	46.0	120.4	78.1	89.0	60.1
15-Jul	90.0	72.6	77.5	55.4	46.0	120.4	80.5	84.4	57.9
22-Jul	89.0	72.5	78.5	56.1	47.0	133.0	82.7	90.7	62.1
29-Jul	88.0	71.3	76.8	55.1	47.0	112.7	75.0	84.9	58.7
5-Aug	88.0	74.0	76.8	54.6	45.0	121.1	78.0	85.8	58.8
12-Aug	87.0	68.7	76.6	53.9	44.0	108.5	77.6	83.3	57.2
19-Aug	88.0	72.8	75.5	53.6	42.0	119.7	81.1	83.5	56.9
26-Aug	85.0	70.8	73.3	53.4	42.0	119.0	78.9	83.6	57.1
2-Sep	86.0	70.1	70.6	49.7	38.0	113.4	71.3	76.4	50.0
9-Sep	83.0	70.6	68.6	48.2	36.0	113.4	82.0	72.5	46.9
16-Sep	77.0	63.7	63.2	43.9	33.0	97.3	69.0	61.4	40.1
23-Sep	77.0	62.0	59.6	40.3	29.0	84.0	66.0	53.7	35.1
30-Sep	76.0	59.2	59.1	39.0	28.0	77.7	67.8	50.1	32.4
7-Oct	72.0	57.4	54.7	35.7	25.0	67.9	63.7	42.4	27.2
14-Oct	70.0	57.4	53.0	34.9	22.0	72.8	61.0	39.9	26.0
21-Oct	67.0	55.3	48.2	31.8	22.0	68.6	58.2	34.8	22.4
28-Oct	68.0	56.6	47.6	31.2	17.0	64.4	67.7	33.5	21.7
4-Nov	61.0	49.2	42.1	26.1	5.0	56.0	55.1	29.3	17.6
11-Nov	55.0	47.8	34.8	20.5	0.0	52.5	50.6	23.2	13.7
18-Nov	51.0	44.3	33.3	19.2	-5.0	42.7	44.7	22.1	13.7
25-Nov	45.0	42.2	26.7	12.4	-11.0	42.0	43.4	18.3	10.1
2-Dec	40.0	36.8	22.5	7.0	-22.0	32.9	37.2	15.6	8.8
9-Dec	37.0	32.9	20.5	3.4	-22.0	28.0	33.2	14.1	7.1
16-Dec	34.0	30.9	17.7	-0.1	-26.0	25.9	31.7	12.9	6.3
23-Dec	36.0	32.7	15.4	-0.5	-29.0	25.9	33.5	11.9	6.2
31-Dec	34.0	30.6	13.3	-3.8	-29.0	23.1	32.7	10.6	5.3

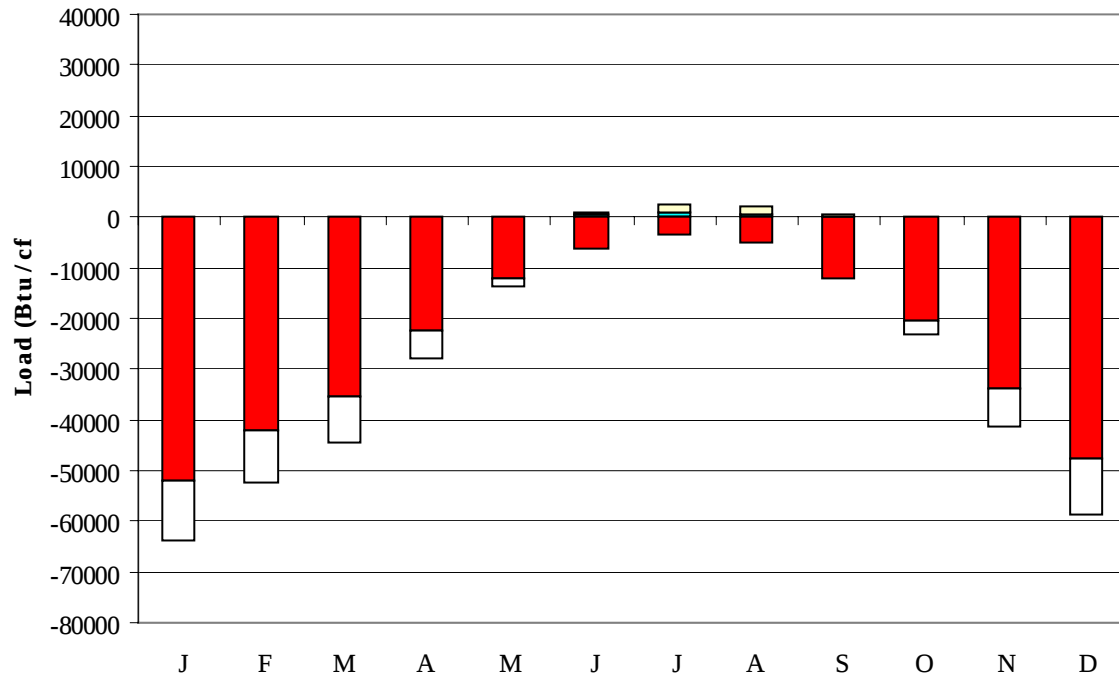
Degree Days, Heating and Cooling
(Base 65°F)



■ Mean Cooling Degree Days
 ■ Mean Heating Degree Days

	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1906
FEB	0	1540
MAR	0	1278
APR	7	774
MAY	46	386
JUN	89	171
JUL	150	90
AUG	109	139
SEP	24	380
OCT	3	703
NOV	0	1218
DEC	0	1737
ANN	429	10322

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	-51817	0	-12127
FEB	0	-42116	0	-10174
MAR	0	-35529	0	-8857
APR	24	-22316	0	-5411
MAY	246	-12016	39	-1726
JUN	494	-5999	562	-78
JUL	891	-3544	1744	-1
AUG	558	-5079	1501	-10
SEP	90	-11920	295	-378
OCT	5	-20500	0	-2726
NOV	0	-33908	0	-7451
DEC	0	-47443	0	-11078
ANN	2308	-292187	4141	-60017

Average Annual Solar Radiation – Nearest Available Site

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

City: INTERNATIONAL FALLS
 State: MN
 WBAN No: 14918
 Lat(N): 48.57
 Long(W): 93.38
 Elev(ft): 1184

Stn Type: Secondary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS

Window: 1
 Overhang: 0.781
 Vert Gap: 0.322

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	450	770	1170	1510	1740	1840	1850	1560	1110	700	430	350	1120
	Std Dev	32	55	97	126	156	145	96	123	100	62	30	26	36
	Minimum	370	600	940	1300	1360	1580	1670	1350	900	580	370	260	1060
	Maximum	510	840	1370	1780	2000	2110	2040	1770	1300	840	490	400	1200
	Diffuse	270	410	620	680	770	850	800	680	540	390	280	220	540
Clear Day	Global	580	950	1510	2080	2490	2660	2550	2170	1620	1050	630	470	1570
NORTH	Global	150	240	360	440	550	630	610	470	330	230	160	130	360
	Diffuse	150	240	360	430	490	540	510	440	330	230	160	130	330
Clear Day	Global	130	200	290	400	590	730	660	450	300	210	130	110	350
EAST	Global	340	540	770	970	1070	1090	1130	980	720	470	290	260	720
	Diffuse	200	310	450	520	580	620	610	530	410	280	190	160	410
Clear Day	Global	540	770	1120	1410	1570	1630	1570	1420	1160	840	560	450	1090
SOUTH	Global	920	1190	1240	1140	980	910	960	1030	1010	880	670	750	970
	Diffuse	330	450	560	560	570	600	600	550	470	360	290	280	470
Clear Day	Global	1780	2000	2030	1700	1380	1230	1280	1510	1800	1900	1740	1630	1660
WEST	Global	340	550	780	940	1040	1100	1120	980	730	480	300	270	720
	Diffuse	200	310	460	530	590	640	630	540	410	280	190	160	410
Clear Day	Global	540	770	1120	1410	1570	1630	1570	1420	1160	840	560	450	1090

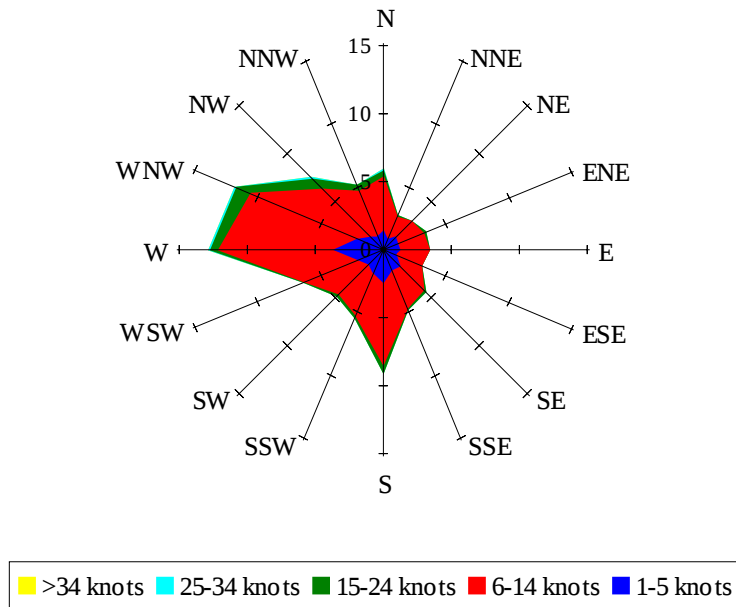
Average Annual Solar Heat and Illumination – Nearest Available Site

(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	270	500	800	1070	1240	1320	1330	1110	770	470	270	210	780
NORTH	Unshaded	110	170	250	300	360	420	400	310	230	160	110	87	240
	Shaded	85	130	200	240	300	340	330	260	190	130	84	68	200
EAST	Unshaded	230	380	540	700	770	780	810	700	510	330	200	180	510
	Shaded	190	310	440	540	590	600	620	550	400	270	160	150	400
SOUTH	Unshaded	700	890	890	770	630	580	620	690	700	640	510	570	680
	Shaded	670	800	640	410	320	340	340	450	530	470	550	490	490
WEST	Unshaded	230	380	550	670	740	780	800	710	520	340	210	180	510
	Shaded	200	320	440	530	570	600	620	550	410	270	170	150	400

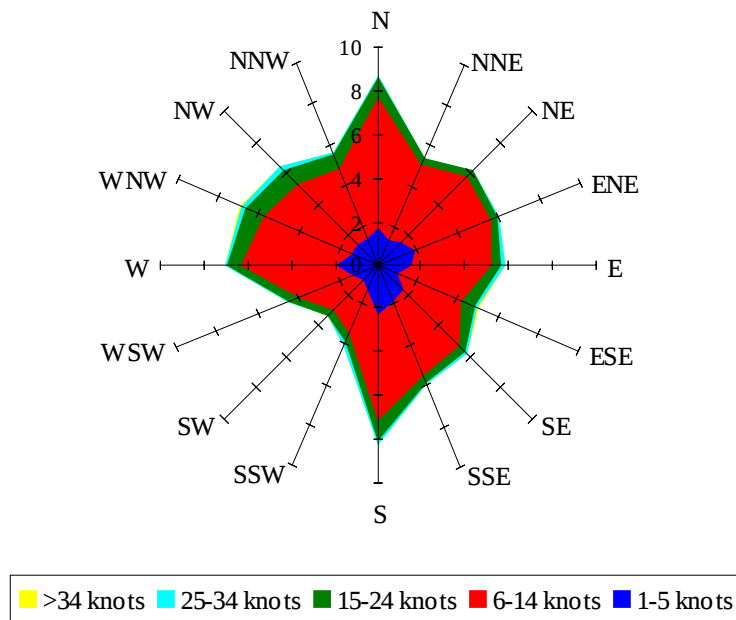
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	31	61	72	58	25	47	78	94	90	69
	M.Cloudy	20	42	50	41	18	28	49	60	61	46
NORTH	M.Clear	8	13	14	12	8	14	15	16	16	14
	M.Cloudy	9	16	18	15	8	12	16	18	18	15
EAST	M.Clear	71	59	14	12	8	81	73	34	16	14
	M.Cloudy	25	31	18	15	8	33	39	26	18	15
SOUTH	M.Clear	39	80	94	76	33	11	40	59	55	32
	M.Cloudy	16	38	48	38	15	11	26	38	37	23
WEST	M.Clear	8	13	17	63	66	11	15	16	46	77
	M.Cloudy	9	16	19	33	25	11	16	18	33	43
M.Clear	(% hrs)	31	31	29	30	32	32	30	23	22	27
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	22	55	73	68	43	4	24	31	18	0
	M.Cloudy	12	32	42	43	27	3	16	20	12	0
NORTH	M.Clear	7	12	14	13	10	2	7	8	6	0
	M.Cloudy	5	12	15	15	10	2	7	9	6	0
EAST	M.Clear	61	68	30	13	10	16	34	8	6	0
	M.Cloudy	16	29	20	15	10	4	13	9	6	0
SOUTH	M.Clear	20	59	82	76	45	14	68	82	55	0
	M.Cloudy	8	26	37	38	21	4	21	26	16	0
WEST	M.Clear	7	12	14	46	71	2	7	15	37	0
	M.Cloudy	5	12	15	27	29	2	7	10	12	0
M.Clear	(% hrs)	32	29	26	24	28	27	27	27	29	31

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



Percent Calm = 7.76

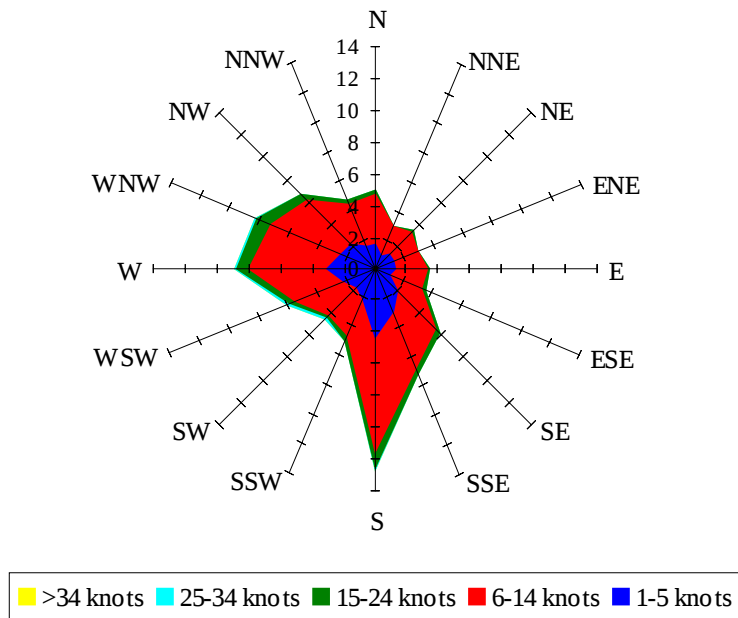
Wind Summary - March, April, and May **Labels of Percent Frequency on North Axis**



Percent Calm = 6.17

Wind Summary - June, July, and August

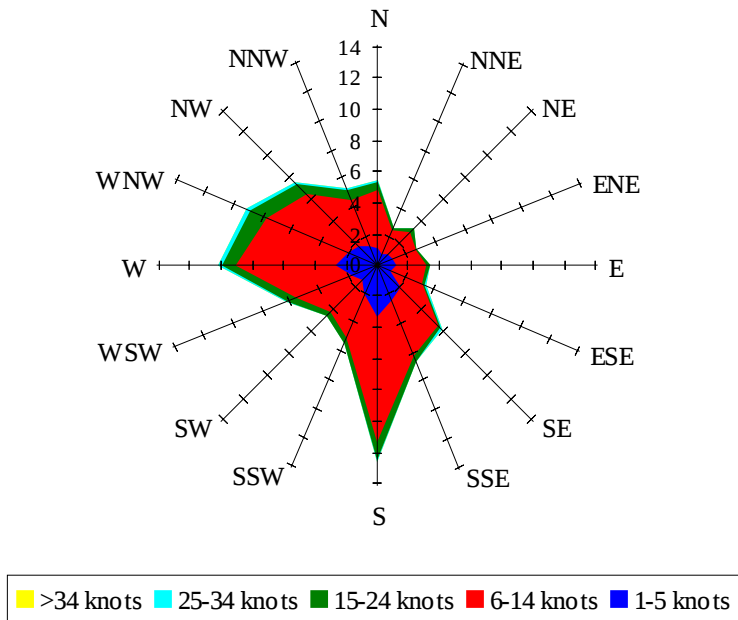
Labels of Percent Frequency on North Axis



Percent Calm = 9.79

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.96