

KAPUSKASING CN

Latitude = 49.42 N

Longitude = 82.47 W

Period of Record = 1973 to 1996

WMO No. 718310

Elevation = 745 feet

Average Pressure = 29.13 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	91	71	83	10.8	SW
0.4% Occurrence	84	67	75	10.2	SW
1.0% Occurrence	81	66	72	9.5	SW
2.0% Occurrence	78	64	69	9.4	SW
Mean Daily Range	20	-	-	-	-
97.5% Occurrence	-18	-18	1	5.6	W
99.0% Occurrence	-26	-27	1	4.3	W
99.6% Occurrence	-31	-31	1	3.6	WNW
Median of Extreme Lows	-36	-36	1	2.8	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	74	85	110	10.8	SW
0.4% Occurrence	70	78	97	8.9	SW
1.0% Occurrence	68	77	91	8.6	SW
2.0% Occurrence	66	74	84	8.3	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	115	79	0.74	9.9	SW
0.4% Occurrence	101	75	0.65	9.2	S
1.0% Occurrence	94	73	0.61	8.0	SSW
2.0% Occurrence	88	70	0.57	7.6	SW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		1	122	12	159

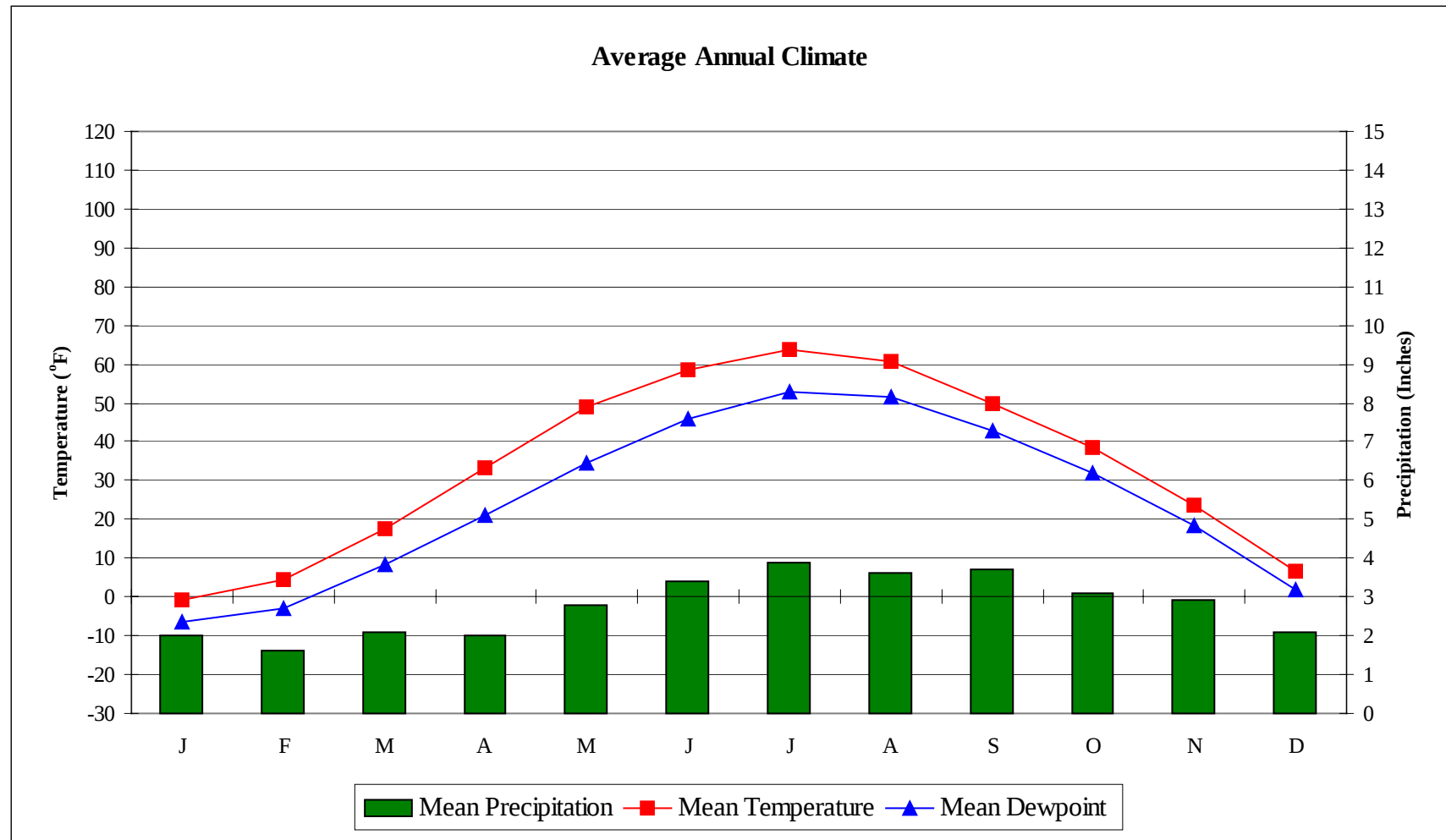
Other Site Data

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
3	N/A	N/A	0.2 + 0.1
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 (#)
36.3	N/A	N/A	60

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

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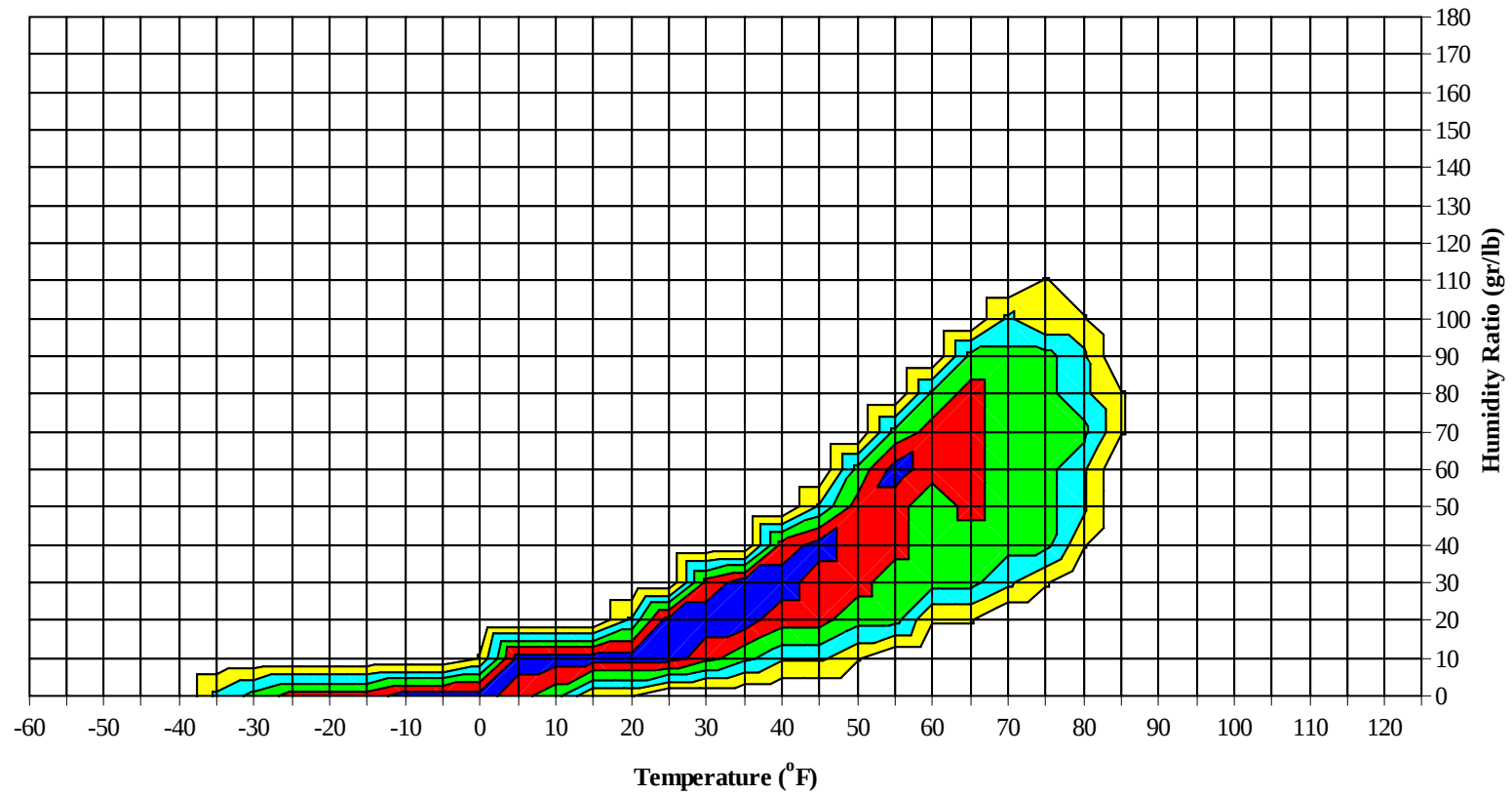
WMO No. 718310



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WMO No. 718310

Long Term Psychrometric Summary

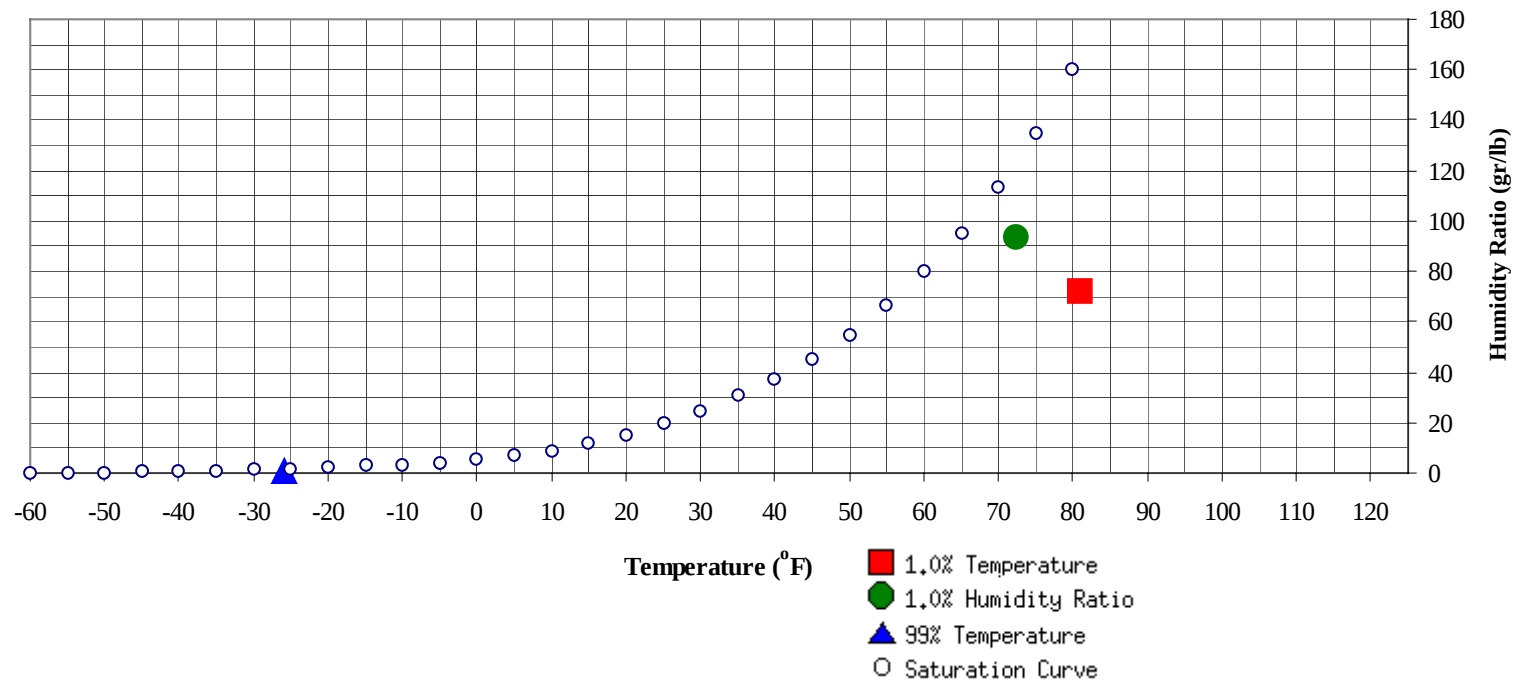


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	-26	0.8	-6.1		93.8	72.5	67.1	64.4	32.0

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	81	72.3	65.6	30.8

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WMO No. 718310

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	09	17			01	09	17			01	09	17			
	To 08	To 16	To 00			To 08	To 16	To 00			To 08	To 16	To 00			
95 / 99																
90 / 94																
85 / 89																
80 / 84																
75 / 79																
70 / 74																
65 / 69																
60 / 64											0 0 0 51.7					
55 / 59											1 1 2 48.2					
50 / 54						0 45.7					0 3 2 5 42.5					
45 / 49						0 1 1 2 40.5					1 10 5 16 38.6					
40 / 44	0 40.0					1 3 2 6 36.7					2 13 10 25 36.2					
35 / 39	1	2	1	4	33.9	3	7	7	17	34.1	14	25	24	63	33.4	
30 / 34	5	7	8	20	30.1	8	10	9	27	30.1	23	31	30	84	29.2	
25 / 29	13	15	14	42	25.4	10	14	14	38	24.7	25	32	34	91	23.9	
20 / 24	8	11	11	30	21.1	10	14	14	38	20.4	18	23	24	65	19.9	
15 / 19	15	18	16	49	16.2	14	23	21	58	15.7	25	31	32	88	15.5	
10 / 14	20	23	23	66	11.3	17	29	27	73	10.7	26	29	25	80	10.7	
5 / 9	22	28	25	75	6.0	20	28	26	74	5.7	27	19	23	69	5.6	
0 / 4	20	31	27	78	0.6	21	29	27	77	0.5	23	14	17	54	0.6	
-5 / -1	16	24	23	63	-3.7	18	17	18	53	-3.7	15	6	8	29	-3.8	
-10 / -6	25	30	32	87	-8.1	24	20	25	69	-8.1	19	6	7	32	-8.0	
-15 / -11	22	19	23	64	-12.5	19	12	12	43	-12.6	12	2	3	17	-12.4	
-20 / -16	25	19	22	66	-16.9	23	10	11	44	-16.9	11	1	2	14	-16.9	
-25 / -21	23	10	13	46	-22.1	17	5	6	28	-22.1	5	0	1	6	-21.9	
-30 / -26	17	7	8	32	-27.4	12	2	3	17	-27.2	2	0			2	-27.1
-35 / -31	8	2	3	13	-31.9	5	1	0	6	-31.9	1				1	-31.9
-40 / -36	4	1	1	6	-36.2	2	0	0	2	-35.9	0				0	-35.0
-45 / -41	2	0	0	2	-41.4	0	0			-41.9						
-50 / -46	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.

KAPUSKASING CN

WMO No. 718310

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	73.5
90 / 94							0	0	0	65.2		1	1	2	69.4
85 / 89							1	1	2	64.9		5	3	8	67.0
80 / 84		1	0	1	63.3		7	4	11	62.1		13	7	20	65.0
75 / 79		1	1	2	60.6		12	8	20	59.1	1	24	16	41	62.0
70 / 74		2	1	3	55.5	1	20	14	35	57.1	5	37	27	69	59.4
65 / 69	0	4	2	6	53.5	3	16	12	31	54.7	10	31	27	68	57.7
60 / 64	1	6	5	12	50.4	10	28	25	63	52.0	31	45	46	122	55.4
55 / 59	2	12	8	22	46.8	18	32	31	81	48.6	43	35	41	119	52.0
50 / 54	4	19	14	37	42.5	27	35	36	98	45.0	49	22	33	104	48.2
45 / 49	7	28	22	57	38.8	36	33	37	106	41.4	42	16	23	81	43.7
40 / 44	10	25	26	61	36.2	30	21	26	77	38.0	25	6	9	40	39.9
35 / 39	31	39	40	110	33.1	45	24	27	96	34.6	20	4	6	30	36.0
30 / 34	45	39	49	133	29.1	44	11	19	74	30.1	12	1	2	15	31.1
25 / 29	48	28	35	111	24.2	25	4	6	35	25.3	2	0	0	2	27.2
20 / 24	25	14	14	53	20.0	8	1	1	10	20.8					
15 / 19	23	11	14	48	15.8	2	0	0	2	17.0					
10 / 14	19	6	7	32	10.8	0	0	0	0	11.1					
5 / 9	13	2	2	17	6.0										
0 / 4	7	0	1	8	1.1										
-5 / -1	2	0	0	2	-3.6										
-10 / -6	2		0	2	-7.4										
-15 / -11	0			0	-10.0										
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															
-50 / -46															

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WMO No. 718310

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															
90 / 94		2	1	3	73.1		1	0	1	70.8		0		0	74.0
85 / 89		5	3	8	69.3		3	1	4	69.2		0	0	0	72.1
80 / 84	0	23	11	34	67.0		17	8	25	67.4		2	1	3	69.3
75 / 79	2	42	26	70	64.2	0	33	17	50	64.9		6	2	8	66.1
70 / 74	10	56	43	109	62.0	5	45	34	84	62.4	1	14	7	22	62.3
65 / 69	19	37	39	95	60.1	19	37	31	87	60.5	4	16	11	31	59.3
60 / 64	51	44	54	149	57.8	41	51	53	145	57.4	13	31	23	67	56.6
55 / 59	64	25	42	131	54.1	53	35	46	134	53.7	21	42	38	101	52.4
50 / 54	57	10	20	87	49.9	57	19	36	112	49.7	35	48	44	127	48.3
45 / 49	32	2	8	42	45.4	43	6	17	66	45.1	49	42	51	142	44.0
40 / 44	10	0	1	11	41.1	19	0	3	22	41.0	39	22	26	87	40.2
35 / 39	4		0	4	37.4	10	0	1	11	37.0	45	15	26	86	36.0
30 / 34	0			0	32.3	1			1	32.7	26	3	10	39	31.2
25 / 29											7	0	1	8	26.6
20 / 24											0			0	21.8
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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WMO No. 718310

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															
75 / 79		0	0	0	58.0										
70 / 74		2	0	2	59.2										
65 / 69		3	2	5	56.9										
60 / 64	1	8	5	14	54.5		0	0	0	51.1					
55 / 59	5	17	10	32	50.7	0	1	1	2	50.2					
50 / 54	10	27	20	57	46.8	3	6	4	13	46.8	0	0		0	50.8
45 / 49	24	39	34	97	43.1	5	8	6	19	42.8	0	0	1	1	43.4
40 / 44	27	31	31	89	39.2	4	11	7	22	38.6	0	1	1	2	39.3
35 / 39	48	47	48	143	35.1	21	27	27	75	34.7	4	6	4	14	34.5
30 / 34	66	52	63	182	30.3	39	43	41	122	30.6	15	20	19	54	30.7
25 / 29	48	18	27	93	25.5	40	44	44	127	25.2	21	21	21	63	25.7
20 / 24	11	2	7	20	21.0	29	26	30	85	20.8	18	16	18	52	21.1
15 / 19	6	1	2	9	16.8	34	29	31	94	16.5	20	27	23	70	16.7
10 / 14	2	0	0	2	11.9	23	21	19	63	11.4	22	29	26	77	11.3
5 / 9	0	0		0	8.4	15	12	13	40	6.2	26	28	29	83	6.1
0 / 4						10	6	8	24	1.1	25	30	27	82	0.8
-5 / -1						6	3	4	13	-3.5	15	15	17	47	-3.6
-10 / -6						6	2	5	13	-7.9	22	24	20	67	-8.0
-15 / -11						3	1	1	5	-12.2	16	12	16	44	-12.5
-20 / -16						2	0	1	3	-16.6	19	10	15	44	-16.7
-25 / -21						1	0		1	-21.0	12	5	8	25	-22.0
-30 / -26											8	2	3	13	-27.2
-35 / -31											3	1	1	5	-31.8
-40 / -36											1	0	0	1	-36.0
-45 / -41											0	0	0	0	-41.0
-50 / -46															

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KAPUSKASING CN

WMO No. 718310

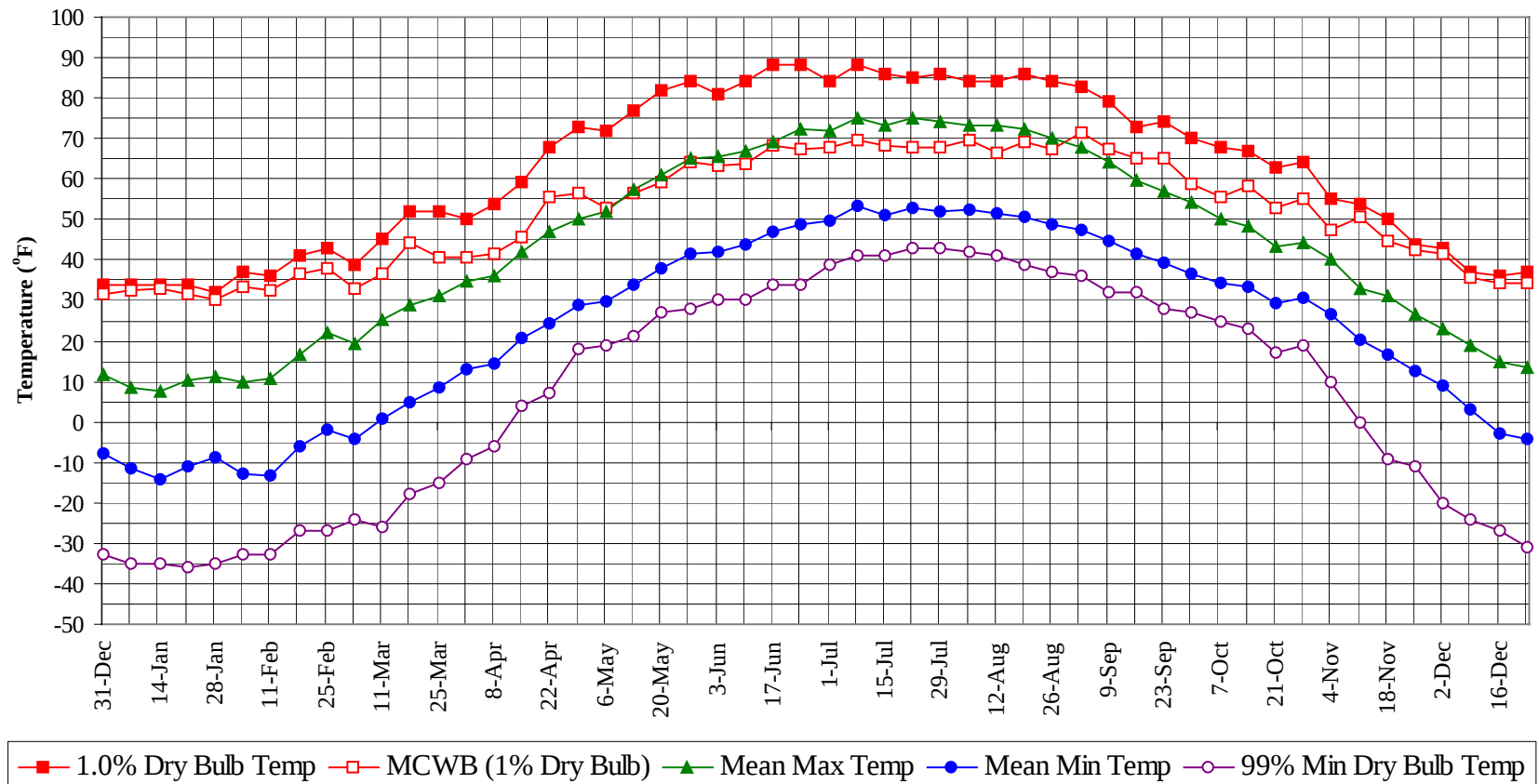
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

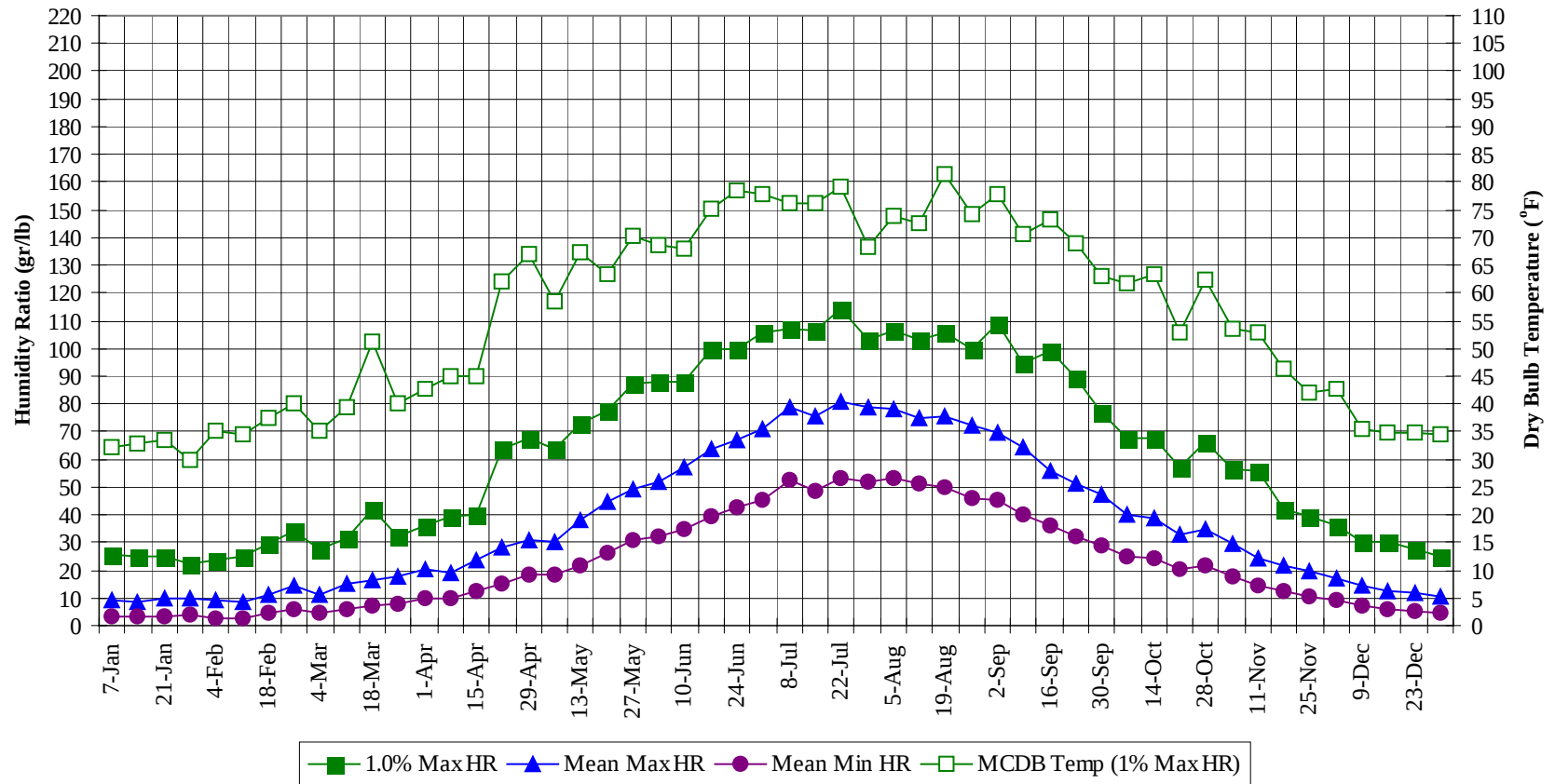
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		0	0	0	73.5
90 / 94		4	2	6	71.4
85 / 89		14	8	22	68.1
80 / 84	0	62	31	93	66.1
75 / 79	3	119	69	191	63.4
70 / 74	22	177	126	325	61.0
65 / 69	54	144	122	320	59.0
60 / 64	148	214	210	572	56.2
55 / 59	207	200	216	622	52.2
50 / 54	241	189	210	639	47.7
45 / 49	238	185	203	625	42.9
40 / 44	167	134	140	440	38.7
35 / 39	244	196	212	652	34.6
30 / 34	284	217	251	752	30.1
25 / 29	239	178	196	612	24.9
20 / 24	127	109	119	354	20.6
15 / 19	140	141	139	419	16.1
10 / 14	130	137	129	395	11.0
5 / 9	123	118	118	358	5.9
0 / 4	107	111	109	326	0.7
-5 / -1	73	65	71	209	-3.7
-10 / -6	100	82	90	272	-8.0
-15 / -11	73	46	55	174	-12.5
-20 / -16	80	41	51	172	-16.8
-25 / -21	59	21	28	108	-22.1
-30 / -26	39	11	14	64	-27.3
-35 / -31	17	4	4	25	-31.9
-40 / -36	7	1	1	9	-36.1
-45 / -41	2	0	0	2	-41.4
-50 / -46	0	0		0	

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Annual Summary of Temperatures

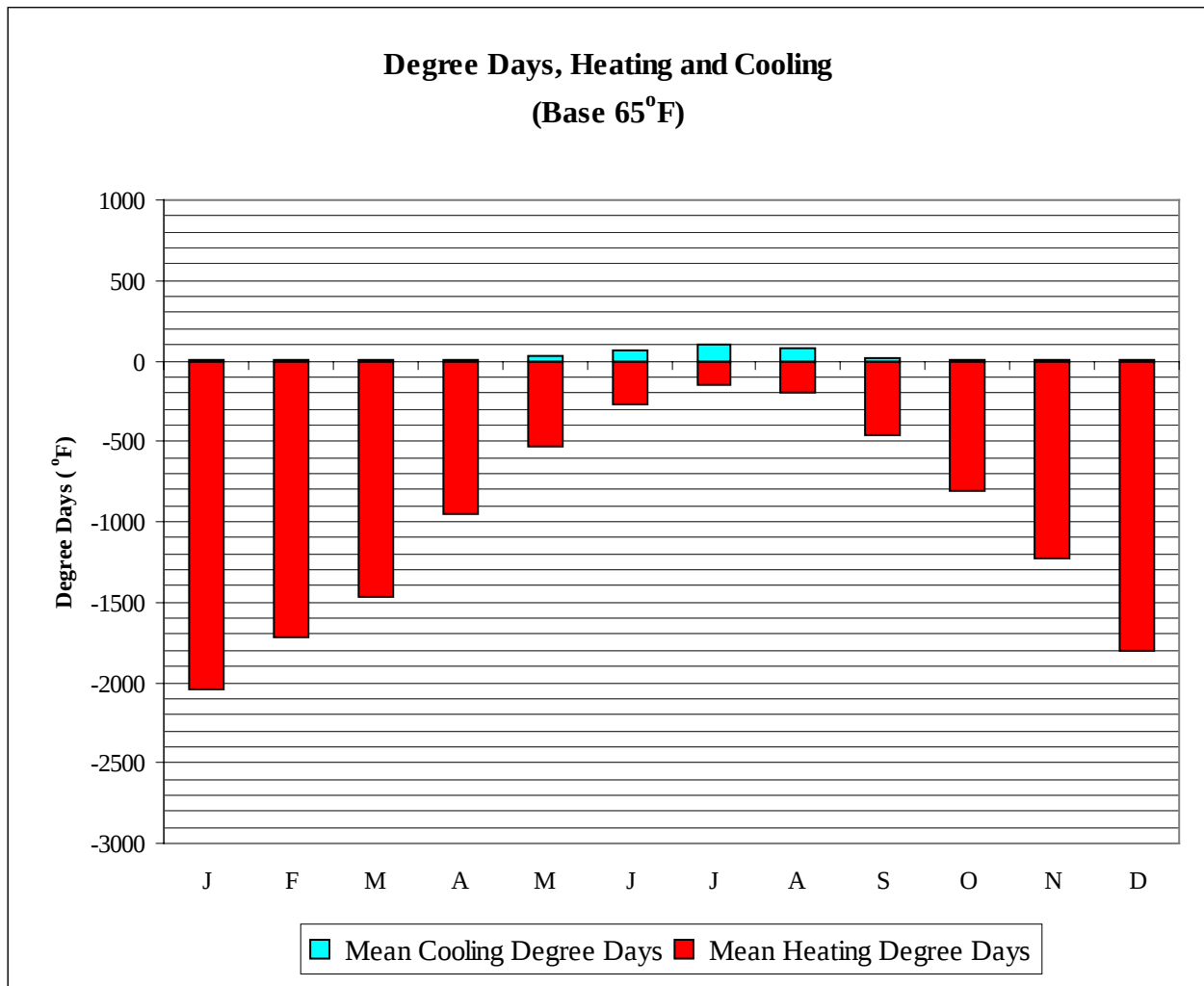


Long Term Humidity and Dry Bulb Temperature Summary



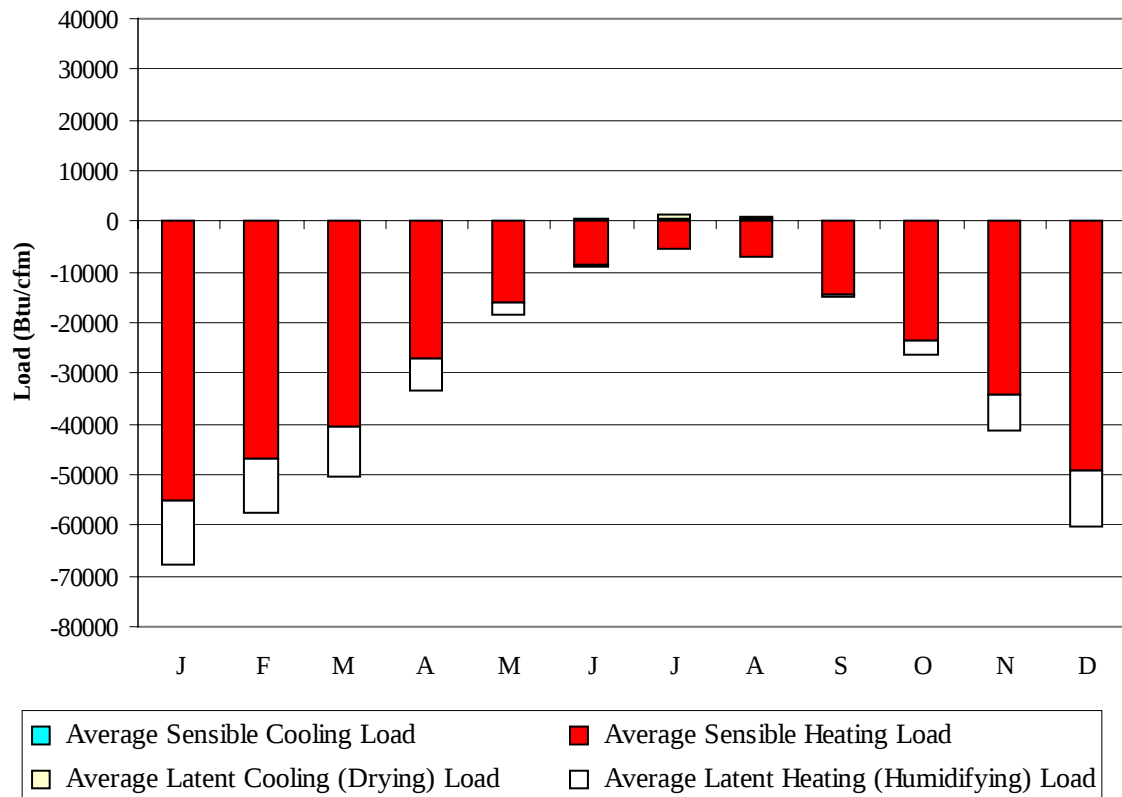
KAPUSKASING CN**WMO No. 718310****Long Term Dry Bulb Temperature and Humidity Summary**

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	34.0	32.5	8.6	-11.5	-35.0	25.9	32.3	9.2	3.5
14-Jan	34.0	32.8	7.4	-14.1	-35.0	25.2	32.7	8.7	3.0
21-Jan	34.0	31.6	10.3	-11.1	-36.0	25.2	33.3	9.6	3.5
28-Jan	32.0	30.1	11.3	-9.0	-35.0	22.4	29.8	9.9	3.7
4-Feb	37.0	33.4	9.8	-12.9	-33.0	23.8	35.3	8.9	2.9
11-Feb	36.0	32.3	10.6	-13.1	-33.0	25.2	34.5	8.6	3.0
18-Feb	41.0	36.7	16.5	-6.1	-27.0	29.4	37.4	11.1	4.4
25-Feb	43.0	37.7	21.9	-1.8	-27.0	34.3	40.0	14.3	5.9
4-Mar	39.0	32.8	19.5	-4.2	-24.0	27.3	35.2	11.4	4.3
11-Mar	45.0	36.5	25.1	0.9	-26.0	31.5	39.5	14.8	6.0
18-Mar	52.0	44.5	28.8	4.8	-18.0	42.0	51.2	16.5	7.3
25-Mar	52.0	40.9	31.3	8.3	-15.0	32.2	39.9	17.5	8.0
1-Apr	50.0	40.8	34.5	13.2	-9.0	36.4	42.7	20.2	9.7
8-Apr	54.0	41.7	35.9	14.5	-6.0	39.2	45.1	19.4	9.8
15-Apr	59.0	45.7	41.9	20.8	4.0	39.9	44.9	23.8	12.5
22-Apr	68.0	55.7	46.9	24.4	7.0	63.7	62.2	28.4	15.2
29-Apr	73.0	56.7	50.3	29.1	18.0	67.9	67.1	31.1	18.1
6-May	72.0	52.9	52.1	29.7	19.0	63.7	58.3	30.5	18.2
13-May	77.0	56.7	57.2	33.7	21.0	72.8	67.2	38.3	21.8
20-May	82.0	59.1	61.1	37.7	27.0	77.7	63.5	44.8	26.2
27-May	84.0	64.1	65.0	41.8	28.0	87.5	70.4	49.5	30.8
3-Jun	81.0	63.1	65.7	41.9	30.0	88.2	68.7	52.0	32.2
10-Jun	84.0	63.8	66.9	43.7	30.0	88.2	68.0	57.1	34.6
17-Jun	88.0	68.1	69.1	46.9	34.0	100.1	75.1	63.6	39.2
24-Jun	88.0	67.3	72.5	48.8	34.0	100.1	78.6	67.1	42.6
1-Jul	84.0	67.9	72.0	49.5	39.0	105.7	77.7	70.6	45.2
8-Jul	88.0	69.8	75.2	53.2	41.0	107.1	76.0	79.1	52.4
15-Jul	86.0	68.1	73.4	51.0	41.0	106.4	76.2	75.6	48.5
22-Jul	85.0	68.0	75.1	53.0	43.0	114.1	79.3	80.5	52.9
29-Jul	86.0	67.9	74.3	52.1	43.0	102.9	68.3	78.5	51.6
5-Aug	84.0	69.6	73.3	52.5	42.0	106.4	73.8	77.8	53.0
12-Aug	84.0	66.7	73.5	51.3	41.0	102.9	72.5	75.0	50.9
19-Aug	86.0	69.0	72.4	50.5	39.0	105.7	81.4	75.3	49.6
26-Aug	84.0	67.3	70.1	49.0	37.0	100.1	74.2	71.9	46.3
2-Sep	83.0	71.4	67.9	47.6	36.0	109.2	77.9	69.7	45.4
9-Sep	79.0	67.2	64.2	44.7	32.0	94.5	70.7	64.2	40.4
16-Sep	73.0	65.2	59.5	41.5	32.0	99.4	73.4	56.1	36.0
23-Sep	74.0	65.0	57.1	39.2	28.0	89.6	69.0	51.0	32.4
30-Sep	70.0	58.7	54.3	36.4	27.0	77.0	63.0	47.2	28.7
7-Oct	68.0	55.8	50.2	34.1	25.0	67.9	61.8	40.2	25.1
14-Oct	67.0	58.3	48.3	33.2	23.0	67.9	63.4	38.9	24.3
21-Oct	63.0	53.0	43.2	29.4	17.0	57.4	53.0	32.8	20.5
28-Oct	64.0	55.0	44.1	30.6	19.0	66.5	62.4	34.8	21.4
4-Nov	55.0	47.4	40.3	26.5	10.0	56.7	53.5	29.8	17.8
11-Nov	54.0	50.5	33.0	20.1	0.0	56.0	52.9	24.4	14.2
18-Nov	50.0	44.7	31.0	16.5	-9.0	42.0	46.4	21.8	12.2
25-Nov	44.0	42.7	26.6	12.5	-11.0	39.2	42.2	19.8	10.5
2-Dec	43.0	41.7	23.1	8.7	-20.0	36.4	42.6	17.3	9.4
9-Dec	37.0	35.5	19.0	3.1	-24.0	30.1	35.4	14.6	7.0
16-Dec	36.0	34.5	14.6	-3.0	-27.0	30.1	34.9	12.5	5.8
23-Dec	37.0	34.4	13.6	-4.4	-31.0	27.3	34.8	11.6	5.4
31-Dec	34.0	31.6	11.7	-7.9	-33.0	25.2	34.4	10.7	4.3



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	2036
FEB	0	1717
MAR	0	1465
APR	3	958
MAY	31	534
JUN	67	264
JUL	105	150
AUG	77	203
SEP	14	467
OCT	1	812
NOV	0	1231
DEC	0	1806
ANN	298	11643

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	-55186	0	-12467
FEB	0	-46702	0	-10937
MAR	0	-40389	0	-9895
APR	9	-27137	0	-6400
MAY	150	-15961	35	-2512
JUN	352	-8592	282	-330
JUL	535	-5379	837	-6
AUG	347	-6965	717	-19
SEP	33	-14283	186	-556
OCT	0	-23411	0	-3029
NOV	0	-34217	0	-7000
DEC	0	-49211	0	-11017
ANN	1426	-327433	2057	-64168

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

No Solar Radiation
Data Available

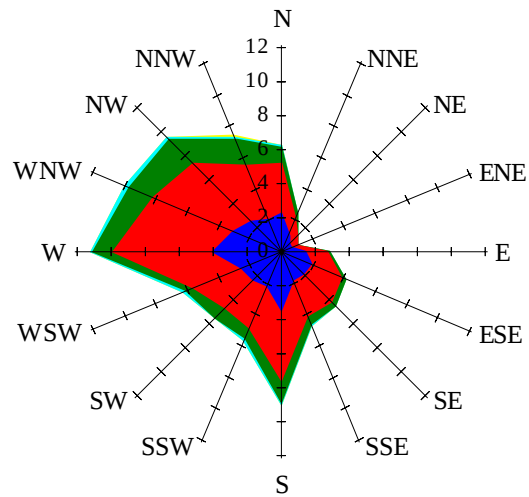


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

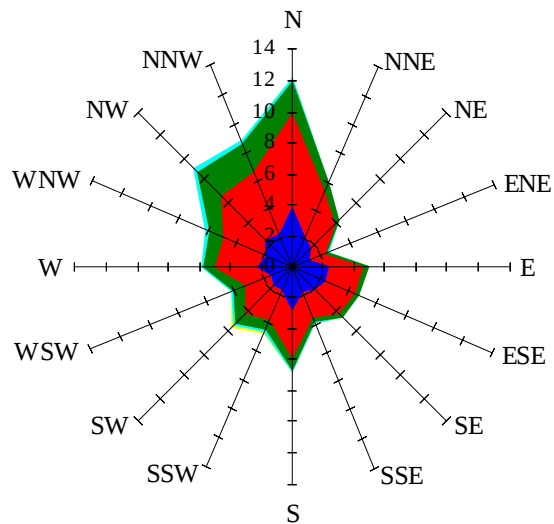
Labels of Percent Frequency on North Axis



Percent Calm = 9.25

Wind Summary - March, April, and May

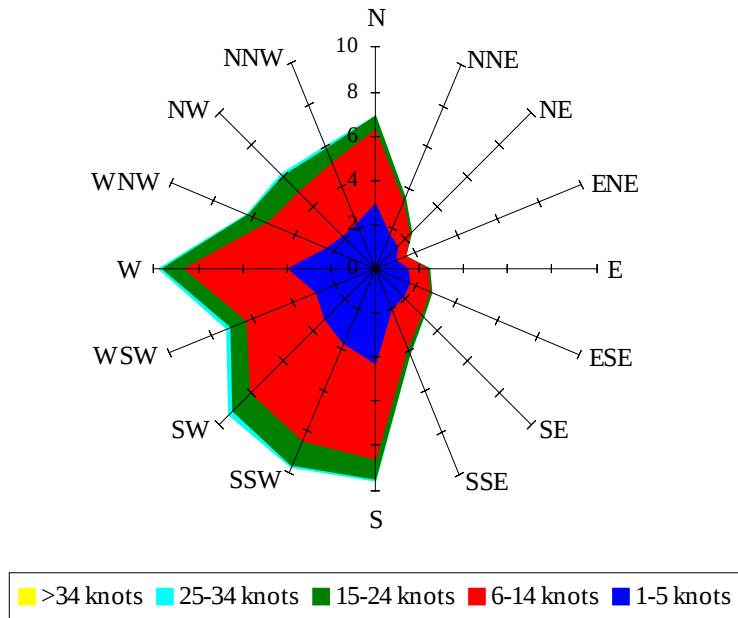
Labels of Percent Frequency on North Axis



Percent Calm = 7.34

Wind Summary - June, July, and August

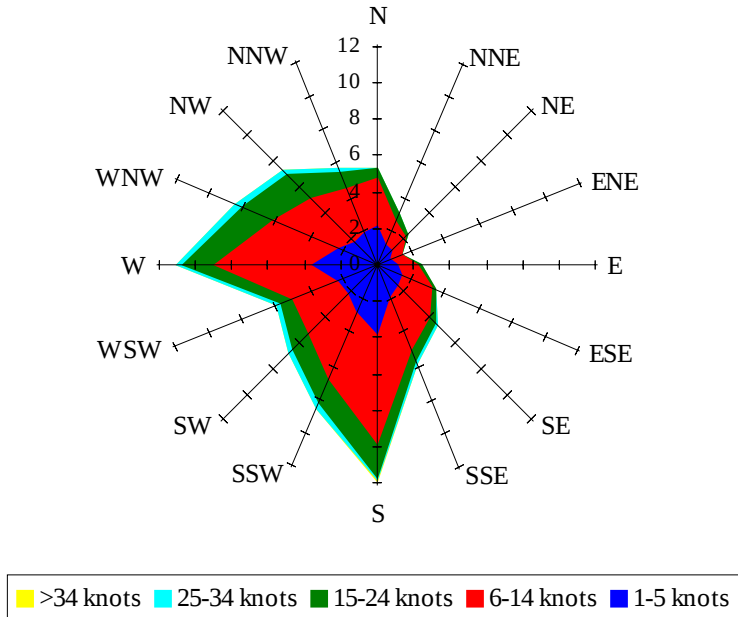
Labels of Percent Frequency on North Axis



Percent Calm = 10.01

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.86