

GREAT FALLS MT

Latitude = 47.48 N

Longitude = 111.30 W

Period of Record = 1973 to 1996

WMO No. 727750

Elevation = 3658 feet

Average Pressure = 26.19 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	98	62	40	12.6	SW
0.4% Occurrence	92	61	44	11.6	WSW
1.0% Occurrence	88	60	45	11.2	SW
2.0% Occurrence	85	60	46	11.0	SW
Mean Daily Range	22	-	-	-	-
97.5% Occurrence	-4	-5	4	7.4	SW
99.0% Occurrence	-12	-12	2	6.7	SW
99.6% Occurrence	-18	-18	2	6.0	SW
Median of Extreme Lows	-24	-24	1	7.4	SW
	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	68	85	88	9.1	ENE
0.4% Occurrence	64	84	68	9.7	E
1.0% Occurrence	62	82	61	9.7	SW
2.0% Occurrence	61	80	59	9.9	SW
	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	98	75	0.58	7.0	E
0.4% Occurrence	82	70	0.49	8.6	WSW
1.0% Occurrence	76	67	0.45	8.7	SW
2.0% Occurrence	71	66	0.42	8.9	SW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		26	383	0	9

Other Site Data

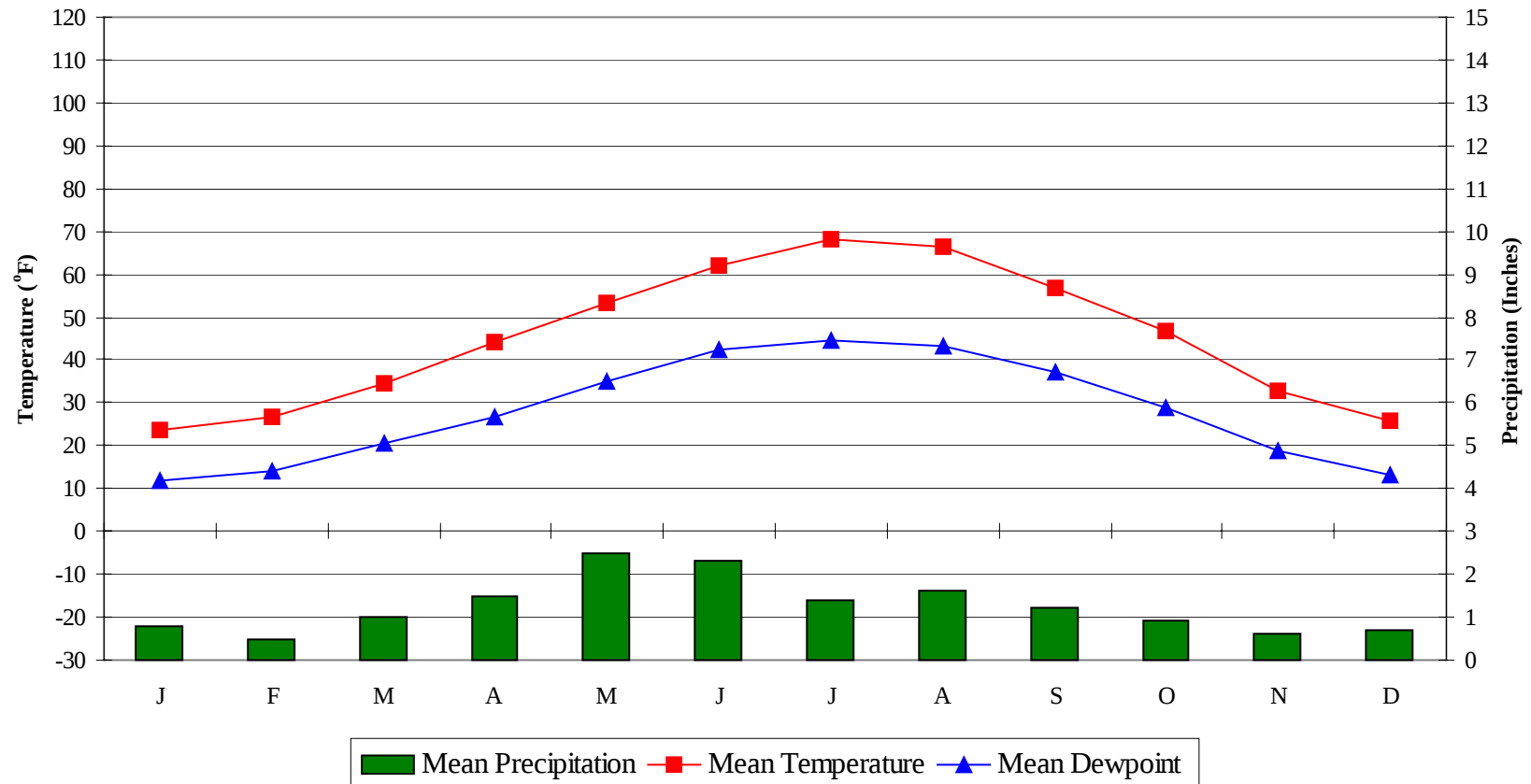
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
5	1.5	90	0.0 + 0.4
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
47.6	107	15	84

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

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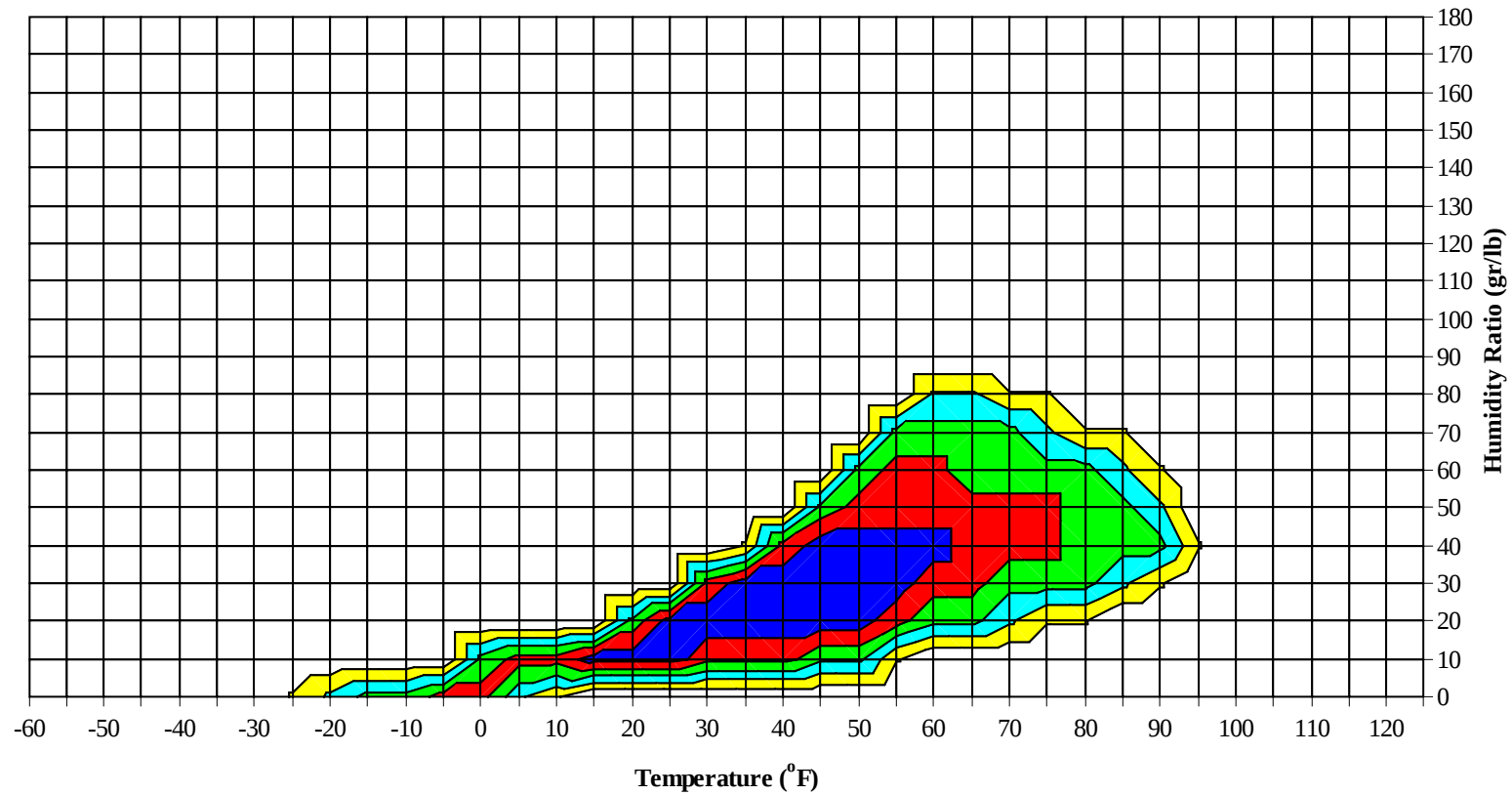
Average Annual Climate



GREAT FALLS MT

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Long Term Psychrometric Summary

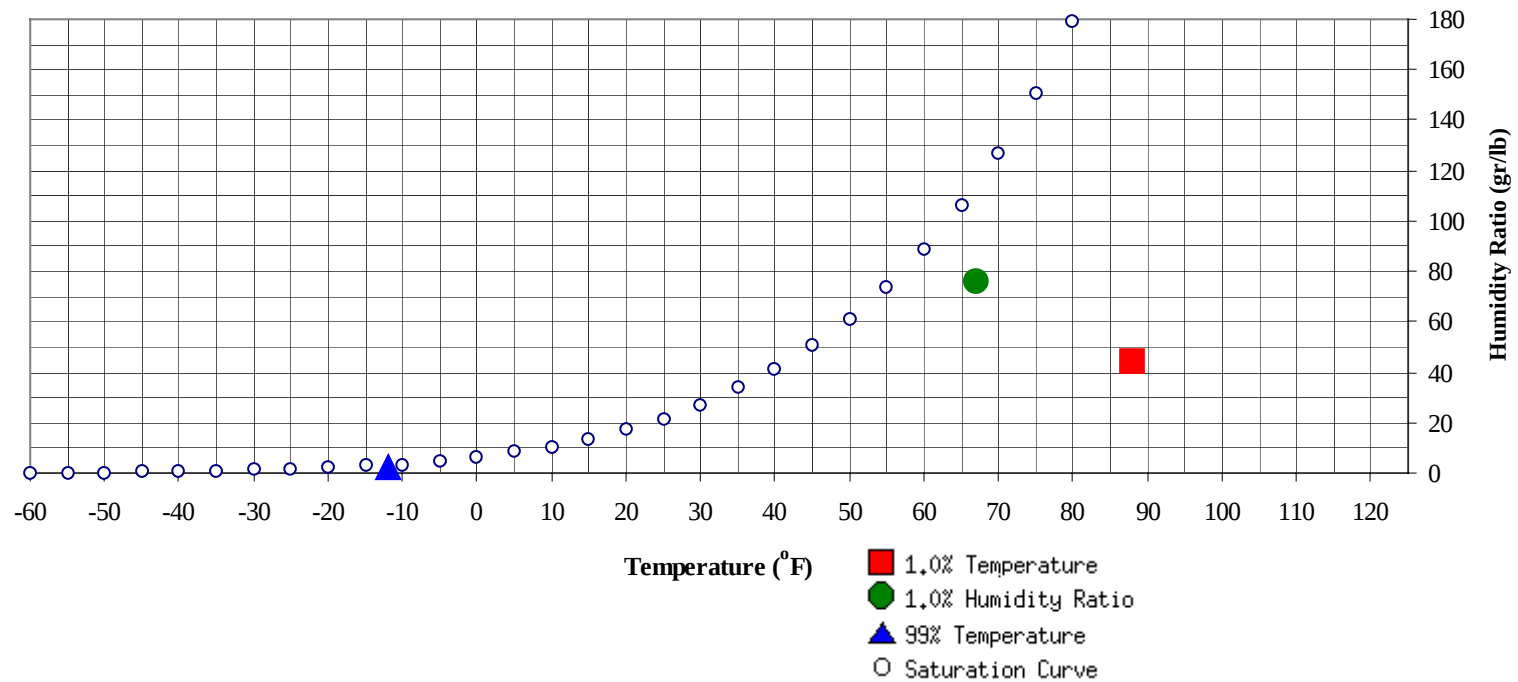


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	-12	2.3	-2.5		76.3	66.9	59.8	56	27.9

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	88	44.5	60.2	28.1

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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															
80 / 84															
75 / 79												0		0	52.7
70 / 74												1	0	1	49.3
65 / 69		0		0	45.0		1		1	46.2		2	1	3	46.8
60 / 64		1		1	42.3		4	1	5	44.1		10	3	13	44.6
55 / 59	0	5	1	6	41.6	0	10	2	12	41.8	1	20	7	28	42.5
50 / 54	2	12	4	18	40.0	2	20	6	28	39.7	4	29	16	49	40.0
45 / 49	9	21	12	42	37.2	7	26	18	51	37.0	11	36	26	73	37.3
40 / 44	23	33	28	84	34.4	23	29	31	83	34.1	23	36	41	100	34.7
35 / 39	29	31	34	94	31.1	33	29	33	95	31.0	41	32	46	119	31.8
30 / 34	33	30	34	97	27.6	33	20	30	83	28.0	57	27	40	124	28.6
25 / 29	30	21	28	79	24.0	30	15	22	67	24.2	43	17	27	87	24.7
20 / 24	25	16	21	62	19.9	22	11	16	49	20.0	26	12	13	51	20.7
15 / 19	19	11	15	45	15.5	14	10	11	35	15.7	14	9	10	33	15.9
10 / 14	13	11	11	35	10.8	11	11	11	33	10.7	8	7	7	22	11.2
5 / 9	12	12	10	34	6.0	9	10	11	30	6.2	8	3	4	15	6.6
0 / 4	14	16	13	43	1.1	10	10	9	29	1.2	4	4	4	12	1.1
-5 / -1	9	8	10	27	-3.1	7	6	7	20	-3.1	3	2	2	7	-2.9
-10 / -6	13	9	12	34	-7.6	10	7	8	25	-7.6	3	1	2	6	-7.0
-15 / -11	8	7	8	23	-12.2	9	2	3	14	-11.8	1	0	1	2	-11.9
-20 / -16	6	2	5	13	-16.6	3	1	2	6	-16.6	1	0	0	1	-16.8
-25 / -21	2	1	1	4	-21.5	1	0	1	2	-21.5	0			0	-20.0
-30 / -26	1	0	0	1	-26.5	1	1	1	3	-26.5					
-35 / -31	0		0	0	-31.3	1	0	0	1	-31.3					
-40 / -36															
-45 / -41															

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 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	65.0
90 / 94												5	2	7	62.0
85 / 89		0	0	0	54.8		0	0	0	58.5		12	5	17	61.1
80 / 84		2	1	3	55.1		9	3	12	56.8	0	23	11	34	59.2
75 / 79		5	2	7	52.7	0	14	6	20	55.0	1	31	19	51	57.7
70 / 74	0	11	4	15	50.8	1	22	13	36	53.2	6	39	28	73	56.0
65 / 69	0	17	8	25	48.5	3	30	19	52	51.0	15	44	35	94	53.8
60 / 64	2	25	14	41	46.4	10	44	33	87	48.8	32	38	43	113	51.6
55 / 59	8	29	24	61	44.0	21	43	40	104	46.6	52	27	39	118	49.7
50 / 54	18	36	32	86	41.0	45	35	45	125	44.4	62	14	34	110	46.8
45 / 49	28	36	34	98	38.5	59	24	42	125	41.5	49	6	19	74	43.2
40 / 44	37	31	38	106	35.7	54	13	27	94	38.1	19	1	4	24	39.6
35 / 39	53	22	38	113	32.8	35	7	14	56	34.0	3	0	0	3	35.3
30 / 34	54	13	27	94	29.5	17	3	6	26	30.4	0			0	31.6
25 / 29	23	6	10	39	24.9	2	0	1	3	26.5					
20 / 24	8	4	3	15	20.7	0			0	23.0					
15 / 19	5	1	2	8	16.2										
10 / 14	3	1	1	5	11.6										
5 / 9	1	0	0	1	7.0										
0 / 4	0	0	0	0	2.7										
-5 / -1	0		0	0	-2.3										
-10 / -6	0			0	-5.0										
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															
-45 / -41															

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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		
100 / 104		0	0	0	63.9		0	0	0	64.2					
95 / 99		3	1	4	62.5		3	1	4	61.5		0		0	60.3
90 / 94		17	8	25	61.5		12	5	17	60.6		2	1	3	60.2
85 / 89		28	15	43	60.6		29	13	42	59.6		8	2	10	58.1
80 / 84	1	45	26	72	59.4	0	39	22	61	58.6		16	6	22	56.9
75 / 79	4	48	35	87	57.8	2	42	28	72	57.1	1	26	11	38	55.3
70 / 74	15	44	42	101	56.2	11	43	40	94	55.5	2	32	19	53	53.6
65 / 69	34	31	42	107	54.8	28	33	42	103	54.0	6	34	26	66	51.5
60 / 64	57	18	38	113	53.1	50	24	40	114	52.3	17	35	38	90	49.3
55 / 59	67	8	24	100	50.8	68	13	32	113	50.5	33	30	40	103	47.3
50 / 54	50	4	13	67	48.1	54	8	16	78	47.8	50	23	37	110	45.0
45 / 49	19	1	3	23	44.2	26	2	7	35	44.2	55	15	27	97	42.3
40 / 44	2			2	42.2	7	0	1	8	40.3	41	10	20	71	39.1
35 / 39						1	0	1	2	35.4	22	5	10	37	35.1
30 / 34						1	0	0	1	32.7	10	3	4	17	31.0
25 / 29											3	0	1	4	26.0
20 / 24											1		0	1	22.6
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															

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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	57.0										
85 / 89		0	0	0	55.8										
80 / 84		3	1	4	54.4										
75 / 79		9	1	10	53.1		0		0	48.0					
70 / 74	0	15	4	19	51.4		1		1	48.7					
65 / 69	1	24	8	33	49.0		2	0	2	46.7					
60 / 64	7	30	19	56	47.0	0	7	2	9	45.8		1	0	1	46.1
55 / 59	18	33	29	80	44.5	4	15	7	26	43.8	1	5	2	8	43.1
50 / 54	29	39	39	107	41.9	11	24	16	51	41.0	4	13	5	22	40.2
45 / 49	39	30	40	109	39.5	18	31	18	67	37.9	9	22	12	43	37.1
40 / 44	46	24	40	110	36.8	25	37	30	92	34.4	23	34	23	80	34.1
35 / 39	41	16	30	87	33.4	34	33	41	108	31.1	32	38	36	106	30.9
30 / 34	38	13	22	73	29.8	42	29	41	112	28.1	35	36	40	111	27.4
25 / 29	17	4	8	29	25.3	37	17	29	83	24.5	37	24	36	97	23.8
20 / 24	6	3	2	11	21.1	21	11	17	49	20.1	27	18	25	70	19.8
15 / 19	2	1	3	6	16.4	14	8	11	33	15.8	20	10	16	46	15.6
10 / 14	2	1	1	4	11.4	9	6	8	23	11.0	14	9	10	33	11.1
5 / 9	1	0	1	2	6.8	5	6	6	17	6.3	10	10	8	28	6.2
0 / 4	1	0	0	1	1.1	7	6	6	19	1.2	7	6	9	22	1.2
-5 / -1	0	0	0	0	-3.2	5	3	4	12	-3.0	6	4	4	14	-3.1
-10 / -6	0		0	0	-6.6	4	2	4	10	-7.2	5	6	7	18	-7.8
-15 / -11						1	1	1	3	-11.8	5	5	5	15	-12.4
-20 / -16						1	1	1	3	-16.7	6	5	6	17	-17.0
-25 / -21						1	0	0	1	-21.1	4	2	3	9	-21.8
-30 / -26						0			0	-25.0	1	0	1	2	-26.5
-35 / -31											0	0	0	0	-31.2
-40 / -36											0	0		0	-36.2
-45 / -41											0			0	-40.0

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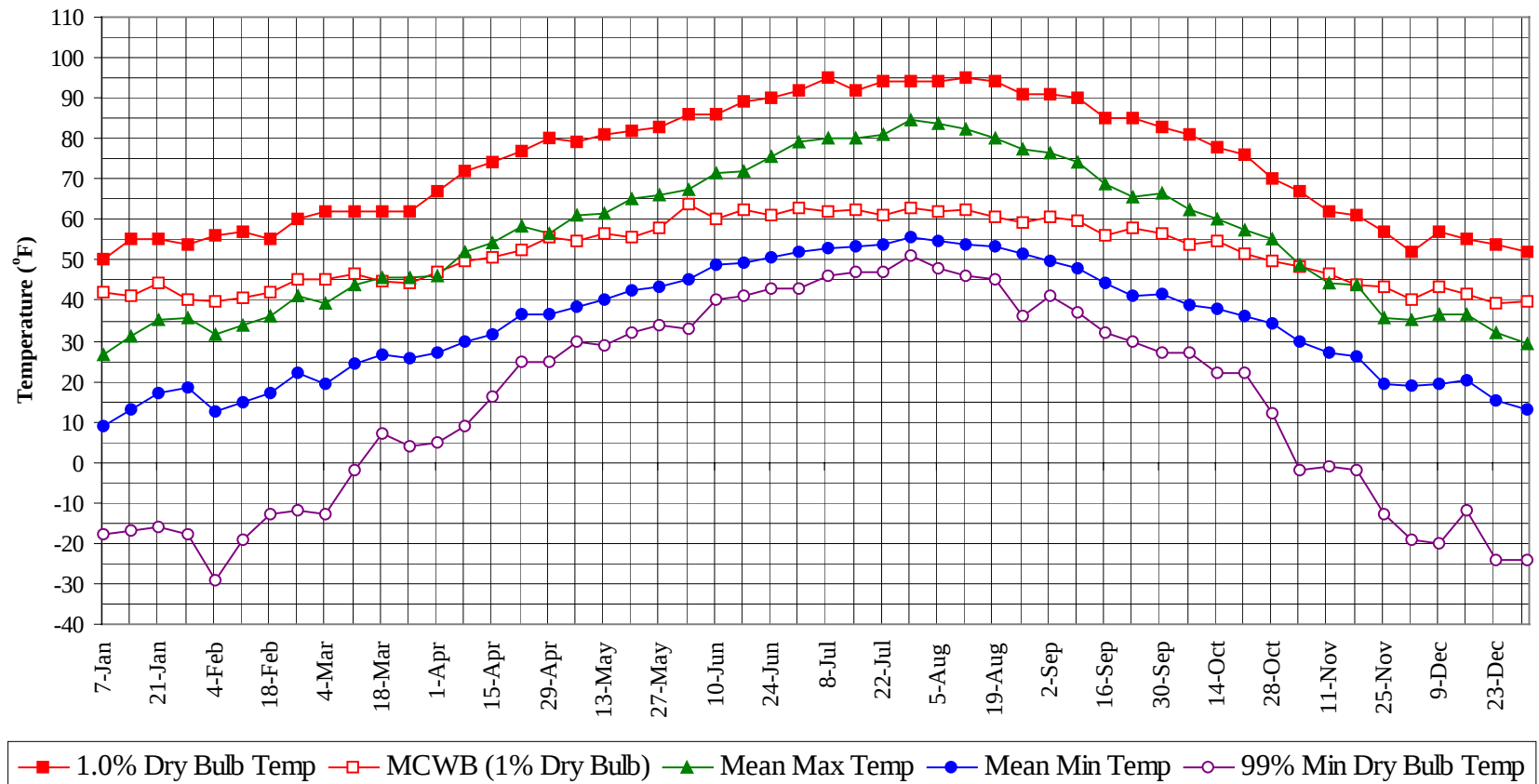
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

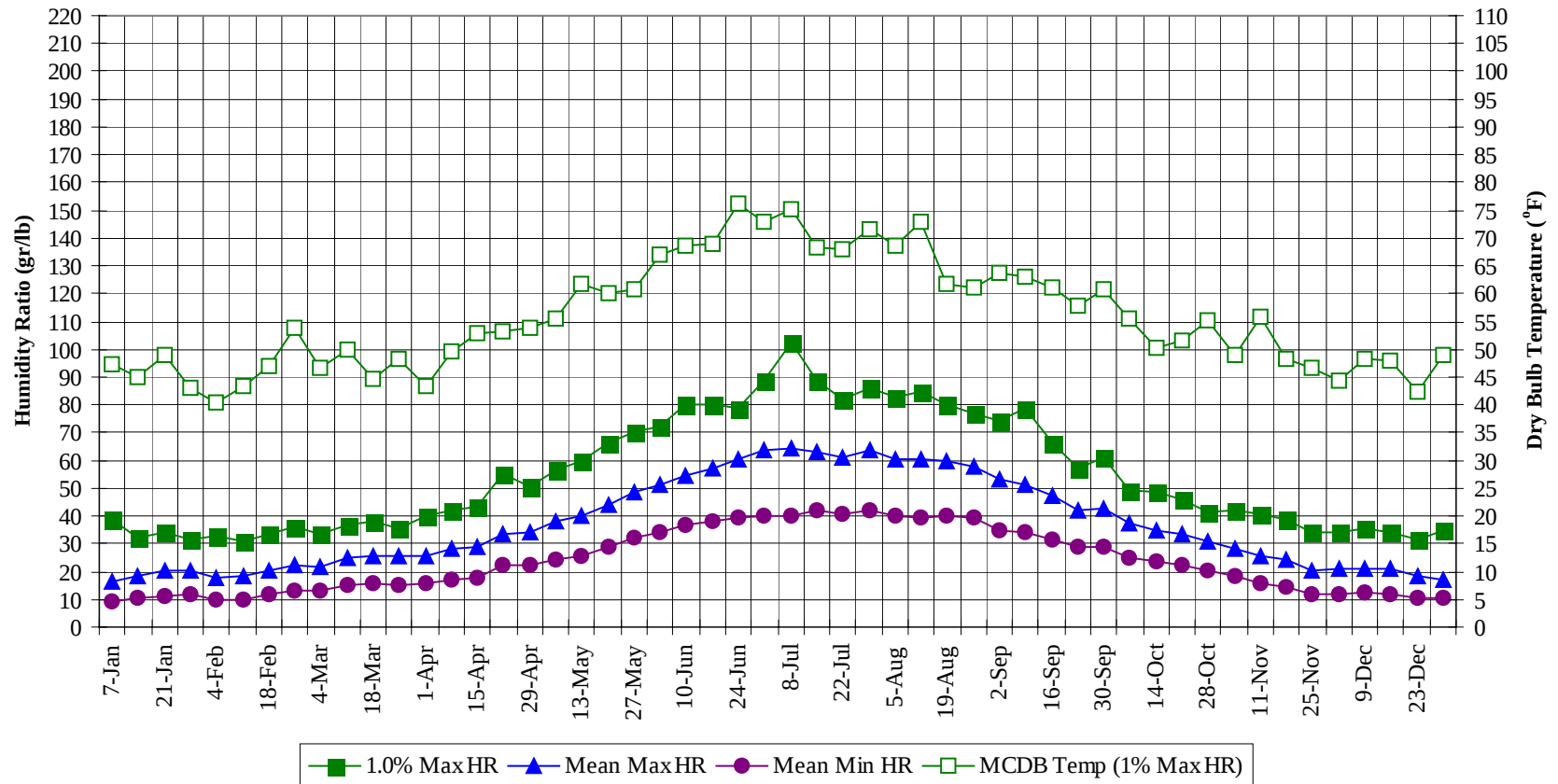
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104		1	0	1	64.0
95 / 99		8	3	11	62.3
90 / 94		37	16	53	61.2
85 / 89		79	37	116	60.0
80 / 84	1	135	69	205	58.6
75 / 79	8	173	102	283	56.8
70 / 74	35	206	150	391	54.9
65 / 69	87	216	182	485	52.8
60 / 64	176	234	229	639	50.3
55 / 59	273	238	244	755	47.5
50 / 54	330	256	263	849	43.9
45 / 49	326	251	256	833	39.9
40 / 44	322	251	282	855	35.9
35 / 39	324	214	284	822	32.0
30 / 34	321	175	246	742	28.5
25 / 29	225	106	162	493	24.4
20 / 24	136	74	99	309	20.1
15 / 19	88	51	67	206	15.7
10 / 14	60	47	49	156	10.9
5 / 9	46	42	40	128	6.2
0 / 4	44	43	42	129	1.1
-5 / -1	31	23	29	83	-3.1
-10 / -6	35	26	33	94	-7.6
-15 / -11	25	16	18	59	-12.1
-20 / -16	17	9	15	41	-16.8
-25 / -21	8	3	5	16	-21.7
-30 / -26	3	1	3	7	-26.5
-35 / -31	2	0	0	2	-31.3
-40 / -36	0	0		0	-36.2
-45 / -41	0			0	-40.0

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



GREAT FALLS MT

WMO No. 727750

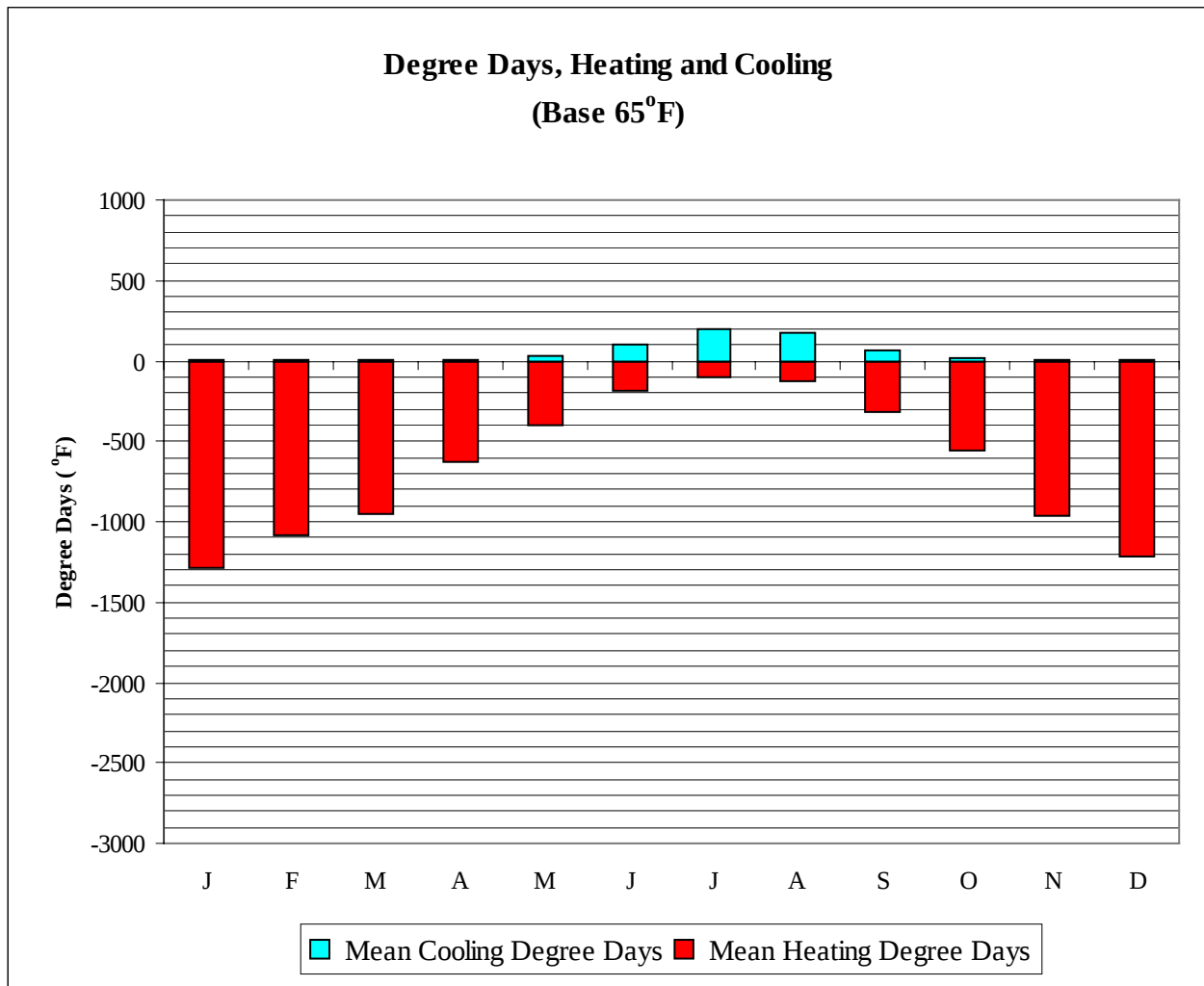
Long Term Dry Bulb Temperature and Humidity Summary

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	50.0	41.9	26.7	8.9	-18.0	38.5	47.4	16.3	8.9
14-Jan	55.0	41.1	31.3	13.2	-17.0	32.2	44.8	18.6	10.2
21-Jan	55.0	44.1	35.3	17.2	-16.0	34.3	48.9	20.2	11.5
28-Jan	54.0	40.1	35.5	18.7	-18.0	31.5	43.1	20.1	11.8
4-Feb	56.0	39.9	31.5	12.4	-29.0	32.9	40.5	17.6	9.9
11-Feb	57.0	40.5	34.0	14.7	-19.0	30.8	43.5	18.1	10.1
18-Feb	55.0	41.9	36.3	17.3	-13.0	33.6	47.0	20.7	12.0
25-Feb	60.0	45.0	41.2	21.9	-12.0	36.4	53.8	22.2	13.1
4-Mar	62.0	45.2	39.4	19.3	-13.0	33.6	46.5	21.7	12.8
11-Mar	62.0	46.5	43.7	24.2	-2.0	37.1	50.0	24.8	15.2
18-Mar	62.0	44.7	45.9	26.5	7.0	37.8	44.5	25.6	15.9
25-Mar	62.0	44.4	45.5	25.6	4.0	35.7	48.4	25.5	15.0
1-Apr	67.0	47.2	46.3	26.9	5.0	39.9	43.4	25.9	16.0
8-Apr	72.0	49.6	51.9	29.9	9.0	42.0	49.7	28.0	17.1
15-Apr	74.0	50.5	54.1	31.6	16.0	43.4	52.8	29.0	17.8
22-Apr	77.0	52.3	58.3	36.4	25.0	55.3	53.1	33.3	22.0
29-Apr	80.0	55.8	56.5	36.7	25.0	50.4	53.7	34.1	22.2
6-May	79.0	54.5	60.9	38.3	30.0	56.7	55.4	37.9	24.4
13-May	81.0	56.5	61.4	40.2	29.0	59.5	61.6	40.0	25.9
20-May	82.0	55.8	65.1	42.5	32.0	66.5	60.1	44.1	28.6
27-May	83.0	57.8	66.0	43.3	34.0	70.0	60.9	48.5	32.2
3-Jun	86.0	63.6	67.2	45.2	33.0	72.1	66.9	51.0	33.9
10-Jun	86.0	60.1	71.3	48.7	40.0	79.8	68.7	54.7	36.9
17-Jun	89.0	62.4	72.1	49.3	41.0	79.8	68.8	57.4	38.2
24-Jun	90.0	61.2	75.8	50.7	43.0	79.1	76.2	60.7	39.4
1-Jul	92.0	62.9	79.0	51.8	43.0	88.9	72.9	63.5	40.0
8-Jul	95.0	61.9	79.9	53.0	46.0	102.2	75.2	64.0	40.3
15-Jul	92.0	62.5	80.0	53.4	47.0	88.9	68.3	63.2	41.8
22-Jul	94.0	61.2	81.1	53.8	47.0	81.9	68.1	61.0	40.9
29-Jul	94.0	63.1	84.5	55.7	51.0	86.1	71.7	63.5	42.0
5-Aug	94.0	61.8	83.5	54.9	48.0	82.6	68.6	60.4	40.0
12-Aug	95.0	62.2	82.3	54.0	46.0	84.7	72.8	60.4	39.4
19-Aug	94.0	60.6	80.2	53.2	45.0	79.8	61.6	60.0	40.0
26-Aug	91.0	59.4	77.3	51.6	36.0	77.0	61.0	57.9	39.5
2-Sep	91.0	60.4	76.5	49.5	41.0	74.2	63.6	53.1	35.1
9-Sep	90.0	59.6	74.1	48.0	37.0	79.1	63.0	51.4	34.4
16-Sep	85.0	56.0	68.6	44.1	32.0	66.5	61.1	47.3	31.6
23-Sep	85.0	57.9	65.6	40.9	30.0	57.4	57.8	41.8	28.7
30-Sep	83.0	56.5	66.6	41.6	27.0	60.9	60.6	42.4	28.8
7-Oct	81.0	53.8	62.6	38.7	27.0	49.0	55.5	37.5	24.9
14-Oct	78.0	54.9	60.2	37.8	22.0	48.3	50.2	35.1	23.6
21-Oct	76.0	51.5	57.7	36.2	22.0	46.2	51.6	33.4	22.5
28-Oct	70.0	49.8	55.1	34.5	12.0	41.3	55.2	30.9	20.5
4-Nov	67.0	48.4	48.7	29.9	-2.0	42.0	49.0	28.1	18.2
11-Nov	62.0	46.4	44.4	26.9	-1.0	40.6	55.8	25.8	16.0
18-Nov	61.0	44.0	43.7	26.3	-2.0	38.5	48.4	24.1	14.7
25-Nov	57.0	43.6	35.9	19.2	-13.0	34.3	46.5	20.2	12.1
2-Dec	52.0	40.3	35.3	19.0	-19.0	34.3	44.4	21.1	11.8
9-Dec	57.0	43.2	36.8	19.2	-20.0	35.7	48.2	21.1	12.2
16-Dec	55.0	41.5	36.8	20.3	-12.0	34.3	48.0	21.3	12.1
23-Dec	54.0	39.5	31.9	15.3	-24.0	31.5	42.3	18.2	10.6
31-Dec	52.0	39.6	29.5	13.1	-24.0	35.0	48.9	17.1	10.3

GREAT FALLS

MT

WMO No. 727750



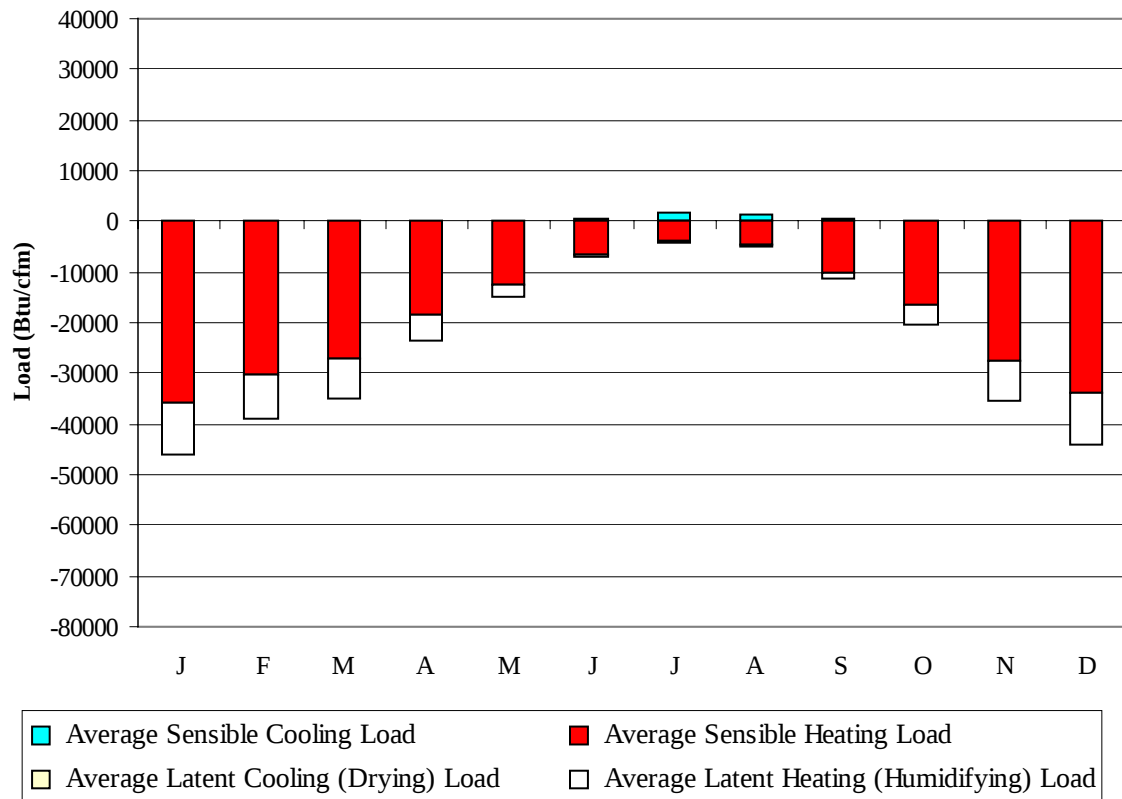
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1289
FEB	0	1078
MAR	1	950
APR	11	628
MAY	33	405
JUN	101	191
JUL	202	100
AUG	174	129
SEP	65	318
OCT	15	558
NOV	0	970
DEC	0	1219
ANN	601	7835

GREAT FALLS

MT

WMO No. 727750

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	-35811	0	-10307
FEB	0	-30142	0	-8894
MAR	0	-27023	0	-7846
APR	32	-18503	0	-5079
MAY	152	-12593	1	-2169
JUN	684	-6506	5	-543
JUL	1781	-3732	39	-313
AUG	1510	-4635	1	-385
SEP	404	-10053	2	-1254
OCT	46	-16616	0	-3969
NOV	0	-27469	0	-7941
DEC	0	-33997	0	-9960
ANN	4609	-227080	48	-58660

Average Annual Solar Radiation – Nearest Available Site

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

City: GREAT FALLS
 State: MT
 WBAN No: 24143
 Lat(N): 47.48
 Long(W): 111.37
 Elev(ft): 3662

Stn Type: Primary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS
 Window: 1
 Overhang: 0.75
 Vert Gap: 0.326

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	460	750	1150	1530	1850	2110	2240	1870	1360	900	530	380	1260
	Std Dev	34	49	85	115	130	154	112	121	138	60	37	29	38
	Minimum	360	680	900	1340	1550	1810	2000	1660	1060	750	400	290	1160
	Maximum	540	870	1300	1780	2040	2500	2400	2120	1620	1000	580	430	1320
	Diffuse	250	380	550	710	800	820	680	600	500	370	260	210	510
Clear Day	Global	620	990	1540	2140	2570	2750	2640	2250	1710	1130	690	520	1630
NORTH	Global	150	230	340	450	570	670	640	480	350	250	160	130	370
	Diffuse	150	230	340	430	510	550	510	440	340	250	160	130	340
Clear Day	Global	120	180	270	400	610	750	680	450	300	210	140	110	350
EAST	Global	340	530	770	980	1140	1270	1370	1190	910	640	390	290	820
	Diffuse	190	290	420	540	610	650	610	540	430	310	210	160	410
Clear Day	Global	570	820	1140	1440	1620	1670	1620	1460	1210	900	620	490	1130
SOUTH	Global	920	1150	1250	1140	1020	1010	1120	1230	1290	1260	1000	850	1100
	Diffuse	320	420	520	580	600	620	590	550	490	410	320	270	480
Clear Day	Global	1860	2050	2010	1690	1360	1210	1260	1510	1840	2000	1870	1750	1700
WEST	Global	340	520	740	940	1050	1190	1280	1110	880	620	390	290	780
	Diffuse	190	300	430	540	620	660	620	550	430	310	210	160	420
Clear Day	Global	570	820	1140	1440	1620	1670	1620	1460	1210	900	620	490	1130

Average Annual Solar Heat and Illumination – Nearest Available Site

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

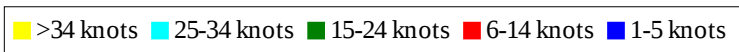
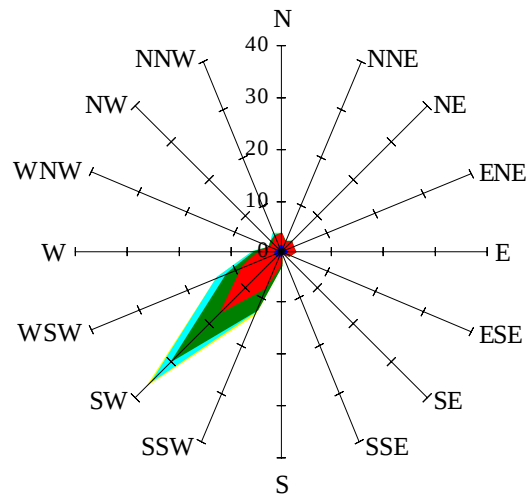
AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Unshaded	280	490	800	1090	1330	1530	1630	1350	960	600	330	220	880
NORTH	Unshaded	110	160	230	300	380	440	410	320	240	170	110	87	250
	Shaded	85	130	190	250	310	370	350	270	200	140	94	70	210
EAST	Unshaded	230	370	550	700	820	910	990	860	650	450	270	190	580
	Shaded	190	310	450	560	640	700	770	680	530	380	230	170	470
SOUTH	Unshaded	700	850	890	770	660	630	700	810	900	930	750	650	770
	Shaded	670	770	660	430	340	360	350	370	570	780	720	630	550
WEST	Unshaded	230	360	530	670	750	850	920	800	630	440	270	190	550
	Shaded	200	300	430	530	590	650	710	630	510	360	230	160	440

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	27	58	71	61	29	44	77	97	95	75
	M.Cloudy	19	43	53	44	21	30	58	73	70	55
NORTH	M.Clear	8	12	14	12	8	17	15	16	16	14
	M.Cloudy	7	14	16	14	8	13	16	18	18	16
EAST	M.Clear	68	61	16	12	8	81	76	40	16	14
	M.Cloudy	30	38	17	14	8	43	52	33	18	16
SOUTH	M.Clear	34	74	92	78	37	10	36	57	57	34
	M.Cloudy	17	44	57	46	19	10	29	45	43	27
WEST	M.Clear	8	12	14	59	69	10	15	16	43	79
	M.Cloudy	7	14	16	37	32	10	16	18	34	52
M.Clear	(% hrs)	25	22	18	16	18	38	37	32	28	24

		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	20	55	76	74	50	3	24	33	22	0
	M.Cloudy	12	37	53	51	34	2	16	23	15	0
NORTH	M.Clear	6	12	14	14	11	2	7	9	7	0
	M.Cloudy	5	12	16	15	11	1	7	9	6	0
EAST	M.Clear	62	73	36	14	11	14	36	9	7	0
	M.Cloudy	22	39	27	15	11	4	17	9	6	0
SOUTH	M.Clear	17	57	83	80	51	12	66	85	62	0
	M.Cloudy	8	32	51	48	29	4	27	38	25	0
WEST	M.Clear	6	12	14	43	75	2	7	12	39	0
	M.Cloudy	5	12	16	30	40	1	7	10	17	0
M.Clear	(% hrs)	44	43	39	37	37	22	25	23	23	24

Wind Summary - December, January, and February

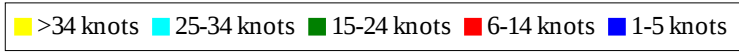
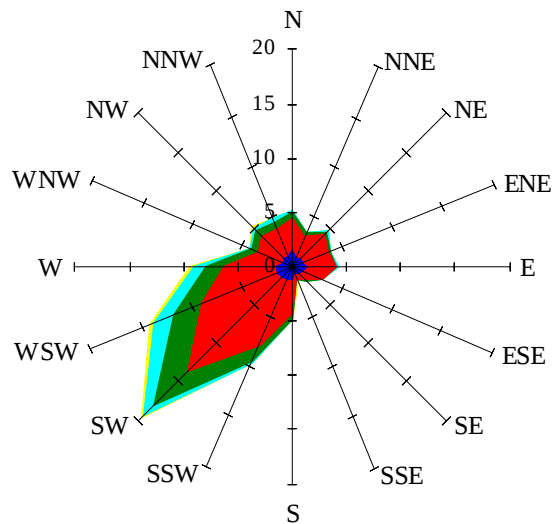
Labels of Percent Frequency on North Axis



Percent Calm = 3.06

Wind Summary - March, April, and May

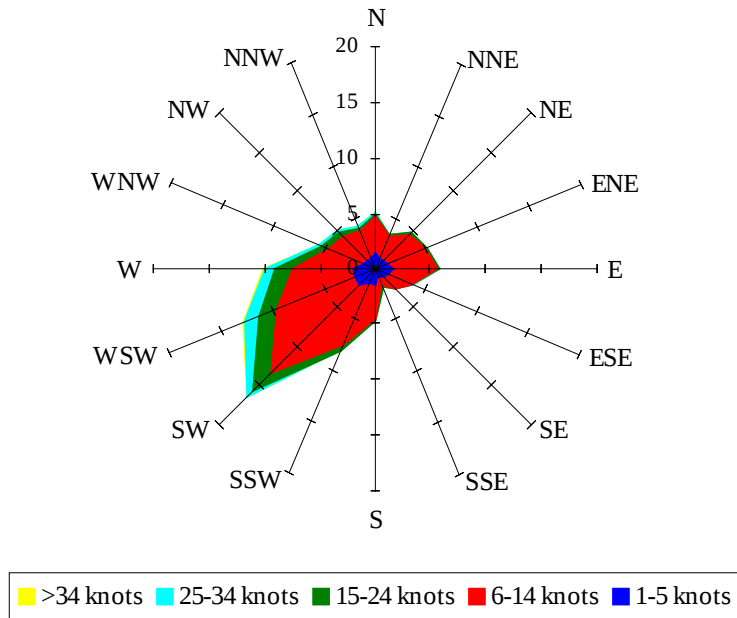
Labels of Percent Frequency on North Axis



Percent Calm = 2.15

Wind Summary - June, July, and August

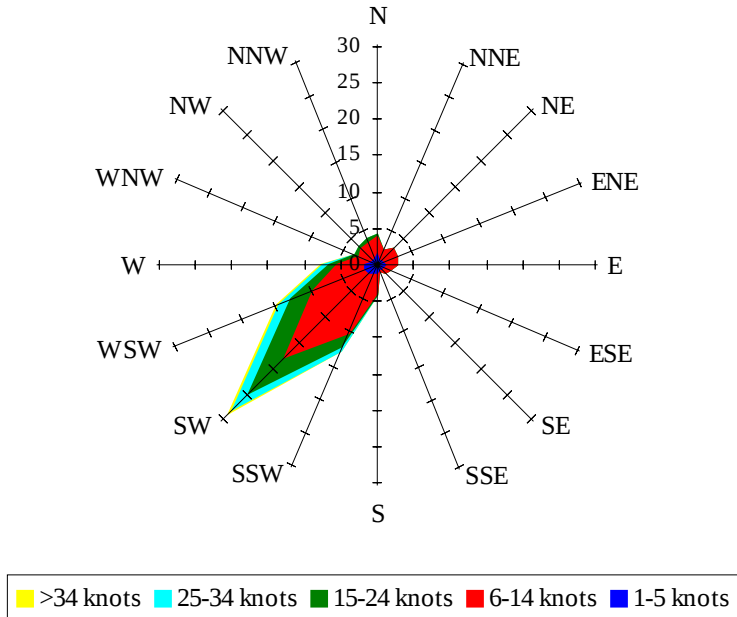
Labels of Percent Frequency on North Axis



Percent Calm = 2.11

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 2.13