

MISSOULA/BELL FIELD MT

Latitude = 46.92 N

WMO No. 727730

Longitude = 114.00 W

Elevation = 3189 feet

Period of Record = 1973 to 1996

Average Pressure = 26.70 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	97	64	48	10.1	NW
0.4% Occurrence	92	63	48	10.5	WNW
1.0% Occurrence	89	62	48	10.5	N
2.0% Occurrence	85	61	49	10.3	N
Mean Daily Range	22	-	-	-	-
97.5% Occurrence	8	7	7	5.8	ESE
99.0% Occurrence	0	-1	4	4.9	E
99.6% Occurrence	-9	-10	2	5.1	ESE
Median of Extreme Lows	-15	-15	2	6.2	ESE
	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	69	88	85	8.6	N
0.4% Occurrence	65	84	70	9.0	N
1.0% Occurrence	63	82	64	9.2	N
2.0% Occurrence	62	81	61	9.3	N
	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	100	72	0.60	6.8	SE
0.4% Occurrence	83	69	0.50	7.1	NW
1.0% Occurrence	78	68	0.47	7.3	S
2.0% Occurrence	73	67	0.44	7.0	N
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		27	385	0	15

Other Site Data

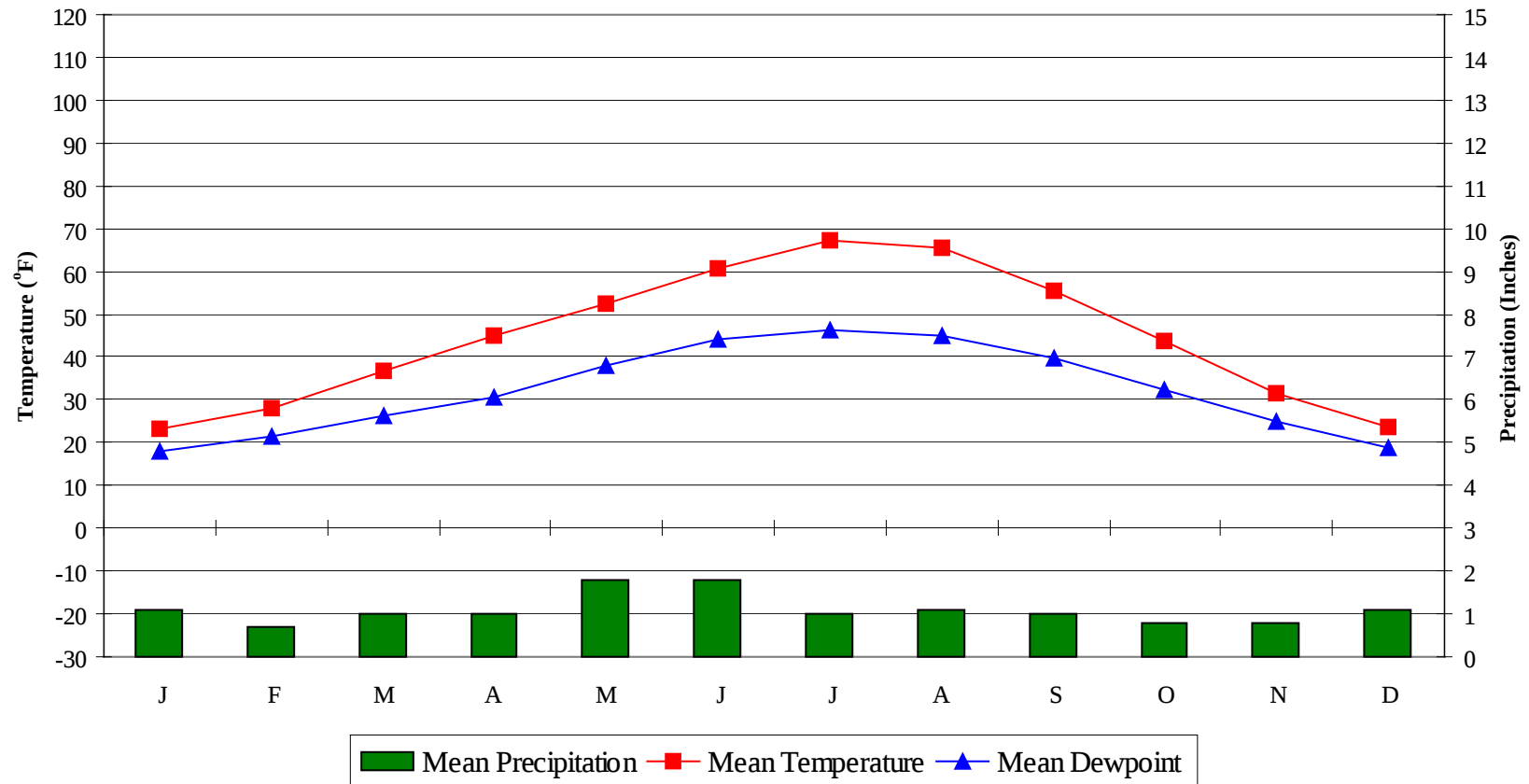
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
5	1.3	N/A	0.0 + 0.4
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
47.0	77	22	101

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

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WMO No. 727730

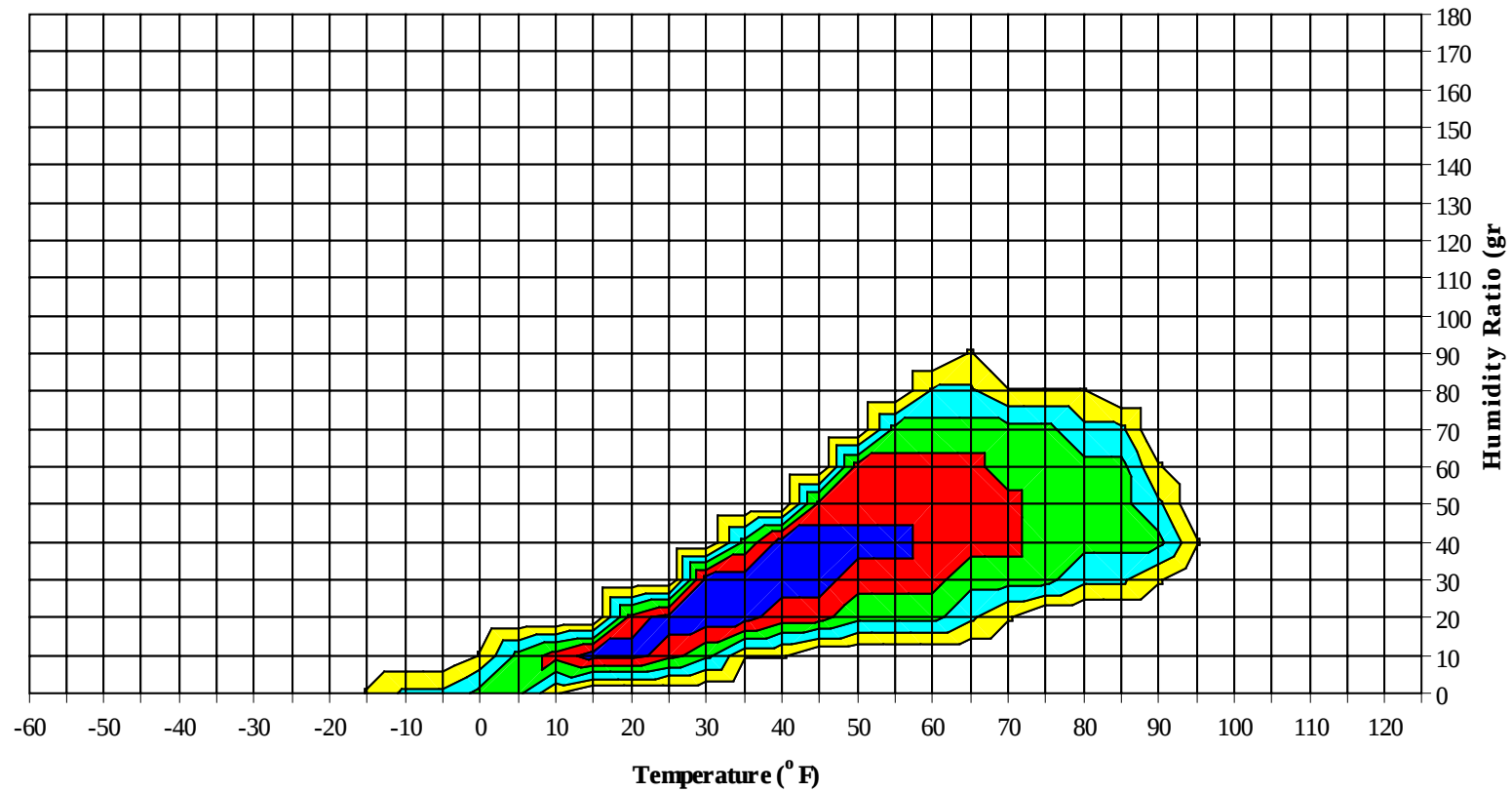
Average Annual Climate



MISSOULA/BELL FIELD MT

WMO No. 727730

Long Term Psychrometric Summary

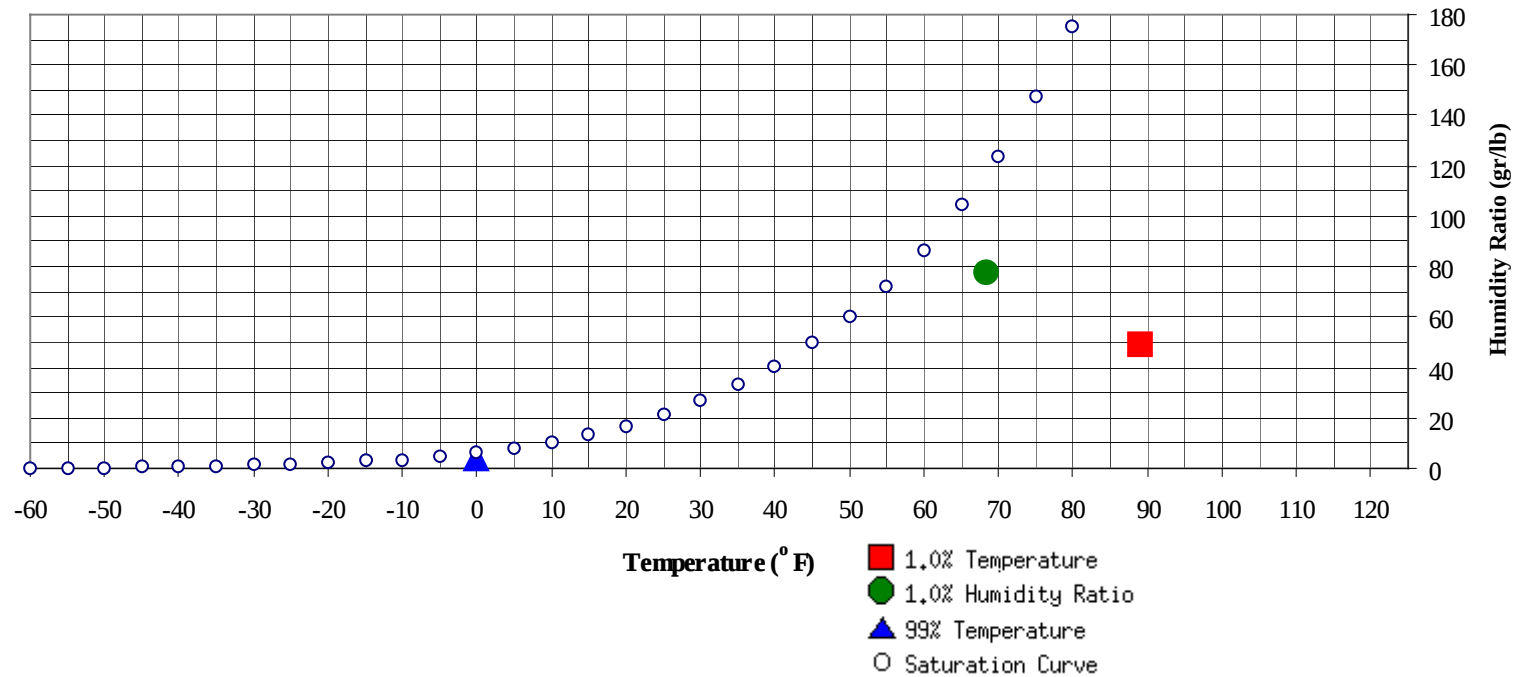


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

MISSOULA/BELL FIELD MT

WMO No. 727730

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	0	4.3	0.7		77.7	68.4	61	57	28.5

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	89	49.2	62	29.1

MISSOULA/BELL FIELD MT

WMO No. 727730

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		
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79												0		0	54.0
70 / 74												0	0	1	51.4
65 / 69								0	0	50.0		2	1	3	48.3
60 / 64							0	0	0	48.0		5	3	8	45.9
55 / 59		0		0	39.0		2	1	2	44.4		11	7	19	44.3
50 / 54		1	1	2	40.6		4	2	6	42.0	1	24	15	40	41.7
45 / 49	0	3	1	5	39.9	1	13	7	21	39.6	2	39	30	70	39.3
40 / 44	6	15	8	29	37.2	5	27	22	54	37.0	18	56	52	125	36.5
35 / 39	18	36	32	87	33.9	21	49	49	119	33.6	46	51	62	159	33.5
30 / 34	46	51	55	152	30.3	58	46	57	161	30.2	84	35	51	170	29.9
25 / 29	44	41	47	132	25.7	47	29	33	109	25.6	58	13	16	87	25.3
20 / 24	37	30	28	95	20.9	34	20	19	74	20.7	24	5	7	35	20.6
15 / 19	31	23	27	81	16.2	23	11	14	49	15.9	9	3	3	15	15.5
10 / 14	18	15	17	50	11.2	13	8	7	28	10.6	3	1	1	6	10.8
5 / 9	18	14	11	43	6.2	8	5	5	19	5.6	2	1	1	4	6.5
0 / 4	11	9	9	30	1.1	5	3	3	11	1.0	1	0	0	1	1.4
-5 / -1	6	3	6	15	-3.0	3	1	2	6	-3.1	0			0	-3.0
-10 / -6	6	3	4	13	-7.6	2	2	1	5	-7.7	0			0	-6.2
-15 / -11	4	2	2	7	-12.1	2	1	1	4	-12.6					
-20 / -16	2	1	1	4	-16.4	1	1	1	3	-17.2					
-25 / -21	1	0	0	1	-21.6	2	0	0	2	-21.1					
-30 / -26	0	0		0	-26.2	0			0	-25.3					

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.

MISSOULA/BELL FIELD MT
WMO No. 727730
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		
105 / 109															
100 / 104															
95 / 99							0		0	67.0		0	0	0	66.9
90 / 94							1	0	1	65.3		5	3	8	63.2
85 / 89		0	0	0	59.0		2	1	3	61.9		11	7	18	62.1
80 / 84		1	1	2	55.4		7	5	12	58.5		21	14	34	60.2
75 / 79		4	3	7	54.7		11	8	19	57.0		27	20	47	58.4
70 / 74		8	5	13	52.6	0	20	12	32	54.8	1	35	25	61	56.7
65 / 69		13	9	22	50.0	0	26	20	47	52.4	6	38	31	76	54.9
60 / 64	0	19	15	34	47.7	3	39	28	70	50.5	23	39	41	104	53.2
55 / 59	3	32	22	57	45.4	15	48	42	106	48.3	44	36	43	123	50.8
50 / 54	10	44	34	88	43.0	36	47	49	132	45.7	64	21	34	119	47.8
45 / 49	22	50	46	119	39.9	59	31	42	132	42.5	56	6	17	78	44.0
40 / 44	49	42	51	142	37.4	66	14	28	108	39.0	35	1	5	41	40.3
35 / 39	67	20	36	122	33.9	43	2	11	56	35.0	9	0	0	10	36.2
30 / 34	57	5	15	78	30.0	20	0	2	23	30.7	1			1	31.8
25 / 29	26	1	2	29	25.7	4		0	4	26.2					
20 / 24	6	0	0	6	21.3	0			0	21.5					
15 / 19	1			1	17.1										
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															

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MISSOULA/BELL FIELD MT
WMO No. 727730
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		
105 / 109			0	0	67.0										
100 / 104		0	0	0	65.3										
95 / 99		4	3	7	64.2		3	2	4	63.4		0	0	0	63.3
90 / 94		17	11	28	62.8		14	9	23	61.9		1	1	2	61.1
85 / 89		29	20	50	61.4		26	18	43	60.7		5	3	9	59.9
80 / 84	0	36	26	62	60.1		35	24	59	59.5		13	8	21	58.2
75 / 79	0	40	32	73	58.7	0	36	28	65	58.3	0	22	14	36	56.5
70 / 74	5	43	34	82	57.2	3	39	34	75	56.6	0	27	18	45	54.8
65 / 69	18	37	40	94	55.8	13	36	40	89	55.2	1	31	25	57	52.9
60 / 64	45	25	38	108	54.0	38	32	42	112	53.6	8	36	33	76	51.1
55 / 59	71	11	28	111	51.5	69	18	31	118	51.2	20	38	40	99	49.1
50 / 54	67	5	11	83	48.5	69	7	15	91	48.3	42	34	44	120	46.5
45 / 49	32	1	3	36	44.8	40	2	5	47	44.4	63	20	34	118	43.4
40 / 44	8		0	8	41.1	13	0	1	15	40.6	59	8	15	82	39.7
35 / 39	2			2	36.5	3		0	3	36.5	29	3	5	37	35.6
30 / 34						0			0	31.8	13	1	1	15	31.1
25 / 29											3	0	0	3	26.5
20 / 24											1			1	21.9
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															

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MISSOULA/BELL FIELD MT
WMO No. 727730
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		
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84		0	0	1	56.0										
75 / 79		3	1	4	54.7										
70 / 74		7	3	10	52.8										
65 / 69		11	5	17	50.6		0		0	53.3					
60 / 64	0	20	10	31	48.6	0	1	0	1	49.5					
55 / 59	3	31	21	55	46.2	1	4	1	6	46.6		0		0	44.3
50 / 54	8	43	33	84	44.0	3	11	5	19	43.9	1	1	0	2	42.6
45 / 49	22	48	50	121	41.5	6	19	13	38	41.1	2	3	2	7	40.8
40 / 44	49	41	58	148	38.5	15	34	25	75	37.9	5	12	5	22	37.5
35 / 39	61	24	40	124	34.7	27	48	47	122	34.2	16	29	23	69	34.2
30 / 34	57	13	19	89	30.5	68	55	67	190	30.4	39	52	51	142	30.3
25 / 29	34	4	6	44	26.1	45	30	38	113	25.8	43	46	51	140	25.7
20 / 24	11	1	1	14	21.4	34	17	21	72	20.9	45	41	41	127	20.9
15 / 19	1	0	0	1	16.5	18	9	12	39	16.2	41	28	34	104	16.4
10 / 14	0	0		0	10.7	11	6	6	23	10.9	23	16	19	58	11.5
5 / 9	0			0	6.4	5	3	3	12	6.4	15	9	11	34	6.4
0 / 4						4	1	2	7	1.4	9	4	4	17	1.6
-5 / -1						1	0	1	2	-2.9	3	1	1	6	-2.9
-10 / -6						1	0	0	1	-7.0	2	2	2	5	-8.2
-15 / -11						0			0	-11.0	2	2	2	6	-12.6
-20 / -16											1	1	1	2	-17.0
-25 / -21											1	0	1	2	-22.0
-30 / -26											1	0	0	1	-26.9

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MISSOULA/BELL FIELD MT

WMO No. 727730

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

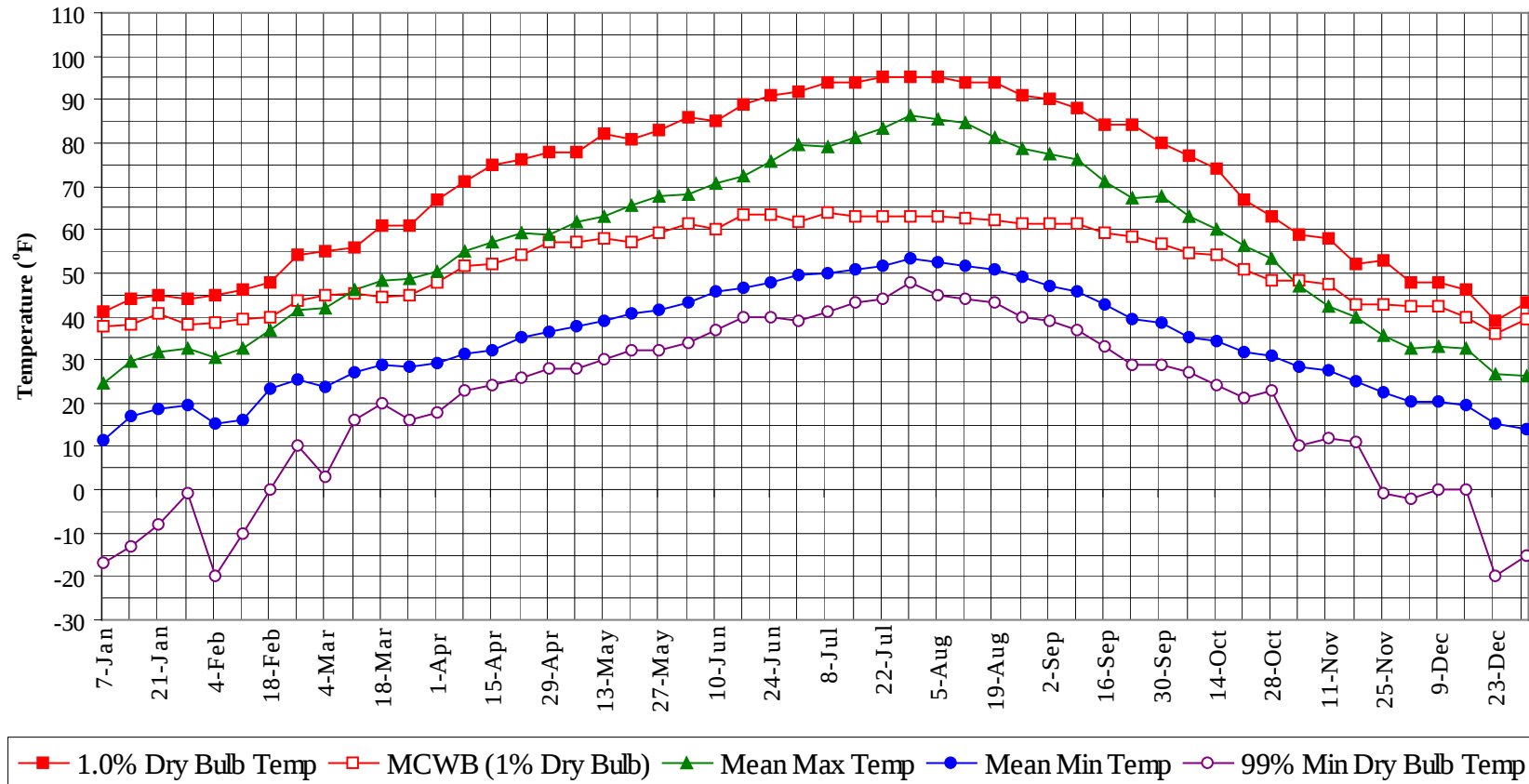
Annual Totals						
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	
	01 To 08	09 To 16	17 To 00			
105 / 109			0	0	67.0	
100 / 104		0	0	0	65.3	
95 / 99		7	4	12	64.0	
90 / 94		37	24	61	62.5	
85 / 89		74	50	123	61.2	
80 / 84	0	113	77	190	59.6	
75 / 79	1	143	107	250	57.9	
70 / 74	9	178	132	319	56.0	
65 / 69	39	194	172	405	54.1	
60 / 64	118	216	210	544	52.0	
55 / 59	226	231	236	694	49.3	
50 / 54	300	240	242	783	46.0	
45 / 49	306	234	249	789	42.0	
40 / 44	327	251	269	846	38.1	
35 / 39	341	263	305	910	34.1	
30 / 34	445	258	319	1022	30.3	
25 / 29	305	164	194	663	25.7	
20 / 24	192	114	118	425	20.9	
15 / 19	125	75	91	291	16.2	
10 / 14	69	47	51	167	11.1	
5 / 9	49	32	32	112	6.2	
0 / 4	29	18	19	66	1.3	
-5 / -1	14	6	9	29	-3.0	
-10 / -6	11	7	7	25	-7.7	
-15 / -11	8	5	5	17	-12.4	
-20 / -16	4	3	2	9	-16.8	
-25 / -21	3	1	1	5	-21.6	
-30 / -26	1	0	0	1	-26.6	

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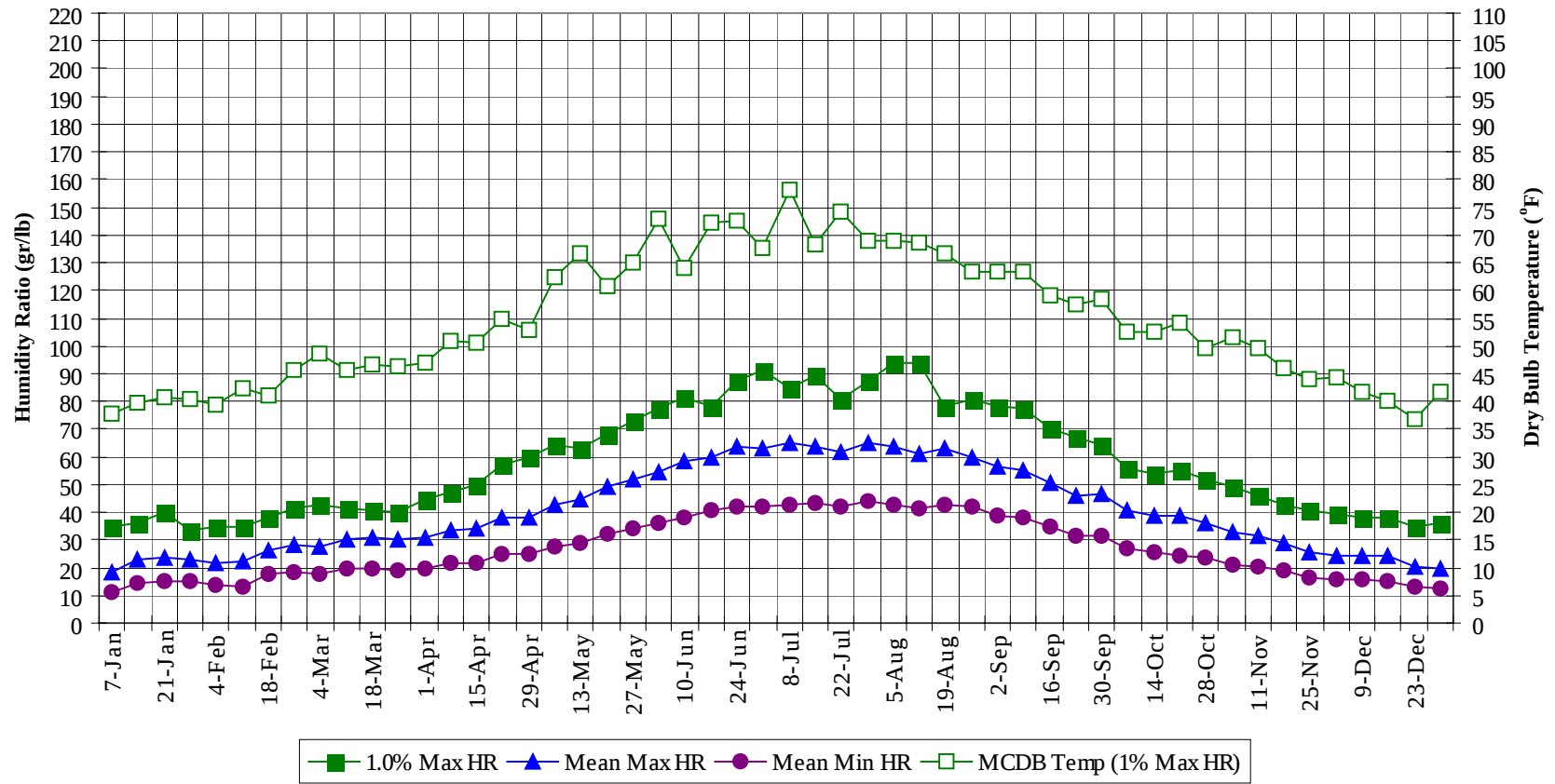
MISSOULA/BELL FIELD MT

WMO No. 727730

Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



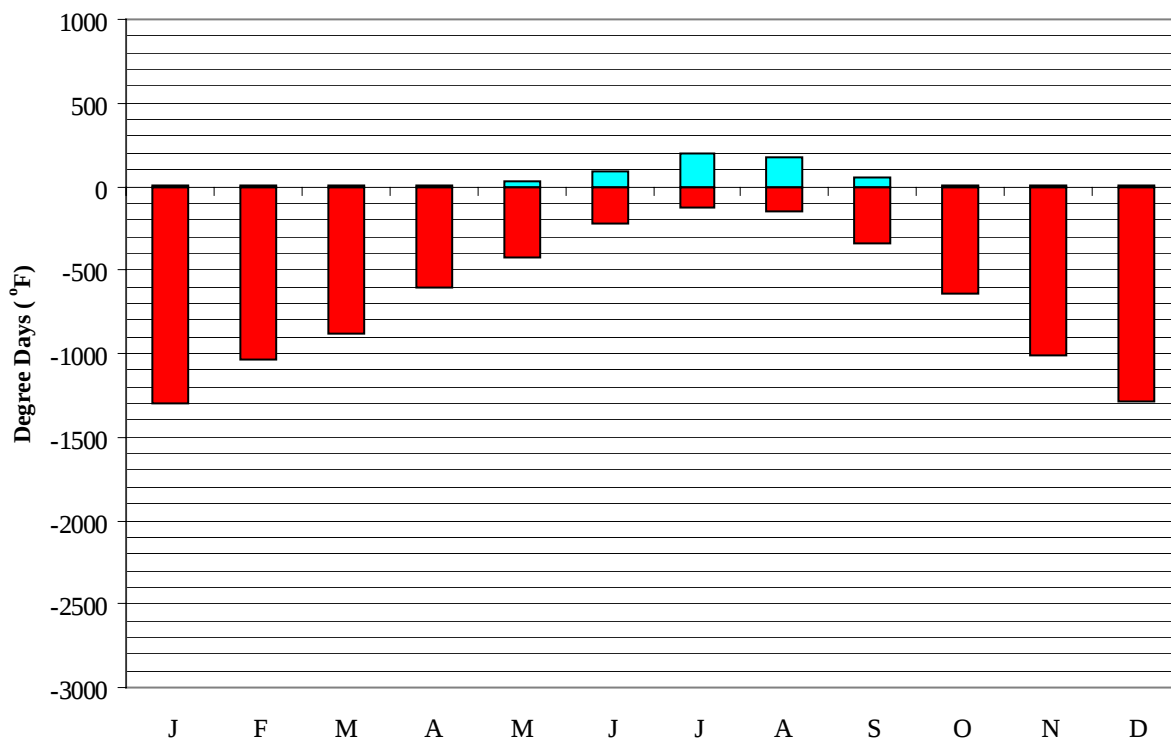
MISSOULA/BELL FIELD MT
WMO No. 727730
Long Term Dry Bulb Temperature and Humidity Summary

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	41.0	37.6	24.4	11.3	-17.0	35.0	37.7	18.5	11.5
14-Jan	44.0	38.2	29.5	17.1	-13.0	36.4	39.7	22.7	14.4
21-Jan	45.0	40.8	31.8	18.8	-8.0	39.9	40.9	23.6	15.1
28-Jan	44.0	38.2	32.6	19.5	-1.0	33.6	40.3	22.9	15.0
4-Feb	45.0	38.4	30.3	15.2	-20.0	35.0	39.3	21.4	13.5
11-Feb	46.0	39.3	32.7	16.3	-10.0	35.0	42.3	22.4	13.2
18-Feb	48.0	39.6	37.0	23.2	0.0	37.8	41.0	26.5	17.7
25-Feb	54.0	43.7	41.5	25.2	10.0	41.3	45.7	28.2	18.4
4-Mar	55.0	44.9	41.8	23.6	3.0	42.7	48.8	27.5	17.7
11-Mar	56.0	45.3	45.9	27.1	16.0	41.3	45.7	30.0	19.8
18-Mar	61.0	44.6	48.2	28.6	20.0	40.6	46.6	30.6	19.9
25-Mar	61.0	44.9	48.8	28.5	16.0	39.9	46.3	30.0	19.2
1-Apr	67.0	48.0	50.3	29.1	18.0	44.8	47.0	31.0	19.9
8-Apr	71.0	51.6	54.9	31.5	23.0	47.6	50.9	33.7	21.6
15-Apr	75.0	52.1	56.9	32.0	24.0	49.7	50.4	34.1	21.5
22-Apr	76.0	54.1	59.2	35.0	26.0	57.4	54.8	38.2	24.9
29-Apr	78.0	57.0	58.9	36.5	28.0	59.5	52.8	38.3	24.9
6-May	78.0	57.0	62.0	37.6	28.0	64.4	62.5	42.5	27.7
13-May	82.0	58.1	63.2	38.9	30.0	63.0	66.8	44.6	29.1
20-May	81.0	57.2	65.7	40.8	32.0	68.6	60.8	49.0	32.0
27-May	83.0	59.1	67.6	41.5	32.0	72.8	65.0	52.2	34.1
3-Jun	86.0	61.5	68.3	43.2	34.0	77.7	72.8	54.3	36.2
10-Jun	85.0	59.9	70.9	45.7	37.0	81.2	64.1	58.6	38.3
17-Jun	89.0	63.4	72.4	46.7	40.0	78.4	72.1	60.1	40.5
24-Jun	91.0	63.3	75.8	47.8	40.0	87.5	72.6	63.7	42.1
1-Jul	92.0	62.0	79.5	49.4	39.0	91.0	67.8	63.2	42.0
8-Jul	94.0	63.9	79.2	50.1	41.0	84.7	78.3	65.3	42.9
15-Jul	94.0	63.2	81.1	50.6	43.0	89.6	68.4	63.8	43.1
22-Jul	95.0	63.3	83.4	51.5	44.0	80.5	74.2	62.0	42.0
29-Jul	95.0	63.0	86.5	53.2	48.0	87.5	69.1	65.1	44.3
5-Aug	95.0	62.9	85.4	52.6	45.0	93.8	69.0	63.5	42.4
12-Aug	94.0	62.8	84.8	51.5	44.0	93.8	68.5	61.2	41.4
19-Aug	94.0	62.0	81.4	50.7	43.0	78.4	66.6	63.1	42.8
26-Aug	91.0	61.3	78.8	49.1	40.0	80.5	63.2	59.9	42.1
2-Sep	90.0	61.3	77.5	46.9	39.0	78.4	63.3	56.7	38.8
9-Sep	88.0	61.4	76.2	45.8	37.0	77.7	63.2	55.0	38.0
16-Sep	84.0	59.2	71.2	42.6	33.0	70.0	59.1	50.7	35.1
23-Sep	84.0	58.2	67.2	39.2	29.0	67.2	57.5	46.1	31.5
30-Sep	80.0	56.6	67.7	38.6	29.0	64.4	58.6	46.5	31.8
7-Oct	77.0	54.8	63.1	35.3	27.0	56.0	52.4	41.0	26.9
14-Oct	74.0	54.2	59.9	34.2	24.0	53.9	52.5	38.6	25.8
21-Oct	67.0	50.7	56.2	31.6	21.0	55.3	54.3	38.6	24.6
28-Oct	63.0	48.1	53.1	31.1	23.0	51.8	49.5	36.2	23.8
4-Nov	59.0	48.2	46.8	28.4	10.0	49.0	51.6	33.1	21.2
11-Nov	58.0	47.4	42.5	27.6	12.0	46.2	49.5	31.5	20.4
18-Nov	52.0	42.6	39.7	25.0	11.0	42.7	45.9	29.2	19.0
25-Nov	53.0	42.9	35.4	22.3	-1.0	40.6	43.9	25.7	16.7
2-Dec	48.0	42.1	32.4	20.4	-2.0	39.2	44.4	24.3	15.5
9-Dec	48.0	42.2	32.9	20.2	0.0	37.8	41.7	24.6	16.0
16-Dec	46.0	39.7	32.6	19.5	0.0	37.8	40.0	24.4	15.4
23-Dec	39.0	36.0	26.8	15.4	-20.0	35.0	36.9	20.4	12.9
31-Dec	43.0	39.5	26.1	13.9	-15.0	36.4	41.7	19.5	12.2

MISSOULA/BELL FIELD MT

WMO No. 727730

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



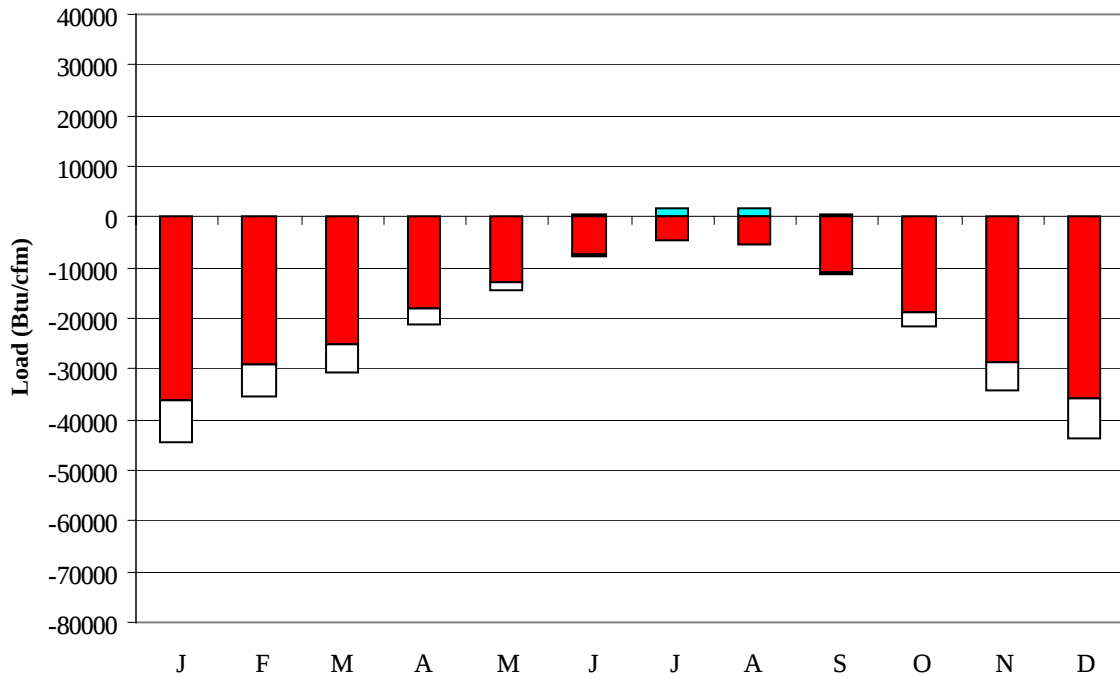
■ Mean Cooling Degree Days ■ Mean Heating Degree Days

	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1299
FEB	0	1040
MAR	0	880
APR	10	603
MAY	33	420
JUN	94	227
JUL	194	129
AUG	168	152
SEP	58	342
OCT	6	639
NOV	0	1011
DEC	0	1285
ANN	563	8027

MISSOULA/BELL FIELD MT

WMO No. 727730

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	-36090	0	-8193
FEB	0	-29152	0	-6401
MAR	0	-25218	0	-5289
APR	26	-17862	0	-3418
MAY	169	-13000	0	-1277
JUN	698	-7544	15	-228
JUL	1869	-4586	20	-107
AUG	1561	-5298	23	-167
SEP	349	-10729	0	-632
OCT	10	-18794	0	-2647
NOV	0	-28534	0	-5516
DEC	0	-35711	0	-8075
ANN	4682	-232518	58	-41950

Average Annual Solar Radiation – Nearest Available Site

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

City: MISSOULA
 State: MT
 WBAN No: 24153
 Lat(N): 46.92
 Long(W): 114.08
 Elev(ft): 3189

Stn Type: Secondary

SHADING GEOMETRY IN DIMENSIONLESS UNITS

Window: 1

Overhang: 0.734

Vert Gap: 0.328

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	410	660	1010	1420	1740	1980	2200	1840	1340	850	450	340	1190
	Std Dev	36	54	103	113	152	166	131	151	153	94	32	23	35
	Minimum	350	520	860	1190	1410	1650	1880	1620	1090	710	400	300	1120
	Maximum	510	790	1250	1690	2010	2400	2390	2150	1640	1060	510	390	1250
	Diffuse	300	410	540	670	770	760	590	540	460	360	290	250	500
Clear Day	Global	640	1000	1540	2140	2570	2740	2640	2270	1730	1140	710	540	1640
NORTH	Global	160	230	320	420	550	640	630	470	340	240	160	130	360
	Diffuse	160	230	320	410	490	520	480	420	330	240	160	130	330
Clear Day	Global	130	190	270	390	600	740	680	450	300	210	140	110	350
EAST	Global	270	430	650	890	1050	1180	1350	1190	880	580	300	220	750
	Diffuse	200	280	390	500	580	600	570	510	410	290	200	160	390
Clear Day	Global	580	820	1140	1430	1610	1660	1620	1470	1220	900	620	500	1130
SOUTH	Global	640	860	1010	1030	940	930	1070	1180	1250	1130	680	560	940
	Diffuse	310	390	470	530	570	570	540	510	460	380	290	260	440
Clear Day	Global	1840	2020	1980	1660	1340	1180	1230	1490	1830	1980	1860	1730	1680
WEST	Global	290	450	650	870	1020	1140	1300	1130	890	600	310	240	740
	Diffuse	200	290	400	500	590	610	580	520	410	300	200	160	400
Clear Day	Global	580	820	1140	1430	1610	1660	1620	1470	1220	900	620	500	1130

Average Annual Solar Heat and Illumination – Nearest Available Site

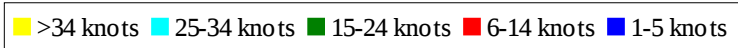
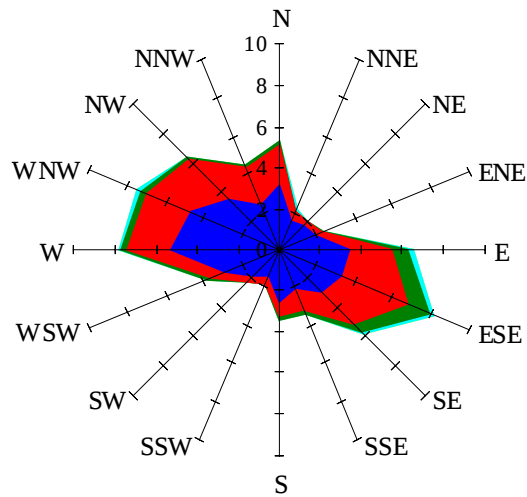
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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	270	430	700	1010	1250	1440	1600	1330	940	570	290	210	840
NORTH	Unshaded	110	160	220	290	360	420	400	310	230	170	110	92	240
	Shaded	86	130	180	240	300	350	350	270	200	140	90	72	200
EAST	Unshaded	190	300	460	640	750	850	970	850	630	410	210	150	540
	Shaded	150	250	370	510	590	660	770	690	520	340	170	120	430
SOUTH	Unshaded	480	640	720	700	610	580	660	770	870	820	510	420	650
	Shaded	450	570	530	390	320	330	320	360	550	690	480	390	450
WEST	Unshaded	200	310	460	620	730	810	940	810	630	420	220	160	530
	Shaded	160	260	370	490	570	630	740	650	520	350	180	130	420

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	56	70	61	33	40	75	94	95	77
	M.Cloudy	15	35	45	39	21	24	49	64	64	52
NORTH	M.Clear	7	11	13	12	8	19	14	15	15	14
	M.Cloudy	6	13	15	14	8	12	16	18	17	16
EAST	M.Clear	68	64	20	12	8	81	79	43	15	14
	M.Cloudy	21	30	18	14	8	31	44	32	17	16
SOUTH	M.Clear	30	71	88	77	42	10	32	54	56	36
	M.Cloudy	12	32	44	37	18	9	24	38	38	27
WEST	M.Clear	7	11	13	54	72	10	14	15	37	76
	M.Cloudy	6	13	15	29	27	9	16	18	29	46
M.Clear	(% hrs)	18	19	17	17	15	40	38	37	33	26
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	17	53	75	75	54	1	23	34	24	3
	M.Cloudy	10	33	47	47	34	1	14	20	15	2
NORTH	M.Clear	6	11	14	14	11	1	7	9	7	2
	M.Cloudy	4	12	15	15	12	1	6	9	7	1
EAST	M.Clear	59	76	41	14	11	6	39	10	7	2
	M.Cloudy	17	36	26	15	12	2	12	9	7	1
SOUTH	M.Clear	13	54	81	81	55	5	65	84	64	10
	M.Cloudy	6	27	43	44	29	1	16	25	19	3
WEST	M.Clear	6	11	14	39	75	1	7	9	37	12
	M.Cloudy	4	12	15	26	37	1	6	9	13	3
M.Clear	(% hrs)	42	42	45	44	41	9	11	11	12	14

Wind Summary - December, January, and February

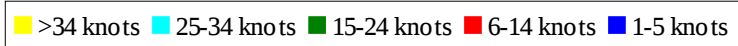
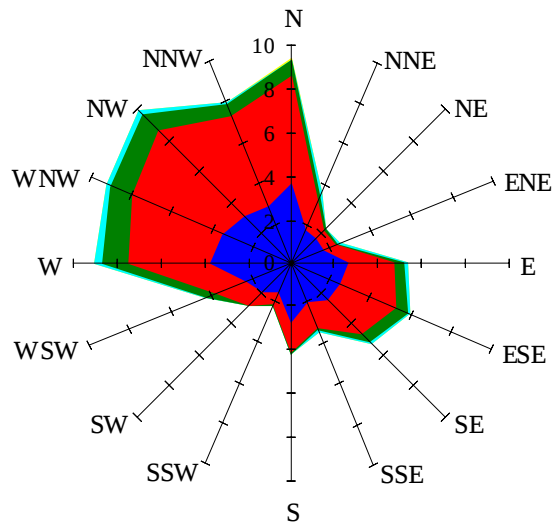
Labels of Percent Frequency on North Axis



Percent Calm = 27.43

Wind Summary - March, April, and May

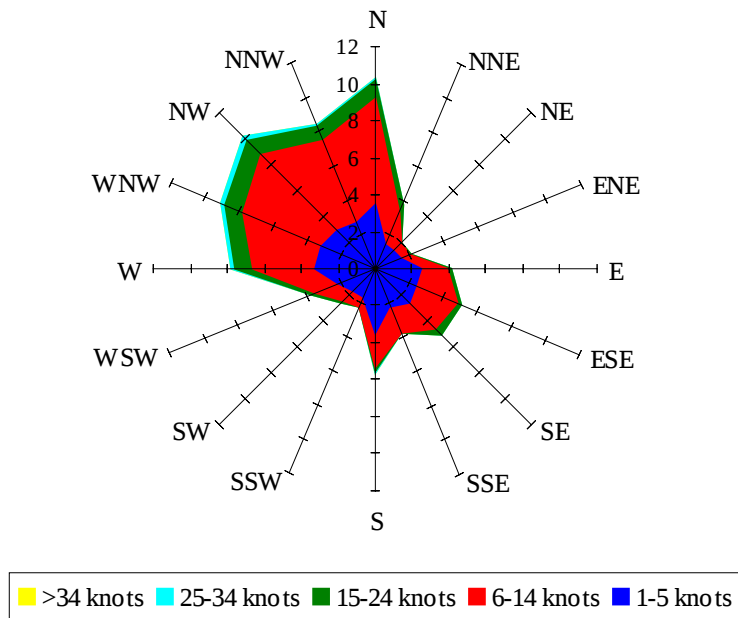
Labels of Percent Frequency on North Axis



Percent Calm = 13.76

Wind Summary - June, July, and August

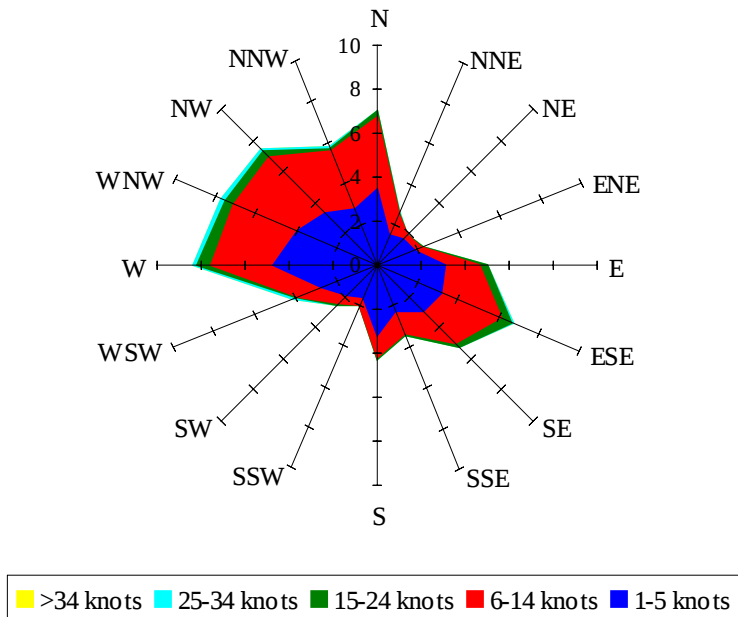
Labels of Percent Frequency on North Axis



Percent Calm = 14.24

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 23.47