

JOPLIN MO

Latitude = 37.15 N

Longitude = 94.50 W

Period of Record = 1973 to 1996

WMO No. 723495

Elevation = 981 feet

Average Pressure = 28.96 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	100	75	97	11.4	SSW
0.4% Occurrence	96	75	104	11.1	SSW
1.0% Occurrence	94	75	106	11.2	SSW
2.0% Occurrence	91	75	107	10.8	S
Mean Daily Range	20	-	-	-	-
97.5% Occurrence	17	15	9	9.2	N
99.0% Occurrence	10	9	6	8.7	N
99.6% Occurrence	4	3	5	8.8	N
Median of Extreme Lows	-2	-3	3	8.5	N
	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	82	93	148	10.1	S
0.4% Occurrence	78	90	128	11.2	S
1.0% Occurrence	77	89	123	11.1	S
2.0% Occurrence	76	88	119	11.0	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	157	86	1.00	7.5	ENE
0.4% Occurrence	136	85	0.88	10.0	S
1.0% Occurrence	129	85	0.82	11.2	S
2.0% Occurrence	123	82	0.79	10.0	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		124	1158	756	2062

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
7	3.5	90	2.9 + 1.3
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 (#)
59.7	N/A	N/A	52

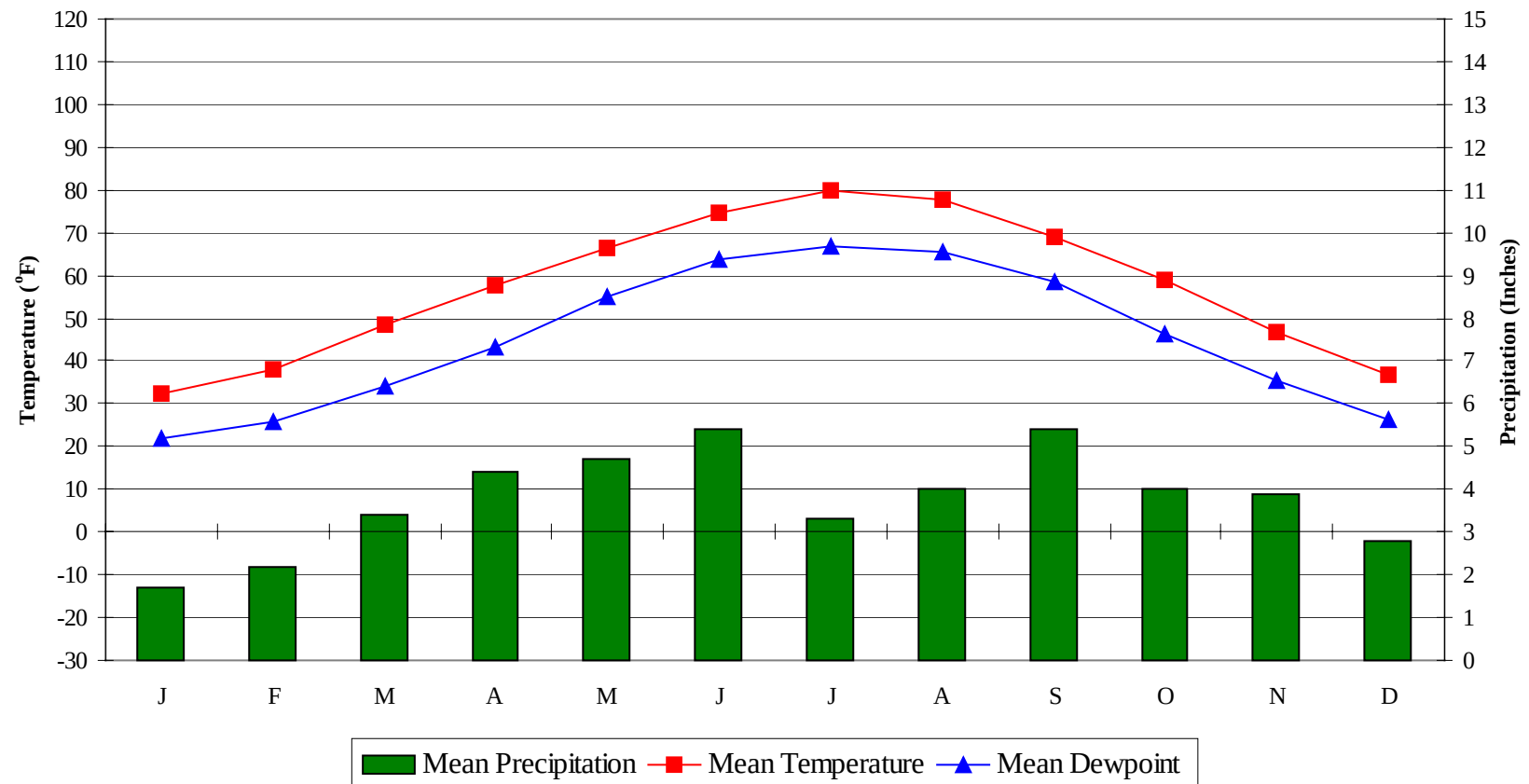
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

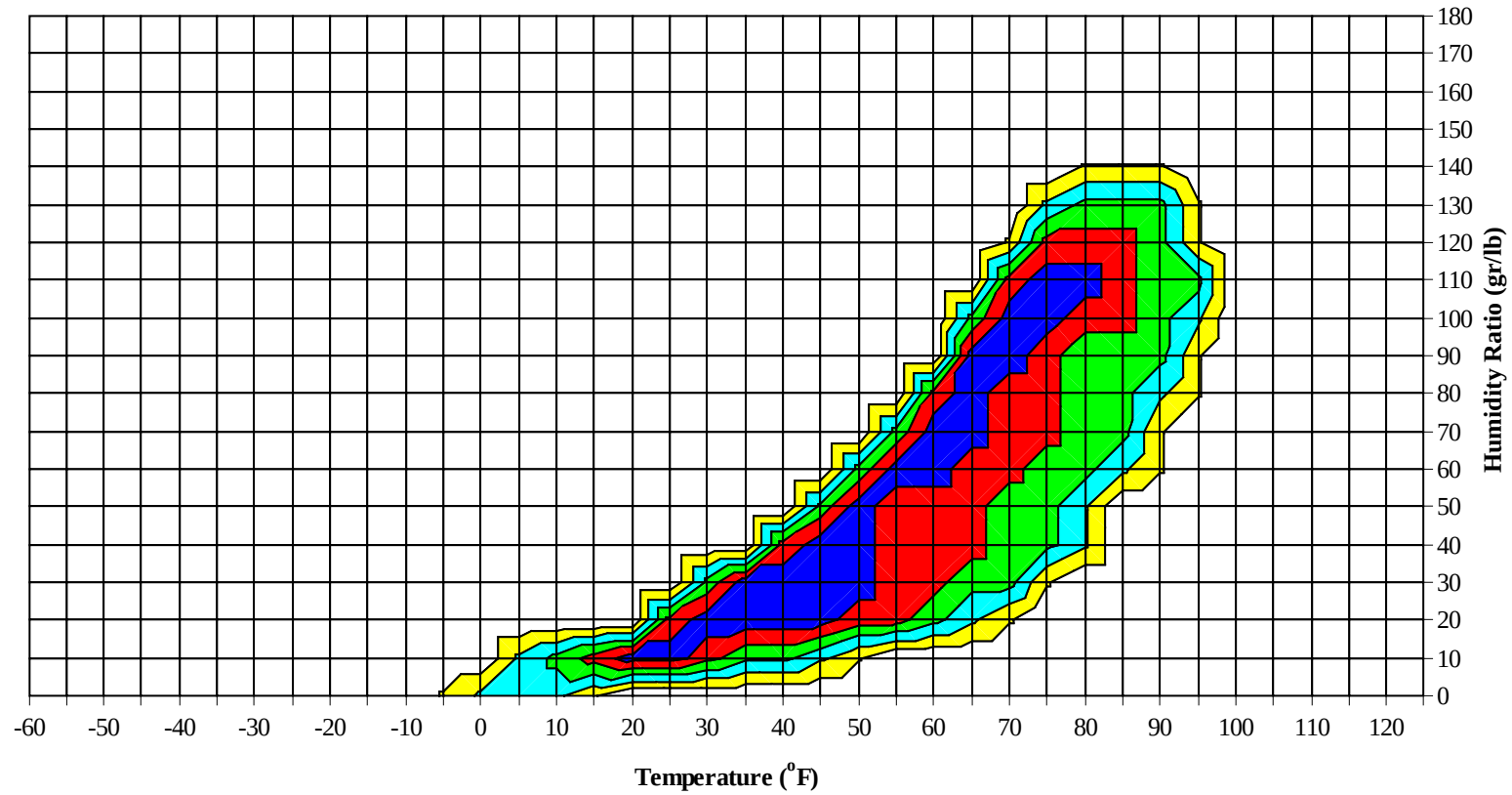


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Long Term Psychrometric Summary

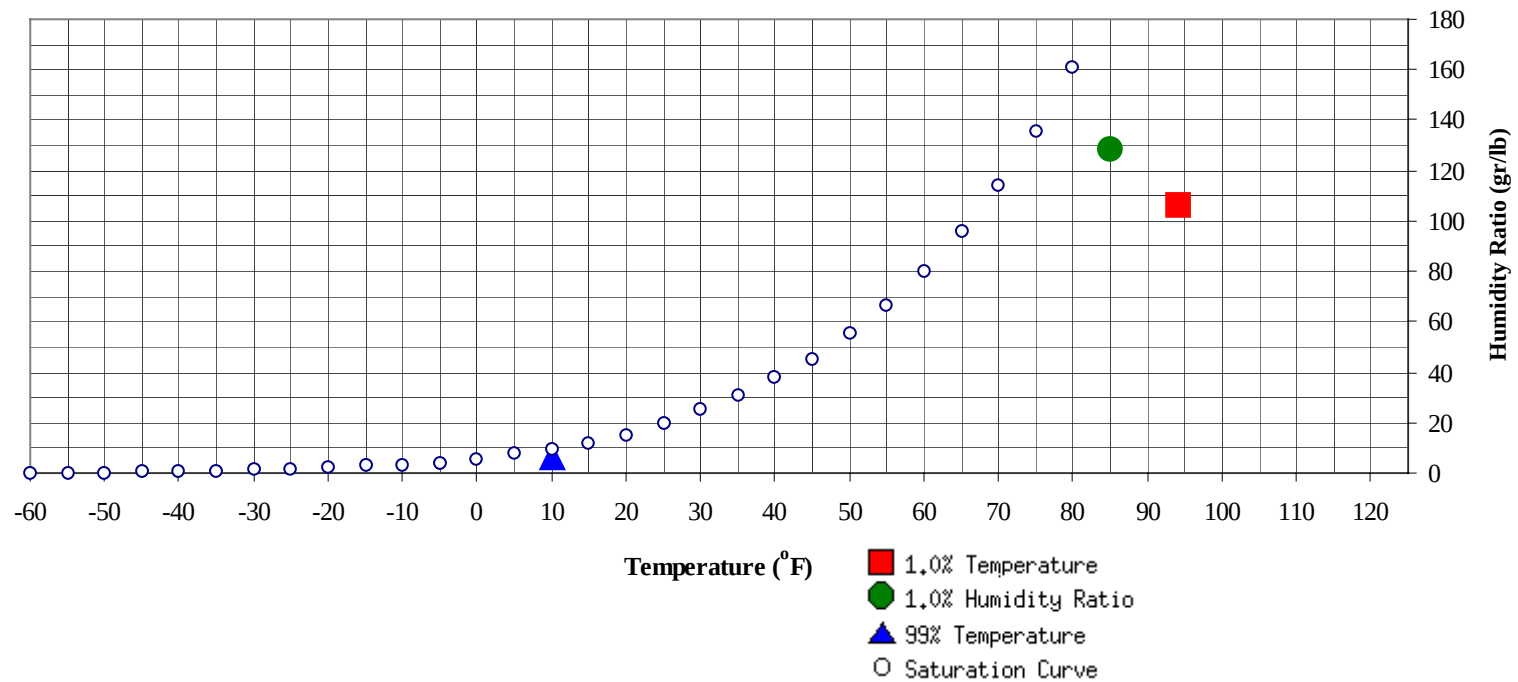


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	10	6.2	3.3		128.8	85	76.4	73.1	40.6

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	94	106.4	75.4	39.3

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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		
105 / 109															
100 / 104															
95 / 99															
90 / 94												0		0	62.0
85 / 89							0	0	0	59.7		0	0	0	61.8
80 / 84							0	0	0	61.3		4	1	5	60.9
75 / 79		0		0	53.0		1	0	1	57.4		12	4	16	60.0
70 / 74		0	0	0	52.4	0	4	1	5	55.7	1	18	9	28	58.2
65 / 69	0	2	1	3	52.4	1	12	4	17	53.5	7	26	17	50	55.5
60 / 64	1	8	3	12	52.2	5	18	10	33	51.6	14	30	25	69	52.3
55 / 59	5	12	8	25	48.9	6	19	15	40	47.7	20	28	30	78	49.0
50 / 54	7	19	13	39	44.1	13	20	21	54	44.2	28	32	35	95	44.9
45 / 49	11	27	22	60	40.6	17	24	24	65	40.7	35	29	37	101	41.6
40 / 44	19	30	29	79	37.0	23	26	29	78	37.3	38	26	34	98	37.6
35 / 39	32	36	37	106	33.0	35	29	33	97	33.4	35	20	24	79	33.3
30 / 34	48	35	43	127	29.3	42	26	32	100	29.2	34	14	21	69	29.0
25 / 29	37	26	32	95	24.7	30	17	21	68	24.7	21	4	7	32	24.8
20 / 24	31	19	21	71	20.1	20	13	15	48	20.0	10	3	4	17	20.2
15 / 19	22	15	15	52	15.3	13	7	9	29	15.4	3	1	1	5	15.4
10 / 14	16	8	12	36	10.6	9	4	5	18	10.7	2	0	0	2	10.8
5 / 9	10	5	6	21	5.8	5	2	4	11	6.1	1	0		1	6.4
0 / 4	5	2	3	10	1.2	3	1	1	5	1.6	0			0	3.0
-5 / -1	3	1	1	5	-3.0	1	0	0	1	-3.2					
-10 / -6	2	0	0	2	-7.4	0	0		0	-7.0					
-15 / -11	0	0		0	-12.0	0			0	-11.0					
-20 / -16															

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		
105 / 109															
100 / 104												0		0	83.3
95 / 99											3	1		4	75.0
90 / 94		1	0	1	72.2		1	0	1	73.1	0	21	6	27	74.8
85 / 89		4	1	5	66.8		14	4	18	71.5	0	57	24	81	73.4
80 / 84		17	5	22	64.2	0	41	15	56	68.7	8	62	41	111	71.1
75 / 79	0	27	13	40	62.1	6	49	31	86	66.0	37	47	57	141	69.0
70 / 74	8	36	24	68	60.0	24	50	47	121	63.7	66	29	53	148	66.8
65 / 69	21	32	31	84	57.4	48	43	53	144	60.9	65	16	36	117	63.6
60 / 64	29	36	40	106	53.7	60	28	46	134	57.5	37	5	18	60	59.3
55 / 59	37	31	37	106	50.2	48	13	28	89	53.0	19	0	4	23	55.0
50 / 54	39	24	34	98	46.6	34	6	17	57	49.0	6		1	7	50.6
45 / 49	37	15	27	79	42.4	17	2	7	26	44.7	1			1	46.6
40 / 44	34	10	17	61	38.3	9	0	1	10	40.3					
35 / 39	22	4	8	34	34.1	2			2	35.9					
30 / 34	10	1	2	13	29.6	0			0	30.8					
25 / 29	2	0	0	2	24.9										
20 / 24	0			0	21.1										
15 / 19	0			0	17.0										
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WMO No. 723495

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		1	0	1	74.1										
100 / 104		5	2	7	74.7		3	1	4	74.7					
95 / 99		19	6	25	75.9	0	19	6	25	75.3		3	0	3	74.0
90 / 94	0	59	24	83	75.0	0	46	16	62	74.8		13	4	17	73.3
85 / 89	3	74	39	115	73.7	2	61	30	93	73.4		34	8	42	72.0
80 / 84	30	50	59	139	72.4	16	56	48	120	71.7	3	48	24	75	69.9
75 / 79	72	22	60	154	70.7	57	35	61	152	70.3	19	43	37	99	67.8
70 / 74	81	13	42	136	68.2	81	18	53	152	68.0	42	34	49	125	65.9
65 / 69	44	4	13	61	64.7	54	6	23	82	64.2	49	28	41	118	62.3
60 / 64	13	0	3	16	60.1	26	2	10	38	60.2	45	20	33	98	58.2
55 / 59	5		1	6	56.3	10	0	2	12	55.2	34	11	22	67	53.7
50 / 54	0			0	50.8	3		0	3	50.3	22	5	14	41	49.5
45 / 49						0			0	47.7	14	1	6	21	45.2
40 / 44											8	0	2	10	41.0
35 / 39											2		1	3	36.7
30 / 34											1			1	31.9
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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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		
105 / 109															
100 / 104															
95 / 99															
90 / 94		1	0	1	67.3										
85 / 89		5	1	6	67.5										
80 / 84	0	16	3	19	65.9		1		1	62.1					
75 / 79	1	33	9	43	63.1		5	0	5	62.1		0		0	63.0
70 / 74	8	41	21	70	61.1	1	14	3	18	60.3		2	0	2	60.9
65 / 69	21	44	38	103	58.5	7	22	11	40	58.0	1	7	2	10	58.0
60 / 64	36	41	46	123	55.4	14	28	21	63	54.8	5	13	6	24	54.0
55 / 59	45	28	43	116	51.6	21	32	27	80	50.4	6	19	9	34	49.0
50 / 54	40	20	36	96	47.4	24	30	34	88	45.8	11	24	19	54	44.7
45 / 49	34	10	26	70	43.4	29	33	34	96	42.0	18	30	26	74	41.1
40 / 44	32	6	17	55	39.3	36	27	34	97	38.1	24	37	32	93	37.2
35 / 39	20	2	7	29	35.4	41	27	35	103	33.8	43	39	47	130	33.6
30 / 34	7	1	2	10	31.0	32	13	22	67	29.5	48	33	44	126	29.5
25 / 29	2	0	1	3	26.1	20	6	11	37	25.2	37	17	27	81	25.0
20 / 24	0		0	0	20.9	10	3	4	17	20.5	24	10	15	49	20.1
15 / 19	0			0	17.5	2	0	2	4	15.6	12	6	8	26	15.4
10 / 14						2	0	0	2	11.0	7	4	5	16	10.7
5 / 9						1			1	7.5	6	2	3	11	6.1
0 / 4											3	2	2	7	1.3
-5 / -1											1	1	1	3	-3.2
-10 / -6											2	1	1	4	-7.6
-15 / -11											1	0	0	1	-12.4
-20 / -16											0			0	-15.0

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.

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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		
105 / 109		1	0	1	74.1
100 / 104		8	3	11	74.8
95 / 99	0	44	13	57	75.5
90 / 94	0	142	49	190	74.7
85 / 89	5	249	105	359	73.0
80 / 84	57	294	194	546	70.6
75 / 79	192	276	270	738	68.1
70 / 74	313	261	301	875	65.2
65 / 69	317	243	270	830	60.8
60 / 64	284	230	261	775	56.0
55 / 59	256	194	225	675	51.1
50 / 54	226	181	224	631	46.3
45 / 49	213	172	209	594	42.0
40 / 44	222	162	195	579	37.8
35 / 39	234	158	191	583	33.6
30 / 34	223	123	167	514	29.4
25 / 29	149	71	99	319	24.8
20 / 24	96	48	59	203	20.1
15 / 19	53	30	36	119	15.4
10 / 14	37	17	23	77	10.7
5 / 9	22	9	13	44	6.0
0 / 4	11	5	6	22	1.3
-5 / -1	5	2	3	10	-3.1
-10 / -6	4	1	2	7	-7.5
-15 / -11	1	0	0	1	-12.1
-20 / -16	0			0	-15.0

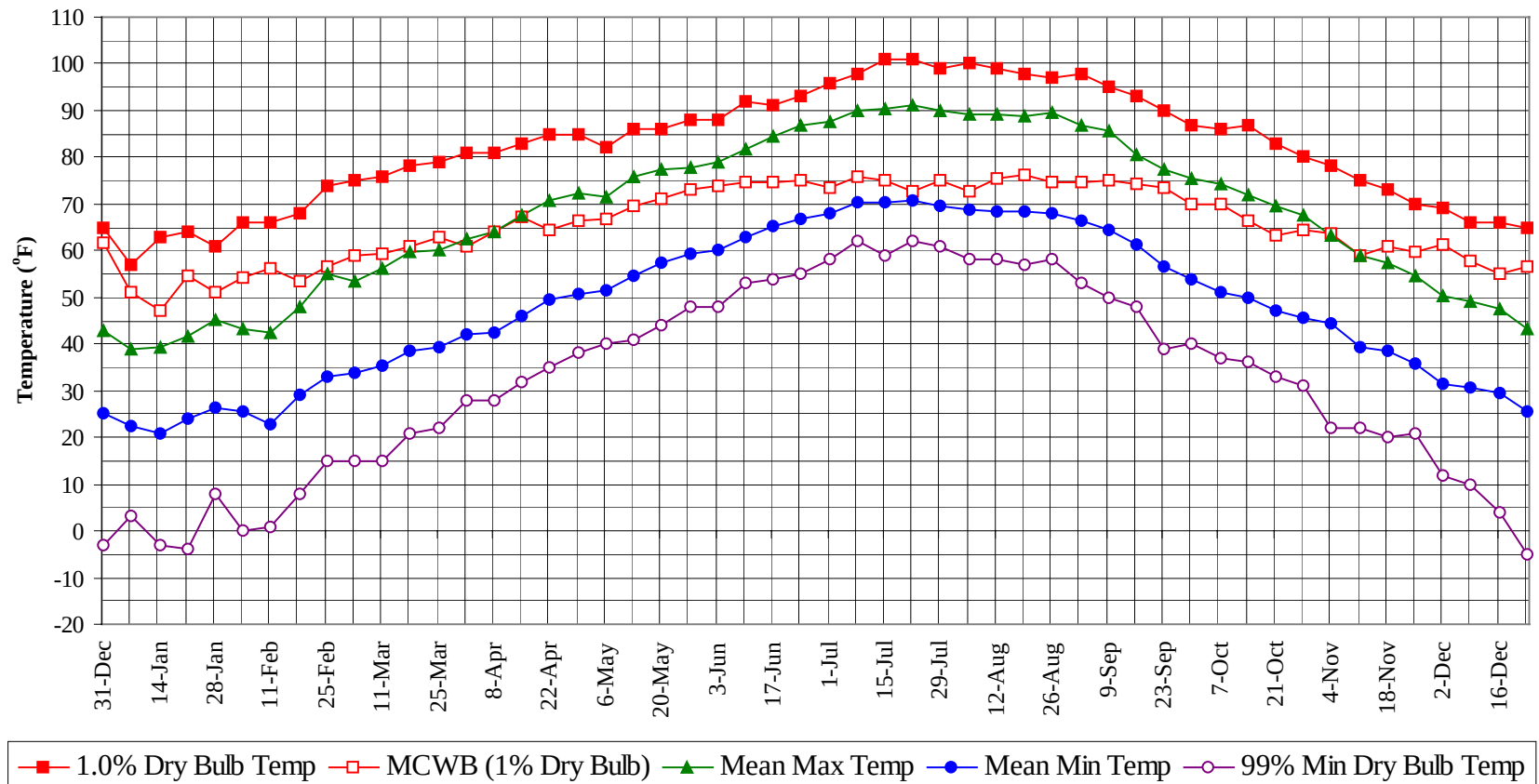
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Annual Summary of Temperatures

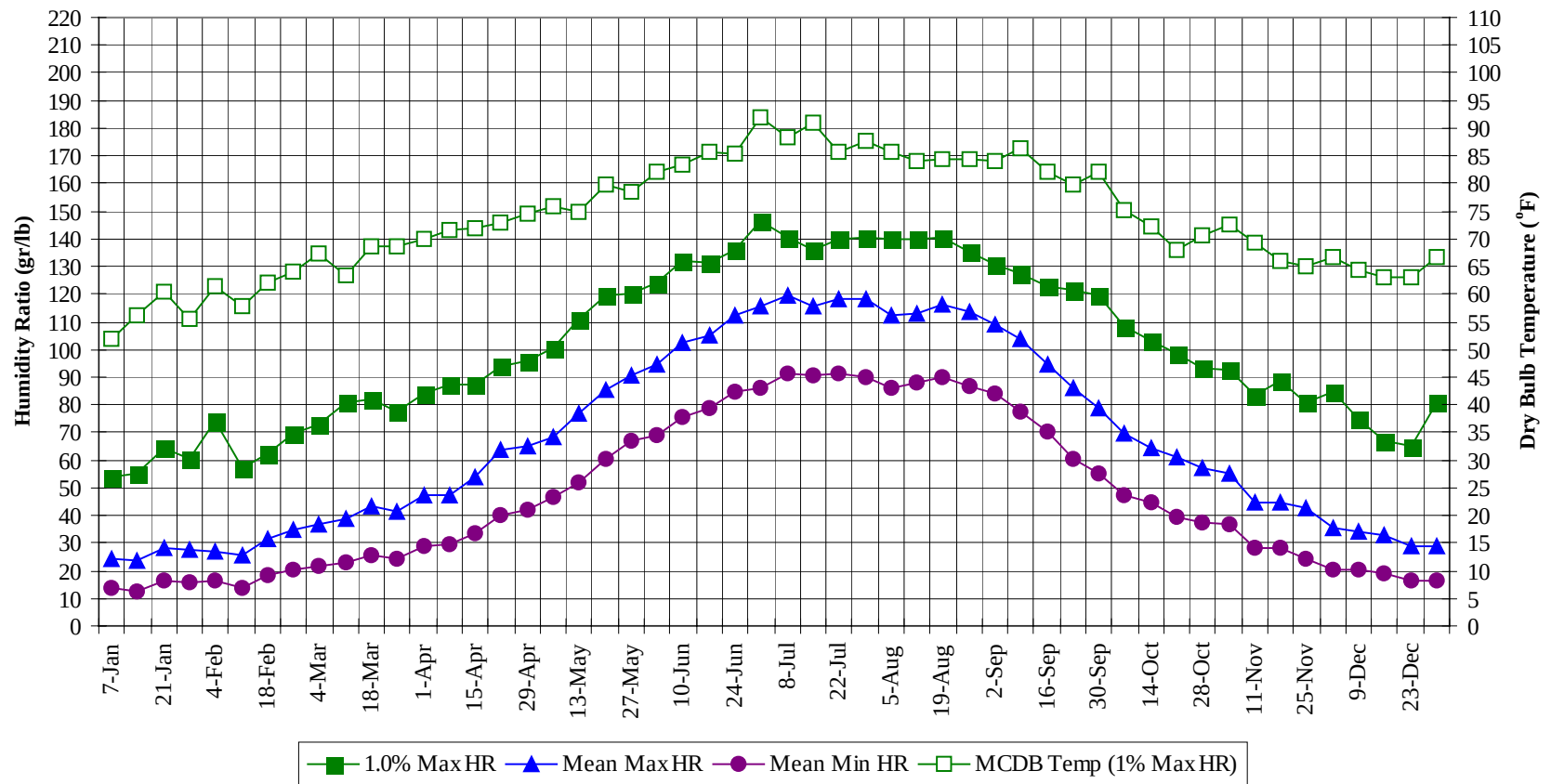


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Long Term Humidity and Dry Bulb Temperature Summary

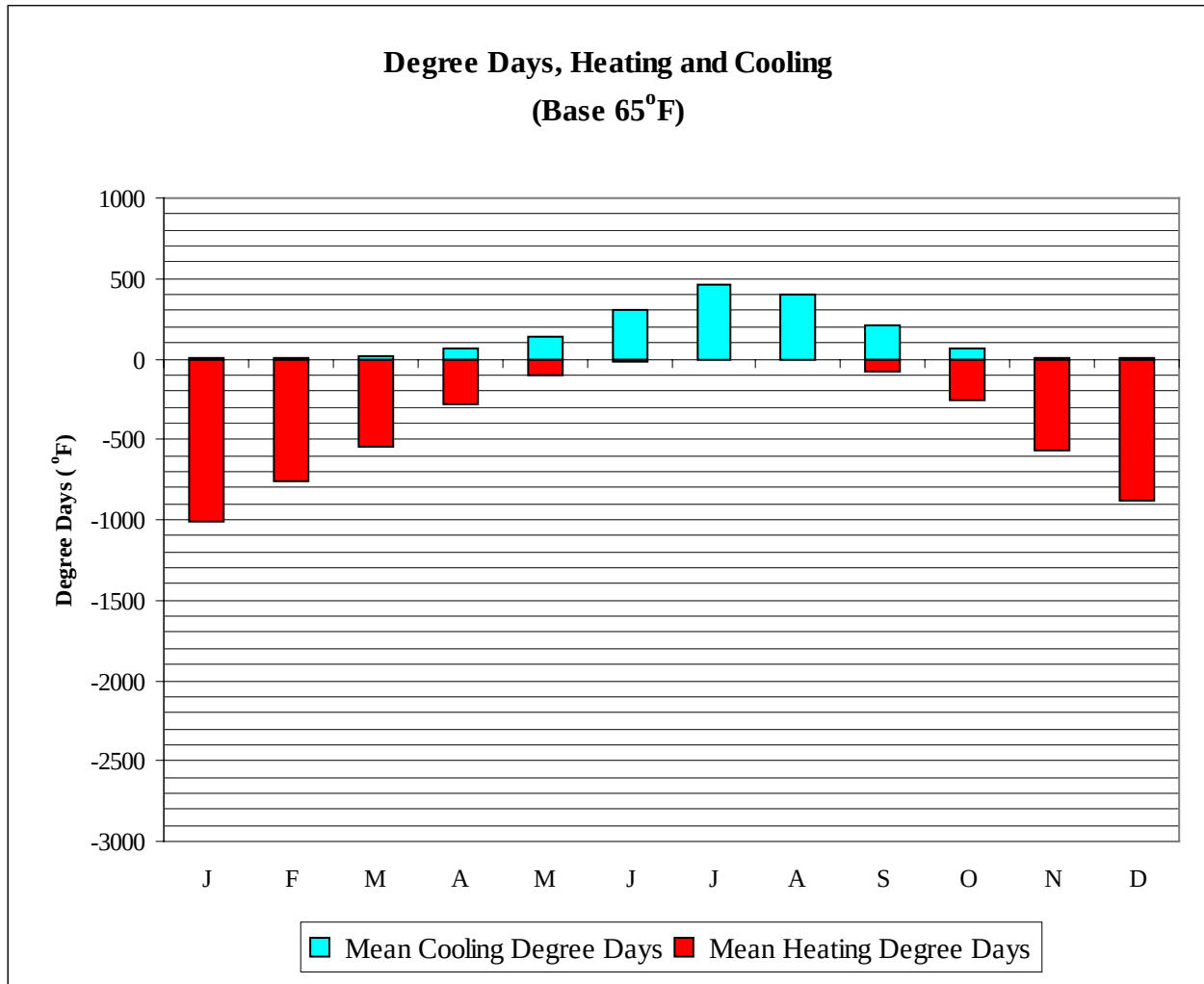


JOPLIN**MO****WMO No. 723495****Long Term Dry Bulb Temperature and Humidity Summary**

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	57.0	51.1	38.9	22.5	3.0	53.9	52.0	24.3	13.9
14-Jan	63.0	47.3	39.5	20.7	-3.0	55.3	56.3	23.5	12.6
21-Jan	64.0	54.8	41.5	24.0	-4.0	64.4	60.5	28.6	16.3
28-Jan	61.0	51.1	45.3	26.4	8.0	60.2	55.4	27.6	15.7
4-Feb	66.0	54.4	43.4	25.4	0.0	74.2	61.5	27.3	16.3
11-Feb	66.0	56.0	42.6	23.0	1.0	57.4	57.7	25.9	14.1
18-Feb	68.0	53.3	48.1	29.0	8.0	62.3	61.9	31.7	18.3
25-Feb	74.0	56.6	54.9	32.8	15.0	69.3	64.1	34.6	20.4
4-Mar	75.0	58.8	53.4	33.9	15.0	72.8	67.4	36.5	21.8
11-Mar	76.0	59.4	56.4	35.4	15.0	80.5	63.3	38.6	22.9
18-Mar	78.0	60.7	59.6	38.7	21.0	81.9	68.7	43.0	25.4
25-Mar	79.0	62.9	60.1	39.3	22.0	77.7	68.5	41.2	24.6
1-Apr	81.0	61.0	62.4	41.9	28.0	84.0	70.1	47.5	28.9
8-Apr	81.0	64.1	64.2	42.3	28.0	87.5	71.5	47.2	29.6
15-Apr	83.0	67.3	67.6	46.1	32.0	87.5	71.9	53.7	33.5
22-Apr	85.0	64.6	70.9	49.5	35.0	93.8	72.9	63.8	40.1
29-Apr	85.0	66.4	72.3	50.8	38.0	95.9	74.4	64.8	42.4
6-May	82.0	66.8	71.5	51.4	40.0	100.8	75.8	68.1	46.8
13-May	86.0	69.7	75.7	54.5	41.0	111.3	75.0	76.6	52.1
20-May	86.0	71.1	77.4	57.3	44.0	119.7	79.7	85.5	60.1
27-May	88.0	73.0	77.9	59.4	48.0	120.4	78.5	90.5	66.8
3-Jun	88.0	73.9	78.9	60.3	48.0	123.9	82.0	94.5	68.8
10-Jun	92.0	74.8	81.7	62.7	53.0	132.3	83.5	102.2	75.6
17-Jun	91.0	74.8	84.6	65.1	54.0	131.6	85.6	105.1	78.9
24-Jun	93.0	75.1	86.9	66.8	55.0	135.8	85.3	112.3	84.9
1-Jul	96.0	73.6	87.8	68.1	58.0	146.3	92.0	115.8	86.2
8-Jul	98.0	75.9	89.9	70.4	62.0	140.7	88.4	119.6	91.2
15-Jul	101.0	75.1	90.3	70.4	59.0	135.8	90.8	115.6	90.7
22-Jul	101.0	72.8	91.1	70.6	62.0	140.0	85.6	118.3	91.1
29-Jul	99.0	75.2	90.0	69.6	61.0	140.7	87.7	118.1	90.0
5-Aug	100.0	72.5	89.3	68.7	58.0	140.0	85.8	112.4	86.1
12-Aug	99.0	75.3	89.1	68.5	58.0	140.0	84.1	112.9	87.7
19-Aug	98.0	76.4	88.8	68.4	57.0	140.7	84.4	116.3	90.0
26-Aug	97.0	74.7	89.5	68.1	58.0	135.1	84.3	113.6	86.6
2-Sep	98.0	74.8	86.8	66.5	53.0	130.9	84.1	109.3	83.9
9-Sep	95.0	75.0	85.5	64.3	50.0	127.4	86.3	103.5	77.3
16-Sep	93.0	74.1	80.7	61.3	48.0	122.5	82.0	94.9	70.5
23-Sep	90.0	73.5	77.3	56.5	39.0	121.8	79.6	86.1	60.7
30-Sep	87.0	70.0	75.6	53.9	40.0	119.7	82.0	78.5	55.0
7-Oct	86.0	69.9	74.3	51.1	37.0	108.5	75.2	69.4	47.0
14-Oct	87.0	66.4	72.0	49.8	36.0	102.9	72.4	64.0	44.5
21-Oct	83.0	63.2	69.7	47.4	33.0	98.7	68.0	61.1	39.6
28-Oct	80.0	64.6	67.5	45.7	31.0	93.1	70.7	57.4	37.5
4-Nov	78.0	63.8	63.3	44.5	22.0	92.4	72.6	55.0	36.5
11-Nov	75.0	58.9	59.0	39.2	22.0	83.3	69.4	44.6	28.0
18-Nov	73.0	60.8	57.3	38.5	20.0	88.9	66.0	44.9	27.9
25-Nov	70.0	59.6	54.5	35.9	21.0	80.5	64.9	42.4	24.5
2-Dec	69.0	61.2	50.3	31.6	12.0	84.7	66.6	35.5	20.7
9-Dec	66.0	57.9	49.2	30.7	10.0	74.9	64.5	34.0	20.2
16-Dec	66.0	55.0	47.6	29.4	4.0	67.2	63.0	32.7	19.3
23-Dec	65.0	56.6	43.4	25.5	-5.0	65.1	63.2	29.1	16.4
31-Dec	65.0	61.6	42.8	25.1	-3.0	80.5	66.8	28.8	16.5

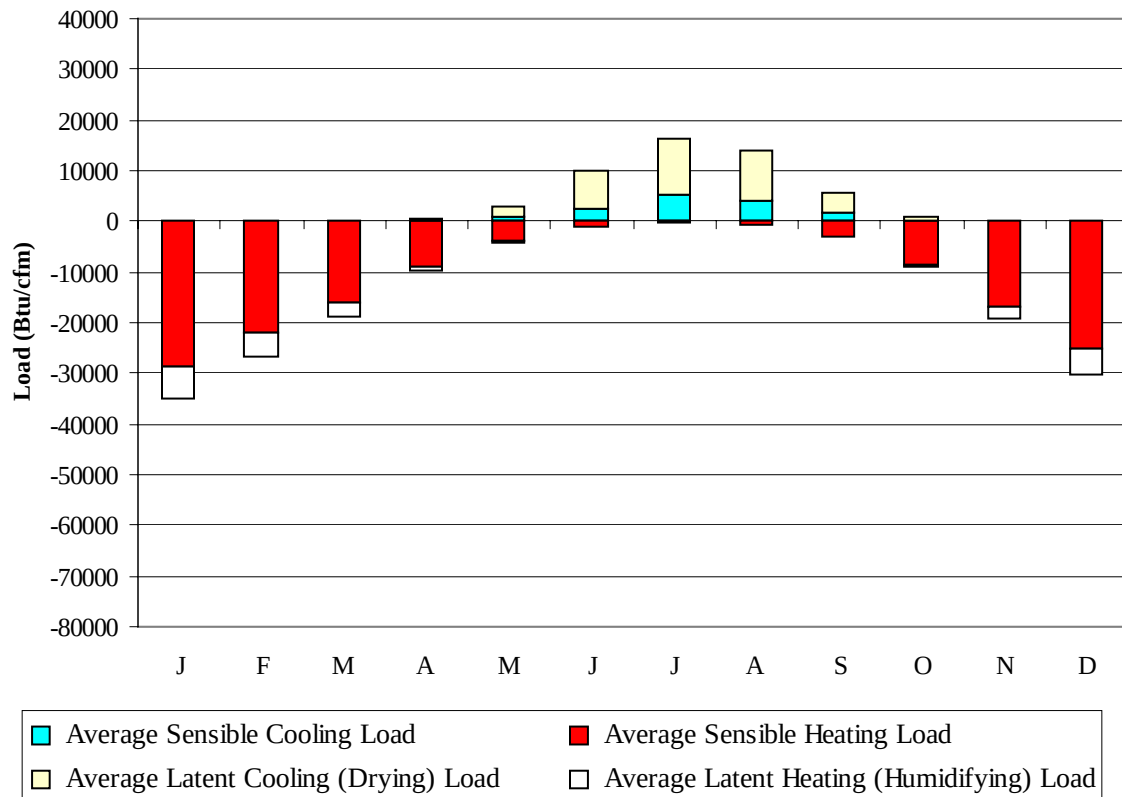
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WMO No. 723495



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1012
FEB	3	766
MAR	22	539
APR	66	280
MAY	142	106
JUN	309	18
JUL	464	3
AUG	405	9
SEP	209	83
OCT	67	261
NOV	11	563
DEC	1	880
ANN	1701	4520

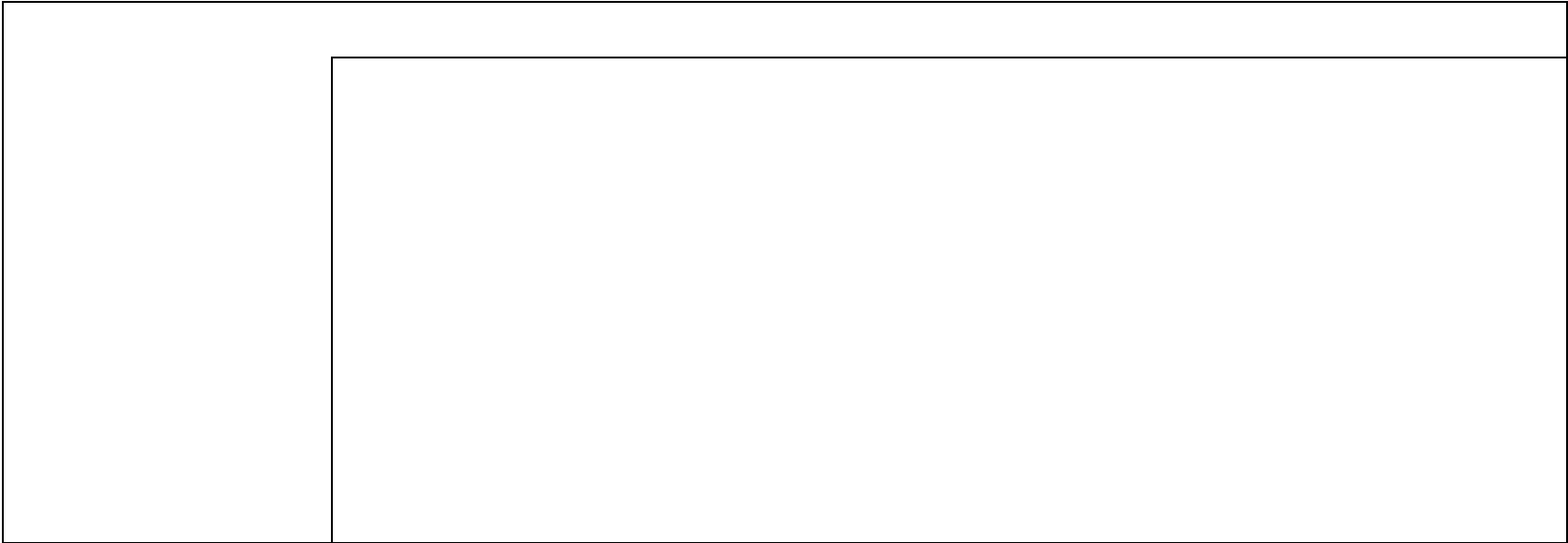
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	-28629	0	-6351
FEB	5	-22011	1	-4639
MAR	60	-16149	15	-2805
APR	302	-8983	166	-909
MAY	773	-3971	2103	-53
JUN	2681	-898	7372	-1
JUL	5140	-213	11275	0
AUG	4170	-476	9666	0
SEP	1653	-3066	4122	-23
OCT	295	-8533	461	-543
NOV	15	-16781	58	-2514
DEC	0	-25207	1	-4986
ANN	15094	-134917	35240	-22824

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

No Solar Radiation
Data Available

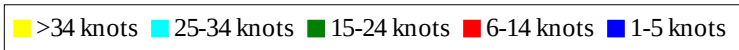
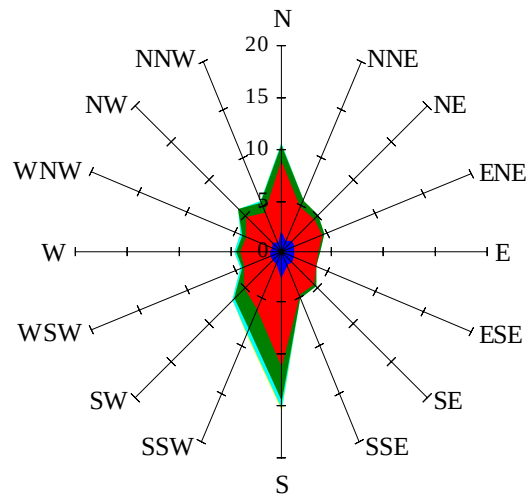


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

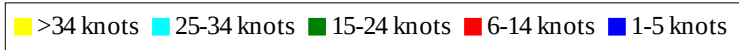
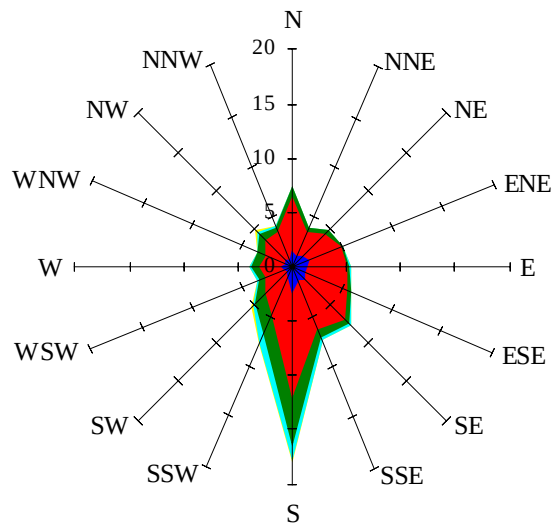
Labels of Percent Frequency on North Axis



Percent Calm = 4.32

Wind Summary - March, April, and May

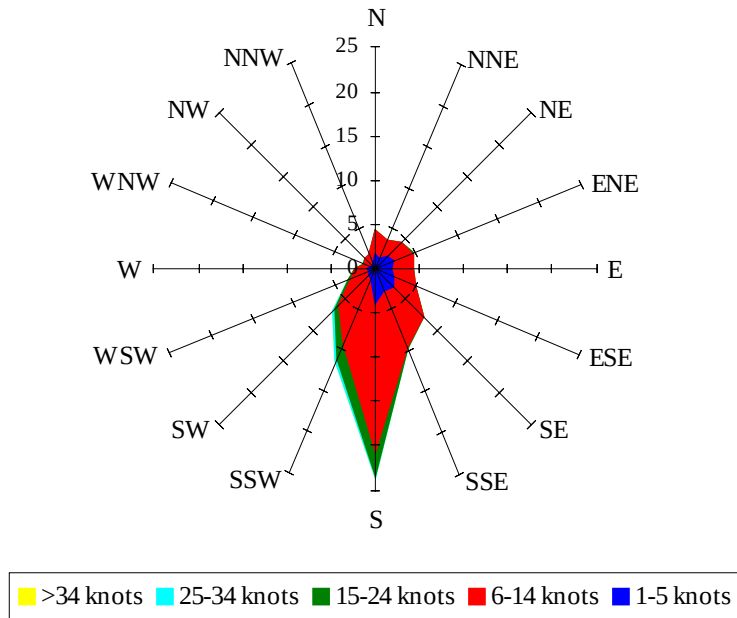
Labels of Percent Frequency on North Axis



Percent Calm = 4.07

Wind Summary - June, July, and August

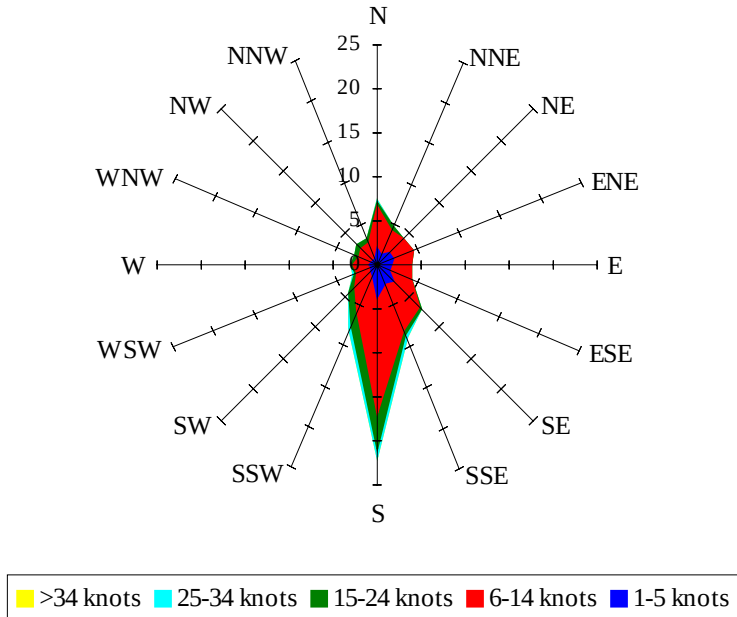
Labels of Percent Frequency on North Axis



Percent Calm = 5.63

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 5.99