

SPIRIT OF ST LOUIS MO

Latitude = 38.67 N

WMO No. 724345

Longitude = 90.65 W

Elevation = 463 feet

Period of Record = 1973 to 1996

Average Pressure = 29.52 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	92	76	112	10.0	S
0.4% Occurrence	95	77	112	9.9	SW
1.0% Occurrence	93	76	113	10.0	S
2.0% Occurrence	90	75	107	9.9	S
Mean Daily Range	19	-	-	-	-
97.5% Occurrence	17	15	9	7.4	NW
99.0% Occurrence	10	9	6	8.3	NW
99.6% Occurrence	4	3	5	8.7	NW
Median of Extreme Lows	10	9	6	8.3	NW
	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	73	80	111	7.3	S
0.4% Occurrence	80	91	137	8.9	S
1.0% Occurrence	78	88	128	8.8	S
2.0% Occurrence	77	87	124	8.5	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	104	77	0.69	6.7	S
0.4% Occurrence	139	87	0.90	7.8	S
1.0% Occurrence	134	85	0.88	7.2	S
2.0% Occurrence	129	82	0.85	6.7	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		43	498	358	878

Other Site Data

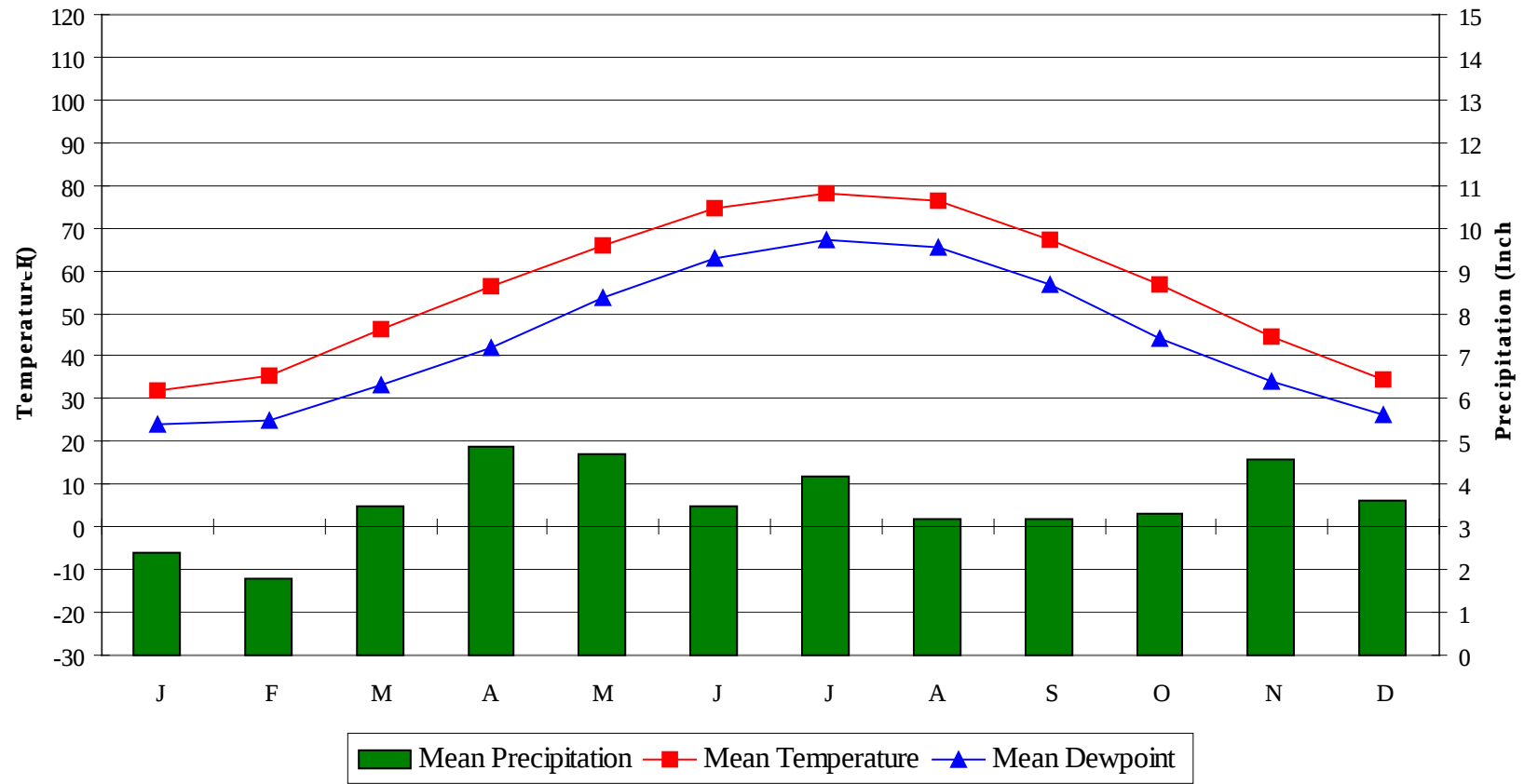
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
8	3.3	90	2.2 + 0.9
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
58.2	38	21	27

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

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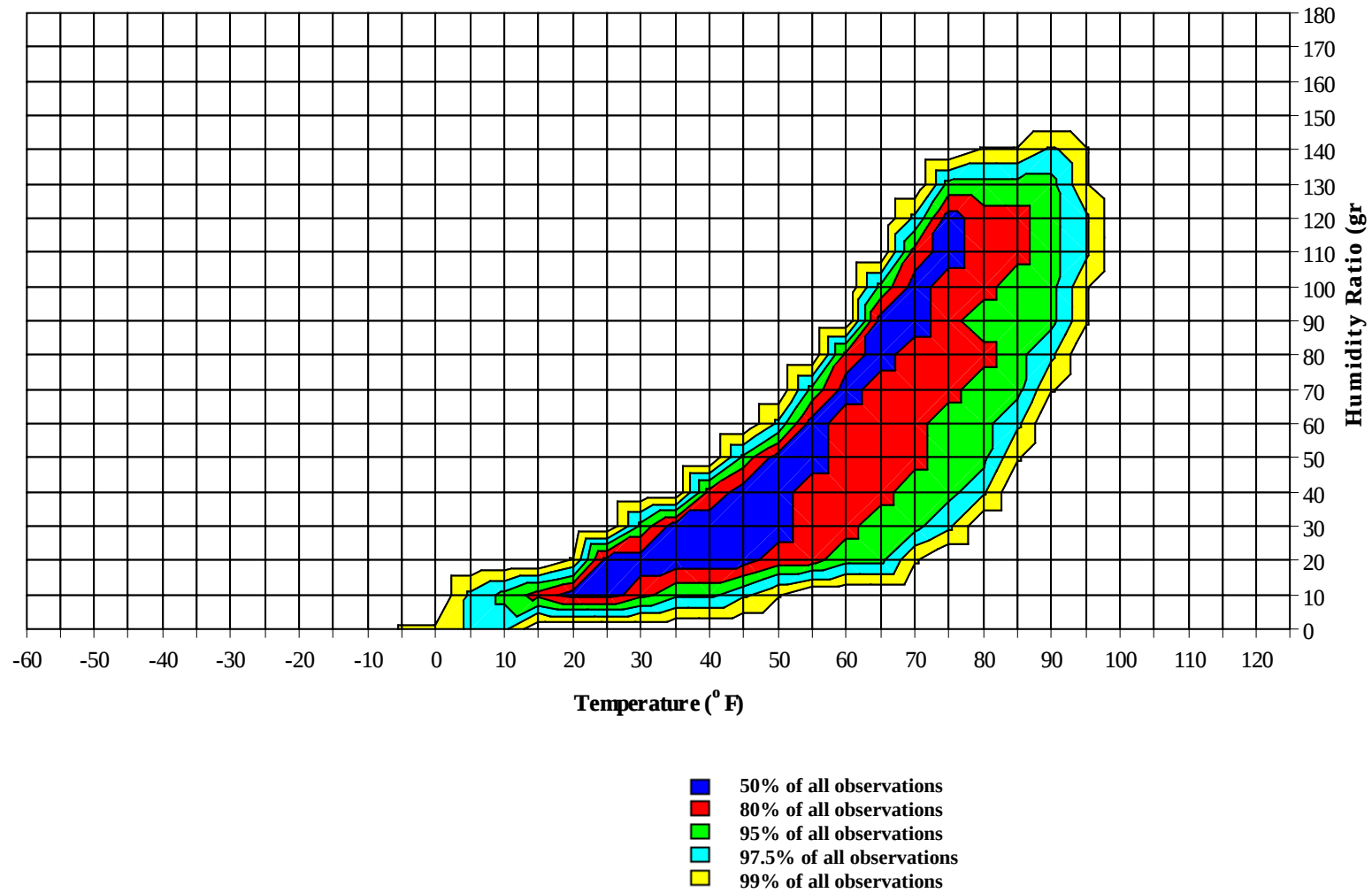
Average Annual Climate



SPIRIT OF ST LOUIS MO

WMO No. 724345

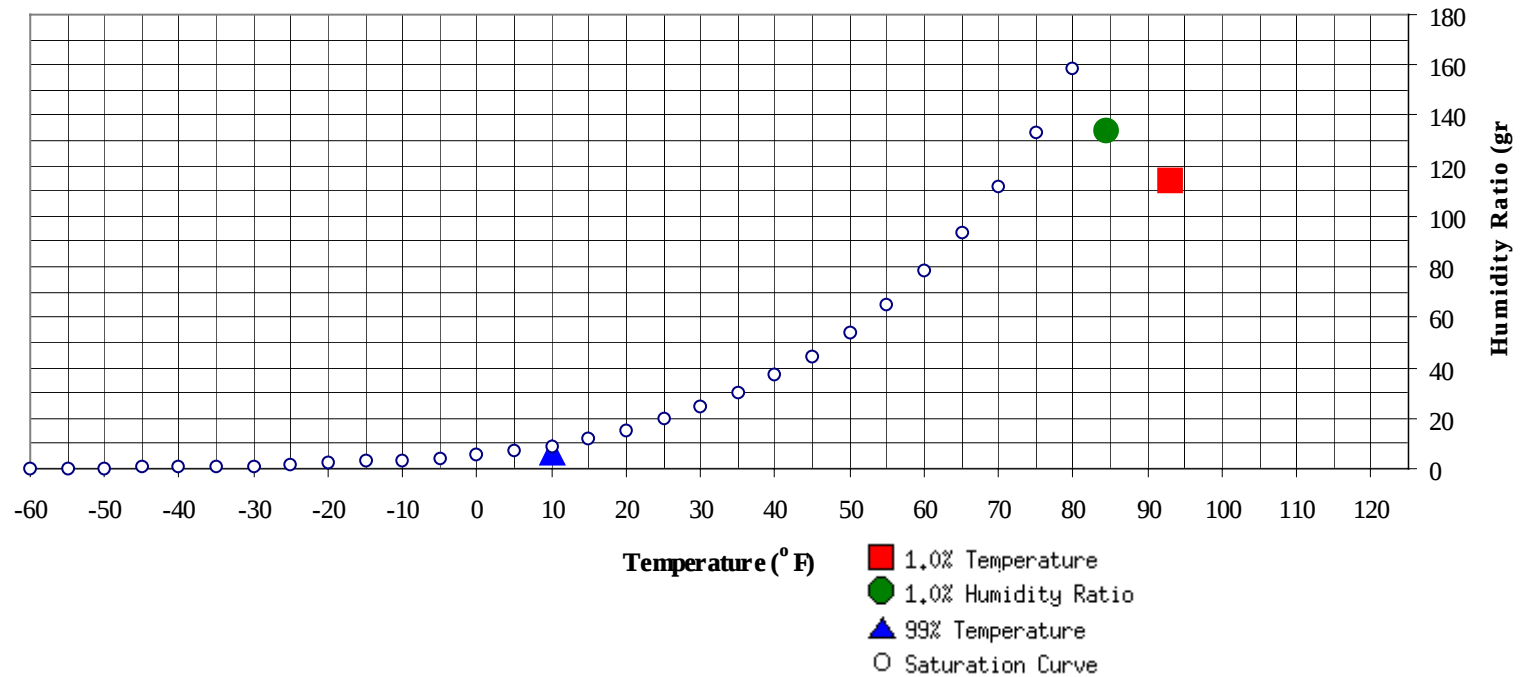
Long Term Psychrometric Summary



SPRIT OF ST LOUIS MO

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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	10	6.3	3.4		133.7	84.5	77.5	75	41.3

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	93	113.8	76.6	40.2

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89												0	0	0	68.0
80 / 84												4	1	5	63.2
75 / 79							1		1	55.2		9	3	12	60.0
70 / 74		1	0	1	56.5		3	0	3	54.9	1	16	9	26	58.1
65 / 69		2	1	3	55.7	0	6	2	8	52.4	5	19	17	41	56.0
60 / 64	1	6	2	9	53.1	2	9	7	18	50.3	8	23	17	48	51.9
55 / 59	3	12	8	23	49.4	4	11	9	24	47.3	17	27	24	68	49.0
50 / 54	4	14	10	28	45.5	5	20	13	38	44.7	20	30	33	82	45.6
45 / 49	8	20	16	44	41.5	14	23	22	59	41.4	35	34	38	106	42.3
40 / 44	21	26	27	74	38.5	20	33	30	83	37.6	38	33	33	103	38.2
35 / 39	34	46	45	125	33.9	37	38	41	116	33.8	32	24	30	86	33.5
30 / 34	53	42	50	145	30.2	42	32	44	119	29.7	40	18	24	82	29.6
25 / 29	37	33	33	103	25.1	43	20	23	86	24.9	26	9	14	49	24.7
20 / 24	32	20	21	73	20.3	23	13	12	49	20.2	18	3	4	25	20.5
15 / 19	22	13	16	51	15.5	12	5	9	27	15.1	6	1	0	7	15.6
10 / 14	13	9	11	33	10.6	8	5	5	18	10.6	1	0	0	1	10.3
5 / 9	10	4	5	19	5.9	7	3	4	14	5.9	1		0	1	6.8
0 / 4	6	1	2	9	1.2	4	0	1	5	1.9	0			0	3.3
-5 / -1	2	1	0	3	-2.4	1	0	0	1	-3.1					
-10 / -6	1		0	1	-7.5	1		0	1	-8.0					
-15 / -11	0		0	0	-11.0	1			1	-12.0					
-20 / -16															
-25 / -21															

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.

SPIRIT OF ST LOUIS MO

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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												1	0	1	74.3
95 / 99							0		0	73.0		4	2	6	74.1
90 / 94		1	0	1	68.4		4	1	5	73.1		27	7	34	74.5
85 / 89		5	2	7	66.6		18	6	24	71.4	0	55	23	78	72.6
80 / 84		13	4	17	64.4	0	32	15	48	68.0	7	61	41	110	69.8
75 / 79	0	23	11	35	62.2	6	47	32	84	65.1	30	48	53	131	68.7
70 / 74	5	29	23	58	59.4	20	45	43	107	63.3	65	26	55	146	67.1
65 / 69	16	33	29	79	56.7	46	48	48	141	60.2	64	12	32	109	63.5
60 / 64	24	34	32	91	53.5	56	31	44	131	57.3	43	5	18	66	59.1
55 / 59	30	31	36	98	49.9	39	16	32	86	52.8	20	1	5	26	54.9
50 / 54	38	30	38	107	46.7	43	6	19	68	48.9	8	0	2	10	50.2
45 / 49	42	21	27	90	42.6	26	1	7	34	45.2	3	0	0	3	46.6
40 / 44	37	15	20	72	38.7	9	0	2	11	40.6		0		0	37.0
35 / 39	24	4	11	39	34.4	3		0	3	36.3					
30 / 34	17	0	4	21	30.1	0			0	32.2					
25 / 29	5		0	5	25.8										
20 / 24	0			0	21.0										
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															

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SPIRIT OF ST LOUIS MO

WMO No. 724345

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		1	0	1	78.1		3	1	4	79.0					
95 / 99		13	3	16	78.1		14	3	17	78.0		2	0	2	75.0
90 / 94		45	16	62	76.6		38	10	48	76.3		8	2	10	73.9
85 / 89	1	66	34	100	74.0	0	53	26	79	73.8		26	5	31	71.2
80 / 84	19	64	57	140	72.5	11	60	45	117	71.9	1	38	17	56	68.8
75 / 79	57	38	58	153	71.2	48	45	57	151	70.5	10	49	33	92	67.4
70 / 74	82	16	50	148	68.8	70	26	56	152	68.3	31	44	43	118	65.1
65 / 69	59	6	21	86	64.9	49	9	26	84	64.2	36	32	42	110	61.8
60 / 64	22	0	7	30	60.4	40	1	17	58	60.6	44	22	39	106	58.2
55 / 59	7	0	1	8	57.1	21		5	26	56.3	44	14	32	91	54.3
50 / 54						8		0	8	51.9	40	5	16	61	50.4
45 / 49											19	1	6	26	45.6
40 / 44											7		3	10	41.1
35 / 39											5		1	6	37.1
30 / 34											1			1	32.9
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															

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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															
85 / 89		4		4	65.0		0		0	58.0					
80 / 84		13	2	15	64.9		1	0	1	59.9					
75 / 79		29	6	35	62.9		5	0	5	60.4		0		0	65.0
70 / 74	3	36	20	60	60.4	0	10	3	13	60.1		1	0	1	62.5
65 / 69	14	39	30	83	58.2	4	14	10	28	57.4		4	1	5	56.8
60 / 64	29	40	38	108	54.9	13	23	19	55	55.1	2	6	4	12	54.1
55 / 59	32	34	43	109	51.0	15	26	24	66	49.7	4	14	7	25	49.4
50 / 54	39	29	38	105	47.0	19	26	25	71	46.0	9	18	11	39	45.3
45 / 49	44	15	34	93	43.6	29	38	34	101	42.6	16	25	24	66	42.1
40 / 44	39	7	22	67	39.7	35	39	40	114	38.4	24	40	38	103	38.4
35 / 39	29	2	12	43	35.5	40	30	35	105	33.9	42	49	46	136	34.2
30 / 34	17	0	3	20	31.6	44	15	28	88	29.6	50	38	46	133	29.7
25 / 29	2			2	27.4	20	9	12	41	25.1	40	24	30	94	24.9
20 / 24						12	3	6	21	20.3	21	12	17	50	20.5
15 / 19						4	1	2	7	16.0	13	6	10	29	15.5
10 / 14						2	0	1	3	10.6	12	5	5	22	10.8
5 / 9						1			1	6.7	5	4	4	13	6.5
0 / 4											3	1	1	5	1.9
-5 / -1											2	1	1	4	-3.0
-10 / -6											2	1	1	4	-6.7
-15 / -11											1	0	1	2	-12.0
-20 / -16											1	0		1	-15.7
-25 / -21											0			0	-22.0

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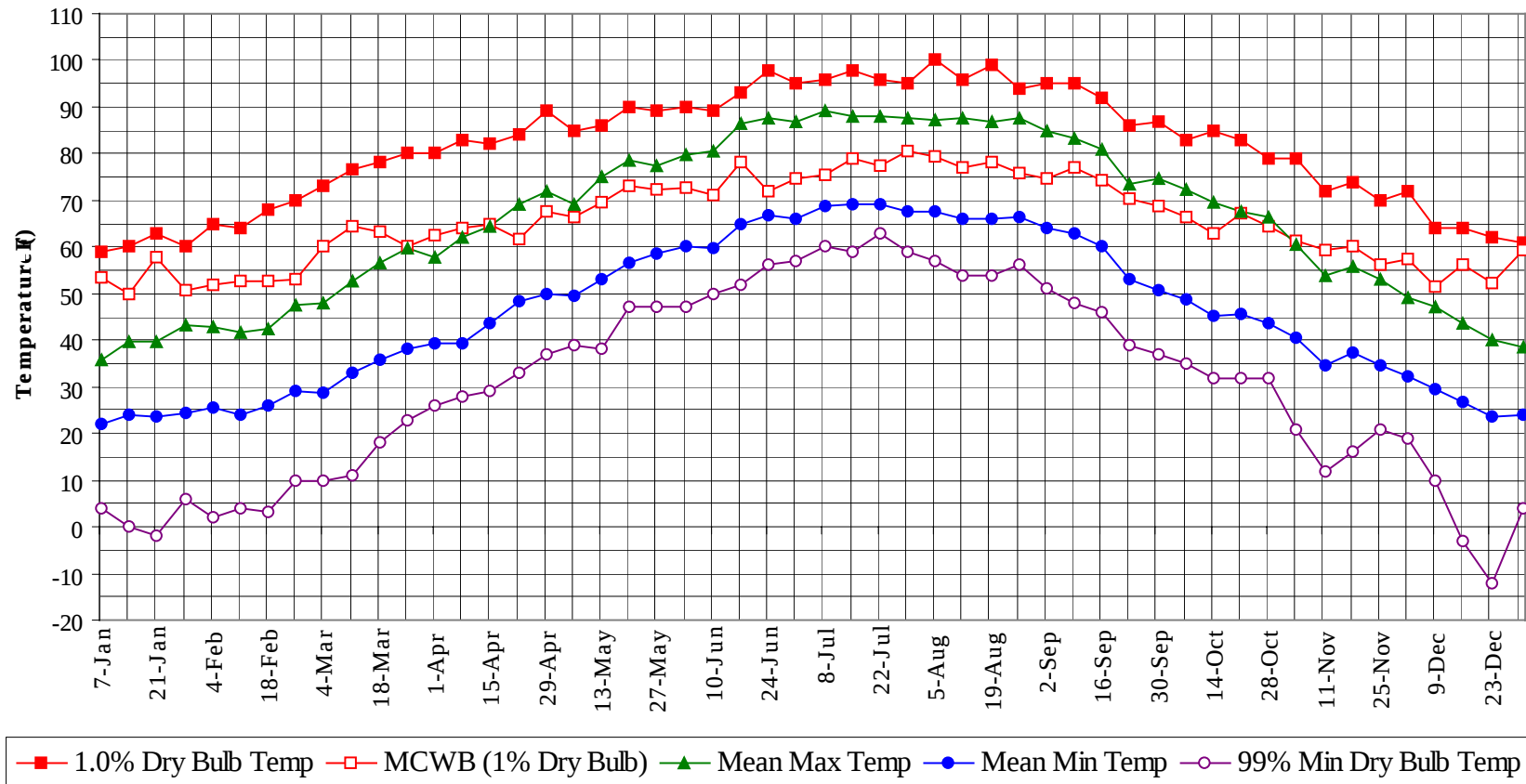
WMO No. 724345

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

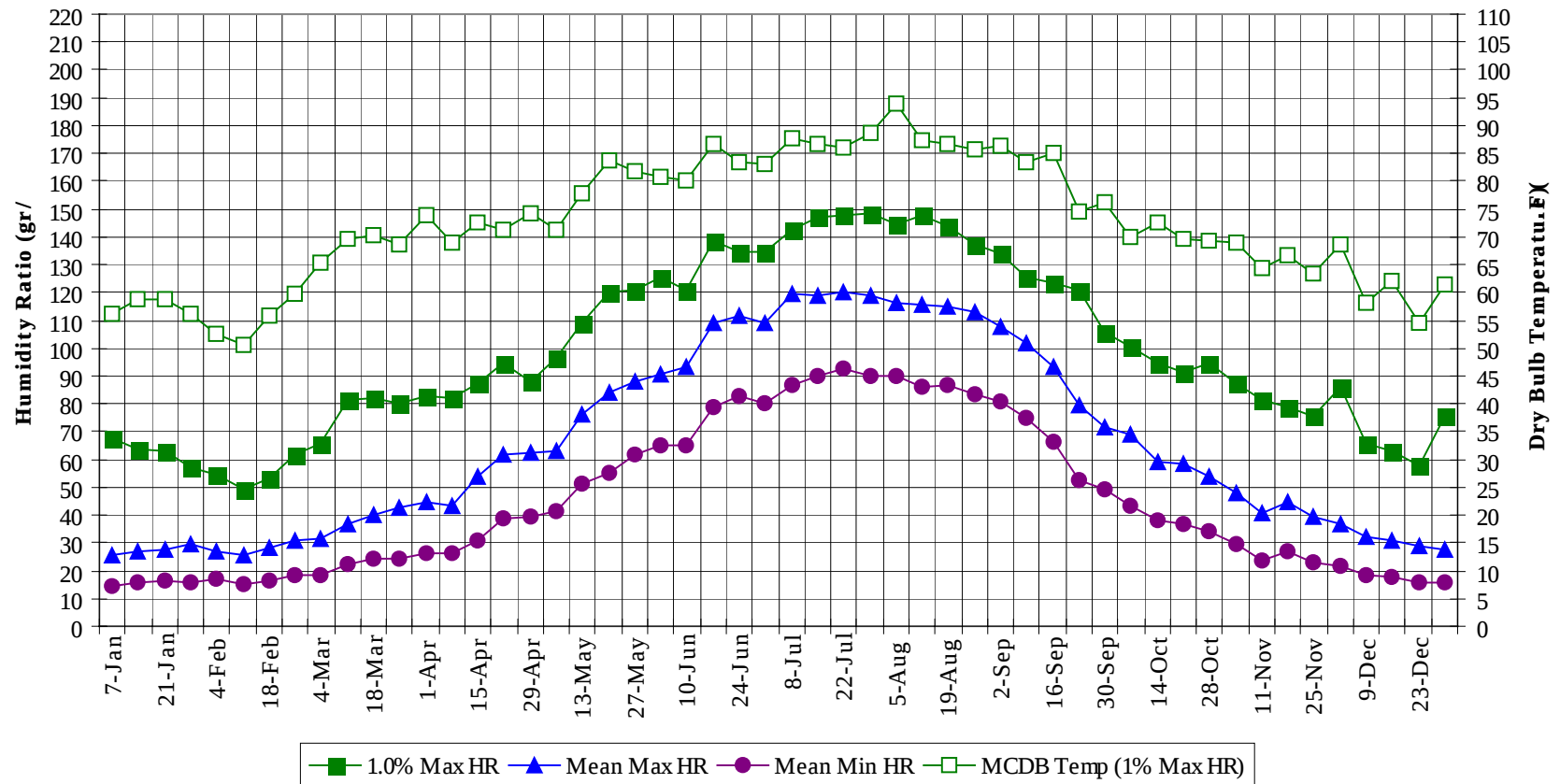
Temperature Range (°F)	Annual Totals				
	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104		5	1	6	77.7
95 / 99		31	8	39	77.3
90 / 94		122	36	158	75.7
85 / 89	2	227	95	324	72.9
80 / 84	38	287	181	506	70.3
75 / 79	147	296	251	694	68.2
70 / 74	271	256	304	831	65.3
65 / 69	289	226	260	775	60.8
60 / 64	284	203	247	735	56.4
55 / 59	235	188	228	650	51.4
50 / 54	234	178	208	619	47.0
45 / 49	237	177	209	622	42.7
40 / 44	236	193	216	644	38.5
35 / 39	252	190	221	662	34.1
30 / 34	270	143	201	614	29.9
25 / 29	175	92	113	381	25.0
20 / 24	109	49	61	218	20.3
15 / 19	58	25	36	120	15.5
10 / 14	38	18	21	77	10.7
5 / 9	23	11	13	47	6.1
0 / 4	13	3	4	20	1.6
-5 / -1	4	2	2	8	-2.8
-10 / -6	3	1	1	5	-7.0
-15 / -11	2	0	1	3	-11.9
-20 / -16	1	0		1	-15.7
-25 / -21	0			0	-22.0

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



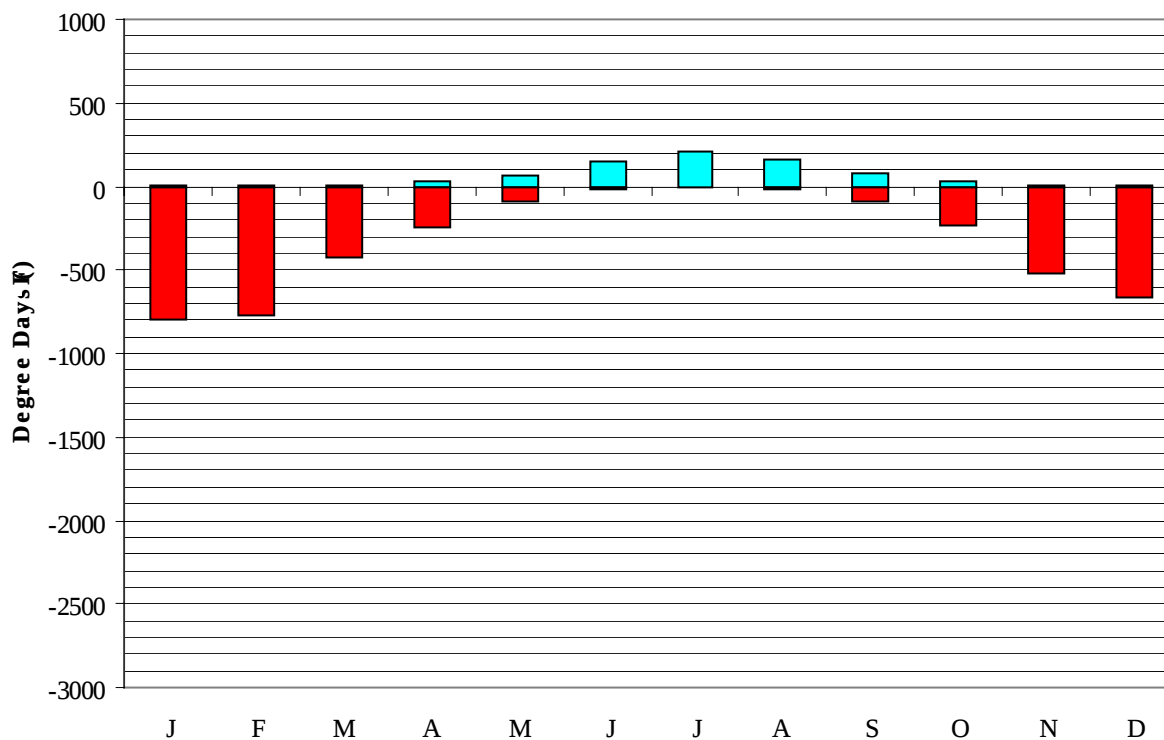
SPIRIT OF ST LOUIS MO

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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	59.0	53.5	35.7	22.1	4.0	67.9	56.2	25.7	14.6
14-Jan	60.0	49.8	39.6	24.1	0.0	63.7	58.9	26.9	15.8
21-Jan	63.0	57.8	39.6	23.8	-2.0	63.0	58.7	27.4	16.1
28-Jan	60.0	50.7	43.0	24.6	6.0	57.4	56.0	29.3	15.5
4-Feb	65.0	51.8	42.7	25.6	2.0	54.6	52.6	27.2	17.0
11-Feb	64.0	52.6	41.8	24.2	4.0	49.0	50.7	25.8	15.1
18-Feb	68.0	52.5	42.6	26.0	3.0	53.2	55.8	28.1	16.5
25-Feb	70.0	53.0	47.6	29.1	10.0	61.6	59.8	30.9	18.7
4-Mar	73.0	60.0	47.8	28.6	10.0	65.8	65.3	31.3	18.7
11-Mar	76.5	64.3	52.7	32.9	11.0	81.2	69.7	36.6	22.4
18-Mar	78.0	63.1	56.7	35.8	18.0	81.9	70.1	39.8	24.1
25-Mar	80.0	60.0	59.6	38.3	23.0	79.8	68.6	42.9	24.5
1-Apr	80.0	62.6	57.6	39.2	26.0	82.6	73.9	44.3	26.4
8-Apr	83.0	64.2	62.0	39.4	28.0	81.9	68.9	43.3	26.1
15-Apr	82.0	64.8	64.6	43.5	29.0	87.5	72.5	54.1	30.8
22-Apr	84.0	61.9	69.3	48.3	33.0	94.5	71.2	61.9	38.7
29-Apr	89.0	67.8	71.9	49.8	37.0	88.2	74.2	62.6	39.3
6-May	85.0	66.6	69.1	49.6	39.0	96.6	71.4	63.1	41.1
13-May	86.0	69.6	75.2	53.1	38.0	109.2	77.9	76.1	51.2
20-May	90.0	73.0	78.5	56.8	47.0	120.4	83.7	84.4	55.2
27-May	89.0	72.3	77.5	58.5	47.0	121.1	81.9	88.0	62.0
3-Jun	90.0	72.9	79.8	60.1	47.0	125.3	80.8	90.5	65.0
10-Jun	89.0	71.0	80.7	59.7	50.0	121.1	80.0	93.2	65.0
17-Jun	93.0	78.0	86.4	64.9	52.0	138.6	86.8	109.2	78.9
24-Jun	98.0	71.8	87.8	66.6	56.0	134.4	83.4	111.5	82.5
1-Jul	95.0	74.6	86.8	66.1	57.0	134.4	83.2	108.9	80.3
8-Jul	96.0	75.6	89.3	68.9	60.0	142.8	87.7	119.9	86.7
15-Jul	98.0	79.0	87.8	69.0	59.0	147.0	86.6	119.0	90.2
22-Jul	96.0	77.5	88.0	69.0	63.0	147.7	85.9	120.1	92.9
29-Jul	95.0	80.4	87.6	67.6	59.0	148.4	88.8	119.1	89.8
5-Aug	100.0	79.2	87.2	67.6	57.0	144.2	93.8	116.2	90.0
12-Aug	96.0	77.2	87.5	66.2	54.0	147.7	87.5	115.6	85.7
19-Aug	99.0	78.0	86.8	65.9	54.0	143.5	86.6	114.9	86.6
26-Aug	94.0	76.0	87.5	66.3	56.0	137.2	85.8	113.0	83.6
2-Sep	95.0	74.7	84.8	64.2	51.0	133.7	86.3	107.9	80.8
9-Sep	95.0	77.0	83.5	63.0	48.0	125.3	83.5	102.1	75.1
16-Sep	92.0	74.3	80.8	60.0	46.0	123.2	85.0	93.4	66.6
23-Sep	86.0	70.4	73.6	53.0	39.0	121.1	74.5	79.8	52.4
30-Sep	87.0	68.6	74.5	50.9	37.0	105.7	76.2	71.4	49.0
7-Oct	83.0	66.6	72.5	48.5	35.0	100.8	69.8	69.1	43.6
14-Oct	85.0	62.8	69.5	45.2	32.0	94.5	72.5	58.9	38.4
21-Oct	83.0	67.0	67.6	45.8	32.0	91.0	69.6	58.4	36.5
28-Oct	79.0	64.6	66.4	43.6	32.0	94.5	69.2	54.1	34.3
4-Nov	79.0	61.2	60.6	40.5	21.0	87.5	68.8	48.2	29.2
11-Nov	72.0	59.2	53.9	34.7	12.0	81.2	64.4	41.0	23.8
18-Nov	74.0	60.0	55.7	37.3	16.0	79.1	66.5	44.5	26.7
25-Nov	70.0	56.0	53.2	34.8	21.0	75.6	63.4	39.7	23.3
2-Dec	72.0	57.3	49.3	32.1	19.0	86.1	68.8	36.8	21.7
9-Dec	64.0	51.4	47.2	29.5	10.0	65.8	58.2	32.5	18.7
16-Dec	64.0	56.0	43.7	26.7	-3.0	63.0	62.1	31.2	17.7
23-Dec	62.0	52.2	40.1	23.6	-12.0	58.1	54.7	29.1	16.0
31-Dec	61.0	59.3	38.6	23.9	4.0	75.6	61.5	27.3	16.1

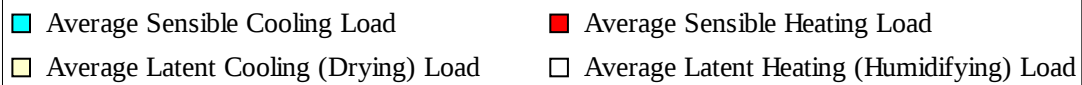
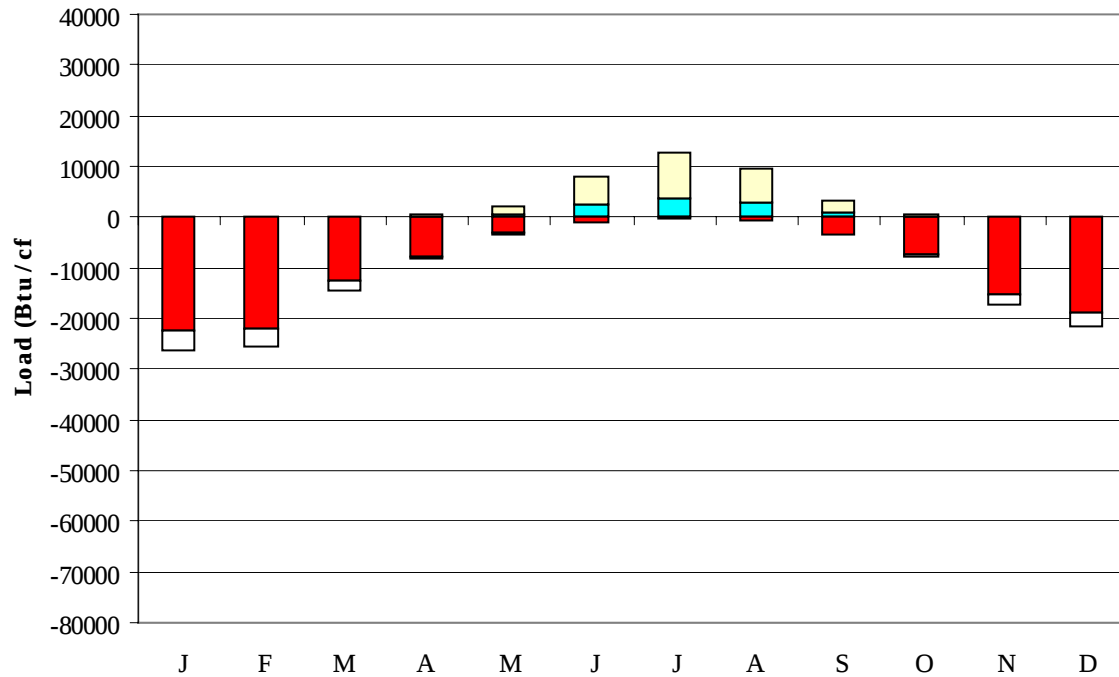
Degree Days, Heating and Cooling
(Base 65°F)



■ Mean Cooling Degree Days ■ Mean Heating Degree Days

	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	798
FEB	1	767
MAR	9	428
APR	29	240
MAY	71	84
JUN	155	21
JUL	212	4
AUG	167	12
SEP	82	92
OCT	27	229
NOV	4	516
DEC	0	661
ANN	758	3852

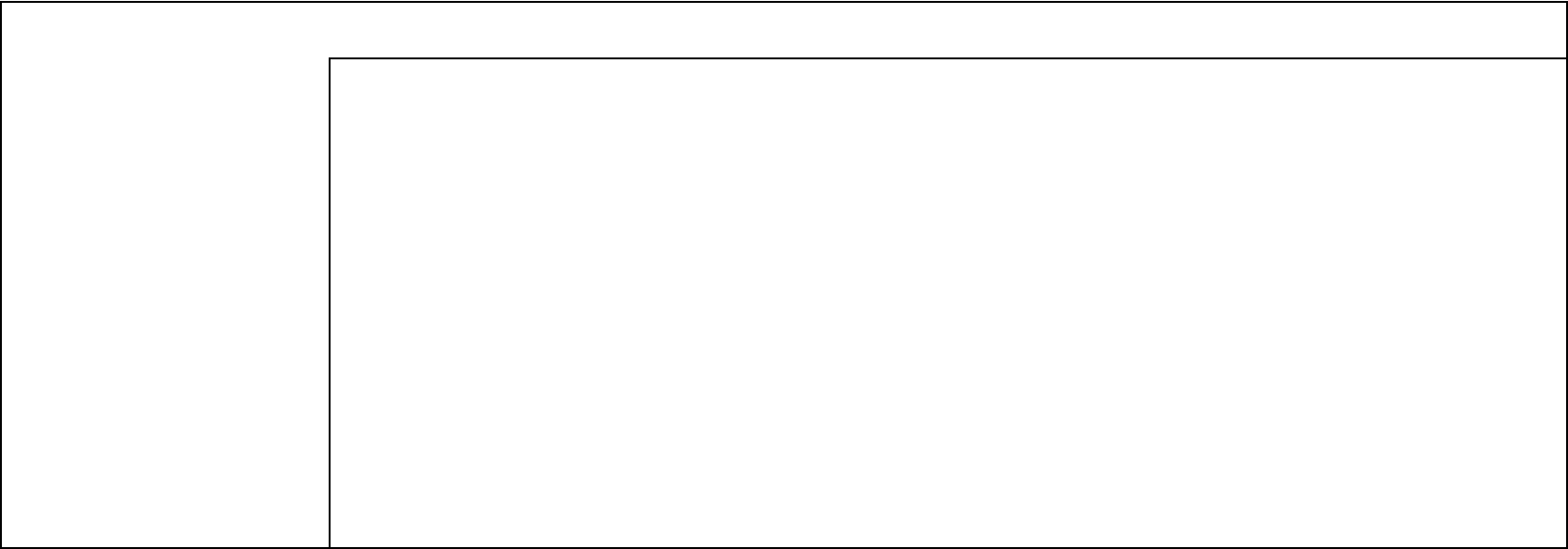
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	-22526	0	-3667
FEB	1	-21915	0	-3609
MAR	37	-12645	9	-1795
APR	225	-7627	105	-728
MAY	631	-3161	1501	-70
JUN	2483	-948	5655	-3
JUL	3630	-263	9116	0
AUG	2707	-573	6882	0
SEP	943	-3320	2487	-30
OCT	155	-7412	190	-466
NOV	13	-15276	24	-1945
DEC	0	-18818	1	-2749
ANN	10825	-114484	25970	-15062

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

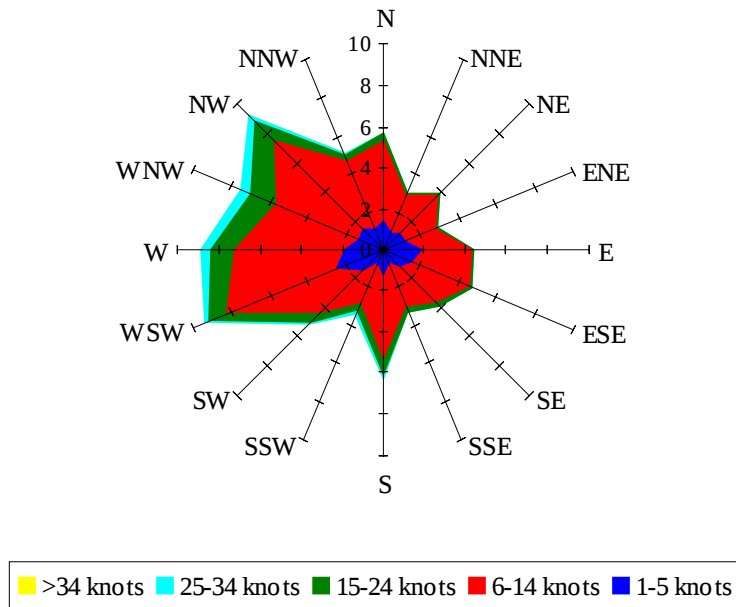
No Solar Radiation
Data Available



Average Annual Solar Heat and Illumination – Nearest Available Site

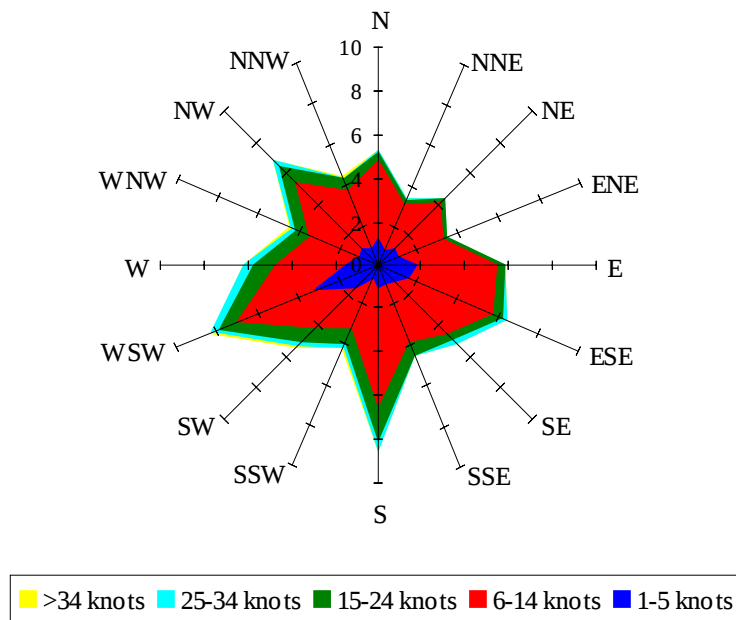
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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



Percent Calm = 14.01

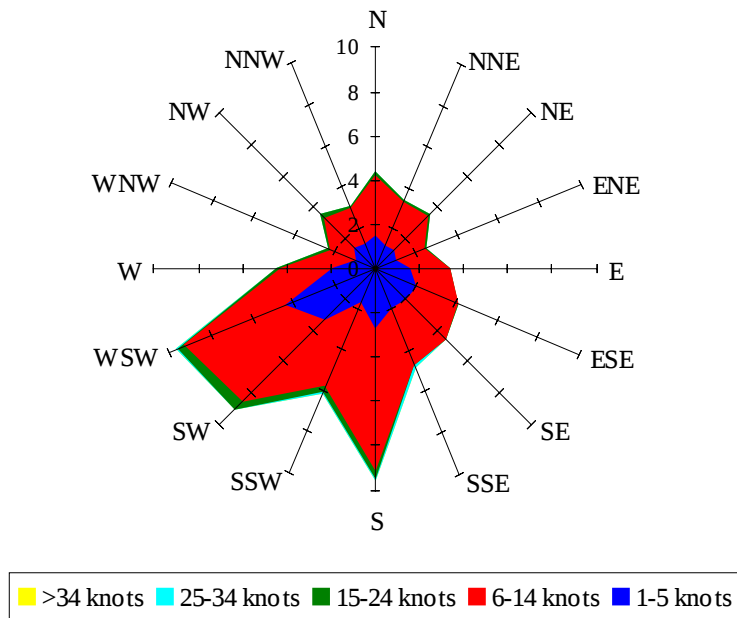
Wind Summary - March, April, and May **Labels of Percent Frequency on North Axis**



Percent Calm = 14.51

Wind Summary - June, July, and August

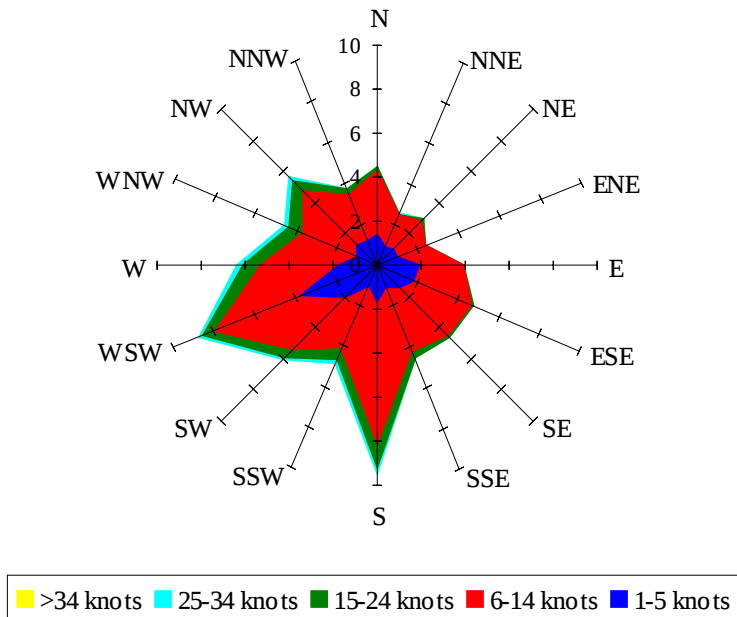
Labels of Percent Frequency on North Axis



Percent Calm = 22.93

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 20.43