

MEMPHIS	TN	
Latitude = 35.35 N		WMO No. 723345
Longitude = 89.87 W		Elevation = 322 feet
Period of Record = 1973 to 1996		Average Pressure = 29.68 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	78	108	5.9	W
0.4% Occurrence	97	77	110	5.8	W
1.0% Occurrence	95	77	110	6.2	SW
2.0% Occurrence	92	76	110	6.4	SSW
Mean Daily Range	19	-	-	-	-
97.5% Occurrence	25	23	13	5.9	N
99.0% Occurrence	19	17	9	6.3	N
99.6% Occurrence	13	12	7	6.5	N
Median of Extreme Lows	9	8	5	7.2	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	83	94	148	5.1	W
0.4% Occurrence	80	92	133	5.6	W
1.0% Occurrence	79	90	130	5.6	SW
2.0% Occurrence	78	89	126	5.7	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	157	91	1.03	4.8	SSE
0.4% Occurrence	138	85	0.90	5.2	SSW
1.0% Occurrence	133	85	0.88	4.6	S
2.0% Occurrence	129	84	0.85	4.8	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		167	1493	1212	2562

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
11	3.6	90	4.0 + 1.6
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 (#)
63.8	9	6	32

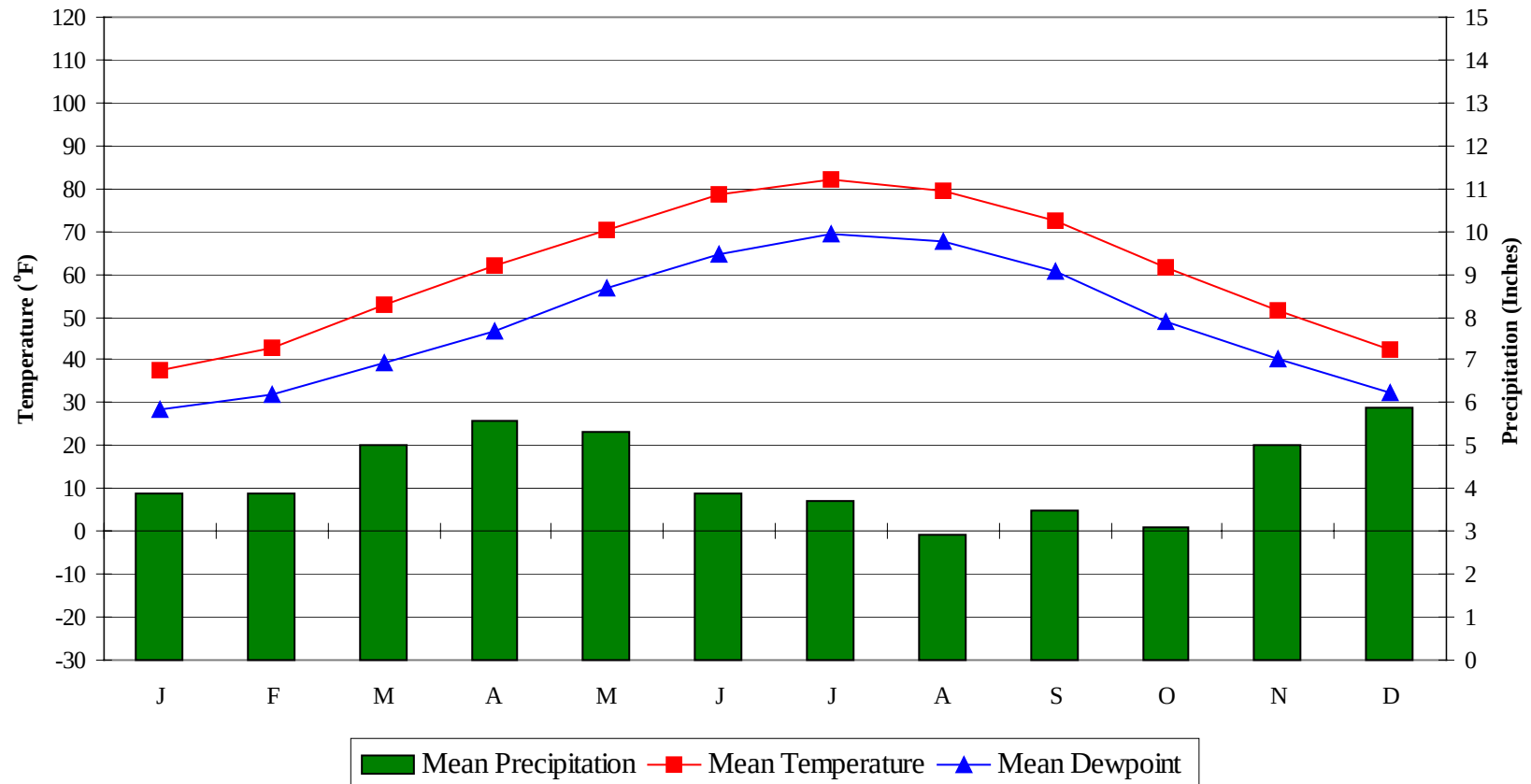
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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WMO No. 723345

Average Annual Climate

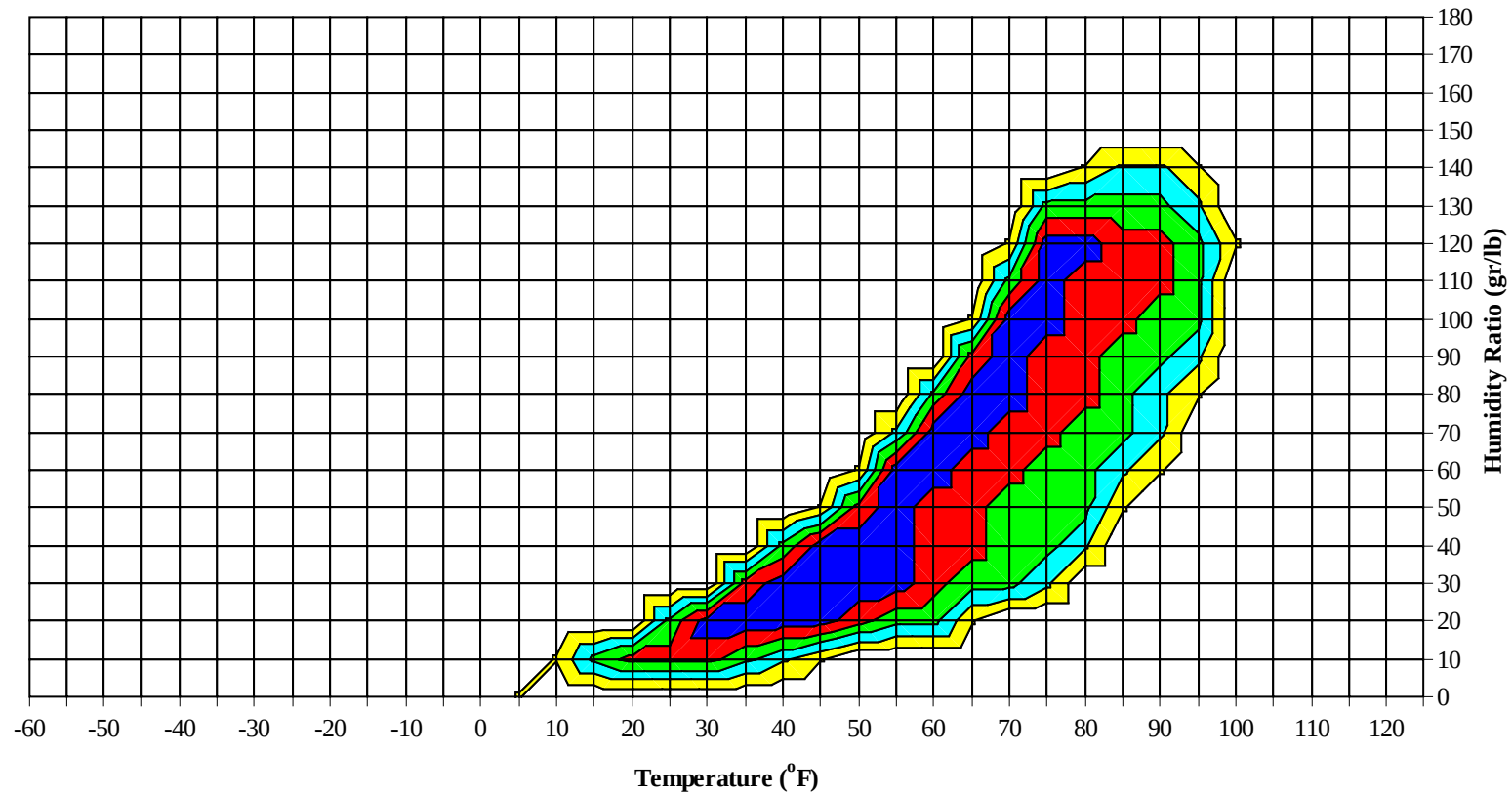


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WMO No. 723345

Long Term Psychrometric Summary



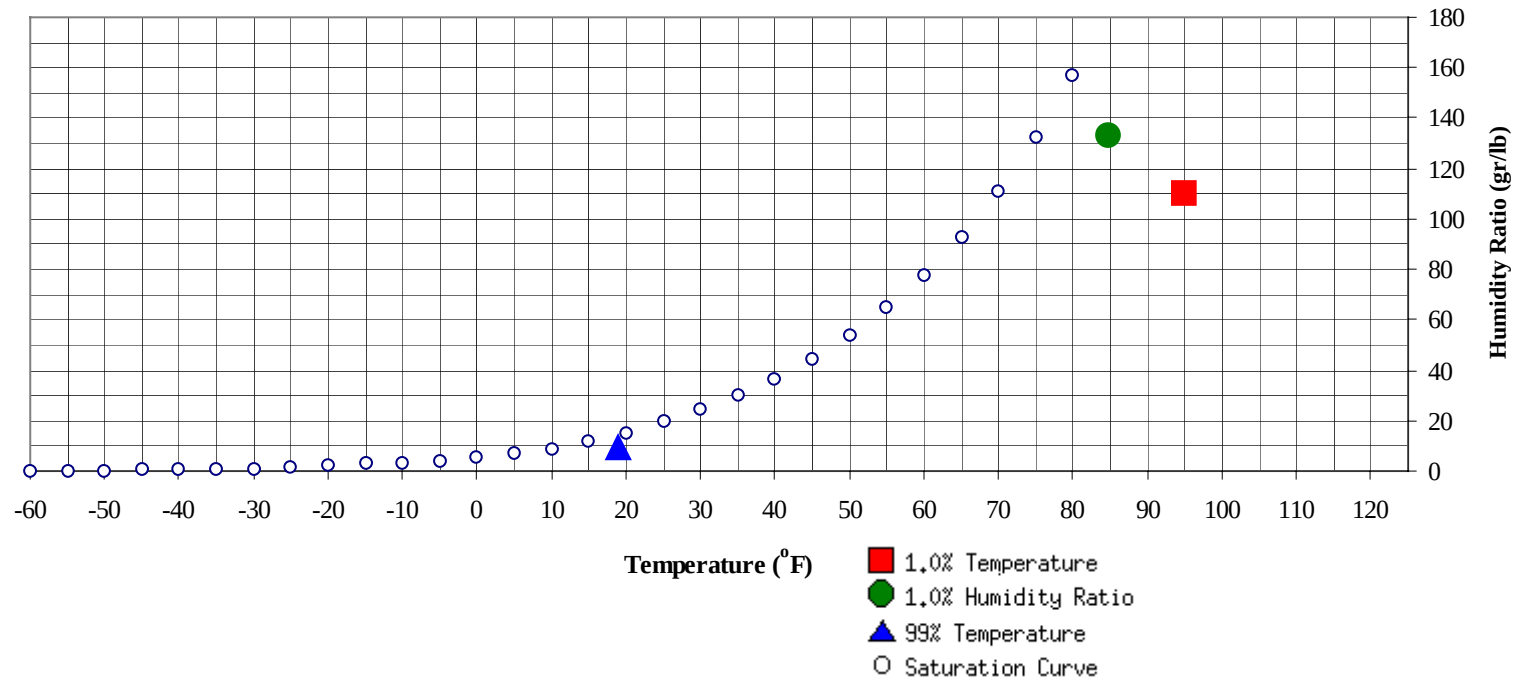
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	19	9.3	6.0		133	84.8	77.6	75	41.2

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	95	110.2	76.8	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															
80 / 84												4	1	5	63.2
75 / 79		0		0	65.0		1	0	1	59.7	0	16	7	23	61.9
70 / 74		1	0	1	63.4		7	2	9	58.9	4	25	16	46	60.1
65 / 69	1	5	3	9	59.7	2	15	8	25	56.5	13	32	24	70	57.4
60 / 64	4	12	8	24	55.2	9	22	16	48	54.6	22	35	32	89	53.9
55 / 59	6	19	12	37	51.0	12	25	20	58	50.5	33	34	38	105	50.3
50 / 54	11	27	21	59	46.3	17	26	23	67	46.1	34	34	38	106	46.1
45 / 49	20	32	26	79	42.0	27	28	32	88	42.1	37	26	33	96	41.9
40 / 44	29	40	38	108	37.9	30	26	35	92	37.8	38	21	31	89	37.5
35 / 39	44	40	43	127	33.7	37	25	28	91	33.4	34	13	17	64	33.5
30 / 34	49	31	38	118	29.4	37	24	27	89	29.1	23	7	9	39	29.5
25 / 29	37	21	27	85	24.6	24	13	15	52	24.4	5	1	1	7	24.8
20 / 24	21	13	17	51	19.9	15	7	9	31	19.9	2	0	1	3	20.0
15 / 19	13	5	7	25	15.4	8	3	4	15	15.6	1	0	0	1	16.4
10 / 14	6	2	3	11	10.8	3	1	1	5	11.1	0	0	0	0	12.0
5 / 9	3	1	2	6	5.9	1	0	1	2	6.6	0		0	0	
0 / 4	2	0	1	3	1.6	0		0	0	2.3					
-5 / -1	0	0	0	0	-2.9										
-10 / -6	0	0	0	0	-6.8										

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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WMO No. 723345

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	75.8
95 / 99							0	0	0	72.6		9	2	11	75.5
90 / 94		1	0	1	67.3		7	1	8	73.0	0	49	14	64	74.3
85 / 89		6	1	7	65.9	0	33	9	42	70.8	2	67	34	103	72.6
80 / 84		24	8	33	65.1	1	53	25	80	68.4	20	58	57	135	71.3
75 / 79	1	35	22	58	63.3	16	54	45	115	66.2	66	34	63	163	69.8
70 / 74	15	40	36	91	61.2	48	43	56	148	64.2	82	17	47	146	67.1
65 / 69	34	40	41	115	58.4	66	32	54	151	61.1	44	5	17	66	62.5
60 / 64	42	39	40	121	54.9	51	18	34	103	56.9	20	0	4	24	57.7
55 / 59	41	25	39	106	50.4	38	7	17	63	52.5	6		1	7	53.7
50 / 54	40	16	26	81	46.4	19	1	6	26	48.6	0			0	49.3
45 / 49	32	9	17	58	42.6	7	0	1	8	44.2					
40 / 44	21	4	8	33	38.5	1		0	1	39.7					
35 / 39	10	0	2	12	34.4	0			0	36.5					
30 / 34	3		0	3	30.3										
25 / 29	0		0	0	26.5										
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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WMO No. 723345

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		4	1	5	78.2		2	0	2	77.6		0		0	75.2
95 / 99		30	8	38	77.5		21	4	25	77.7		5	1	6	75.1
90 / 94	0	74	27	101	76.7	0	54	15	69	76.5		20	3	23	74.6
85 / 89	8	71	49	127	75.2	3	75	36	114	74.7	0	47	13	60	72.7
80 / 84	47	44	66	157	73.8	23	56	59	138	73.0	4	56	30	90	70.6
75 / 79	97	19	65	180	72.1	79	28	72	178	71.5	34	46	53	133	69.4
70 / 74	73	6	26	105	68.9	88	12	43	142	68.5	64	31	52	147	66.7
65 / 69	18	1	5	24	63.6	39	1	15	55	63.6	45	21	37	104	61.8
60 / 64	5		1	6	59.4	12	0	3	15	58.8	38	10	26	74	57.4
55 / 59	0			0	56.3	3		1	4	54.4	30	4	16	50	53.1
50 / 54						1			1	49.3	16	1	6	23	48.7
45 / 49											6		2	8	44.1
40 / 44											2		0	2	39.7
35 / 39											0			0	37.0
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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WMO No. 723345

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	71.9										
85 / 89		8	1	9	69.3										
80 / 84	0	25	4	29	67.3		1		1	63.0					
75 / 79	3	42	14	59	64.6		11	2	13	64.0		1	0	1	68.3
70 / 74	11	48	32	91	62.6	4	24	11	39	62.5	1	3	1	5	64.9
65 / 69	32	44	43	119	59.8	14	29	23	66	59.8	5	13	7	25	60.8
60 / 64	39	38	42	119	55.3	24	35	30	89	55.7	9	18	14	41	55.9
55 / 59	42	25	44	111	51.6	26	37	32	95	50.5	14	26	18	59	51.2
50 / 54	44	12	30	86	47.5	32	35	34	100	46.5	18	35	25	79	46.1
45 / 49	36	4	25	65	43.3	32	32	36	99	42.3	23	42	34	100	41.9
40 / 44	26	1	10	37	39.2	39	21	35	94	38.1	42	42	47	130	37.9
35 / 39	13	1	2	16	35.1	34	10	23	66	33.6	40	30	40	111	33.4
30 / 34	2		1	3	30.6	22	3	12	37	29.5	42	18	29	89	29.2
25 / 29	0		0	0	26.5	10	1	3	14	25.1	30	10	14	54	24.8
20 / 24						3	1	1	5	20.1	11	5	9	25	19.9
15 / 19						0			0	16.0	7	4	4	15	15.2
10 / 14											2	1	2	5	10.6
5 / 9											2	1	1	4	5.5
0 / 4											0	0	1	1	0.7
-5 / -1											1	0		1	-2.9
-10 / -6															

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WMO No. 723345

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		7	1	8	77.7
95 / 99		65	15	80	77.1
90 / 94	1	205	61	267	75.7
85 / 89	13	308	143	464	73.5
80 / 84	95	323	253	672	71.3
75 / 79	299	285	344	928	69.0
70 / 74	394	259	322	975	65.4
65 / 69	314	237	280	830	60.4
60 / 64	277	227	249	754	55.7
55 / 59	251	201	238	690	51.1
50 / 54	232	187	210	629	46.6
45 / 49	221	171	207	599	42.3
40 / 44	226	154	202	582	38.0
35 / 39	210	119	156	485	33.6
30 / 34	178	83	117	377	29.3
25 / 29	106	45	61	212	24.7
20 / 24	53	26	36	115	19.9
15 / 19	28	11	15	54	15.5
10 / 14	11	5	5	21	10.8
5 / 9	7	2	4	13	5.9
0 / 4	2	1	1	4	1.3
-5 / -1	1	0	0	1	-2.9
-10 / -6	0	0	0	0	-6.8

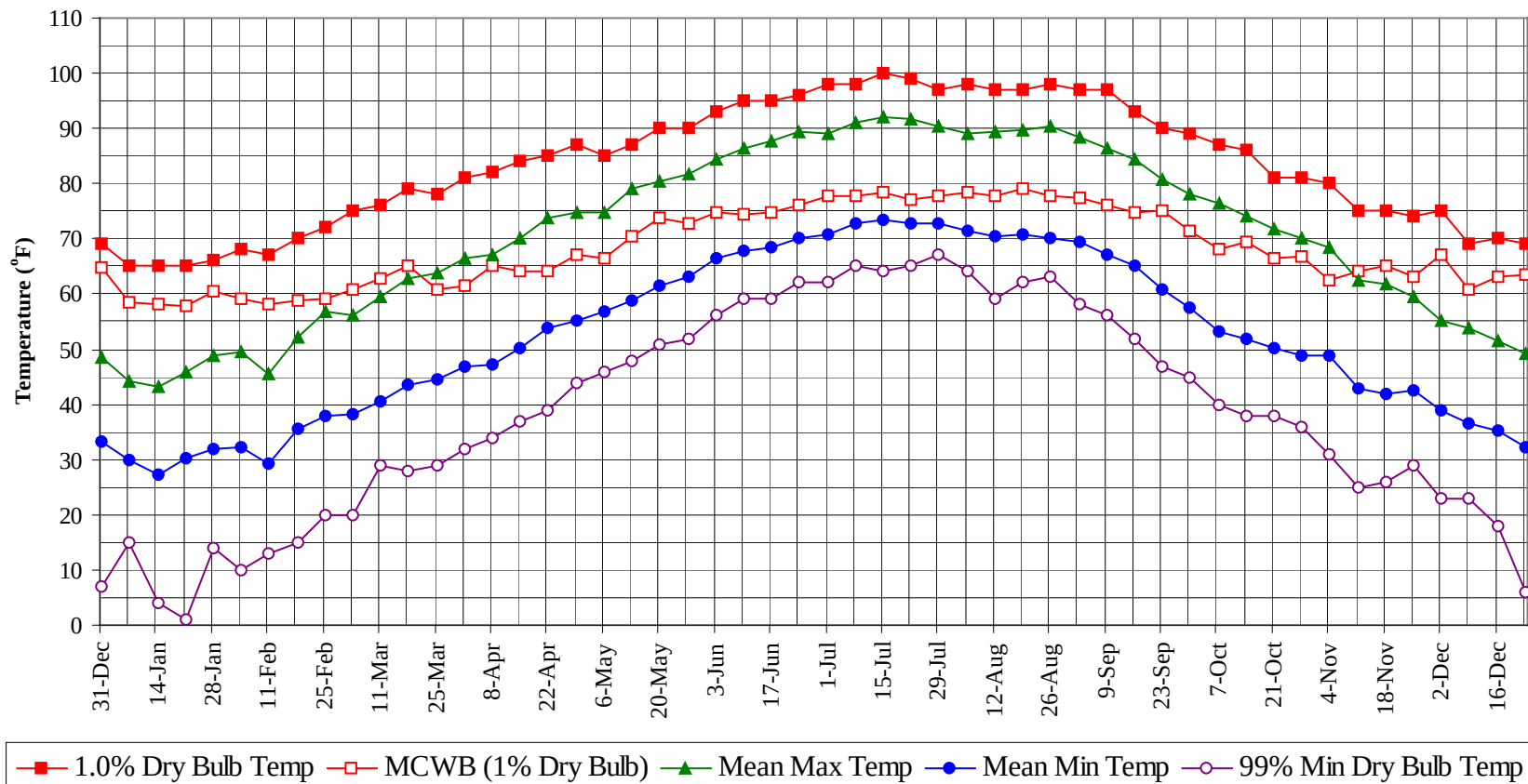
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

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WMO No. 723345

Annual Summary of Temperatures

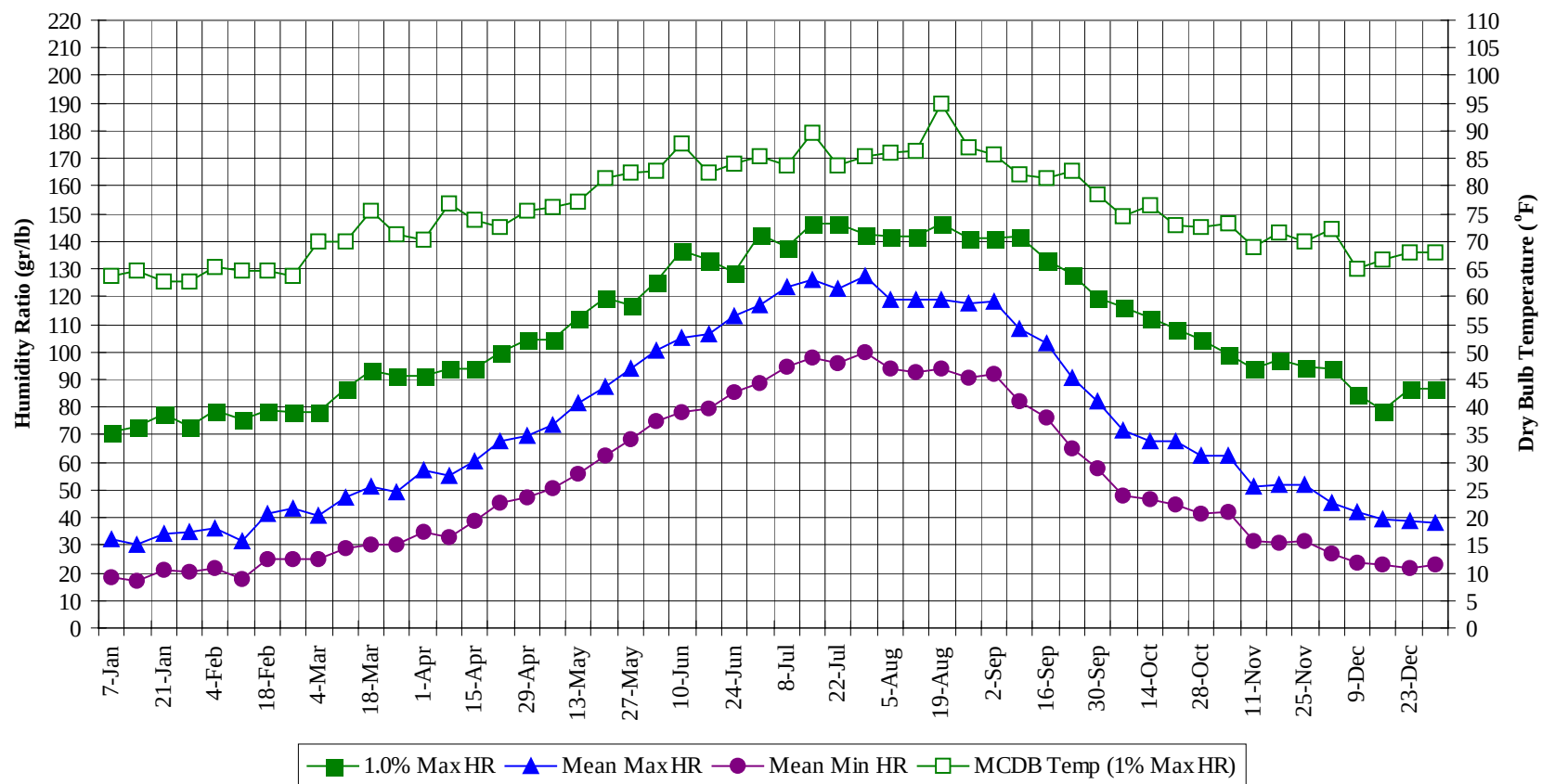


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WMO No. 723345

Long Term Humidity and Dry Bulb Temperature Summary



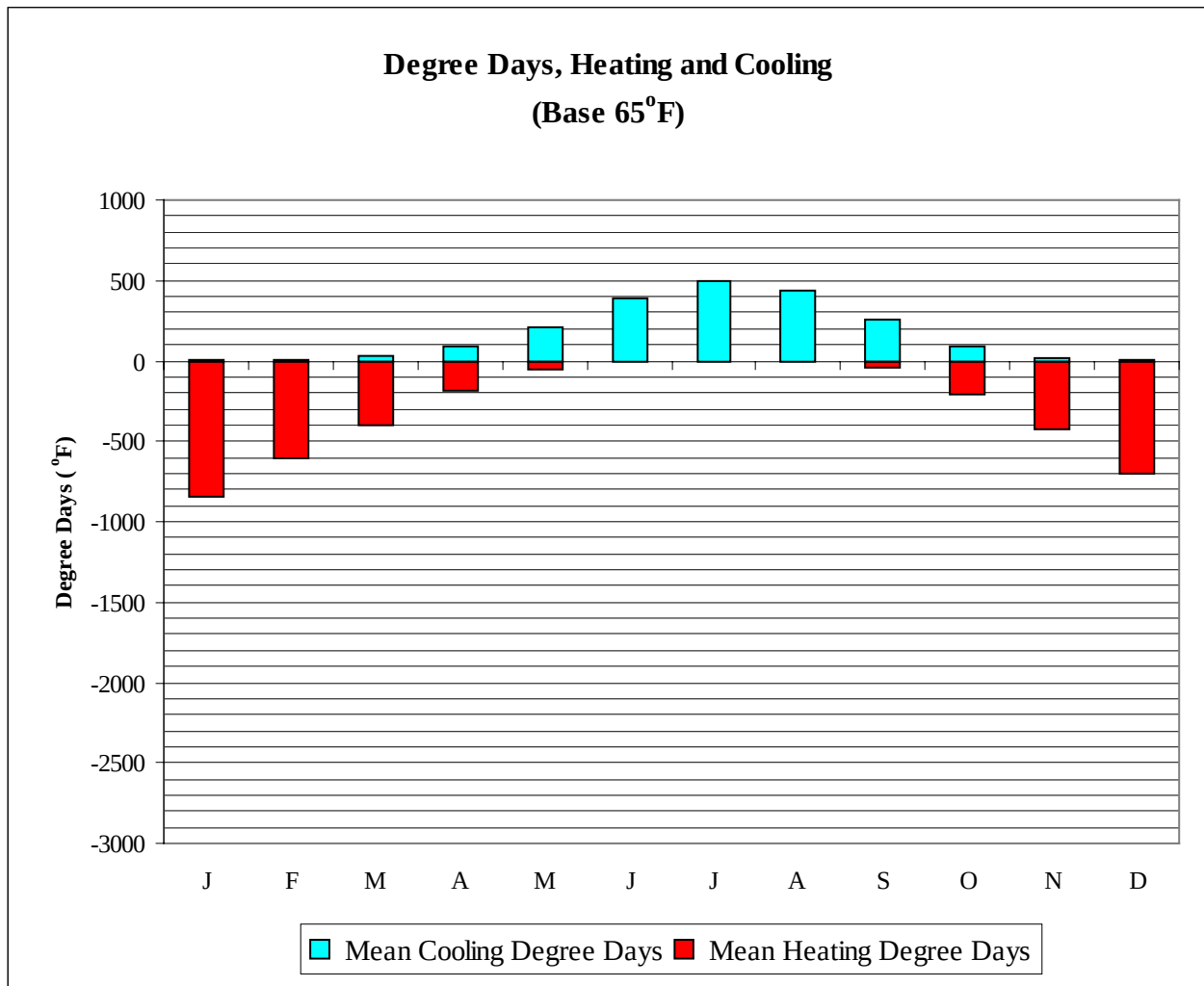
MEMPHIS**TN****WMO No. 723345****Long Term Dry Bulb Temperature and Humidity Summary**

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	65.0	58.6	44.4	29.8	15.0	70.7	63.7	32.0	18.4
14-Jan	65.0	58.2	43.3	27.1	4.0	72.8	64.6	30.5	17.2
21-Jan	65.0	57.9	45.7	30.1	1.0	77.7	62.7	34.4	21.0
28-Jan	66.0	60.5	48.8	31.8	14.0	72.8	62.7	34.7	20.4
4-Feb	68.0	59.3	49.7	32.4	10.0	79.1	65.3	36.0	21.4
11-Feb	67.0	58.1	45.7	29.1	13.0	75.6	64.6	31.3	18.0
18-Feb	70.0	58.8	52.3	35.5	15.0	79.1	64.6	41.7	25.1
25-Feb	72.0	59.0	56.9	37.8	20.0	78.4	63.8	43.1	25.3
4-Mar	75.0	60.7	56.3	38.3	20.0	78.4	69.9	40.8	25.2
11-Mar	76.0	63.0	59.5	40.6	29.0	86.8	69.8	47.6	28.8
18-Mar	79.0	65.3	63.0	43.5	28.0	93.1	75.7	51.2	30.1
25-Mar	78.0	60.9	63.7	44.7	29.0	91.0	71.3	49.4	29.9
1-Apr	81.0	61.4	66.3	47.0	32.0	91.0	70.2	56.9	34.7
8-Apr	82.0	65.3	67.2	47.3	34.0	93.8	76.8	55.0	33.0
15-Apr	84.0	64.2	70.2	50.2	37.0	93.8	73.8	60.3	38.4
22-Apr	85.0	64.1	73.6	53.9	39.0	100.1	72.5	67.8	45.0
29-Apr	87.0	67.1	74.8	55.2	44.0	104.3	75.4	69.7	47.5
6-May	85.0	66.5	74.7	56.9	46.0	104.3	76.1	73.3	50.4
13-May	87.0	70.4	78.9	58.8	48.0	112.0	77.1	81.5	55.6
20-May	90.0	73.9	80.4	61.6	51.0	119.7	81.4	87.6	62.5
27-May	90.0	72.8	81.7	63.3	52.0	116.9	82.4	94.0	68.1
3-Jun	93.0	74.8	84.4	66.3	56.0	125.3	82.7	100.7	74.7
10-Jun	95.0	74.6	86.4	67.9	59.0	136.5	87.7	105.2	78.1
17-Jun	95.0	74.9	87.8	68.4	59.0	133.0	82.3	106.1	79.2
24-Jun	96.0	76.2	89.5	70.1	62.0	128.8	83.9	113.2	85.5
1-Jul	98.0	77.9	89.2	70.8	62.0	142.8	85.5	117.2	88.5
8-Jul	98.0	77.7	91.2	72.7	65.0	137.9	83.7	123.1	94.6
15-Jul	100.0	78.6	92.1	73.3	64.0	146.3	89.8	125.9	98.0
22-Jul	99.0	77.2	91.8	72.6	65.0	146.3	83.8	122.8	96.0
29-Jul	97.0	77.7	90.5	72.6	67.0	142.8	85.4	127.3	99.6
5-Aug	98.0	78.5	89.1	71.3	64.0	142.1	85.9	119.2	94.1
12-Aug	97.0	77.8	89.2	70.4	59.0	142.1	86.3	119.0	92.9
19-Aug	97.0	78.9	89.7	70.8	62.0	146.3	94.7	118.6	93.7
26-Aug	98.0	77.7	90.5	70.2	63.0	141.4	87.1	117.6	90.3
2-Sep	97.0	77.3	88.5	69.5	58.0	141.4	85.7	118.5	91.8
9-Sep	97.0	76.0	86.5	67.2	56.0	142.1	82.2	108.4	82.1
16-Sep	93.0	74.9	84.3	65.0	52.0	133.0	81.3	103.3	76.0
23-Sep	90.0	75.0	80.7	60.9	47.0	128.1	82.7	90.6	64.9
30-Sep	89.0	71.3	78.2	57.6	45.0	119.7	78.3	82.1	58.1
7-Oct	87.0	68.2	76.4	53.3	40.0	116.2	74.7	71.9	47.7
14-Oct	86.0	69.6	74.2	52.0	38.0	112.0	76.5	68.0	46.6
21-Oct	81.0	66.5	71.7	50.2	38.0	108.5	72.9	67.5	44.8
28-Oct	81.0	66.8	70.0	48.7	36.0	104.3	72.6	62.4	41.5
4-Nov	80.0	62.6	68.4	48.9	31.0	99.4	73.2	62.7	41.8
11-Nov	75.0	64.1	62.6	43.0	25.0	93.8	69.0	51.2	31.5
18-Nov	75.0	65.2	61.7	41.8	26.0	97.3	71.7	51.9	31.1
25-Nov	74.0	63.2	59.5	42.6	29.0	94.5	69.9	52.1	31.5
2-Dec	75.0	67.1	55.1	38.8	23.0	93.8	72.4	45.3	27.3
9-Dec	69.0	60.7	53.8	36.5	23.0	84.7	65.1	42.2	23.9
16-Dec	70.0	63.3	51.5	35.2	18.0	79.1	66.7	39.4	22.9
23-Dec	69.0	63.4	49.2	32.2	6.0	86.8	68.1	38.6	21.5
31-Dec	69.0	64.7	48.4	33.1	7.0	86.8	68.1	38.3	22.9

MEMPHIS

TN

WMO No. 723345

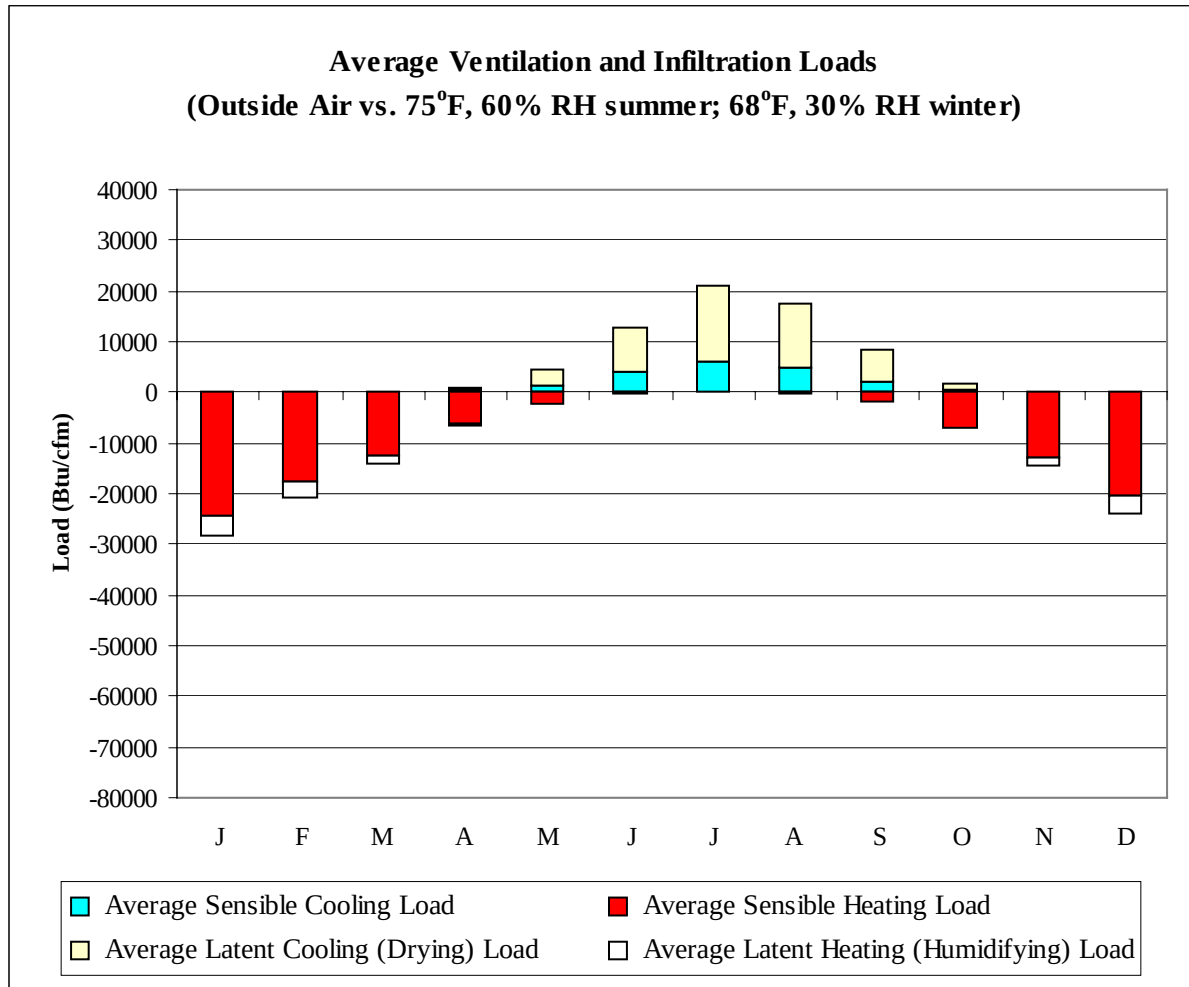


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	1	840
FEB	4	605
MAR	31	404
APR	89	185
MAY	207	52
JUN	390	5
JUL	500	1
AUG	437	3
SEP	257	43
OCT	84	204
NOV	21	420
DEC	3	697
ANN	2025	3459

MEMPHIS

TN

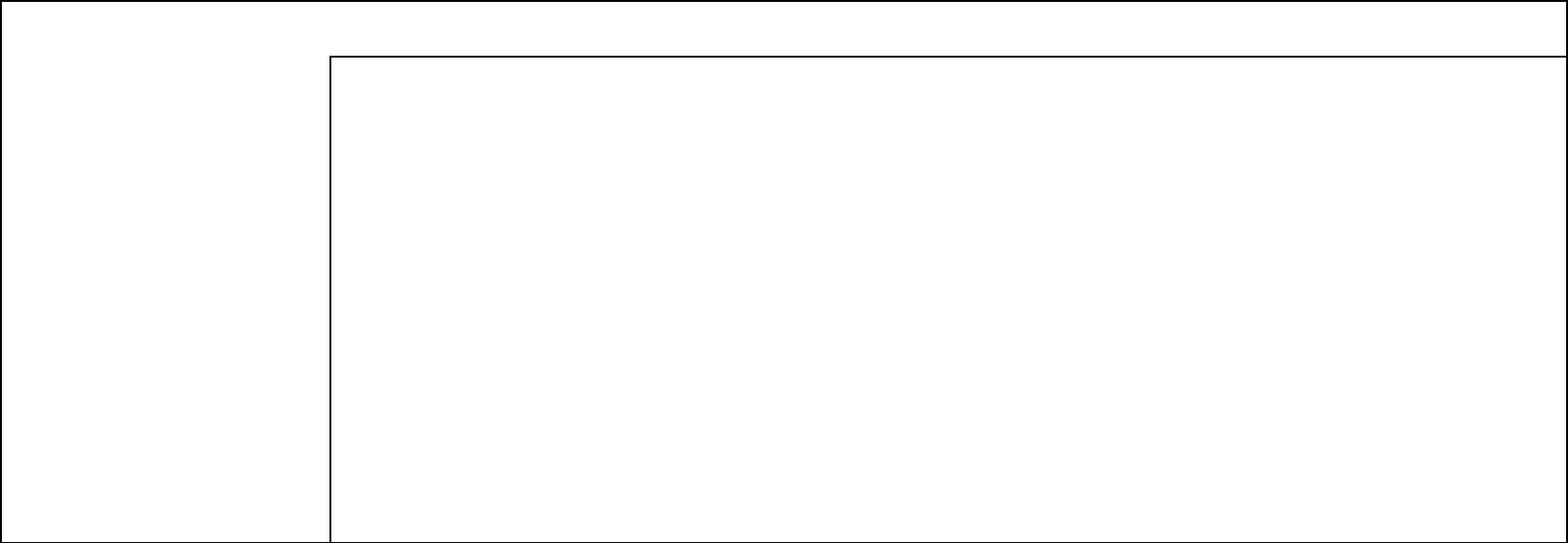
WMO No. 723345



	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	-24174	6	-4300
FEB	2	-17733	13	-3026
MAR	66	-12522	128	-1594
APR	446	-6322	488	-438
MAY	1479	-2170	3000	-25
JUN	4060	-281	8690	0
JUL	6013	-52	14939	0
AUG	4811	-181	12714	0
SEP	2197	-1745	6151	-8
OCT	422	-6854	1146	-271
NOV	26	-12916	274	-1529
DEC	2	-20417	75	-3341
ANN	19524	-105367	47624	-14532

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

No Solar Radiation
Data Available

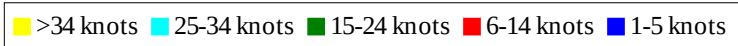
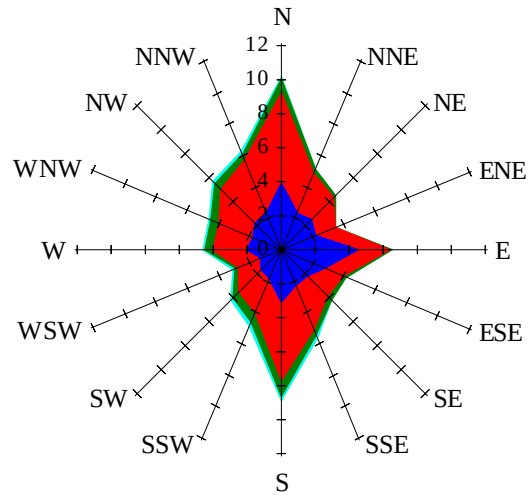


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

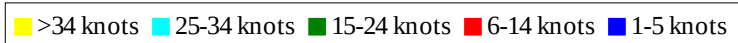
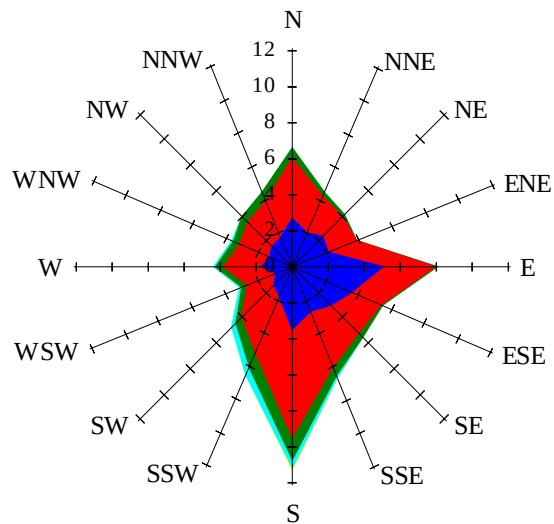
Labels of Percent Frequency on North Axis



Percent Calm = 15.44

Wind Summary - March, April, and May

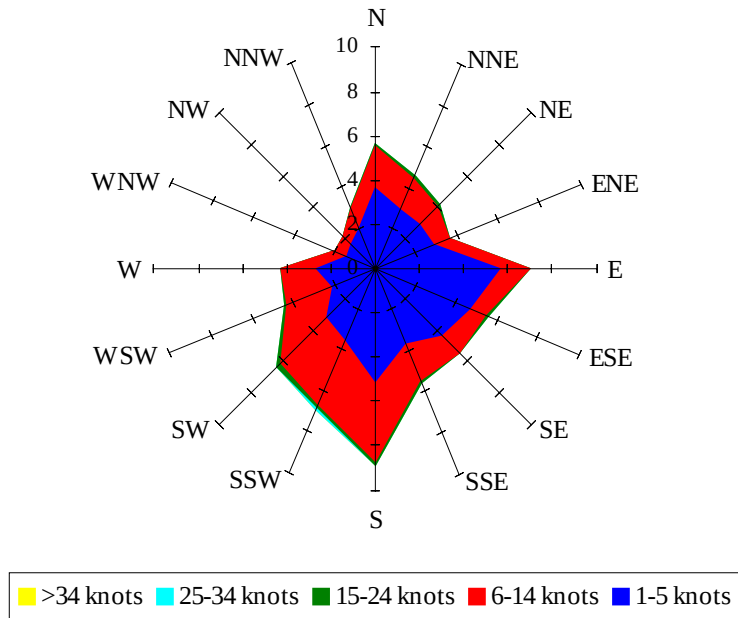
Labels of Percent Frequency on North Axis



Percent Calm = 14.17

Wind Summary - June, July, and August

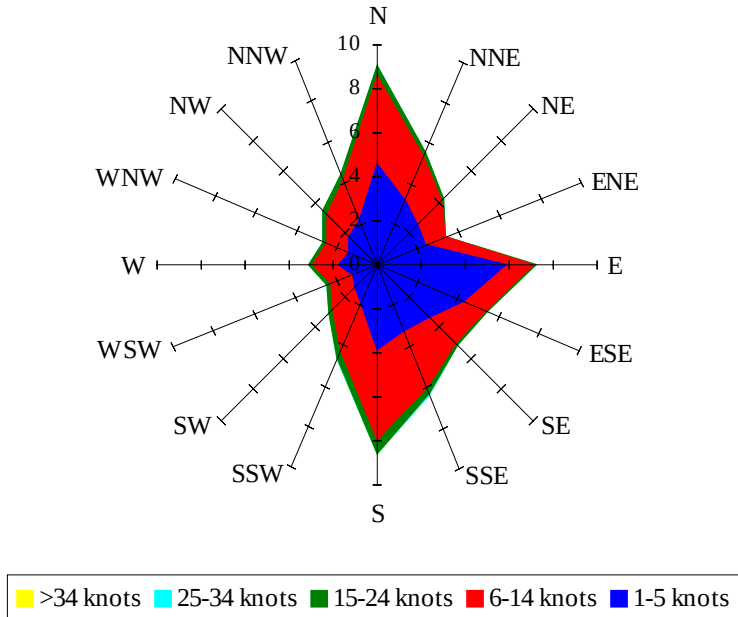
Labels of Percent Frequency on North Axis



Percent Calm = 21.36

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 21.39