

ATHENS/HELLINIKON GR

Latitude = 37.90 N

WMO No. 167160

Longitude = 23.73 E

Elevation = 49 feet

Period of Record = 1973 to 1996

Average Pressure = 29.87 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	99	70	65	14.6	NNE
0.4% Occurrence	93	69	67	13.8	NNE
1.0% Occurrence	91	68	68	13.7	NNE
2.0% Occurrence	90	69	71	12.9	NNE
Mean Daily Range	14	-	-	-	-
97.5% Occurrence	41	37	25	9.2	N
99.0% Occurrence	38	34	23	8.3	NNE
99.6% Occurrence	36	32	21	9.6	N
Median of Extreme Lows	32	29	19	8.7	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	78	90	125	7.4	SSW
0.4% Occurrence	75	85	114	7.6	SSW
1.0% Occurrence	73	84	104	7.3	SSW
2.0% Occurrence	72	84	98	7.9	SSW
	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	133	84	0.88	6.0	SSW
0.4% Occurrence	117	82	0.78	5.8	SW
1.0% Occurrence	110	81	0.74	6.0	SSW
2.0% Occurrence	103	79	0.69	5.4	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		61	1178	132	1137

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	N/A	N/A	0.7 + 1.2
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 (#)
66.5	N/A	N/A	1

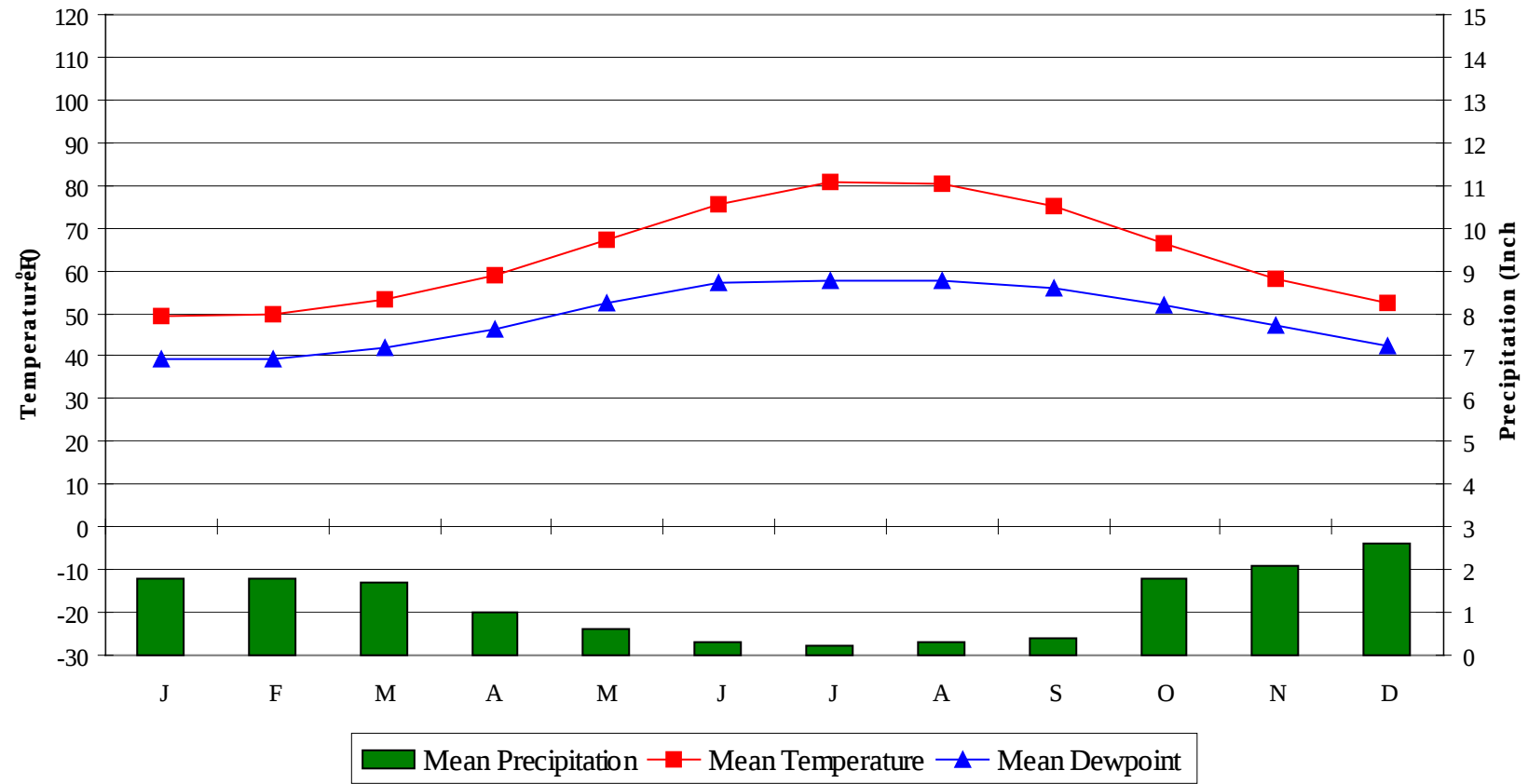
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

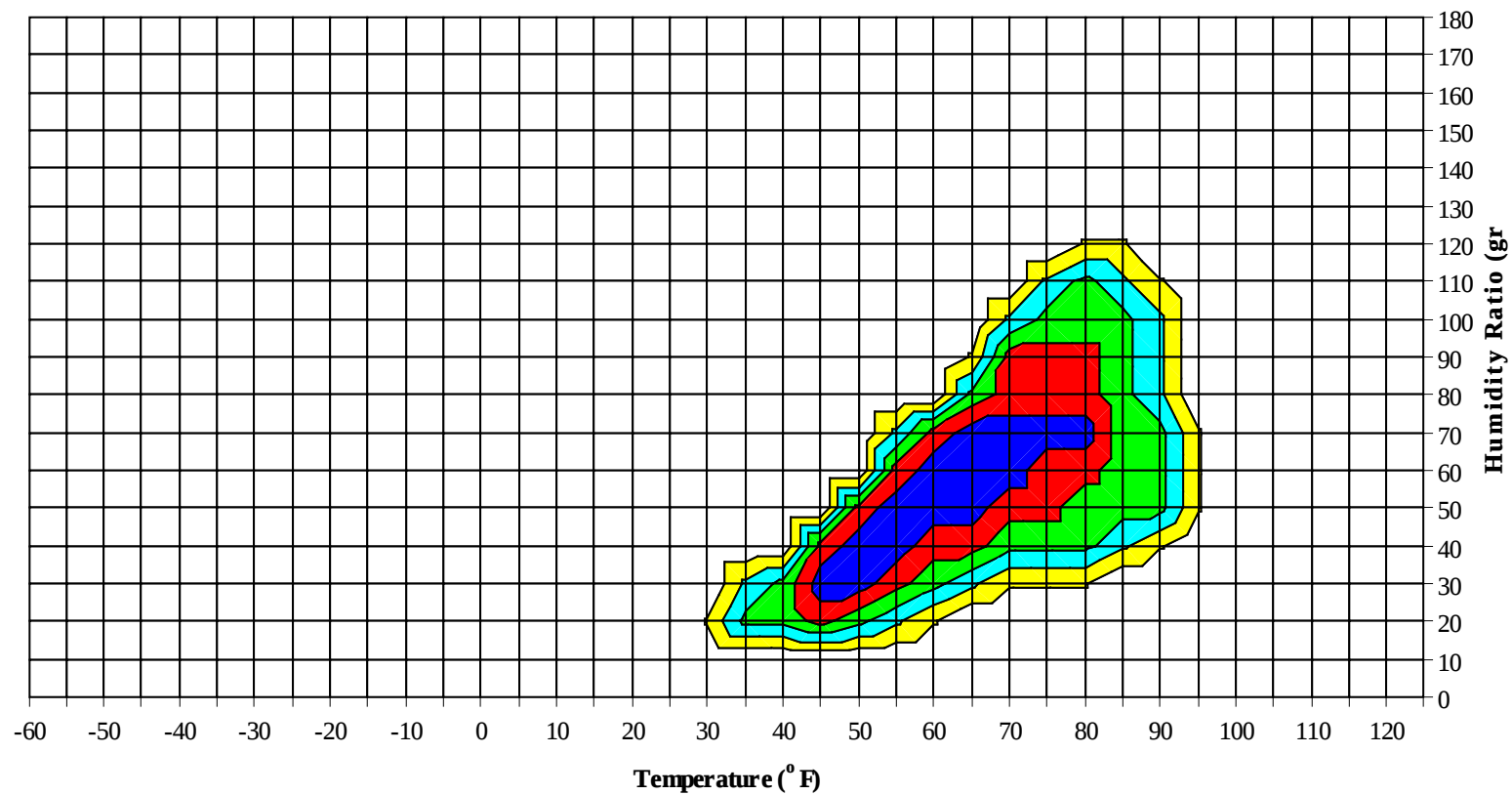


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Long Term Psychrometric Summary

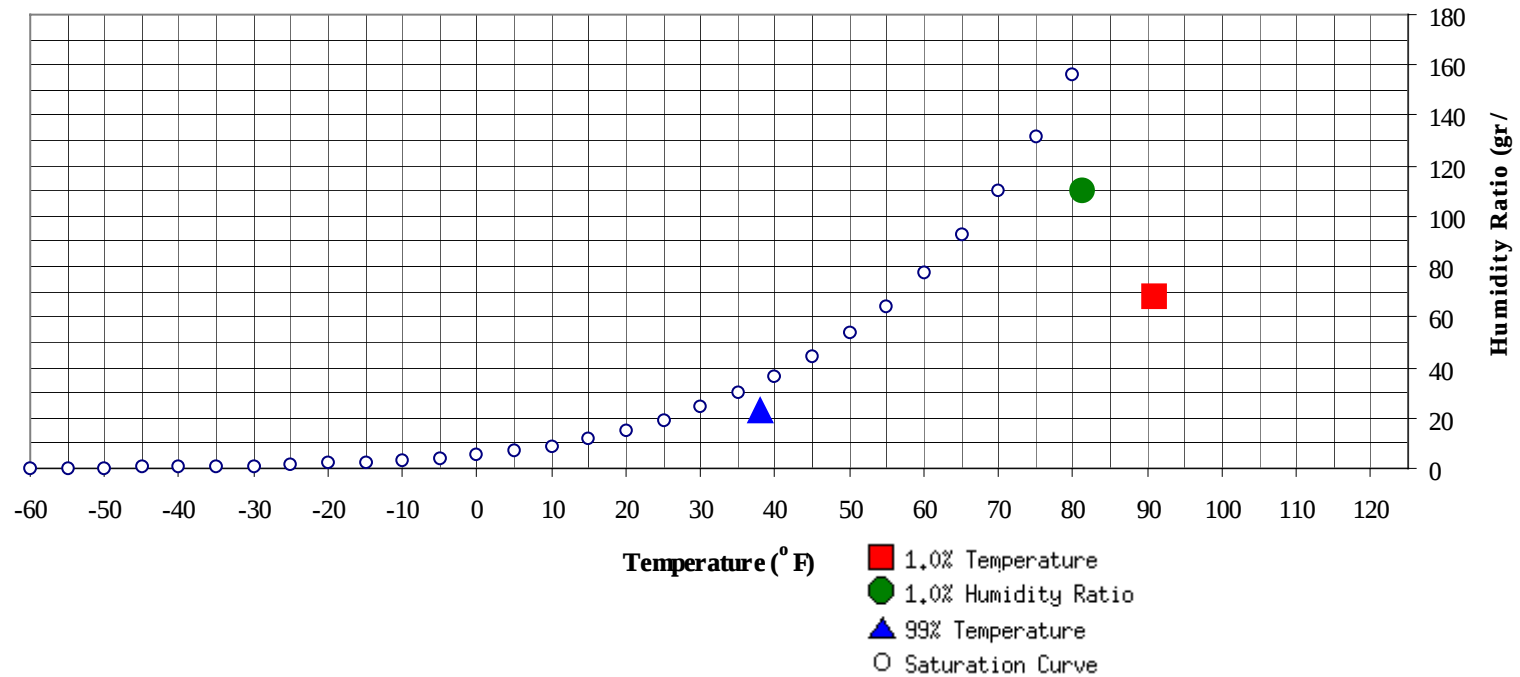


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	38	22.8	12.6		109.9	81.1	73.3	69.8	36.7

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	91	67.8	68.4	32.5

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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															
85 / 89															
80 / 84															
75 / 79												0	0	0	56.4
70 / 74							0		0	56.7		2	1	3	56.4
65 / 69		1	0	1	58.3		2	0	3	56.5	0	11	3	14	56.2
60 / 64	3	23	7	32	55.2	2	29	10	42	54.6	4	67	30	101	54.5
55 / 59	24	71	50	145	51.4	26	67	51	144	51.5	43	83	83	209	51.0
50 / 54	57	78	77	212	46.7	52	58	68	178	47.0	90	53	78	221	47.1
45 / 49	89	50	73	211	42.1	76	43	57	176	42.0	74	21	37	132	42.4
40 / 44	46	16	27	90	37.7	41	15	25	81	37.6	24	5	10	40	37.8
35 / 39	25	7	13	45	33.9	21	6	9	37	33.6	11	3	5	19	33.8
30 / 34	4	1	1	7	30.0	6	2	3	11	29.2	3	1	1	5	29.3
25 / 29	0			0	23.3	1	0	0	1	25.5	0			0	26.0

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 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												1	0	2	68.6
90 / 94							1		1	67.8		11	3	14	67.5
85 / 89							4	1	5	65.7		0	27	11	38
80 / 84		0		0	61.2	0	17	7	24	64.2	7	82	44	133	66.9
75 / 79		4	1	5	58.9	4	51	21	76	63.3	47	82	83	212	65.0
70 / 74	0	27	8	36	58.4	23	92	63	178	61.1	100	29	73	202	62.9
65 / 69	2	47	22	71	56.9	46	49	62	157	59.0	56	3	20	79	60.2
60 / 64	32	102	81	215	54.8	106	28	75	208	56.4	27	2	6	35	57.3
55 / 59	97	44	86	227	51.5	59	4	20	83	52.8	3	0	1	4	53.3
50 / 54	85	13	37	136	47.7	10	0	2	12	48.3					
45 / 49	22	1	5	28	43.4	1			1	43.7					
40 / 44	2	0	0	2	38.8										
35 / 39	0		0	0	35.0										
30 / 34															
25 / 29															

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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		
105 / 109		0	0	0	74.4										
100 / 104		1	0	1	72.0		1	0	1	70.9					
95 / 99		11	3	14	70.1		10	2	11	69.2		1	0	1	67.4
90 / 94	1	51	19	71	68.9	0	46	15	61	68.4		6	1	7	68.8
85 / 89	3	68	34	105	68.2	2	70	33	105	68.5	0	28	6	34	67.6
80 / 84	38	90	87	215	67.2	30	94	86	211	67.2	3	88	34	124	66.9
75 / 79	116	23	81	219	65.1	117	24	87	228	65.2	34	85	87	206	64.8
70 / 74	78	2	22	102	63.1	86	2	24	112	62.4	113	27	85	225	62.1
65 / 69	11	0	2	13	60.2	12	0	1	13	59.6	60	3	20	83	58.8
60 / 64	3	0	0	3	57.7	1		0	2	59.2	27	2	6	35	55.0
55 / 59											3	0	1	4	51.1
50 / 54															
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															

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 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		0		0	68.2										
85 / 89		2	0	2	66.7										
80 / 84		13	2	15	66.9										
75 / 79	3	53	16	72	65.0		2	0	2	65.2					
70 / 74	29	86	65	180	62.1	1	19	4	24	62.4					
65 / 69	51	38	60	149	59.1	10	45	21	77	60.2		5	0	5	58.8
60 / 64	90	36	66	191	55.6	42	79	75	195	56.4	14	53	26	93	56.1
55 / 59	56	13	31	100	51.3	83	55	73	211	51.7	48	84	75	207	51.9
50 / 54	19	3	8	31	47.4	62	29	49	140	46.7	77	57	78	212	47.2
45 / 49	3	1	1	4	44.0	35	7	17	59	41.9	70	33	48	151	42.2
40 / 44						7	1	2	10	37.9	27	8	15	50	37.9
35 / 39						1	0	0	2	35.8	14	4	7	25	34.6
30 / 34						0		0	0	32.0	1	0	0	1	31.4
25 / 29															

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		0	0	0	74.4
100 / 104		2	0	2	71.6
95 / 99		23	5	27	69.6
90 / 94	1	114	38	152	68.6
85 / 89	5	197	85	287	68.1
80 / 84	77	382	257	717	67.0
75 / 79	318	324	375	1016	64.9
70 / 74	428	288	346	1062	62.1
65 / 69	248	207	213	667	59.0
60 / 64	351	422	384	1157	55.7
55 / 59	442	424	471	1337	51.6
50 / 54	454	292	398	1143	47.1
45 / 49	372	155	238	766	42.2
40 / 44	147	46	81	274	37.7
35 / 39	73	21	34	127	33.9
30 / 34	14	3	6	23	29.5
25 / 29	1	0	0	1	24.8

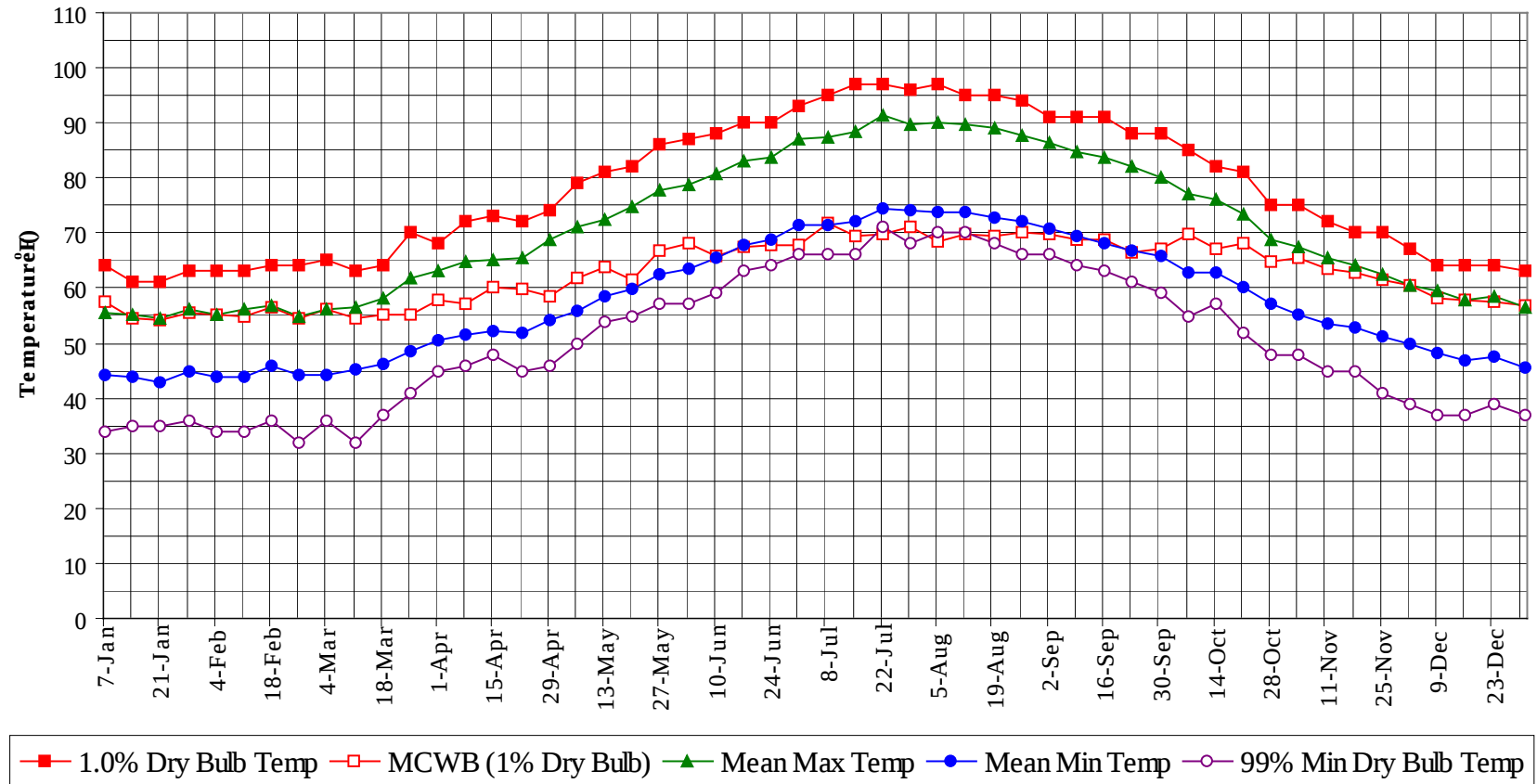
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

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Annual Summary of Temperatures

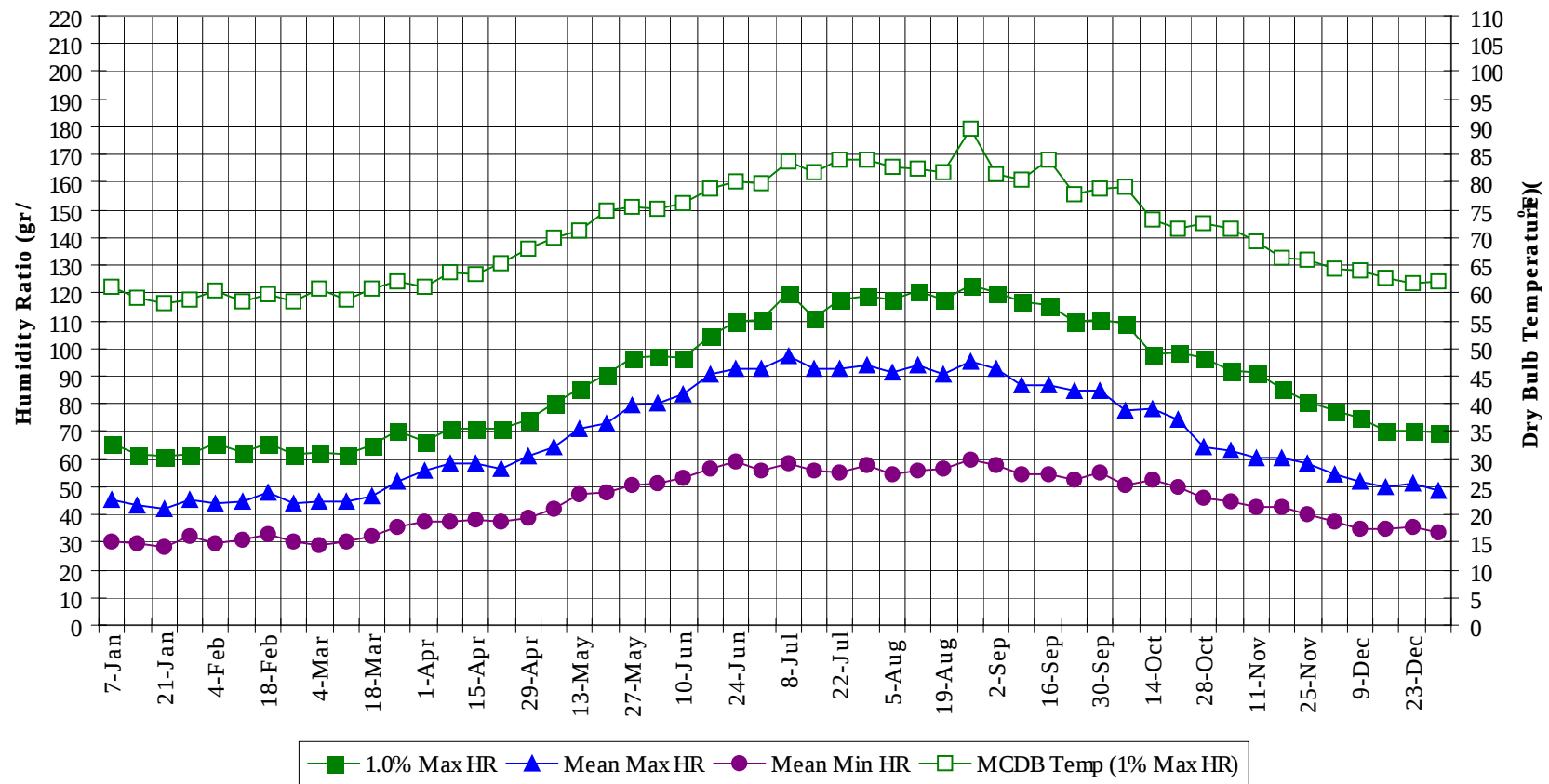


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Long Term Humidity and Dry Bulb Temperature Summary



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Long Term Dry Bulb Temperature and Humidity Summary

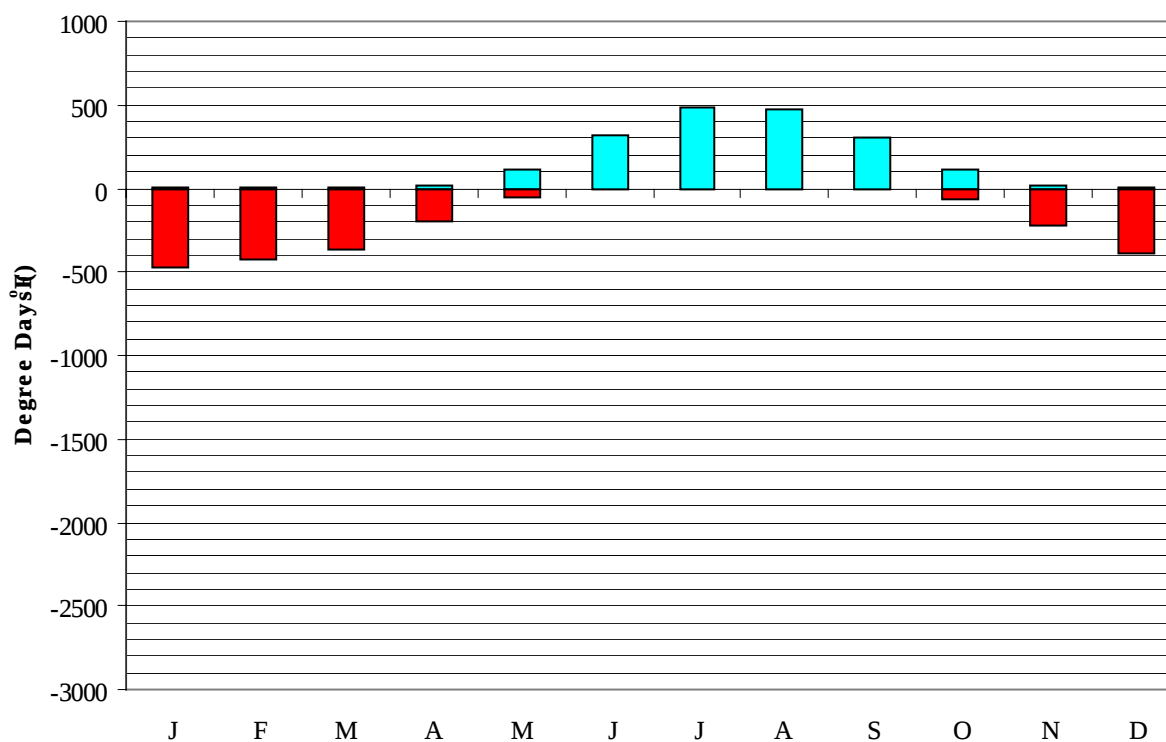
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	64.0	57.4	55.5	44.3	34.0	65.8	61.1	45.0	30.3
14-Jan	61.0	54.7	55.1	43.9	35.0	61.6	59.0	43.3	29.8
21-Jan	61.0	54.1	54.5	42.7	35.0	60.9	58.1	42.2	28.1
28-Jan	63.0	55.4	56.0	44.9	36.0	61.6	58.7	45.5	31.9
4-Feb	63.0	55.1	55.1	43.9	34.0	65.8	60.4	44.0	29.7
11-Feb	63.0	54.8	56.3	43.9	34.0	62.3	58.4	44.9	30.6
18-Feb	64.0	56.4	56.7	45.7	36.0	65.8	59.9	47.9	32.9
25-Feb	64.0	54.4	54.8	44.2	32.0	61.6	58.3	43.8	30.2
4-Mar	65.0	56.0	56.2	44.1	36.0	62.3	60.6	44.7	29.2
11-Mar	63.0	54.5	56.5	45.1	32.0	61.6	58.7	44.7	30.3
18-Mar	64.0	55.0	58.3	46.1	37.0	65.1	60.6	46.7	32.4
25-Mar	70.0	55.3	61.7	48.5	41.0	70.0	62.0	52.0	35.2
1-Apr	68.0	57.8	63.2	50.6	45.0	66.5	61.1	55.7	37.2
8-Apr	72.0	57.2	64.9	51.5	46.0	70.7	63.6	58.4	37.8
15-Apr	73.0	60.2	65.3	52.2	48.0	70.7	63.3	58.2	38.0
22-Apr	72.0	59.9	65.5	51.9	45.0	70.7	65.3	56.8	37.5
29-Apr	74.0	58.5	68.7	54.1	46.0	74.2	67.8	61.0	38.9
6-May	79.0	62.0	71.1	55.9	50.0	79.8	70.0	64.6	42.3
13-May	81.0	63.8	72.5	58.4	54.0	85.4	71.3	71.0	47.3
20-May	82.0	61.4	74.8	59.7	55.0	90.3	74.9	73.2	48.1
27-May	86.0	66.9	77.9	62.5	57.0	96.6	75.5	79.5	50.6
3-Jun	87.0	68.0	78.8	63.5	57.0	97.3	75.1	80.3	51.4
10-Jun	88.0	66.0	80.7	65.5	59.0	96.6	76.1	83.7	53.3
17-Jun	90.0	67.4	83.1	67.6	63.0	104.3	78.7	90.5	56.6
24-Jun	90.0	67.7	83.9	68.6	64.0	109.9	80.1	92.3	59.4
1-Jul	93.0	67.8	86.9	71.4	66.0	110.6	79.9	92.3	56.1
8-Jul	95.0	71.9	87.4	71.4	66.0	120.4	83.8	97.3	58.7
15-Jul	97.0	69.4	88.5	72.3	66.0	111.3	81.8	92.6	55.7
22-Jul	97.0	69.8	91.4	74.3	71.0	117.6	84.2	92.8	55.4
29-Jul	96.0	71.0	89.6	74.0	68.0	119.0	83.9	94.0	57.7
5-Aug	97.0	68.4	90.1	73.8	70.0	117.6	82.9	91.3	54.8
12-Aug	95.0	69.7	89.9	73.7	70.0	121.1	82.4	93.7	56.0
19-Aug	95.0	69.5	89.0	72.7	68.0	117.6	81.8	90.7	56.4
26-Aug	94.0	70.0	87.9	72.1	66.0	122.9	89.5	95.0	59.5
2-Sep	91.0	69.9	86.3	70.8	66.0	120.4	81.5	92.9	57.9
9-Sep	91.0	68.7	84.7	69.3	64.0	116.9	80.4	86.8	54.5
16-Sep	91.0	68.9	83.7	68.1	63.0	115.5	84.0	86.4	54.5
23-Sep	88.0	66.3	81.9	66.9	61.0	109.9	77.9	85.0	52.6
30-Sep	88.0	67.0	80.1	65.7	59.0	110.6	78.7	84.4	55.2
7-Oct	85.0	69.8	77.1	62.7	55.0	109.2	79.1	77.4	50.7
14-Oct	82.0	67.2	76.2	62.7	57.0	98.0	73.4	78.4	52.5
21-Oct	81.0	68.2	73.3	60.1	52.0	98.7	71.7	74.1	50.2
28-Oct	75.0	64.6	68.9	57.2	48.0	96.6	72.5	64.7	45.7
4-Nov	75.0	65.3	67.6	55.2	48.0	91.7	71.6	62.8	44.9
11-Nov	72.0	63.5	65.3	53.3	45.0	91.0	69.2	60.5	42.8
18-Nov	70.0	63.0	64.2	52.9	45.0	85.4	66.5	60.1	42.9
25-Nov	70.0	61.5	62.6	51.1	41.0	80.5	66.0	58.7	40.1
2-Dec	67.0	60.3	60.6	49.9	39.0	77.7	64.3	54.2	37.4
9-Dec	64.0	58.1	59.5	48.2	37.0	74.9	64.2	51.9	35.0
16-Dec	64.0	57.7	57.9	46.9	37.0	70.0	62.9	50.2	34.5
23-Dec	64.0	57.4	58.3	47.5	39.0	70.0	61.7	51.2	35.5
31-Dec	63.0	56.8	56.6	45.7	37.0	69.3	62.2	48.5	33.2

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



■ Mean Cooling Degree Days ■ Mean Heating Degree Days

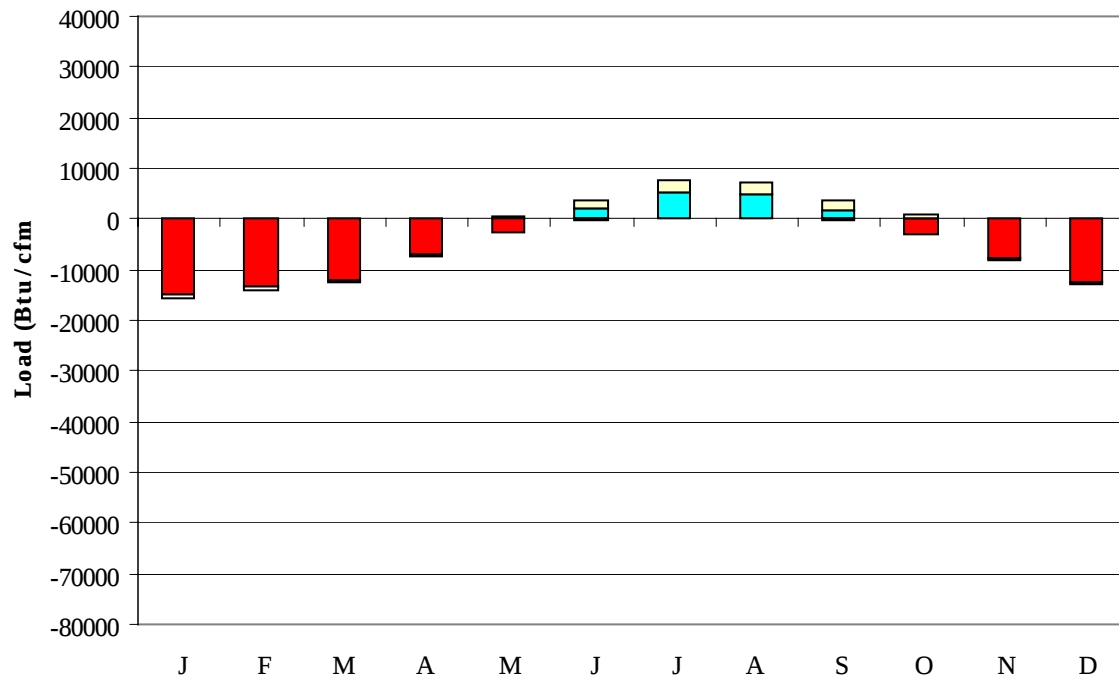
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	479
FEB	0	428
MAR	2	369
APR	16	192
MAY	118	52
JUN	316	4
JUL	488	0
AUG	478	0
SEP	302	4
OCT	108	67
NOV	12	222
DEC	0	386
ANN	1842	2203

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

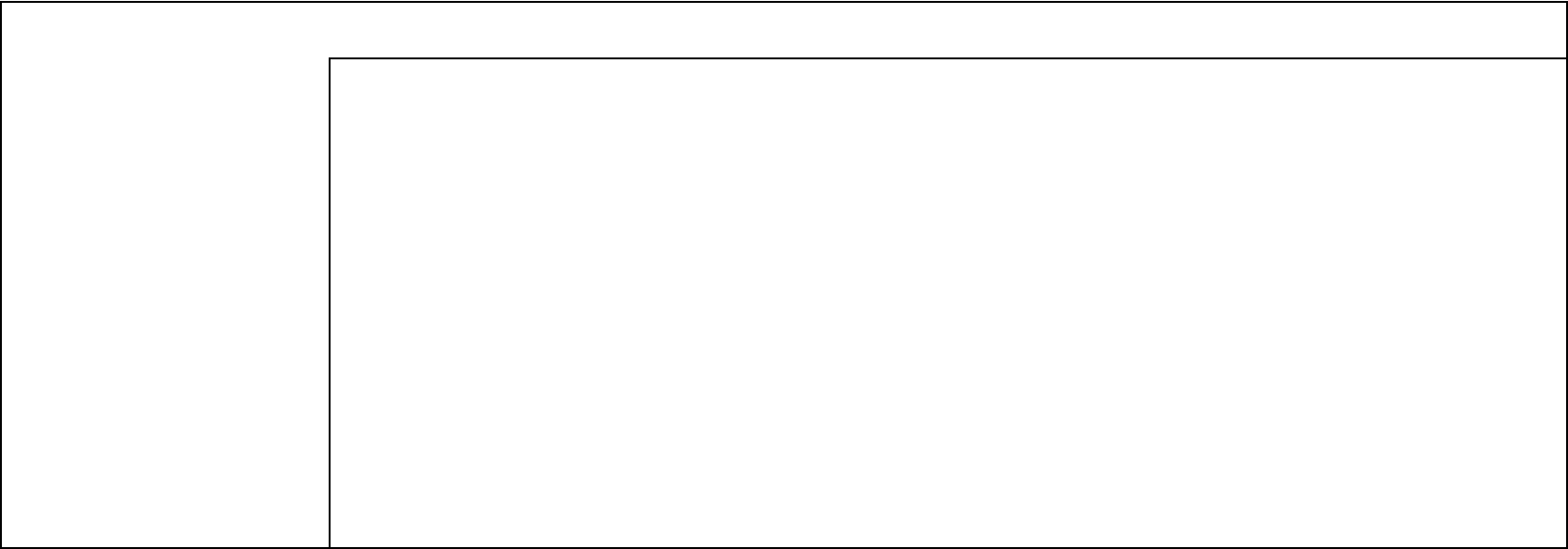


■ Average Sensible Cooling Load	■ Average Sensible Heating Load
■ Average Latent Cooling (Drying) Load	■ Average Latent Heating (Humidifying) Load

	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	-14832	0	-982
FEB	0	-13277	0	-965
MAR	0	-11937	0	-594
APR	6	-7056	0	-131
MAY	366	-2510	233	-36
JUN	2167	-302	1385	-8
JUL	5095	-23	2458	-2
AUG	4823	-15	2496	-1
SEP	1901	-288	1659	-1
OCT	236	-2943	664	-21
NOV	1	-7851	101	-220
DEC	0	-12399	1	-539
ANN	14595	-73433	8997	-3500

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

No Solar Radiation
Data Available

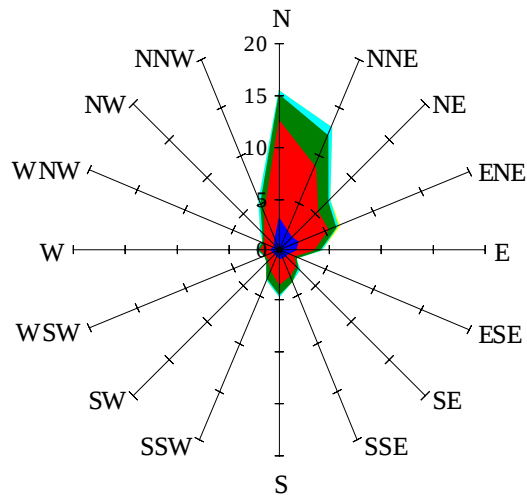


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

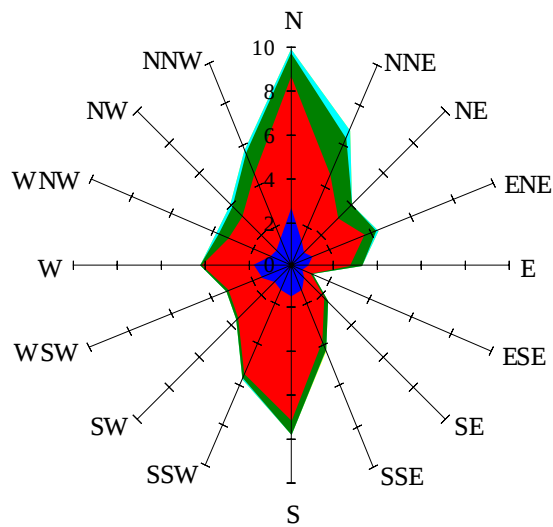
Labels of Percent Frequency on North Axis



Percent Calm = 24.70

Wind Summary - March, April, and May

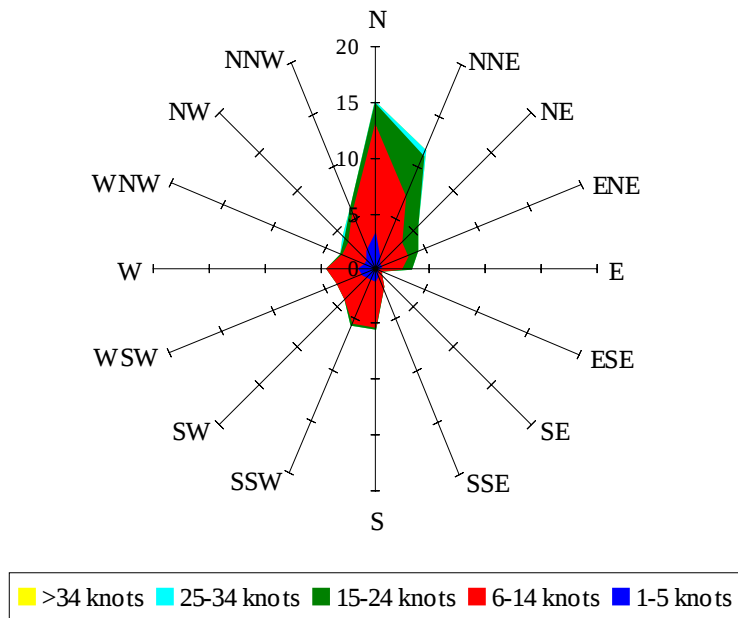
Labels of Percent Frequency on North Axis



Percent Calm = 27.31

Wind Summary - June, July, and August

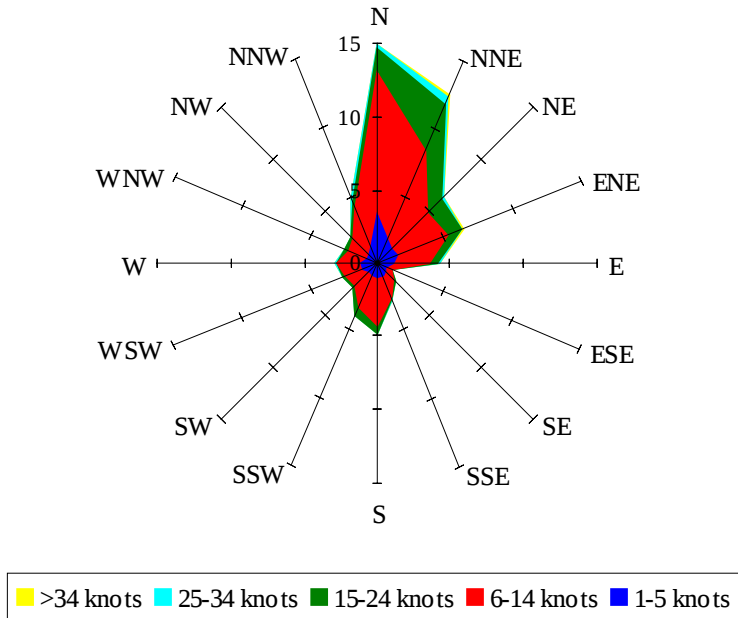
Labels of Percent Frequency on North Axis



Percent Calm = 21.81

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 24.79