

SACRAMENTO/MATHER	CA	WMO No. 724835
Latitude = 38.55 N		Elevation = 95 feet
Longitude = 121.30 W		Average Pressure = 29.86 inches Hg
Period of Record = 1964 to 1993		

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	106	71	57	6.1	W
0.4% Occurrence	101	69	57	6.2	W
1.0% Occurrence	98	68	57	6.5	WNW
2.0% Occurrence	95	67	56	6.4	SW
Mean Daily Range	24	-	-	-	-
97.5% Occurrence	36	35	27	2.1	ESE
99.0% Occurrence	33	32	24	1.5	ESE
99.6% Occurrence	30	29	21	1.3	ESE
Median of Extreme Lows	27	26	18	1.6	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	74	98	85	6.2	W
0.4% Occurrence	71	96	72	6.3	SW
1.0% Occurrence	70	94	69	6.3	SW
2.0% Occurrence	68	91	64	6.4	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	93	88	0.62	5.2	NNW
0.4% Occurrence	84	82	0.56	5.6	SSW
1.0% Occurrence	78	78	0.52	5.7	SSW
2.0% Occurrence	73	76	0.49	5.9	SSW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		261	1092	17	367

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	1.3	85	0.0 + 1.4
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 (#)
62.7	N/A	N/A	11

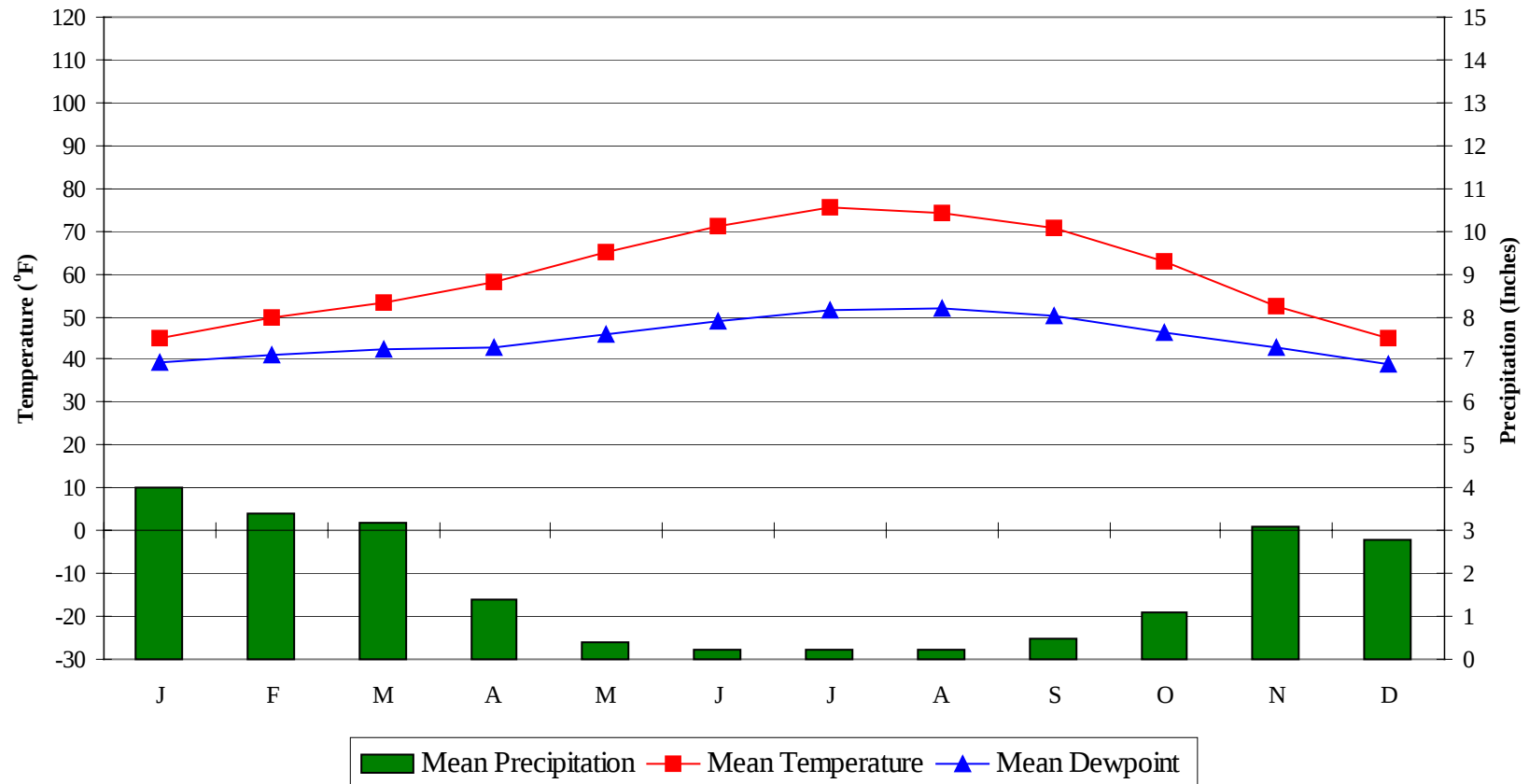
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

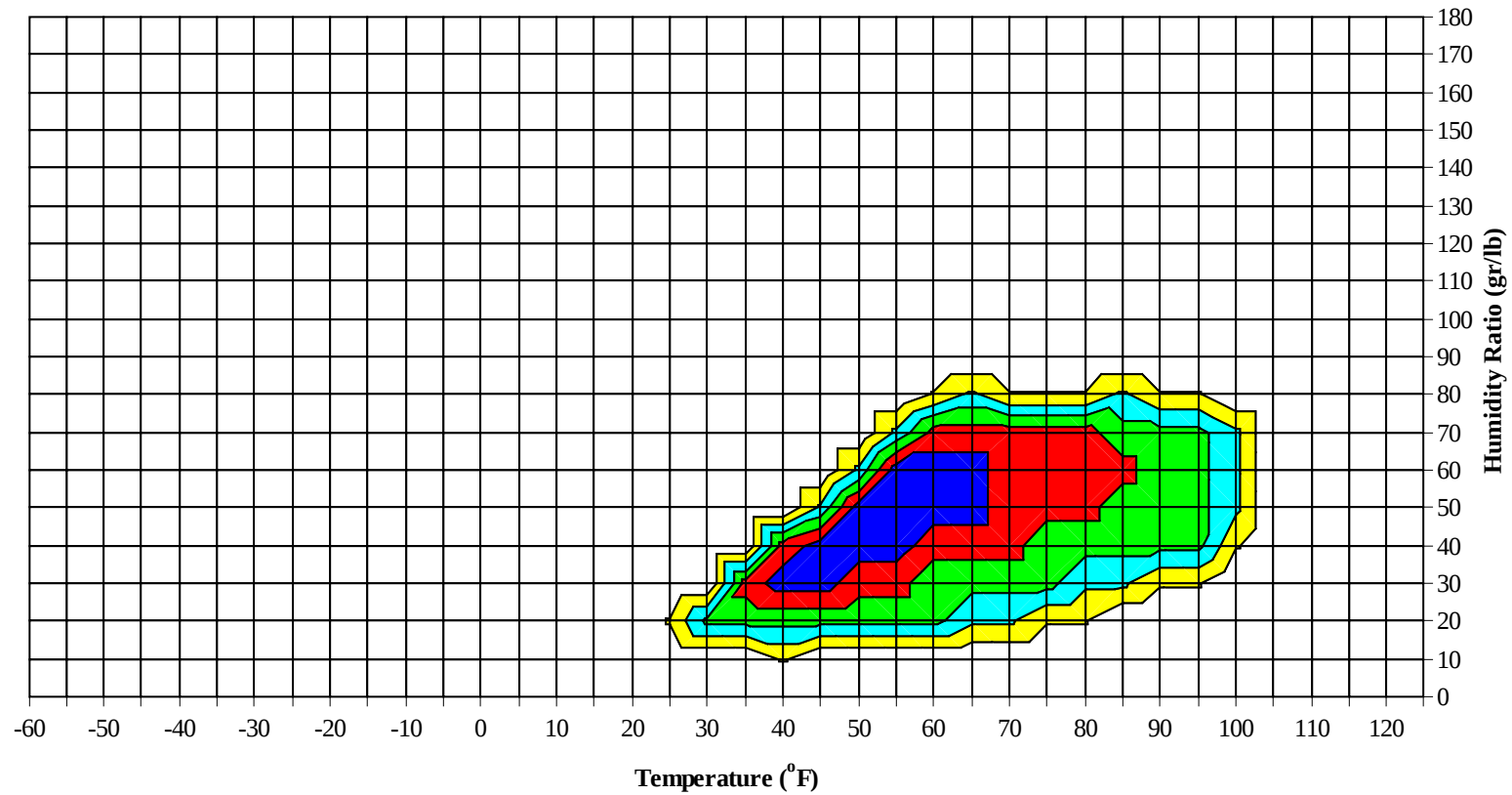


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Long Term Psychrometric Summary



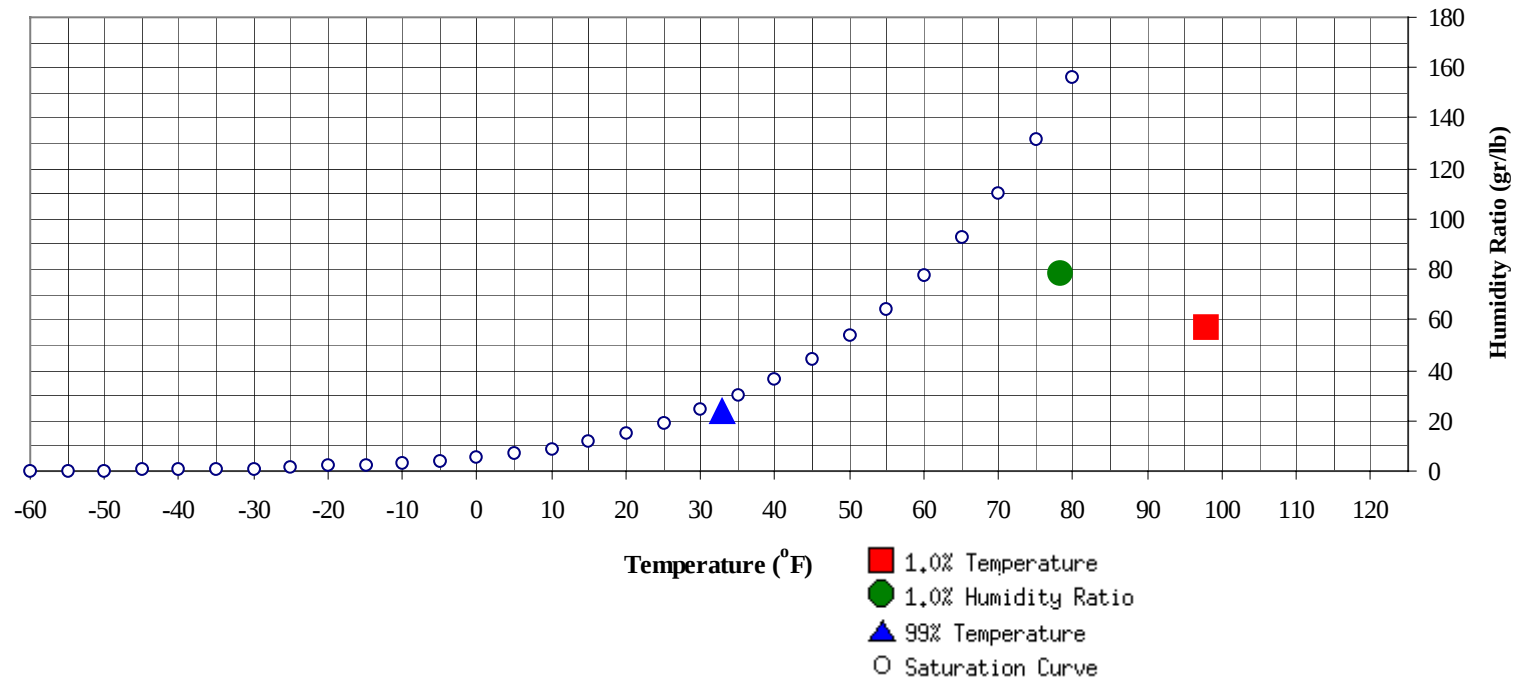
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	33	23.4	11.5		78.4	78.3	66.3	60.1	31.1

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	98	57.3	68.6	32.6

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Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1964 to 1993

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		
110 / 114															
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89												0	0	0	60.8
80 / 84												1	0	1	61.0
75 / 79							0		0	55.8		5	1	6	59.0
70 / 74		0		0	56.5		5	1	6	56.8		16	6	22	57.0
65 / 69		3	0	3	54.2		17	5	22	55.7		35	14	49	55.4
60 / 64	0	14	3	17	53.5	0	37	14	51	53.0	1	58	29	88	52.8
55 / 59	7	36	18	61	51.5	9	60	40	109	50.8	18	68	60	145	50.8
50 / 54	22	65	42	129	47.8	33	59	64	156	47.9	64	46	73	183	47.9
45 / 49	40	63	69	172	44.2	62	33	61	156	44.2	86	17	49	152	44.2
40 / 44	67	45	71	183	40.3	69	11	31	111	40.1	60	3	15	78	40.0
35 / 39	69	19	38	126	36.0	39	2	7	48	35.4	17	0	2	19	35.6
30 / 34	36	3	7	46	31.3	10	0	1	11	31.0	2		0	2	31.4
25 / 29	7	0	1	8	27.0	2	0	0	2	25.0					
20 / 24	0			0	22.9	0			0	20.5					
15 / 19															

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 = 1964 to 1993

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		
110 / 114															
105 / 109												0	0	0	68.9
100 / 104												7	2	9	68.8
95 / 99							0	0	0	68.3		15	7	22	67.6
90 / 94		0	0	0	67.2		15	5	20	65.6		27	11	38	65.8
85 / 89		4	1	5	63.7	0	24	10	34	63.6	0	34	16	50	64.2
80 / 84		13	5	18	61.2	0	35	16	51	61.7	2	47	24	73	62.7
75 / 79		23	9	32	58.7	1	40	21	62	59.7	5	41	29	75	61.0
70 / 74	0	37	16	53	56.9	5	47	28	80	57.5	14	36	36	86	59.0
65 / 69	2	47	25	74	54.6	14	38	36	88	55.7	33	22	40	95	57.0
60 / 64	7	51	38	96	52.6	32	30	45	107	53.8	67	9	44	120	54.9
55 / 59	30	40	56	126	50.6	69	12	48	129	51.3	82	2	25	109	52.4
50 / 54	85	21	60	167	47.9	84	2	31	117	48.2	32	0	5	37	49.3
45 / 49	78	3	26	107	44.0	36	0	6	42	44.6	4		0	4	45.0
40 / 44	33	0	5	38	40.1	7		0	7	40.9	0			0	42.8
35 / 39	5		0	5	36.0	0			0	37.8					
30 / 34															
25 / 29															
20 / 24															
15 / 19															

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)**Period of Record = 1964 to 1993**

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		
110 / 114		0	0	0	73.6		0		0	74.7					
105 / 109		3	1	4	71.4		2	1	3	70.9		0	0	0	71.1
100 / 104		13	5	18	69.7		11	4	15	69.4		3	1	4	69.3
95 / 99		32	14	46	68.4		23	10	33	68.2		14	4	18	68.0
90 / 94		45	22	67	66.9		40	18	58	66.7		29	10	39	66.0
85 / 89	0	45	23	68	65.5	0	44	21	65	65.3	0	39	16	55	64.3
80 / 84	2	42	28	72	63.8	2	46	29	77	64.1	1	44	22	67	62.8
75 / 79	10	33	34	77	62.0	8	36	34	78	62.3	2	41	29	72	61.2
70 / 74	27	23	45	95	60.1	22	28	43	93	60.3	12	35	42	89	59.4
65 / 69	62	11	41	114	57.9	53	15	48	116	58.3	37	23	50	110	57.8
60 / 64	84	2	26	112	55.6	93	2	33	128	56.3	77	10	44	131	55.8
55 / 59	56	0	7	63	53.1	65	0	6	71	53.9	78	1	21	100	53.0
50 / 54	8		0	8	50.4	6		0	6	51.0	30	0	3	33	49.4
45 / 49											3		0	3	45.4
40 / 44											0			0	42.0
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															

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Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1964 to 1993

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		
110 / 114															
105 / 109															
100 / 104															
95 / 99		2	0	2	66.5										
90 / 94		7	1	8	64.9										
85 / 89		15	4	19	63.1										
80 / 84		29	7	36	61.2		1	0	1	58.9					
75 / 79	0	43	15	58	59.6		5	0	5	58.5					
70 / 74	1	48	25	74	57.9		15	2	17	57.2		0		0	52.0
65 / 69	7	47	39	93	56.0	0	33	6	39	55.5	0	2	0	2	55.8
60 / 64	32	37	61	130	54.4	2	50	22	74	53.8	1	17	2	20	53.3
55 / 59	77	17	59	153	51.9	26	60	57	144	51.8	8	45	16	69	51.0
50 / 54	81	3	30	114	48.3	57	46	70	173	48.4	25	68	44	137	47.8
45 / 49	40	0	6	46	44.2	64	22	50	137	44.3	45	58	70	173	44.2
40 / 44	9		0	9	40.1	53	6	26	85	40.0	61	35	64	160	40.1
35 / 39	1			1	36.1	30	1	6	37	35.6	62	19	41	122	35.6
30 / 34						7	0	0	7	31.2	35	4	10	49	31.1
25 / 29						1			1	28.1	8	0	1	9	26.4
20 / 24											2	0	0	2	21.2
15 / 19											0			0	16.7

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Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1964 to 1993

Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
110 / 114		0	0	0	74.1
105 / 109		6	2	8	71.1
100 / 104		35	13	48	69.4
95 / 99		90	36	126	68.1
90 / 94		161	66	227	66.3
85 / 89	1	203	90	294	64.6
80 / 84	6	254	129	389	62.8
75 / 79	26	265	172	463	60.8
70 / 74	80	289	242	611	58.8
65 / 69	205	292	302	799	56.7
60 / 64	393	318	360	1071	54.5
55 / 59	521	345	413	1279	51.7
50 / 54	528	314	426	1268	48.1
45 / 49	462	196	340	998	44.2
40 / 44	362	101	214	677	40.2
35 / 39	225	42	95	362	35.7
30 / 34	91	7	18	116	31.1
25 / 29	18	1	2	21	26.6
20 / 24	2	0	0	2	21.4
15 / 19	0			0	16.7

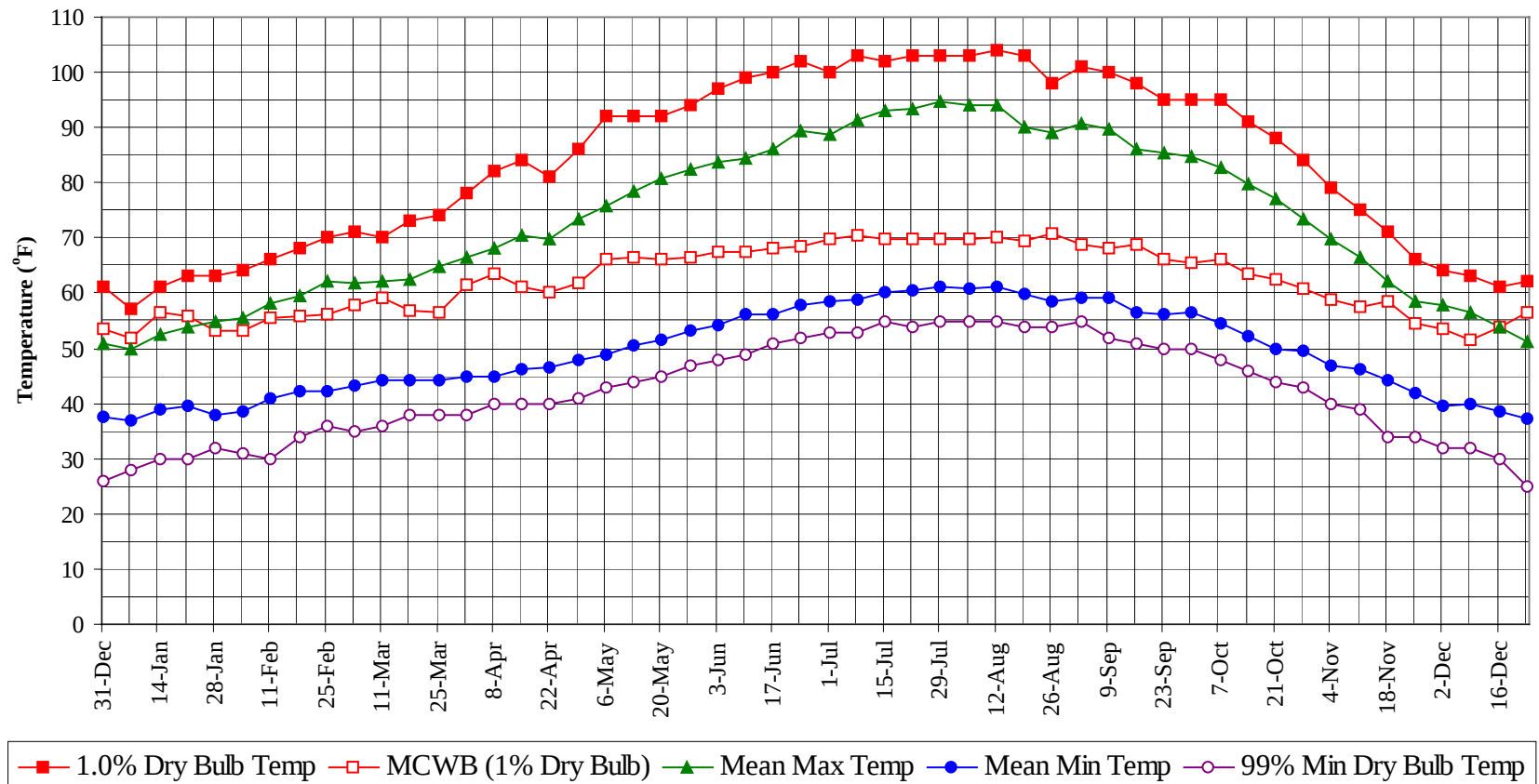
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

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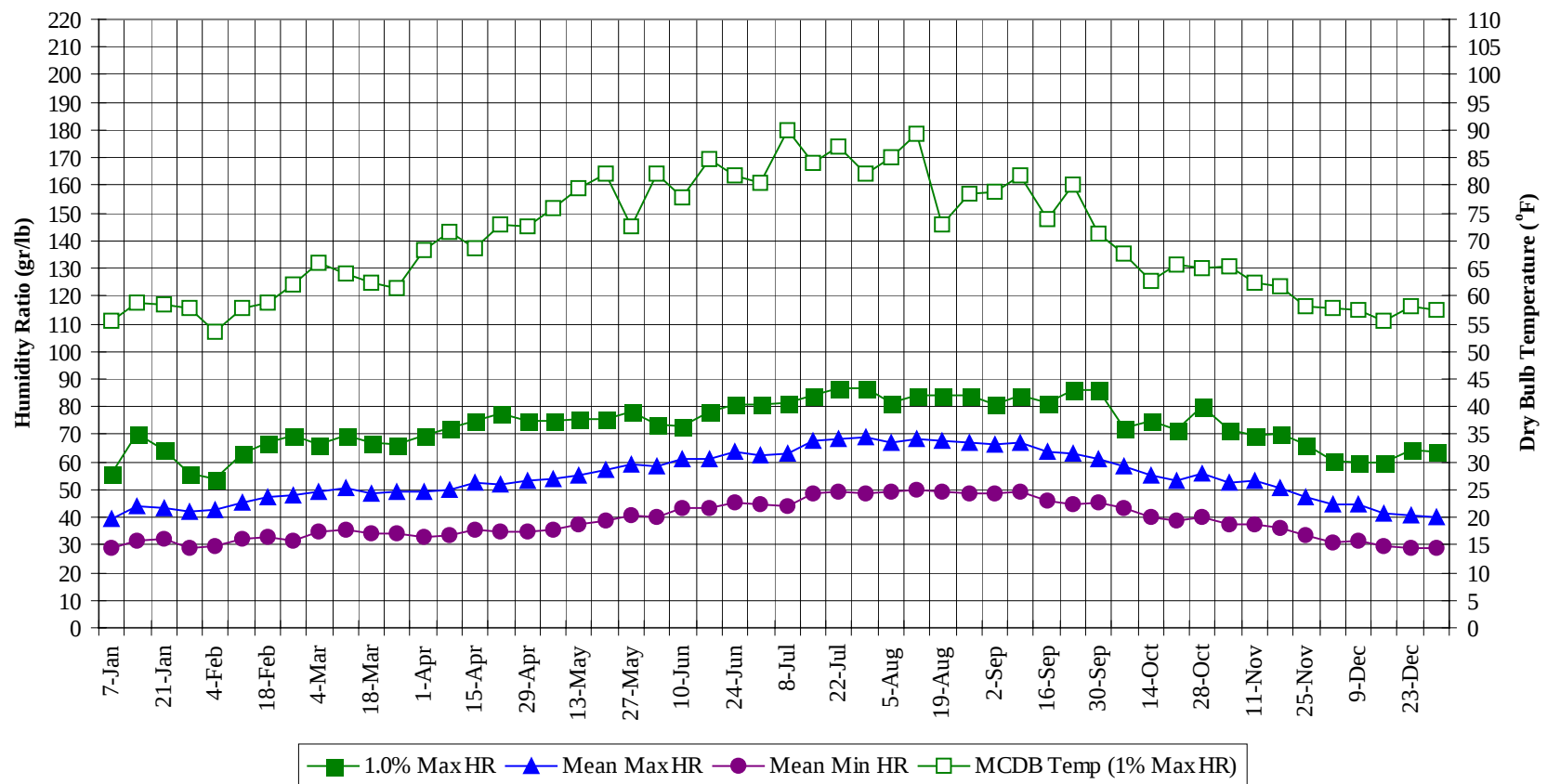
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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



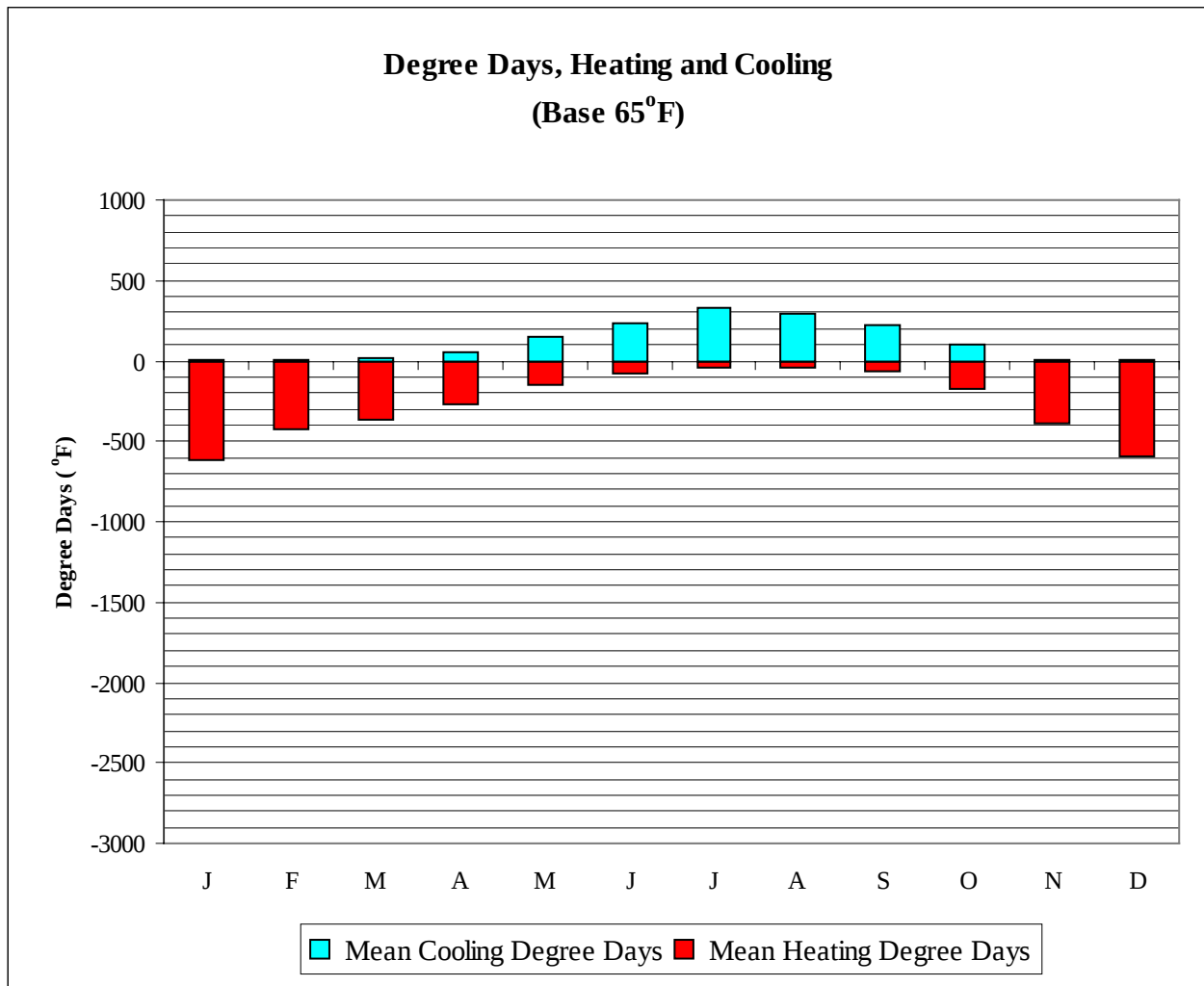
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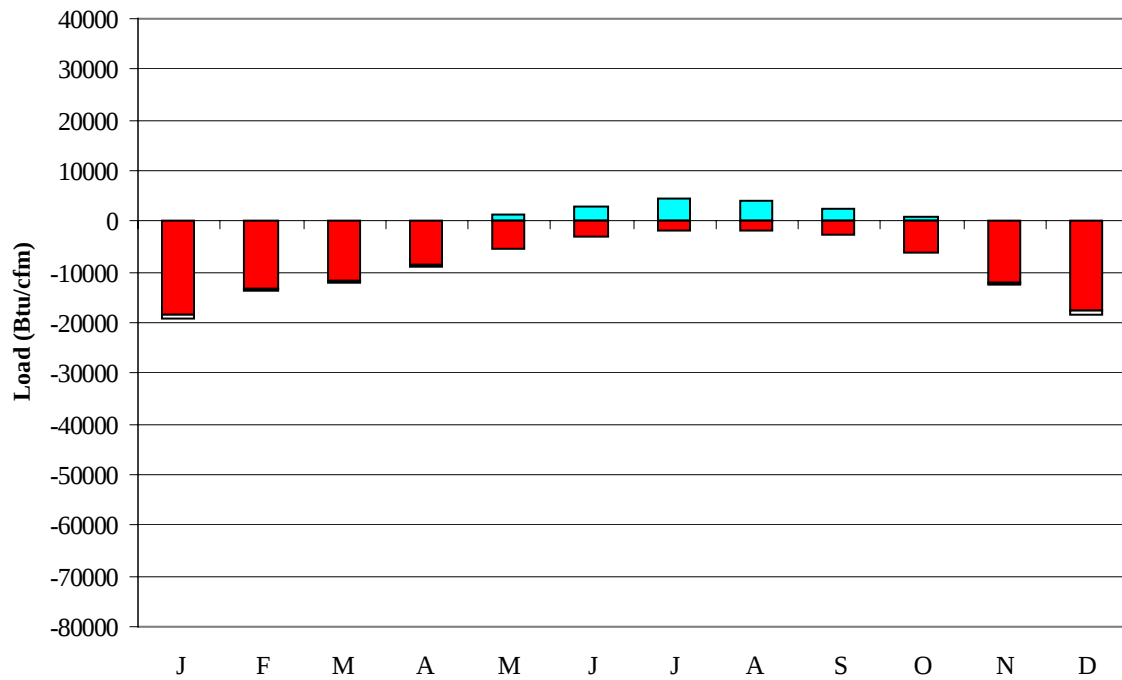
Long Term Dry Bulb Temperature and Humidity Summary

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	57.0	51.8	49.9	37.0	28.0	56.0	55.4	39.5	28.7
14-Jan	61.0	56.6	52.5	38.9	30.0	70.0	58.8	44.0	31.8
21-Jan	63.0	55.7	53.7	39.6	30.0	64.4	58.4	43.5	31.9
28-Jan	63.0	53.1	54.9	37.8	32.0	56.0	57.6	42.1	28.8
4-Feb	64.0	53.1	55.4	38.4	31.0	53.9	53.5	42.5	29.7
11-Feb	66.0	55.5	58.1	40.8	30.0	63.0	57.7	45.6	32.2
18-Feb	68.0	55.7	59.6	42.2	34.0	67.2	58.7	47.4	32.8
25-Feb	70.0	56.3	62.0	42.2	36.0	69.3	62.1	47.7	31.8
4-Mar	71.0	57.7	61.8	43.3	35.0	66.5	65.9	49.2	34.5
11-Mar	70.0	59.2	62.3	44.2	36.0	69.3	64.0	50.4	35.6
18-Mar	73.0	56.9	62.5	44.3	38.0	67.2	62.5	48.8	34.1
25-Mar	74.0	56.4	64.8	44.3	38.0	66.5	61.5	49.5	34.0
1-Apr	78.0	61.6	66.5	44.9	38.0	69.3	68.4	49.2	32.9
8-Apr	82.0	63.6	68.0	45.0	40.0	72.1	71.5	49.6	33.4
15-Apr	84.0	61.2	70.6	46.3	40.0	74.9	68.8	52.6	35.2
22-Apr	81.0	60.0	69.9	46.4	40.0	77.7	72.9	51.7	34.5
29-Apr	86.0	61.7	73.4	47.8	41.0	74.9	72.4	53.2	34.6
6-May	92.0	66.0	75.9	48.9	43.0	74.9	75.7	53.5	35.7
13-May	92.0	66.6	78.5	50.6	44.0	75.6	79.4	55.1	37.6
20-May	92.0	66.0	80.8	51.5	45.0	75.6	81.9	56.8	38.8
27-May	94.0	66.4	82.3	53.1	47.0	78.4	72.7	59.2	40.5
3-Jun	97.0	67.5	83.7	54.3	48.0	73.5	82.1	58.6	40.4
10-Jun	99.0	67.4	84.3	56.0	49.0	72.8	78.0	61.1	43.1
17-Jun	100.0	68.0	86.2	56.2	51.0	78.4	84.6	61.1	43.4
24-Jun	102.0	68.6	89.4	57.9	52.0	80.5	81.7	63.8	45.5
1-Jul	100.0	69.9	88.9	58.6	53.0	80.5	80.5	62.3	44.6
8-Jul	103.0	70.4	91.2	58.9	53.0	81.2	89.9	63.3	44.3
15-Jul	102.0	69.9	93.0	60.3	55.0	84.0	84.2	67.8	48.7
22-Jul	103.0	69.9	93.3	60.6	54.0	86.8	86.9	68.1	49.1
29-Jul	103.0	69.7	94.6	61.2	55.0	86.8	82.1	68.8	48.8
5-Aug	103.0	69.8	94.2	60.9	55.0	81.2	85.2	67.3	49.1
12-Aug	104.0	70.2	94.1	61.1	55.0	84.0	89.4	68.3	49.8
19-Aug	103.0	69.4	90.0	59.8	54.0	84.0	73.0	67.5	49.0
26-Aug	98.0	70.9	89.0	58.6	54.0	84.0	78.5	66.8	48.8
2-Sep	101.0	68.7	90.6	59.3	55.0	80.5	78.9	66.6	48.6
9-Sep	100.0	68.2	89.8	59.2	52.0	84.0	81.9	67.0	49.2
16-Sep	98.0	68.6	86.1	56.6	51.0	81.2	73.9	63.5	46.0
23-Sep	95.0	66.2	85.4	56.2	50.0	86.1	80.1	63.1	44.5
30-Sep	95.0	65.3	84.6	56.4	50.0	86.1	71.2	61.1	45.6
7-Oct	95.0	66.2	82.7	54.5	48.0	72.1	67.7	58.7	43.4
14-Oct	91.0	63.4	79.7	52.3	46.0	74.9	62.7	55.4	40.3
21-Oct	88.0	62.4	77.0	50.0	44.0	71.4	65.6	53.2	38.6
28-Oct	84.0	60.7	73.5	49.6	43.0	79.8	65.1	56.1	40.3
4-Nov	79.0	58.7	69.9	47.0	40.0	71.4	65.3	52.6	37.3
11-Nov	75.0	57.5	66.4	46.2	39.0	69.3	62.4	53.1	37.3
18-Nov	71.0	58.4	62.1	44.3	34.0	70.0	61.8	50.5	36.3
25-Nov	66.0	54.7	58.4	41.8	34.0	66.5	58.2	47.5	33.5
2-Dec	64.0	53.5	57.8	39.7	32.0	60.2	57.9	44.6	30.6
9-Dec	63.0	51.6	56.6	40.0	32.0	59.5	57.5	44.9	31.8
16-Dec	61.0	53.9	53.7	38.5	30.0	59.5	55.5	41.5	29.3
23-Dec	62.0	56.5	51.2	37.1	25.0	64.4	58.0	41.0	29.0
31-Dec	61.0	53.6	50.9	37.5	26.0	63.7	57.6	39.8	29.1



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	619
FEB	3	428
MAR	12	371
APR	51	266
MAY	144	154
JUN	228	74
JUL	324	37
AUG	293	41
SEP	216	68
OCT	101	172
NOV	9	389
DEC	0	592
ANN	1381	3211

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	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-18440	0	-653
FEB	0	-13242	0	-436
MAR	16	-11854	0	-352
APR	265	-8731	12	-339
MAY	1404	-5385	11	-129
JUN	2836	-2918	15	-53
JUL	4568	-1713	70	-5
AUG	3965	-1893	55	-5
SEP	2594	-2774	55	-45
OCT	818	-6044	3	-178
NOV	12	-12282	0	-402
DEC	0	-17681	0	-800
ANN	16478	-102957	221	-3397

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

No Solar Radiation
Data Available

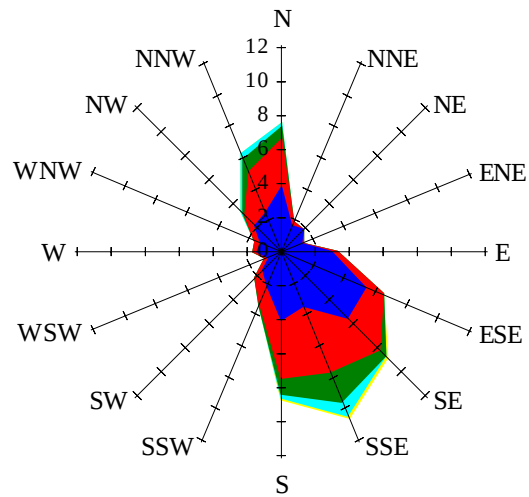


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

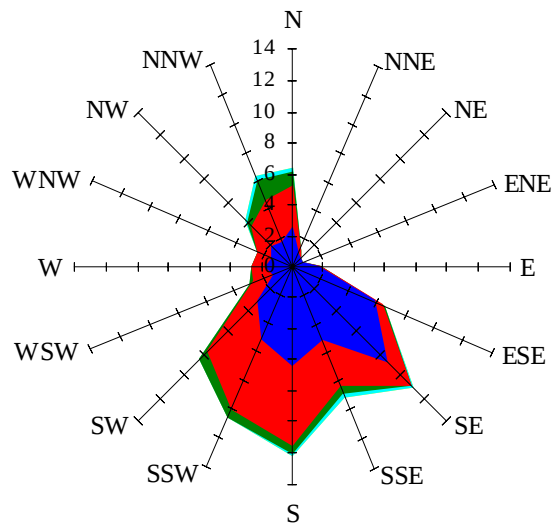
Labels of Percent Frequency on North Axis



Percent Calm = 30.63

Wind Summary - March, April, and May

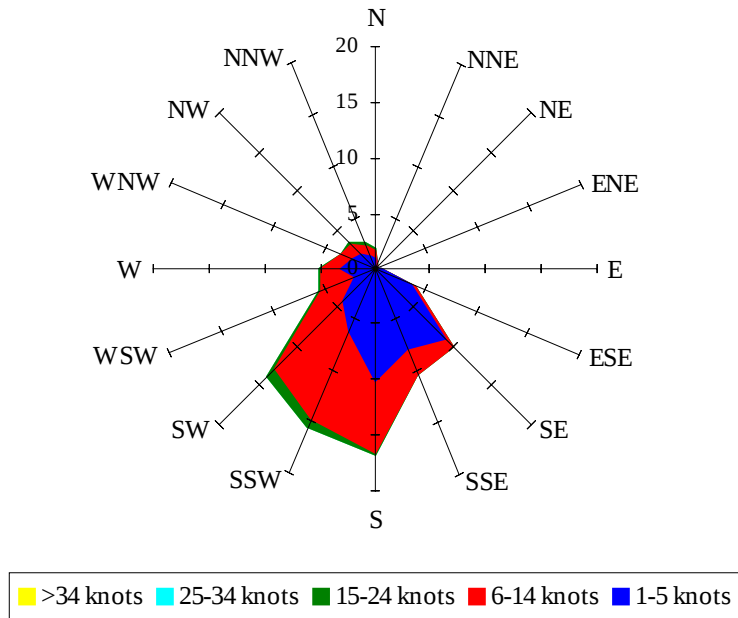
Labels of Percent Frequency on North Axis



Percent Calm = 14.14

Wind Summary - June, July, and August

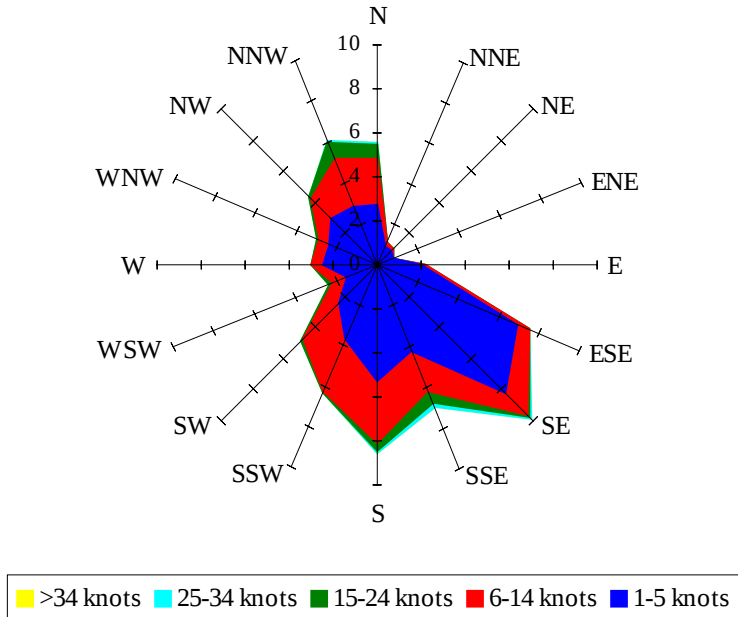
Labels of Percent Frequency on North Axis



Percent Calm = 7.33

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 26.47