

ASHEVILLE NC

Latitude = 35.43 N

Longitude = 82.55 W

Period of Record = 1973 to 1996

WMO No. 723150

Elevation = 2169 feet

Average Pressure = 27.80 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	73	100	8.9	N
0.4% Occurrence	88	72	102	8.7	N
1.0% Occurrence	86	72	102	8.7	N
2.0% Occurrence	84	71	101	8.7	N
Mean Daily Range	21	-	-	-	-
97.5% Occurrence	22	20	13	9.2	NNW
99.0% Occurrence	16	14	9	11.4	NNW
99.6% Occurrence	11	10	8	11.3	NNW
Median of Extreme Lows	3	2	5	13.5	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	76	85	127	7.9	N
0.4% Occurrence	75	84	123	7.9	N
1.0% Occurrence	74	83	119	7.7	N
2.0% Occurrence	73	81	116	7.5	N
	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	137	81	0.85	6.4	S
0.4% Occurrence	127	78	0.79	6.2	N
1.0% Occurrence	123	78	0.77	6.3	N
2.0% Occurrence	119	76	0.74	6.0	N
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		4	460	175	1426

Other Site Data

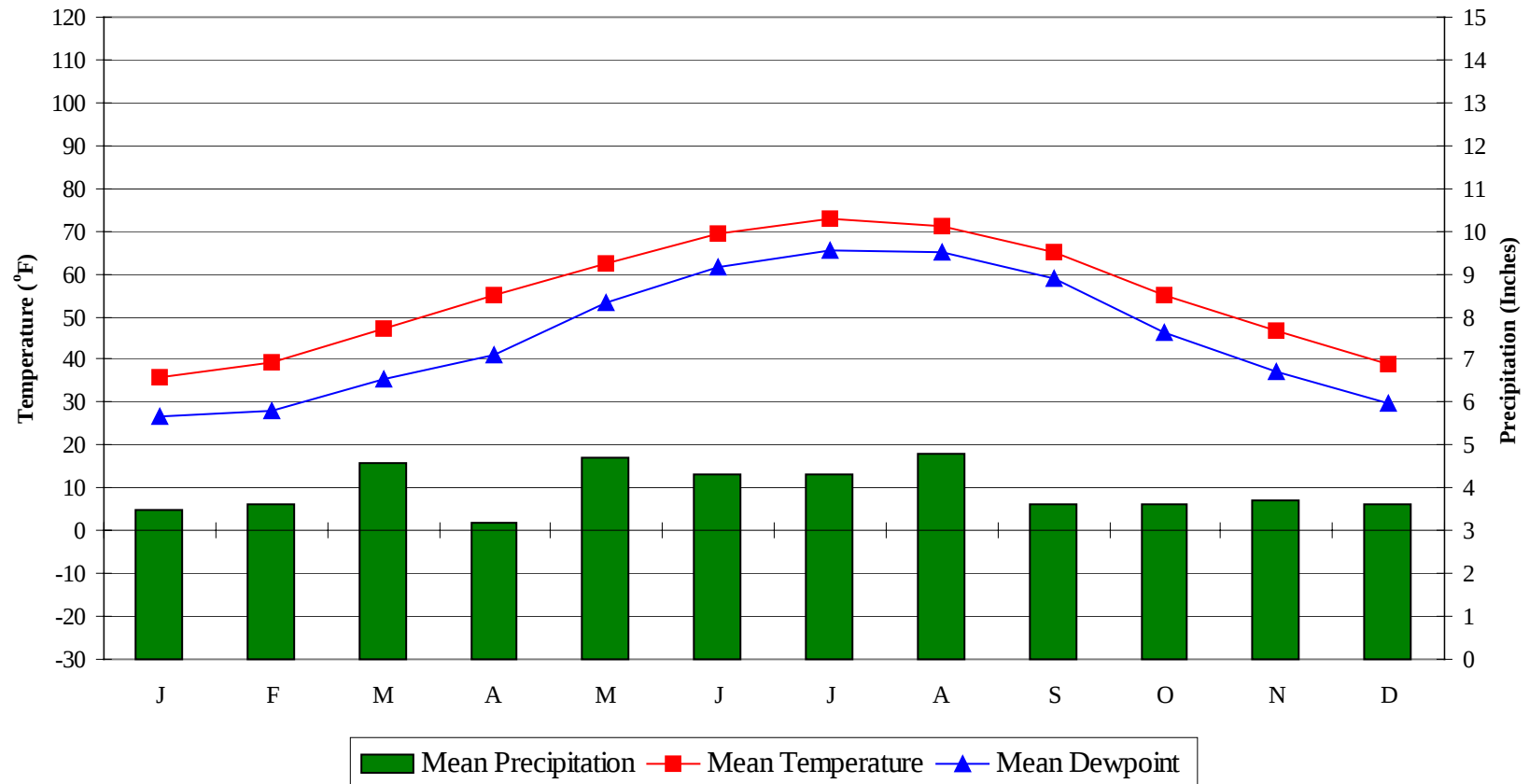
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
7	3.5	90	2.3 + 0.4
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
57.4	N/A	14	67

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

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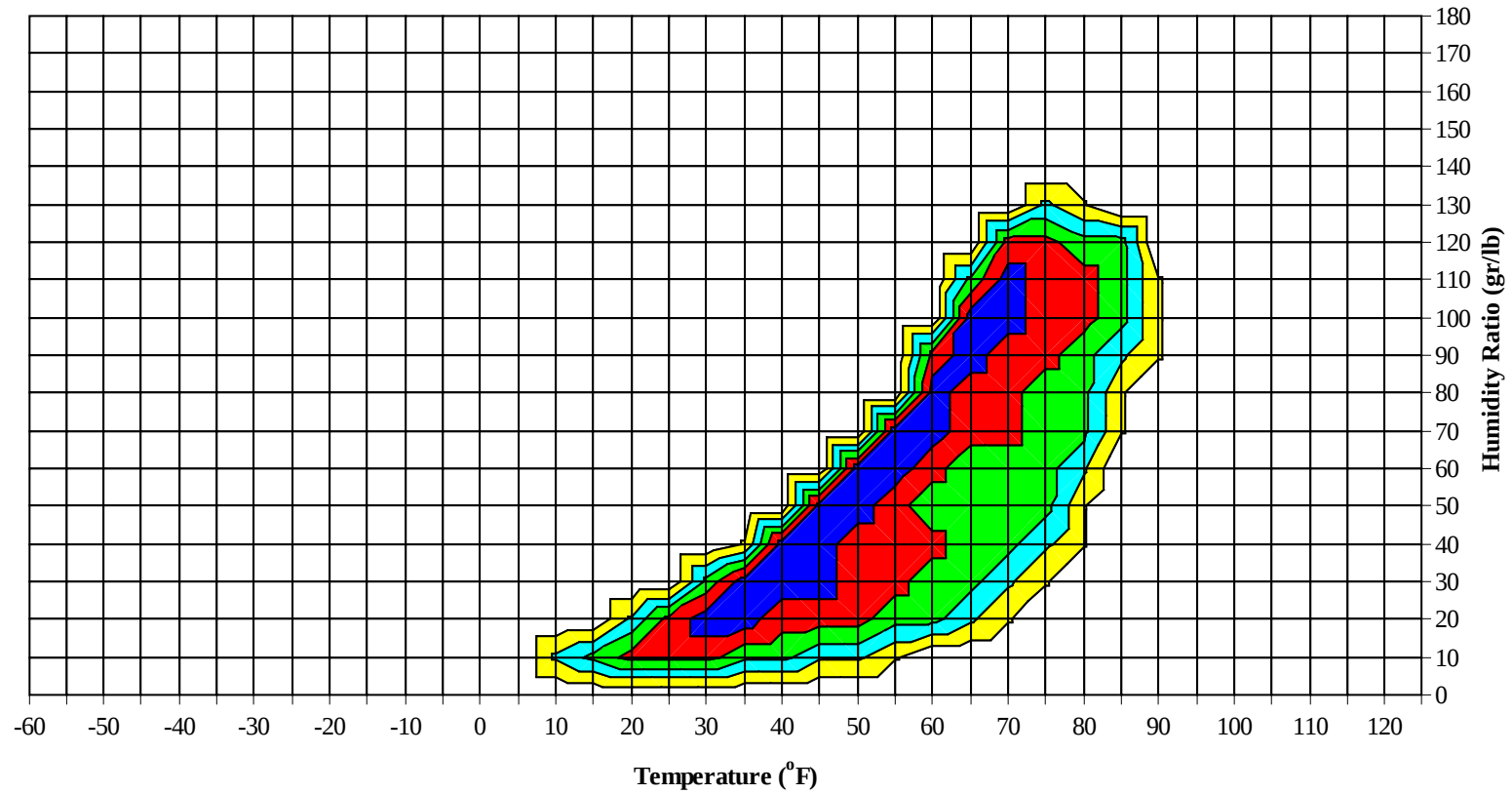
Average Annual Climate



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Long Term Psychrometric Summary

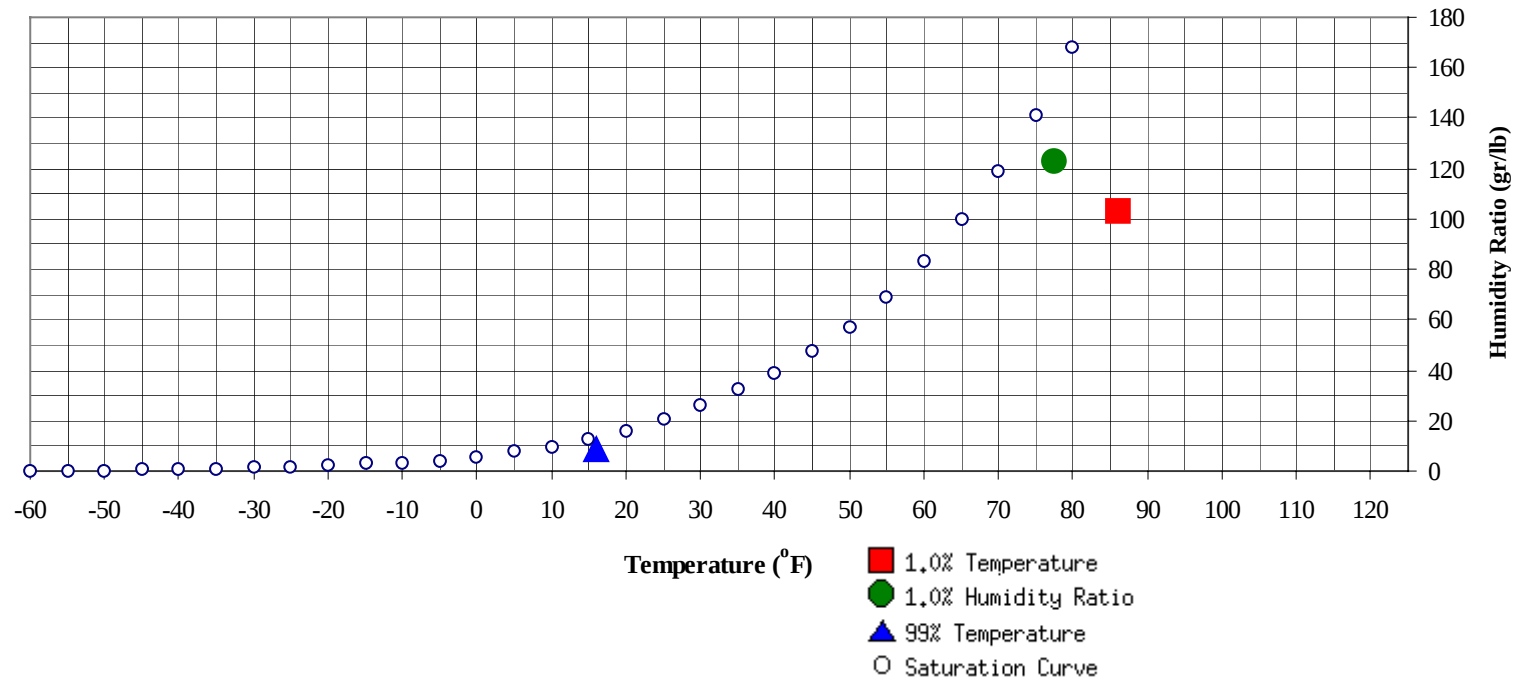


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



	(°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	16	9.1	5.2		123.2	77.5	72.8	71.1	37.9

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	86	103	71.8	36.8

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79		0		0	59.3		1	0	1	57.3		1	0	1	61.2
70 / 74		1	0	1	57.9		2	1	3	55.6		5	1	6	59.0
65 / 69		2	0	2	53.9		6	2	8	53.5		14	5	19	56.0
60 / 64	1	7	2	10	51.5	1	12	7	20	51.4	1	20	13	34	54.3
55 / 59	3	16	8	27	49.5	5	24	16	45	48.6	5	30	23	58	52.5
50 / 54	8	26	18	52	46.6	15	32	29	76	46.4	17	39	34	90	50.3
45 / 49	15	33	31	79	42.4	19	31	29	79	42.0	28	41	44	113	46.6
40 / 44	27	40	41	108	38.2	26	30	33	89	37.7	35	35	40	110	42.4
35 / 39	42	41	44	127	33.9	31	30	36	97	33.4	43	26	35	104	38.2
30 / 34	50	37	45	132	29.2	43	28	33	104	29.2	42	21	27	90	34.0
25 / 29	37	22	28	87	24.6	38	14	22	74	24.6	43	9	18	70	29.5
20 / 24	29	10	15	54	20.1	25	7	10	42	20.1	23	3	6	32	25.0
15 / 19	16	6	10	32	15.4	14	4	5	23	15.4	8	1	2	11	20.2
10 / 14	13	3	3	19	11.1	7	1	2	10	11.2	2	1	1	4	15.7
5 / 9	6	2	2	10	6.4	2	0	0	2	6.2	1	0	0	1	9.9
0 / 4	2	1	1	4	1.4	0	0	0	0	1.2	0		0	0	6.6
-5 / -1	1	0	0	1	-3.4	0			0	-2.0	0			0	2.0
-10 / -6	0	0	0	0	-6.8										
-15 / -11	0	0	0	0	-12.5										
-20 / -16	0			0	-15.3										

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		
95 / 99															
90 / 94												2	1	3	72.1
85 / 89		1	0	1	63.3		2	0	2	68.3		17	5	22	70.4
80 / 84		8	2	10	60.7		18	4	22	66.4		55	18	73	69.2
75 / 79		21	7	28	59.1		49	15	64	64.4	0	69	36	105	67.6
70 / 74	0	31	17	48	57.2	1	58	36	95	62.3	9	59	60	128	66.3
65 / 69	2	40	29	71	55.5	13	50	57	120	60.7	82	27	76	185	64.4
60 / 64	16	43	44	103	54.1	65	39	62	167	58.4	85	9	31	125	60.7
55 / 59	35	35	44	114	51.3	64	18	39	121	54.3	40	1	11	52	55.9
50 / 54	45	28	37	110	47.0	47	9	23	79	49.4	19		2	21	50.9
45 / 49	47	17	28	92	42.7	33	2	10	45	45.0	5		0	5	46.0
40 / 44	42	10	18	70	38.2	17	1	3	21	41.0	1			1	41.6
35 / 39	31	4	10	45	34.0	7	0	0	7	36.3	0			0	37.7
30 / 34	18	1	3	22	29.7	1		0	1	31.7					
25 / 29	5	0	1	6	25.5	0			0	28.3					
20 / 24	0			0	21.3										
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WMO No. 723150

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		
95 / 99		0	0	0	74.6		0	0	0	74.8					
90 / 94		10	3	13	72.9		4	1	5	73.3		1		1	72.2
85 / 89		39	12	51	72.3		26	6	32	72.4		6	1	7	71.9
80 / 84	0	73	28	101	71.1		64	18	82	71.3		31	6	37	69.7
75 / 79	3	67	49	119	69.9	0	70	40	110	69.7	0	50	17	67	67.5
70 / 74	38	42	87	167	68.6	19	58	85	162	68.4	3	59	44	106	65.9
65 / 69	134	14	56	204	65.9	135	23	80	238	65.8	59	47	71	177	64.1
60 / 64	61	3	12	76	61.8	76	3	16	95	61.9	70	29	52	150	60.2
55 / 59	11	0	1	12	56.9	14	0	2	16	56.7	48	11	29	88	55.6
50 / 54	1		0	1	52.5	3	0	0	3	51.9	30	4	15	49	50.9
45 / 49	0			0	46.3	1		0	1	47.0	21	1	5	27	46.0
40 / 44						0			0	43.5	8		1	9	41.8
35 / 39											2		0	2	37.1
30 / 34															
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		
95 / 99															
90 / 94															
85 / 89		0		0	66.8										
80 / 84		2	0	2	66.0		0		0	61.2					
75 / 79		18	2	20	63.0		2	0	2	59.5			0	0	54.0
70 / 74	1	41	10	52	60.4	0	11	1	12	57.7		1	0	1	57.1
65 / 69	4	44	25	73	58.7	1	22	6	29	57.0		6	1	8	57.7
60 / 64	22	48	47	116	56.8	10	35	22	67	55.5	3	16	6	25	55.5
55 / 59	39	41	49	128	53.1	19	37	34	90	52.1	6	22	15	43	51.5
50 / 54	43	29	46	118	48.8	24	40	39	103	47.5	14	32	24	70	47.0
45 / 49	43	17	38	98	44.3	33	35	39	107	42.8	17	39	32	88	42.2
40 / 44	42	6	22	70	40.1	37	27	38	102	38.3	31	36	43	110	38.2
35 / 39	34	2	8	44	36.0	36	19	33	88	33.8	39	36	42	117	33.6
30 / 34	18	0	2	20	31.4	42	9	21	72	29.8	50	32	42	124	29.4
25 / 29	4		0	4	27.2	30	2	7	39	25.5	40	15	25	80	24.7
20 / 24	0			0	22.0	8	0	1	9	21.2	26	6	10	42	20.2
15 / 19						1	0	0	1	16.8	12	3	4	19	15.5
10 / 14						0			0	13.0	6	1	2	9	11.2
5 / 9											2	1	1	4	6.1
0 / 4											1	0	0	1	1.3
-5 / -1											0	0	0	0	-2.7
-10 / -6											0		0	0	-6.9
-15 / -11															
-20 / -16															

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

Period of Record = 1973 to 1996

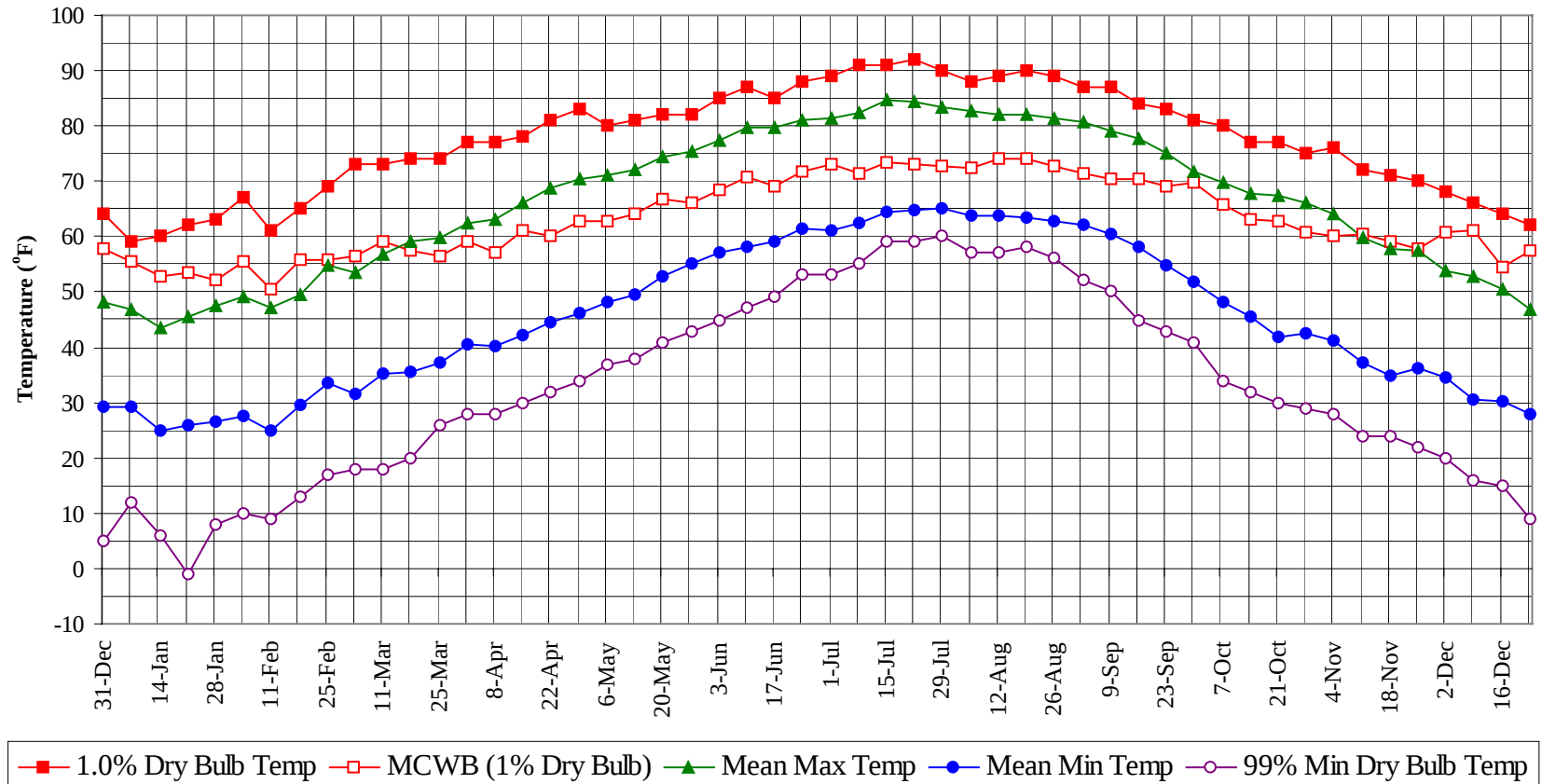
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		1	0	1	74.7
90 / 94		17	4	21	72.9
85 / 89		91	24	115	71.8
80 / 84	0	252	76	328	69.8
75 / 79	4	349	167	519	67.4
70 / 74	71	378	343	792	65.3
65 / 69	426	300	414	1140	63.0
60 / 64	410	274	323	1008	58.1
55 / 59	300	246	280	826	52.7
50 / 54	276	244	276	796	47.8
45 / 49	269	213	254	736	43.0
40 / 44	273	178	234	686	38.5
35 / 39	262	155	200	618	34.0
30 / 34	264	118	165	546	29.5
25 / 29	177	56	90	323	24.8
20 / 24	98	24	39	161	20.2
15 / 19	47	14	20	81	15.5
10 / 14	28	5	7	40	11.1
5 / 9	11	3	3	17	6.3
0 / 4	3	1	1	5	1.3
-5 / -1	1	0	0	1	-3.2
-10 / -6	1	0	0	1	-6.9
-15 / -11	0	0	0	0	-12.5
-20 / -16	0			0	-15.3

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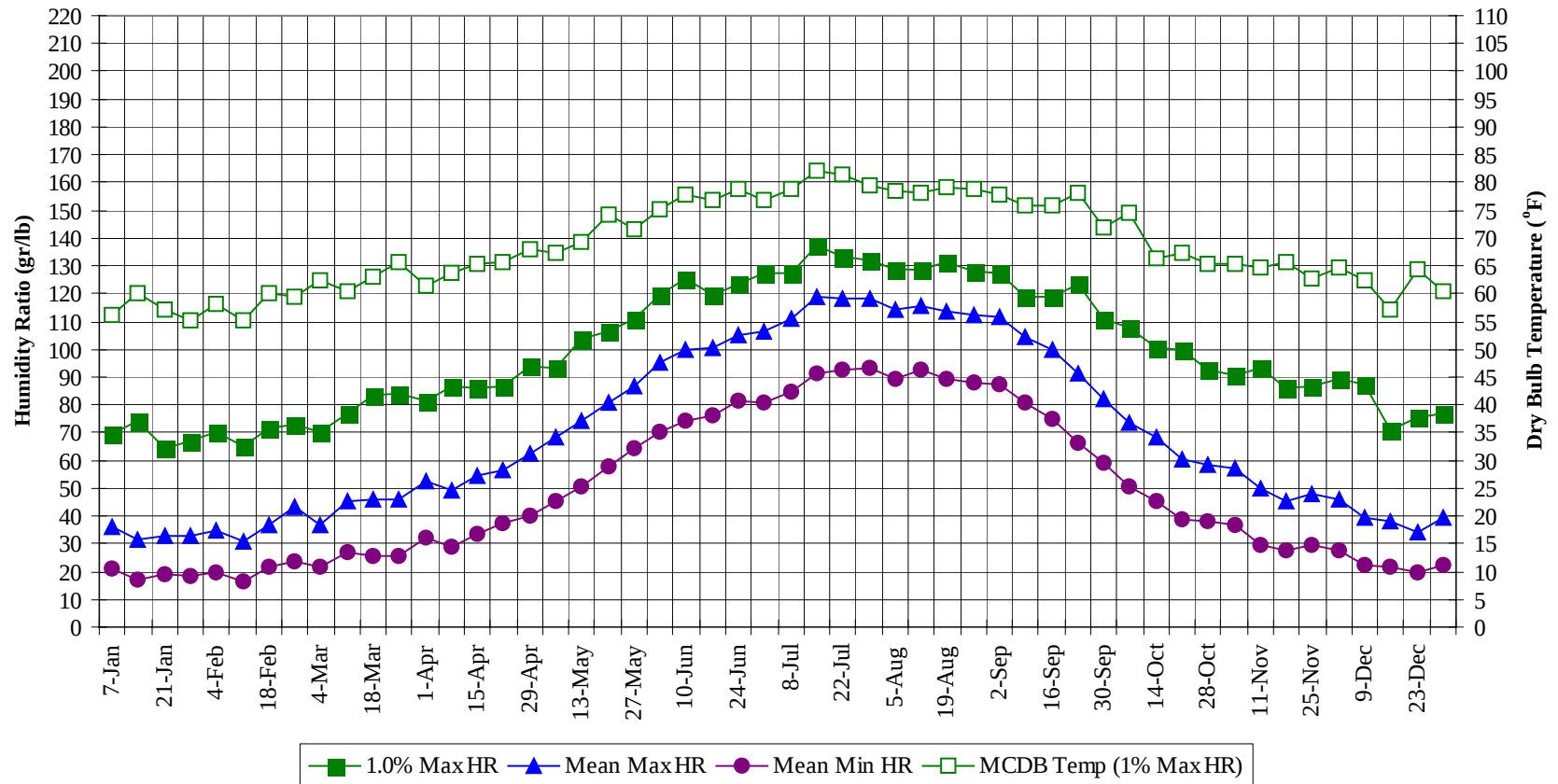
ASHEVILLE NC

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



ASHEVILLE NC

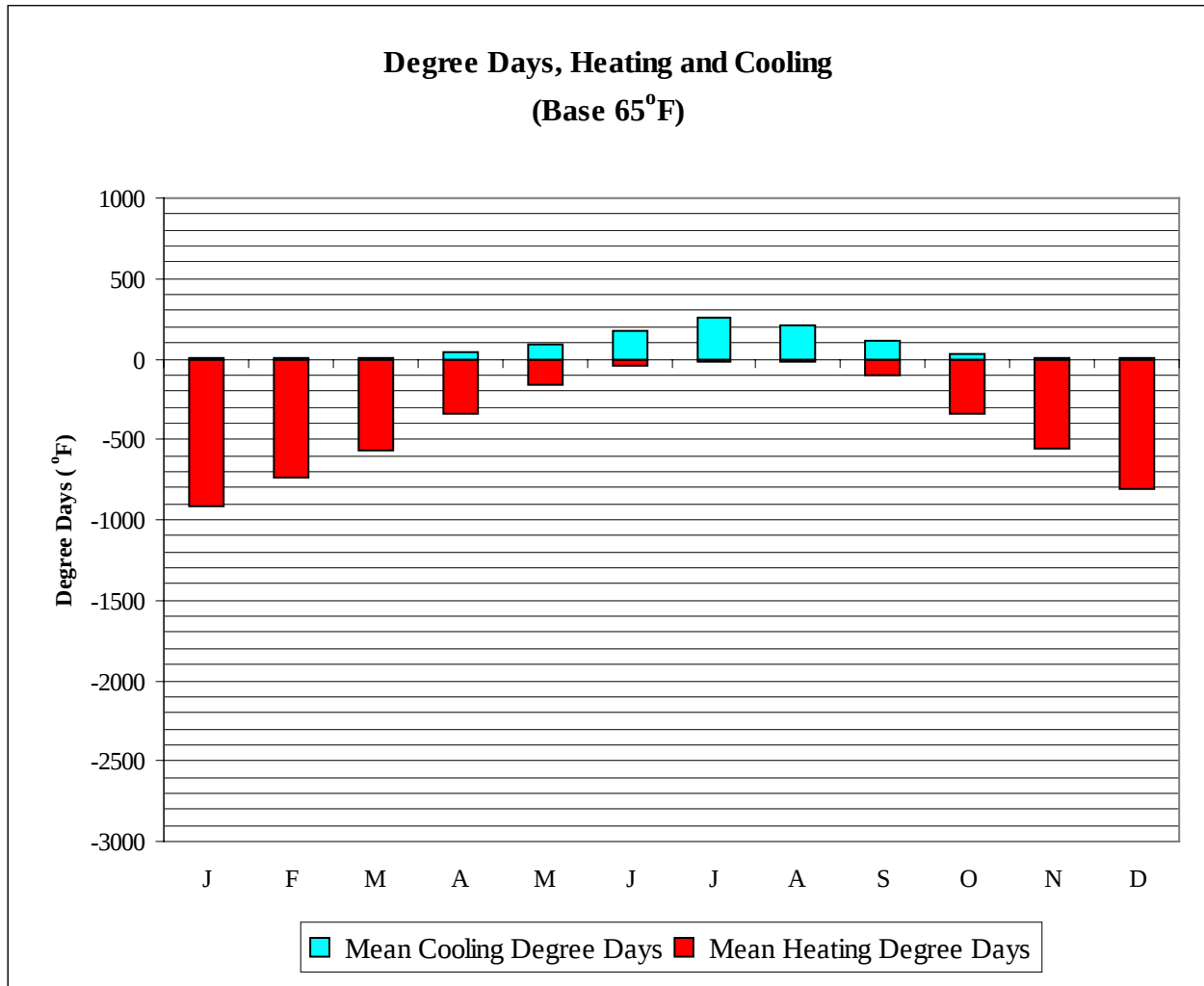
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Long Term Dry Bulb Temperature and Humidity Summary

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	55.4	46.7	29.3	12.0	69.3	56.1	35.9	21.2
14-Jan	60.0	52.7	43.7	24.7	6.0	74.2	60.2	31.3	17.2
21-Jan	62.0	53.6	45.4	25.8	-1.0	64.4	57.0	33.2	19.0
28-Jan	63.0	52.2	47.6	26.5	8.0	67.2	55.0	32.7	18.2
4-Feb	67.0	55.6	49.2	27.4	10.0	70.0	58.1	34.9	19.5
11-Feb	61.0	50.6	47.1	25.0	9.0	65.1	55.1	31.2	16.4
18-Feb	65.0	55.8	49.7	29.6	13.0	71.4	60.0	36.8	21.7
25-Feb	69.0	55.9	54.8	33.5	17.0	72.8	59.4	43.2	23.8
4-Mar	73.0	56.4	53.5	31.4	18.0	70.0	62.3	36.7	21.6
11-Mar	73.0	59.1	56.9	35.3	18.0	77.0	60.4	45.2	26.7
18-Mar	74.0	57.5	59.0	35.5	20.0	83.3	63.1	45.9	25.6
25-Mar	74.0	56.4	59.9	37.2	26.0	84.0	65.7	45.7	25.6
1-Apr	77.0	59.3	62.3	40.5	28.0	81.2	61.6	52.4	32.3
8-Apr	77.0	57.0	63.0	40.1	28.0	86.8	63.6	49.3	28.7
15-Apr	78.0	61.3	66.1	42.0	30.0	86.1	65.3	54.6	33.5
22-Apr	81.0	60.1	68.6	44.5	32.0	86.8	65.8	56.5	37.2
29-Apr	83.0	62.8	70.5	46.1	34.0	93.8	67.9	62.3	39.7
6-May	80.0	62.6	71.0	48.1	37.0	93.1	67.4	68.0	45.3
13-May	81.0	64.2	72.1	49.6	38.0	103.6	69.4	74.1	50.4
20-May	82.0	66.9	74.5	52.9	41.0	106.4	74.2	80.6	58.0
27-May	82.0	66.3	75.6	55.2	43.0	111.3	71.4	86.9	64.4
3-Jun	85.0	68.5	77.5	57.3	45.0	119.7	75.2	95.4	70.4
10-Jun	87.0	70.6	79.6	58.1	47.0	125.3	77.9	100.0	73.9
17-Jun	85.0	69.1	79.7	59.2	49.0	119.7	76.7	100.5	76.0
24-Jun	88.0	71.6	81.1	61.4	53.0	123.2	78.8	105.3	81.6
1-Jul	89.0	72.9	81.4	61.2	53.0	127.4	76.8	106.5	80.6
8-Jul	91.0	71.3	82.3	62.4	55.0	127.4	78.7	111.2	84.8
15-Jul	91.0	73.5	84.8	64.5	59.0	137.2	82.0	118.8	91.4
22-Jul	92.0	73.0	84.2	64.8	59.0	133.0	81.5	118.2	92.5
29-Jul	90.0	72.8	83.4	65.0	60.0	132.3	79.4	118.2	93.2
5-Aug	88.0	72.5	82.6	63.7	57.0	128.8	78.5	114.2	89.3
12-Aug	89.0	74.1	82.0	63.9	57.0	128.8	78.2	115.8	92.3
19-Aug	90.0	73.9	82.0	63.4	58.0	131.6	79.1	113.7	89.4
26-Aug	89.0	72.6	81.5	62.9	56.0	128.1	78.7	112.3	87.8
2-Sep	87.0	71.4	80.8	62.3	52.0	127.4	77.9	111.7	87.1
9-Sep	87.0	70.5	78.9	60.5	50.0	119.0	75.9	104.3	81.0
16-Sep	84.0	70.5	77.6	58.2	45.0	119.0	75.8	99.8	74.9
23-Sep	83.0	69.0	74.9	54.9	43.0	123.2	78.2	91.4	66.5
30-Sep	81.0	69.7	71.6	51.9	41.0	111.3	71.9	82.1	58.8
7-Oct	80.0	65.6	69.8	48.0	34.0	107.8	74.4	73.8	50.7
14-Oct	77.0	63.1	67.9	45.4	32.0	100.8	66.4	68.4	45.3
21-Oct	77.0	62.9	67.3	41.9	30.0	100.1	67.3	60.2	38.7
28-Oct	75.0	60.7	66.2	42.4	29.0	92.4	65.2	58.5	38.1
4-Nov	76.0	60.1	64.0	41.3	28.0	90.3	65.2	57.4	37.0
11-Nov	72.0	60.3	59.7	37.1	24.0	93.1	64.6	49.9	29.6
18-Nov	71.0	59.0	58.0	35.0	24.0	86.1	65.7	45.4	27.3
25-Nov	70.0	57.9	57.4	36.3	22.0	86.8	62.9	48.0	29.6
2-Dec	68.0	60.8	54.0	34.4	20.0	89.6	64.8	46.3	27.5
9-Dec	66.0	61.1	52.8	30.6	16.0	87.5	62.3	39.7	22.2
16-Dec	64.0	54.6	50.4	30.2	15.0	70.7	57.2	38.2	21.8
23-Dec	62.0	57.4	47.0	27.9	9.0	75.6	64.5	34.0	19.8
31-Dec	64.0	57.8	48.3	29.3	5.0	77.0	60.4	39.2	22.3

ASHEVILLE NC

WMO No. 723150

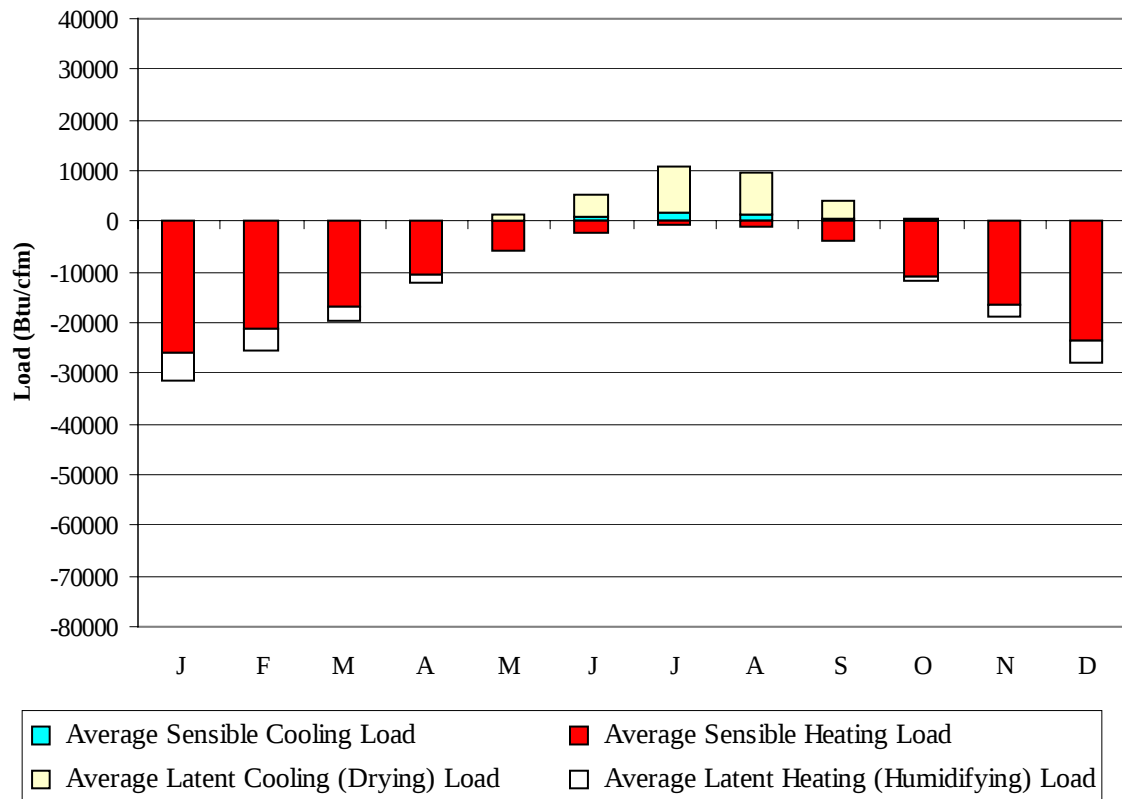


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	912
FEB	2	731
MAR	11	564
APR	39	336
MAY	88	161
JUN	174	46
JUL	256	12
AUG	212	16
SEP	108	101
OCT	30	345
NOV	6	553
DEC	1	811
ANN	926	4588

ASHEVILLE NC

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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 Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-26032	0	-5281
FEB	1	-21110	1	-4460
MAR	12	-16893	7	-2760
APR	127	-10630	54	-1347
MAY	316	-5738	1051	-94
JUN	1007	-2076	4450	-3
JUL	1816	-812	9014	0
AUG	1266	-1079	8382	0
SEP	465	-3904	3639	-11
OCT	51	-10989	351	-568
NOV	3	-16581	50	-2413
DEC	0	-23417	15	-4503
ANN	5064	-139261	27014	-21440

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

No Solar Radiation
Data Available

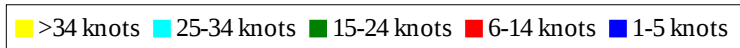
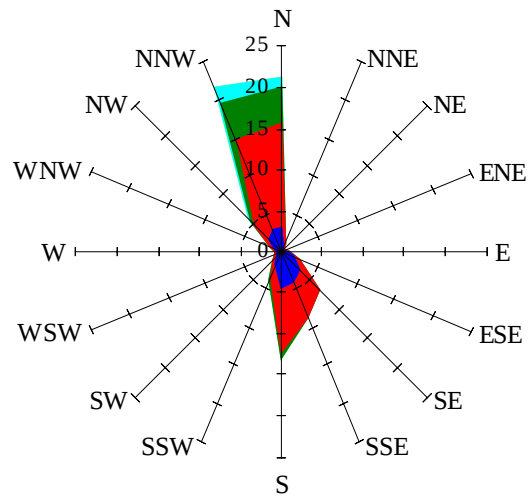


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

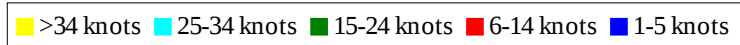
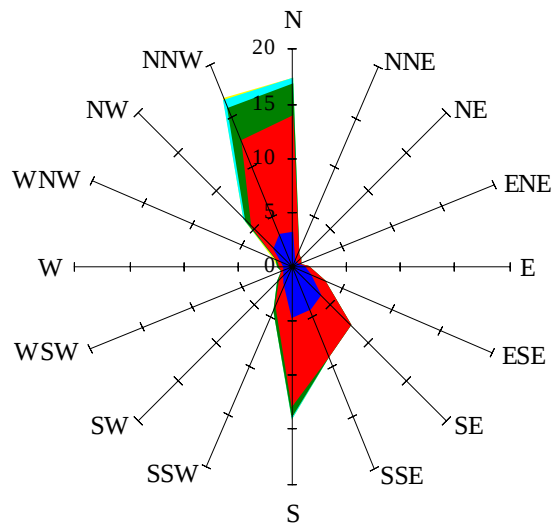
Labels of Percent Frequency on North Axis



Percent Calm = 10.32

Wind Summary - March, April, and May

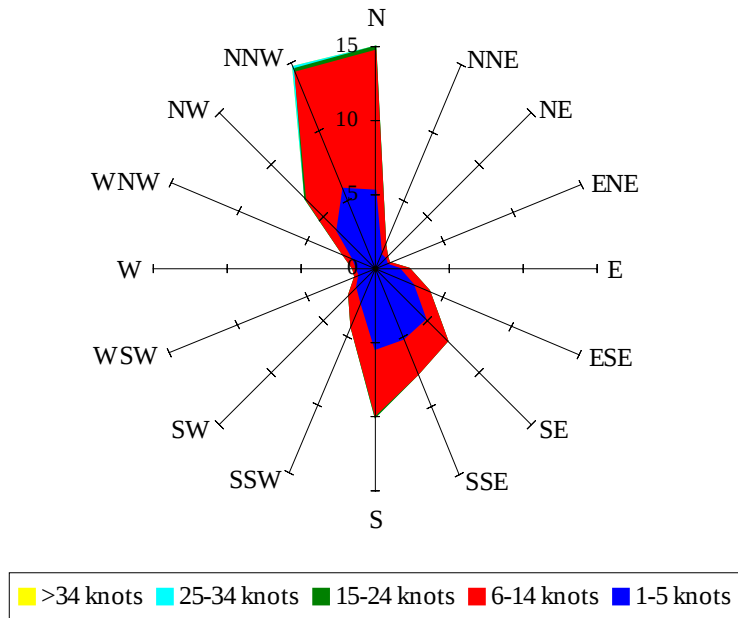
Labels of Percent Frequency on North Axis



Percent Calm = 11.71

Wind Summary - June, July, and August

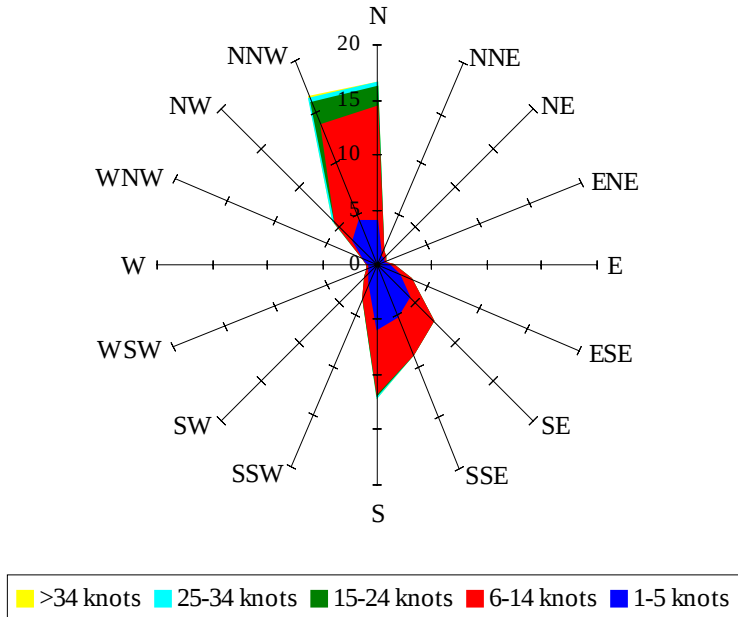
Labels of Percent Frequency on North Axis



Percent Calm = 16.89

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 17.25