

RAF BENTWATERS UK

Latitude = 52.13 N

WMO No. 035963

Longitude = 1.43 E

Elevation = 85 feet

Period of Record = 1964 to 1993

Average Pressure = 29.84 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	81	66	72	9.2	S
0.4% Occurrence	75	64	70	9.1	W
1.0% Occurrence	73	62	67	9.2	S
2.0% Occurrence	71	61	65	9.0	S
Mean Daily Range	11	-	-	-	-
97.5% Occurrence	32	30	21	6.4	WNW
99.0% Occurrence	28	26	16	5.9	NW
99.6% Occurrence	27	26	16	6.0	NW
Median of Extreme Lows	21	20	12	4.4	NNW
	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	69	78	87	8.2	S
0.4% Occurrence	66	73	82	8.0	S
1.0% Occurrence	64	71	77	8.1	S
2.0% Occurrence	63	69	75	7.8	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	92	71	0.61	6.1	SSW
0.4% Occurrence	85	69	0.57	6.4	S
1.0% Occurrence	81	67	0.54	7.1	S
2.0% Occurrence	76	66	0.50	7.0	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		0	8	0	21

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	N/A	N/A	0.0 + 0.0
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 (#)
52.6	N/A	N/A	19

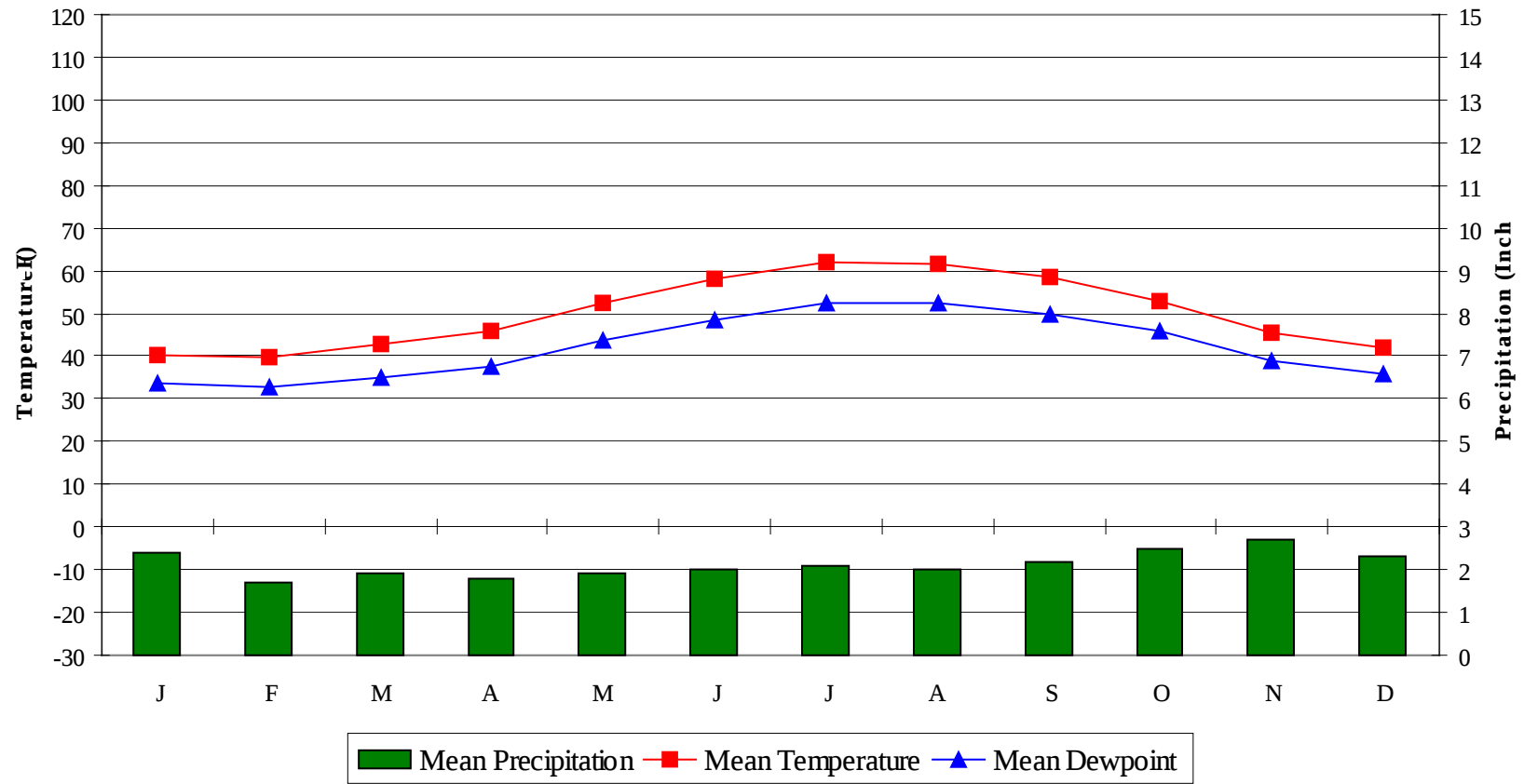
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

RAF BENTWATERS

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Average Annual Climate

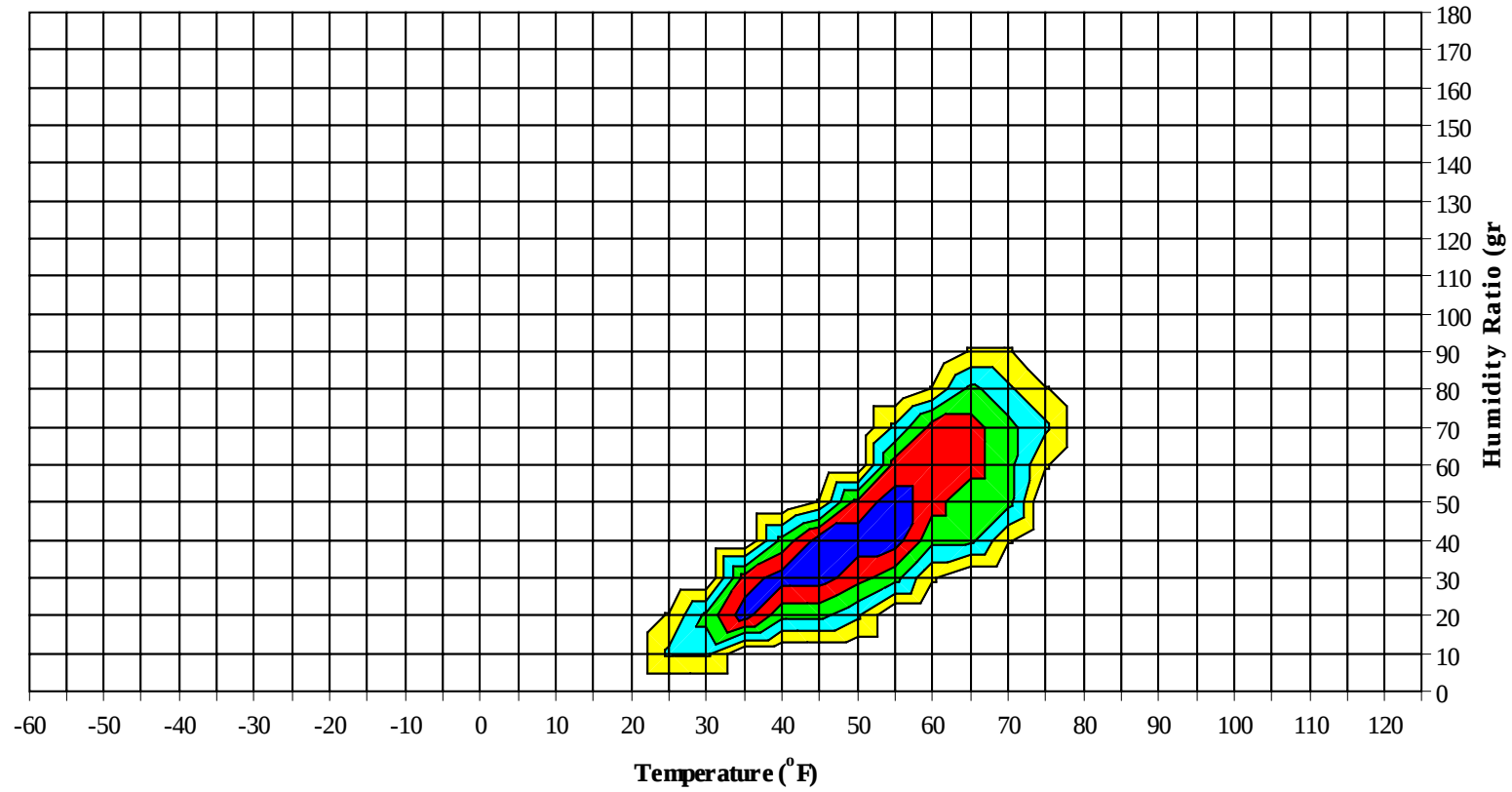


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Long Term Psychrometric Summary

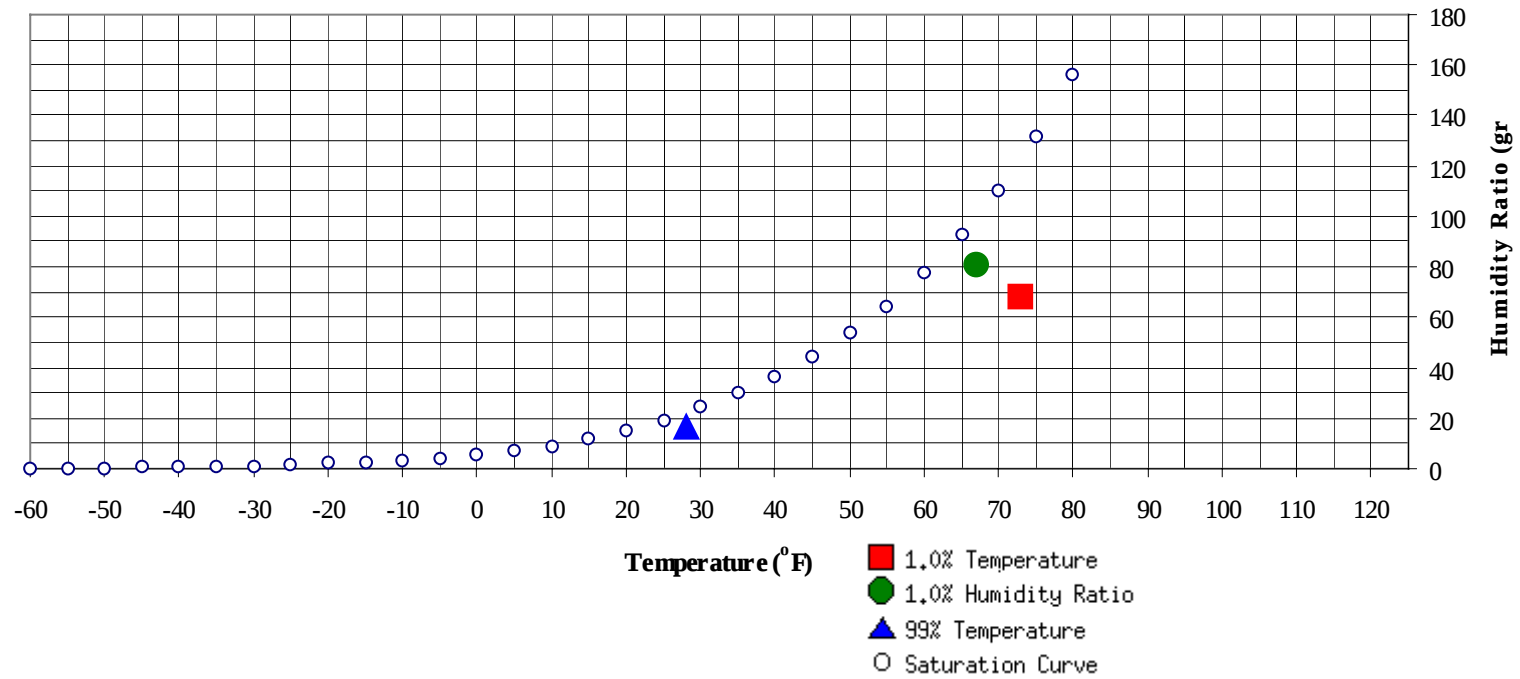


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values

	(°F)	MCHR	Enthalpy	1.0% Humidity	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	28	16.5	9.3	Ratio	80.5	67.1	63.2	60.8	28.6

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	73	68.1	62.6	28.2

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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		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69															
60 / 64												3	0	3	51.9
55 / 59	1	2	1	5	51.0	0	3	1	4	50.8	0	13	3	17	49.6
50 / 54	12	22	16	50	47.5	5	17	8	30	47.1	10	51	24	85	46.4
45 / 49	49	73	56	177	43.2	34	64	45	142	42.8	51	91	74	216	42.4
40 / 44	52	58	54	163	39.3	40	50	50	140	39.1	62	51	63	177	39.0
35 / 39	71	60	73	204	34.8	79	64	74	217	34.6	85	37	62	183	34.9
30 / 34	44	29	36	109	30.0	50	24	37	110	30.1	33	6	16	55	30.2
25 / 29	14	7	9	30	25.3	12	5	7	25	25.2	5	0	2	7	26.2
20 / 24	2	1	1	4	20.9	2	1	1	3	20.8					
15 / 19	1	0	1	1	16.3	1		0	1	18.1					
10 / 14	0	0	0	0	11.9										
5 / 9	0			0	8.0										

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 = 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		
90 / 94															
85 / 89												0		0	67.9
80 / 84												2	0	2	66.3
75 / 79							0		0	61.4	0	6	1	8	63.9
70 / 74		1		1	59.1		6	1	7	60.2	1	28	8	37	60.9
65 / 69		2	0	2	55.9	0	13	2	16	57.7	4	36	15	55	58.1
60 / 64	0	12	2	14	52.9	4	55	18	77	54.3	26	85	57	168	55.6
55 / 59	2	36	14	52	50.2	28	79	54	162	51.1	87	63	88	239	52.4
50 / 54	24	69	43	136	46.5	85	73	93	251	47.8	84	19	56	158	48.8
45 / 49	74	83	85	242	42.6	93	21	64	178	44.1	33	1	13	47	44.5
40 / 44	70	30	56	156	39.1	24	1	11	36	40.0	5	0	1	6	40.8
35 / 39	54	8	35	98	35.2	11	0	3	14	35.9	0			0	37.3
30 / 34	14	0	4	18	30.7	1		0	1	30.9					
25 / 29	1		0	1	26.8										
20 / 24															
15 / 19															
10 / 14															
5 / 9															

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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		
90 / 94		0	0	0	69.5										
85 / 89		0	0	0	68.9							0		0	69.0
80 / 84		3	0	3	66.6		2	0	2	66.1		0	0	0	67.4
75 / 79	0	16	4	20	64.5		15	3	18	64.4		3	0	4	63.9
70 / 74	3	58	21	82	61.9	2	56	16	74	61.6	0	26	5	30	61.4
65 / 69	13	58	35	105	59.8	10	66	35	111	59.5	3	44	14	61	59.0
60 / 64	75	86	95	256	57.3	75	88	100	263	57.3	45	104	79	228	56.6
55 / 59	100	26	69	195	53.7	99	20	73	192	53.9	80	53	82	215	52.8
50 / 54	47	3	21	71	49.6	48	1	19	67	49.6	71	10	45	126	48.9
45 / 49	8		2	10	45.6	12		3	15	45.3	34	1	13	47	44.5
40 / 44						1		0	2	41.2	6		2	8	40.8
35 / 39											1		0	1	37.1
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															

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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		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74		2		2	62.3										
65 / 69	0	9	1	10	60.3										
60 / 64	11	49	22	83	57.2	0	3	1	4	55.5		0	0	0	55.5
55 / 59	55	92	67	214	52.7	13	29	18	61	52.3	3	7	3	13	51.8
50 / 54	78	69	86	233	48.4	43	65	49	157	48.2	25	36	30	91	48.3
45 / 49	62	23	51	135	43.9	67	85	75	227	43.2	58	77	62	197	43.6
40 / 44	25	3	14	43	40.1	45	34	46	124	39.2	53	59	59	170	39.3
35 / 39	15	0	6	22	35.8	48	22	38	107	34.8	67	52	62	181	34.8
30 / 34	1		0	2	31.6	18	4	12	35	30.5	29	18	26	73	30.2
25 / 29	0			0	27.0	3	0	1	5	25.8	8	3	5	16	25.4
20 / 24											2	0	1	3	21.3
15 / 19											0			0	18.3
10 / 14															
5 / 9															

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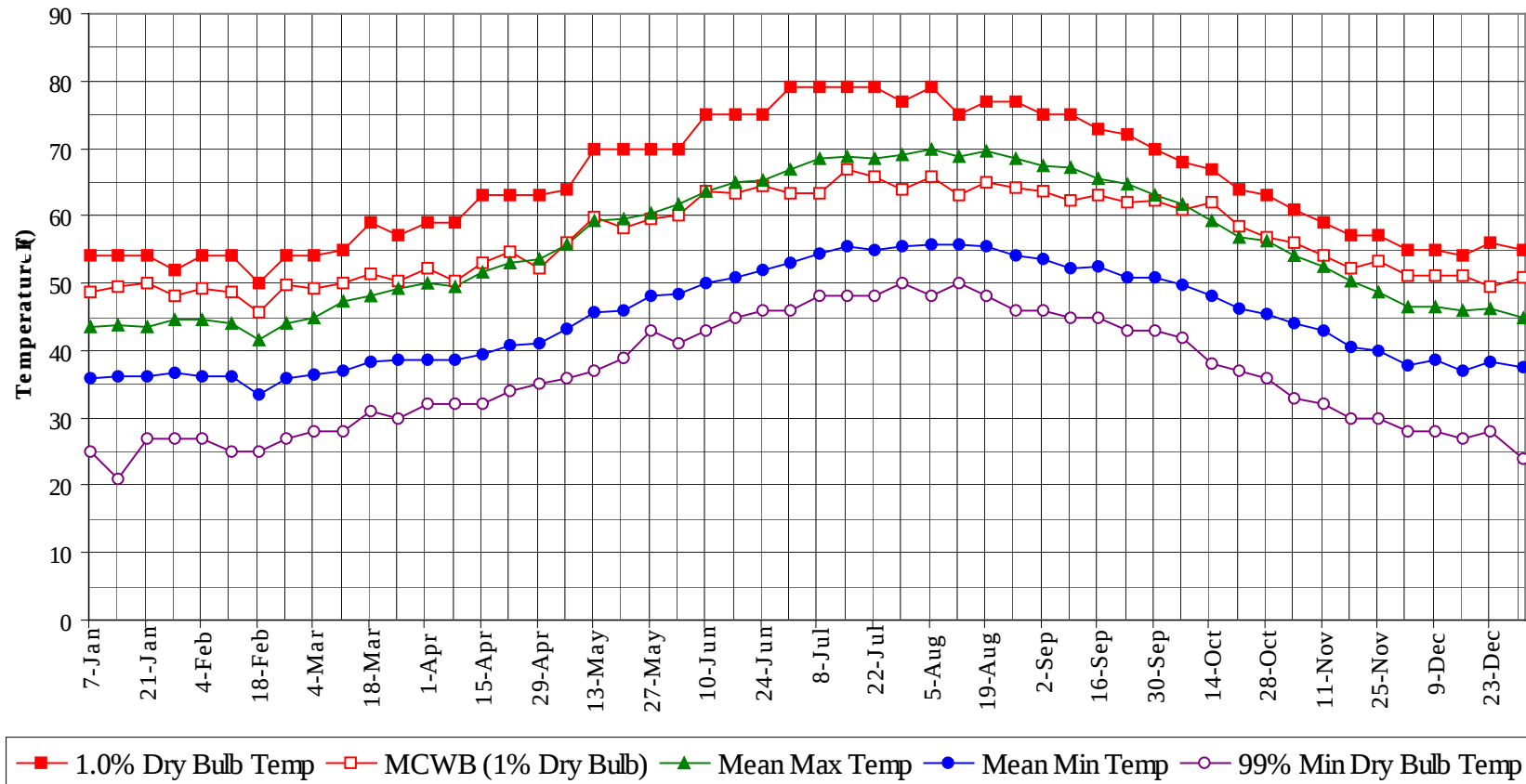
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1964 to 1993

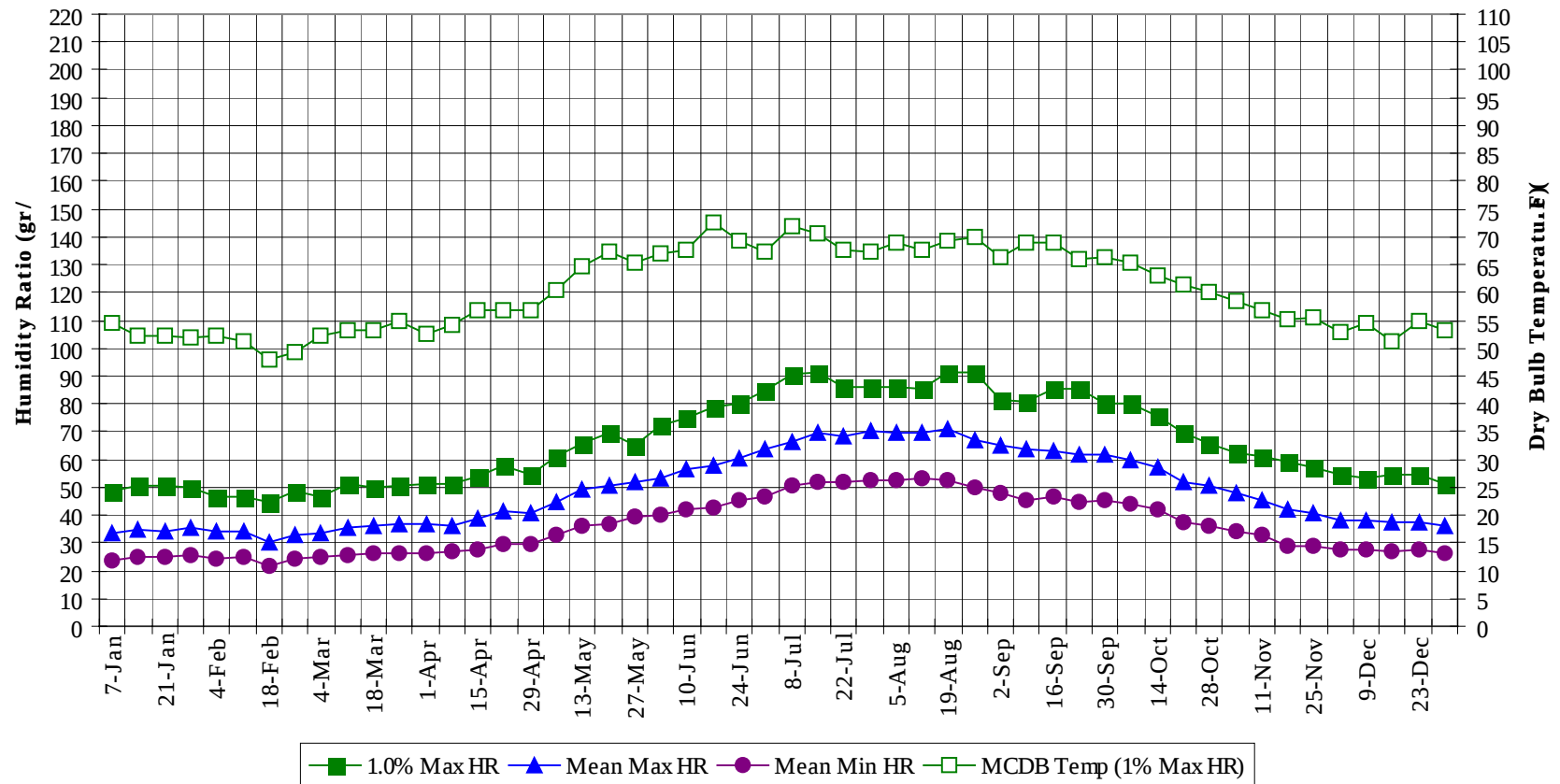
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
90 / 94		0	0	0	69.5
85 / 89		1	0	1	68.4
80 / 84		7	1	8	66.4
75 / 79	0	41	8	49	64.3
70 / 74	6	173	49	228	61.5
65 / 69	29	223	100	352	59.2
60 / 64	233	476	364	1074	56.6
55 / 59	459	418	466	1343	52.6
50 / 54	525	436	485	1446	48.1
45 / 49	575	528	548	1650	43.3
40 / 44	389	294	362	1044	39.3
35 / 39	440	250	361	1051	34.9
30 / 34	195	84	135	414	30.2
25 / 29	45	17	25	86	25.4
20 / 24	6	1	3	10	21.0
15 / 19	1	0	1	2	17.0
10 / 14	0	0	0	0	11.9
5 / 9	0			0	8.0

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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



RAF BENTWATERS

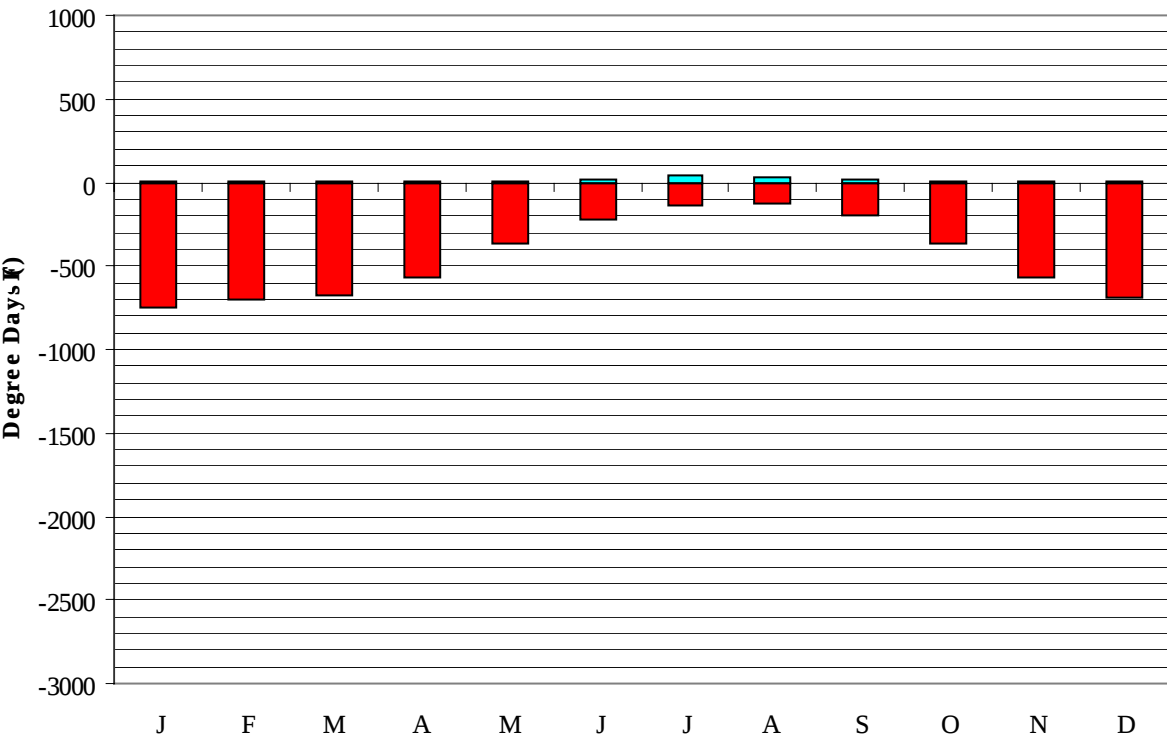
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Long Term Dry Bulb Temperature and Humidity Summary

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	54.0	48.6	43.6	36.0	25.0	48.3	54.5	33.8	23.9
14-Jan	54.0	49.5	43.7	36.2	21.0	50.4	52.2	34.6	24.9
21-Jan	54.0	50.1	43.6	36.1	27.0	50.4	52.4	34.0	24.8
28-Jan	52.0	48.1	44.6	36.7	27.0	49.7	51.9	35.6	25.9
4-Feb	54.0	49.3	44.5	36.2	27.0	46.9	52.2	34.2	24.5
11-Feb	54.0	48.8	44.0	36.1	25.0	46.9	51.2	33.9	25.1
18-Feb	50.0	45.7	41.7	33.6	25.0	44.8	48.0	30.1	21.8
25-Feb	54.0	49.9	44.0	36.0	27.0	48.3	49.3	32.8	24.3
4-Mar	54.0	49.2	44.9	36.3	28.0	46.9	52.2	33.8	25.1
11-Mar	55.0	50.1	47.4	37.1	28.0	51.1	53.0	35.4	25.6
18-Mar	59.0	51.4	48.1	38.2	31.0	49.7	53.3	36.1	26.3
25-Mar	57.0	50.3	49.1	38.5	30.0	50.4	54.8	36.8	26.4
1-Apr	59.0	52.2	49.9	38.6	32.0	51.1	52.4	37.0	26.6
8-Apr	59.0	50.3	49.5	38.6	32.0	51.1	54.2	36.0	26.7
15-Apr	63.0	53.0	51.8	39.4	32.0	53.9	56.8	38.8	27.6
22-Apr	63.0	54.7	52.9	40.9	34.0	58.1	56.7	41.2	29.7
29-Apr	63.0	52.3	53.5	41.0	35.0	54.6	56.8	40.9	29.8
6-May	64.0	56.0	55.9	43.2	36.0	60.9	60.6	44.8	32.9
13-May	70.0	59.9	59.2	45.8	37.0	65.8	64.8	49.4	36.1
20-May	70.0	58.1	59.5	45.8	39.0	69.3	67.4	50.5	37.0
27-May	70.0	59.7	60.4	48.1	43.0	65.1	65.4	52.0	39.2
3-Jun	70.0	60.2	61.6	48.3	41.0	72.1	67.0	53.5	40.3
10-Jun	75.0	63.5	63.5	49.9	43.0	74.9	67.7	56.2	42.0
17-Jun	75.0	63.4	65.0	50.9	45.0	79.1	72.7	57.6	42.8
24-Jun	75.0	64.6	65.2	51.9	46.0	79.8	69.2	60.6	45.4
1-Jul	79.0	63.4	67.0	52.9	46.0	84.7	67.5	63.8	46.9
8-Jul	79.0	63.3	68.5	54.3	48.0	90.3	72.0	66.6	50.3
15-Jul	79.0	66.8	68.9	55.4	48.0	91.0	70.6	69.5	52.0
22-Jul	79.0	65.8	68.5	55.0	48.0	86.1	67.5	68.3	51.9
29-Jul	77.0	64.0	69.2	55.4	50.0	86.1	67.4	70.3	52.6
5-Aug	79.0	65.9	69.8	55.8	48.0	86.1	68.9	69.9	52.7
12-Aug	75.0	63.1	68.9	55.7	50.0	85.4	67.6	69.5	53.2
19-Aug	77.0	64.9	69.7	55.4	48.0	91.0	69.4	70.9	52.8
26-Aug	77.0	64.2	68.5	54.0	46.0	91.0	69.9	67.2	50.1
2-Sep	75.0	63.7	67.3	53.6	46.0	81.2	66.2	65.1	47.9
9-Sep	75.0	62.3	67.2	52.3	45.0	80.5	68.9	63.5	45.6
16-Sep	73.0	63.2	65.5	52.4	45.0	85.4	69.1	63.1	46.6
23-Sep	72.0	62.0	64.7	50.9	43.0	85.4	66.1	61.9	44.6
30-Sep	70.0	62.3	63.1	50.7	43.0	79.8	66.4	61.6	45.5
7-Oct	68.0	61.0	61.6	49.9	42.0	79.8	65.3	59.7	43.9
14-Oct	67.0	62.0	59.4	48.3	38.0	75.6	63.0	57.2	42.1
21-Oct	64.0	58.6	56.8	46.1	37.0	69.3	61.4	52.0	37.7
28-Oct	63.0	56.8	56.2	45.4	36.0	65.8	60.3	50.3	36.3
4-Nov	61.0	56.0	54.1	44.0	33.0	62.3	58.3	47.9	34.3
11-Nov	59.0	54.1	52.5	42.9	32.0	60.9	56.8	45.4	32.7
18-Nov	57.0	52.3	50.2	40.6	30.0	58.8	55.0	41.9	29.2
25-Nov	57.0	53.4	48.6	40.0	30.0	57.4	55.5	40.5	28.8
2-Dec	55.0	51.0	46.6	37.7	28.0	54.6	52.9	38.3	27.3
9-Dec	55.0	51.0	46.5	38.6	28.0	53.2	54.5	38.2	27.6
16-Dec	54.0	51.1	45.8	37.1	27.0	54.6	51.1	37.7	26.8
23-Dec	56.0	49.5	46.2	38.4	28.0	54.6	55.0	37.7	27.3
31-Dec	55.0	50.9	44.9	37.5	24.0	51.1	53.1	35.9	26.3

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



Mean Cooling Degree Days Mean Heating Degree Days

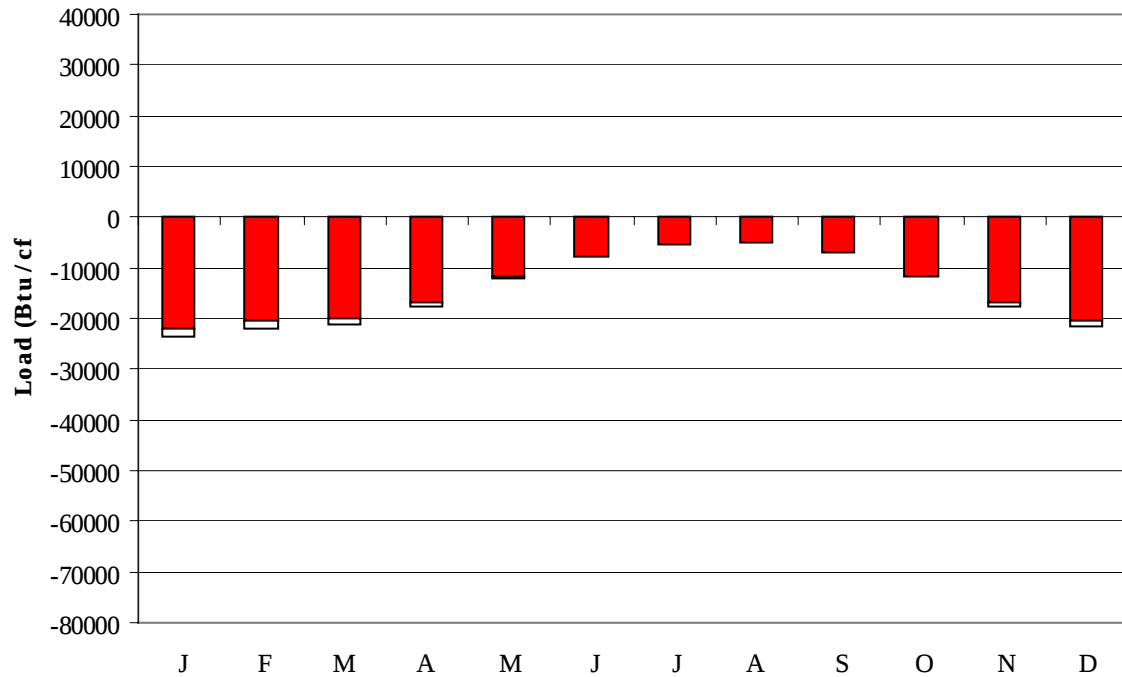
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	749
FEB	0	704
MAR	0	675
APR	0	564
MAY	3	371
JUN	17	217
JUL	39	135
AUG	35	127
SEP	12	198
OCT	1	365
NOV	0	564
DEC	0	691
ANN	108	5360

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

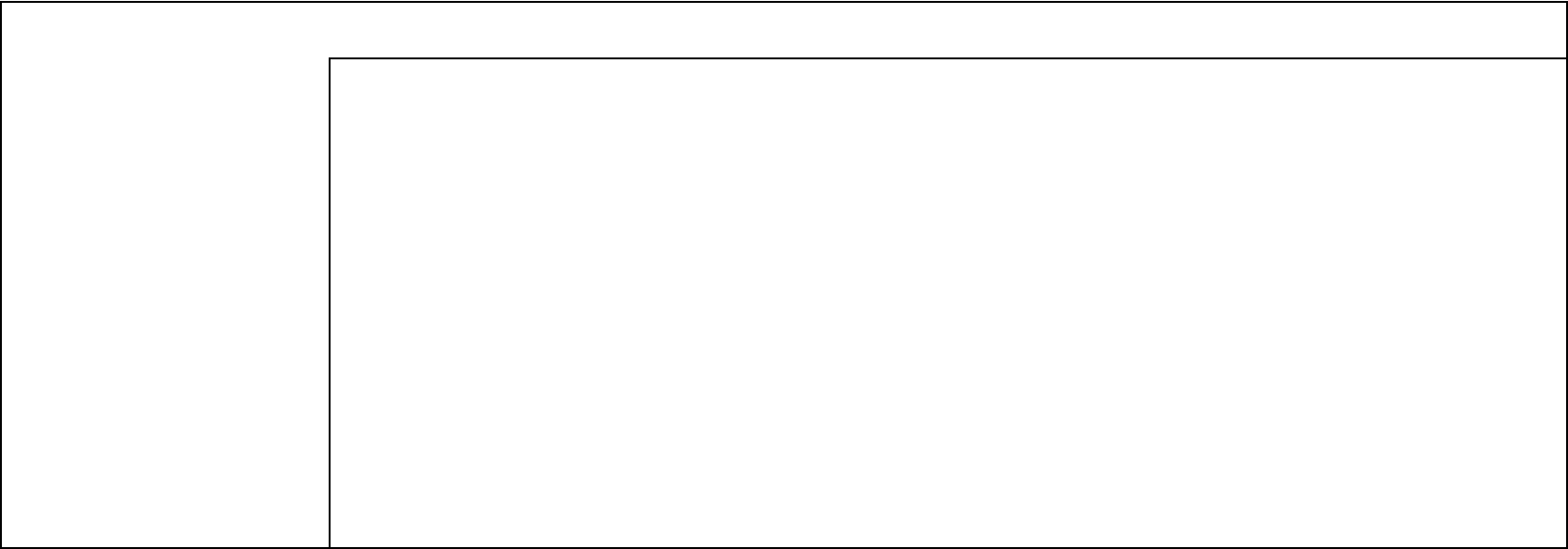


■ Average Sensible Cooling Load	■ Average Sensible Heating Load
■ Average Latent Cooling (Drying) Load	■ Average Latent Heating (Humidifying) Load

	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	-21778	0	-1670
FEB	0	-20403	0	-1694
MAR	0	-19876	0	-1165
APR	0	-16936	0	-764
MAY	0	-11871	0	-127
JUN	26	-7634	25	-6
JUL	58	-5338	126	0
AUG	39	-5053	113	0
SEP	7	-7144	38	-6
OCT	0	-11760	3	-97
NOV	0	-16897	0	-704
DEC	0	-20268	0	-1125
ANN	130	-164958	305	-7358

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

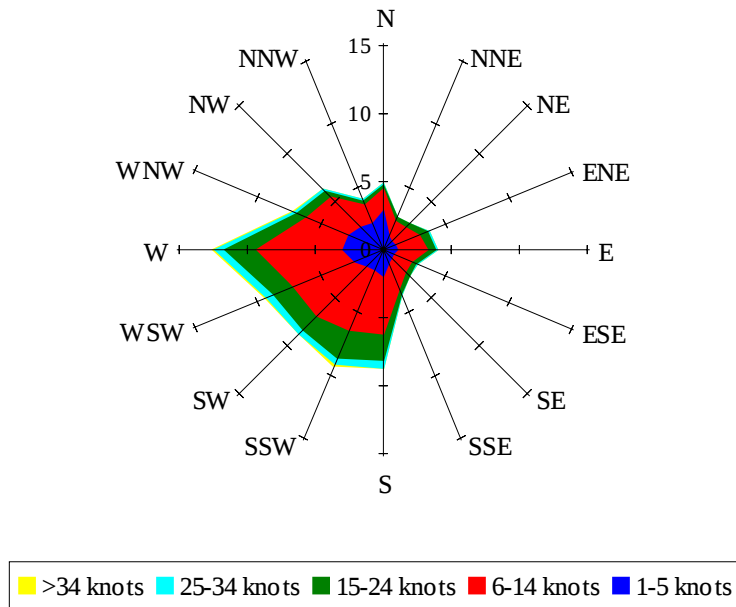
No Solar Radiation
Data Available



Average Annual Solar Heat and Illumination – Nearest Available Site

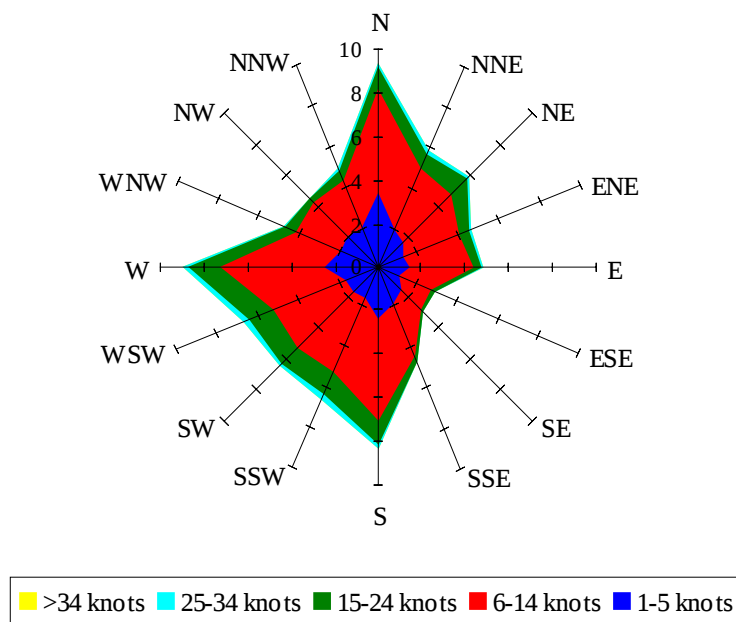
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

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



Percent Calm = 8.19

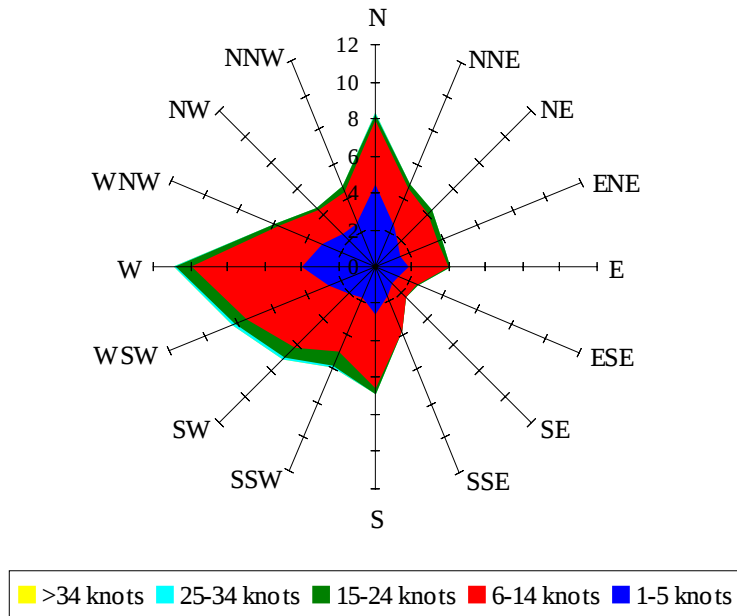
Wind Summary - March, April, and May **Labels of Percent Frequency on North Axis**



Percent Calm = 8.84

Wind Summary - June, July, and August

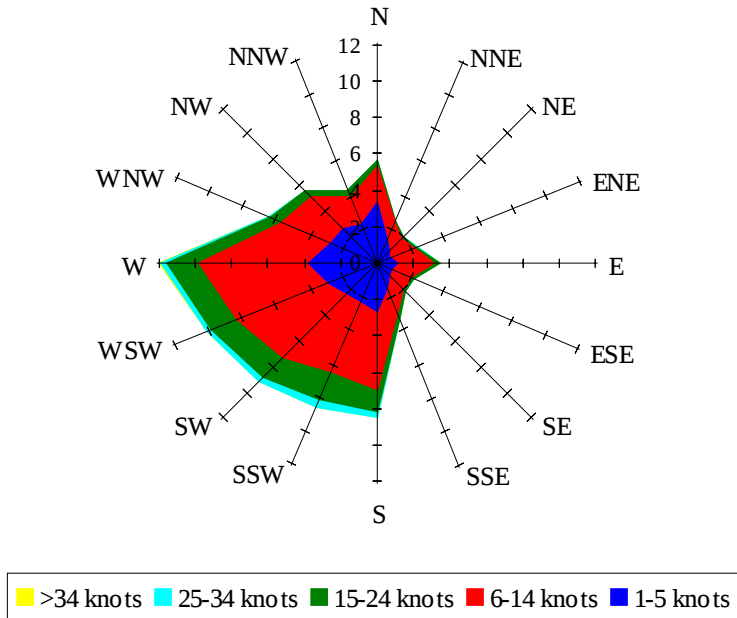
Labels of Percent Frequency on North Axis



Percent Calm = 12.57

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 12.24