

FUTENMA JP

Latitude = 26.27 N

Longitude = 127.75 E

Period of Record = 1973 to 1996

WMO No. 479330

Elevation = 246 feet

Average Pressure = 29.65 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	93	82	148	12.3	W
0.4% Occurrence	90	80	139	11.0	VARIABLE
1.0% Occurrence	90	80	139	11.0	VARIABLE
2.0% Occurrence	88	79	138	11.1	E
Mean Daily Range	9	-	-	-	-
97.5% Occurrence	54	49	43	9.3	N
99.0% Occurrence	52	47	39	9.1	N
99.6% Occurrence	50	45	37	11.3	N
Median of Extreme Lows	48	44	36	13.4	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	84	89	167	10.9	WSW
0.4% Occurrence	82	87	155	11.5	ESE
1.0% Occurrence	81	86	151	11.1	ESE
2.0% Occurrence	80	85	146	11.1	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	175	86	1.14	11.0	S
0.4% Occurrence	161	86	1.05	10.9	W
1.0% Occurrence	153	84	1.00	11.5	S
2.0% Occurrence	152	84	1.00	10.5	SE
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		3	2304	3152	4573

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
10	N/A	N/A	10.4 + 2.1
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 (#)
74.8	N/A	N/A	2

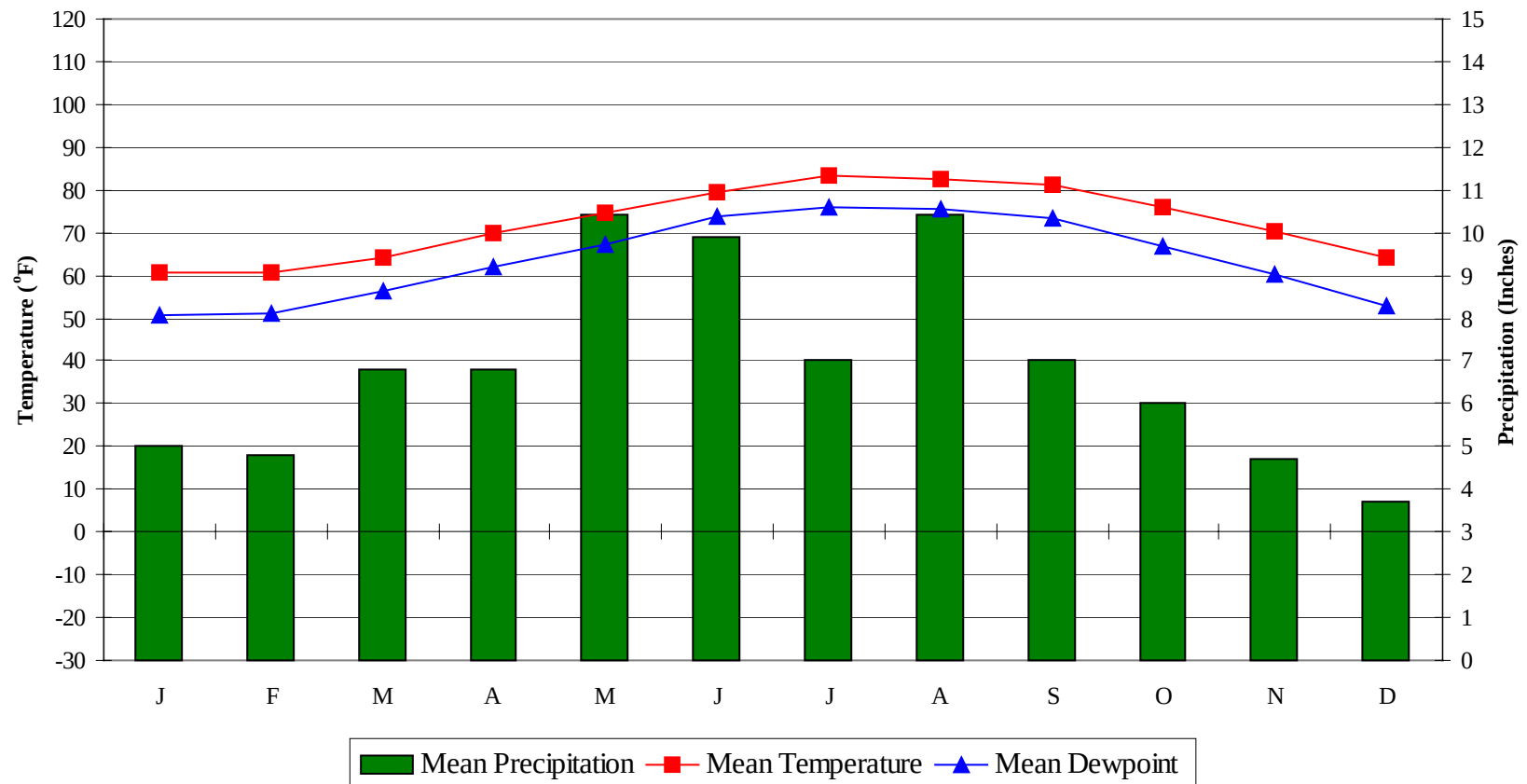
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

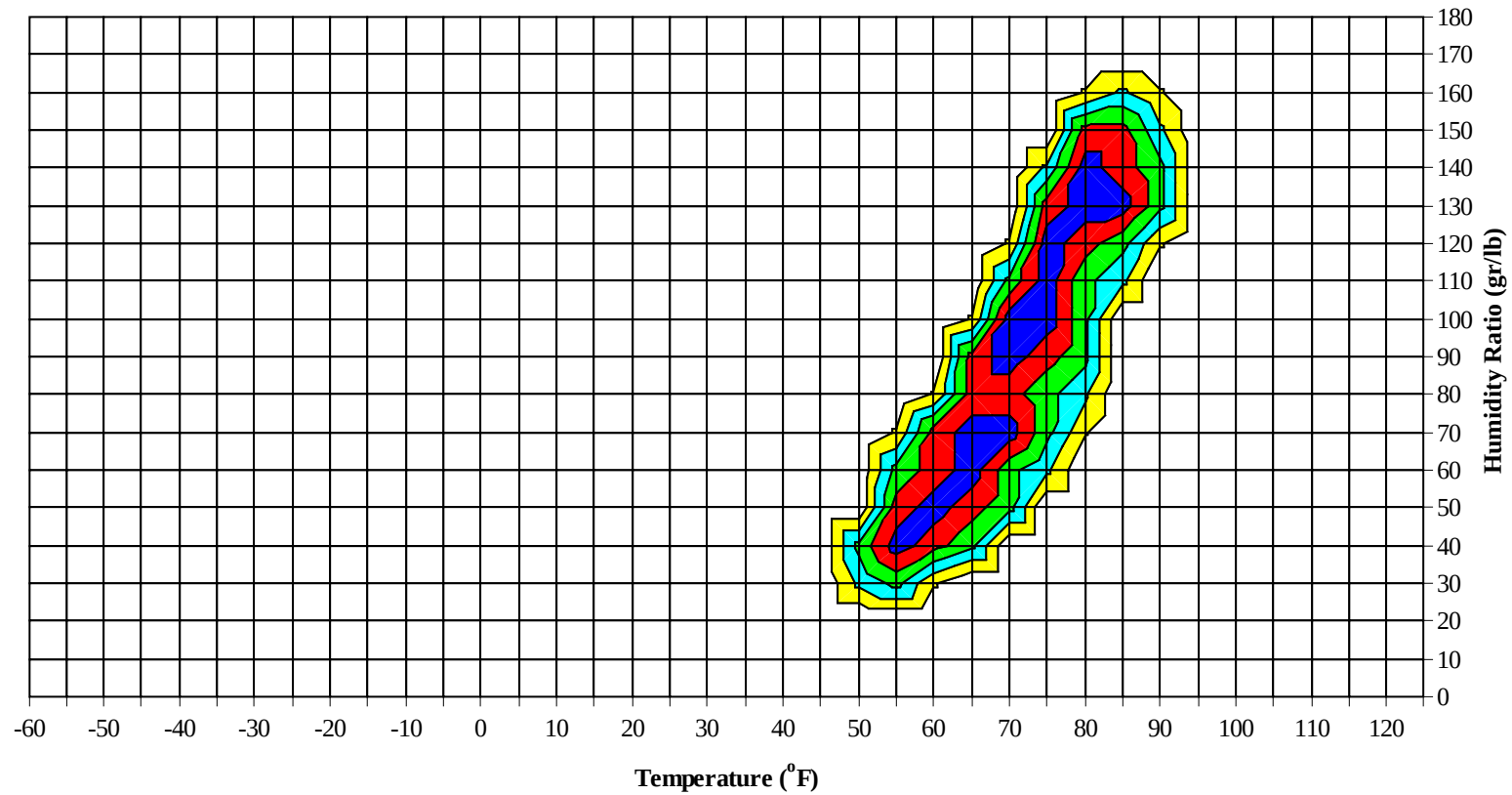


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Long Term Psychrometric Summary



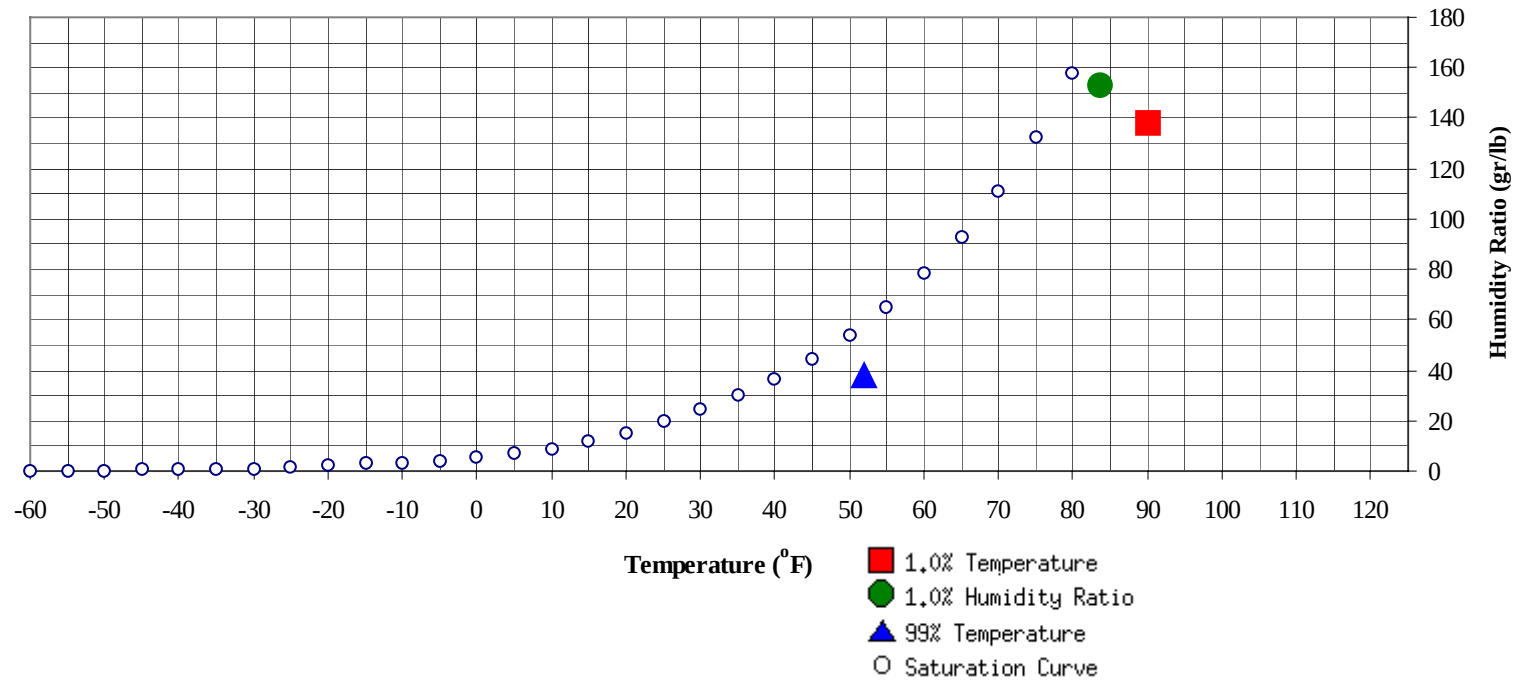
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	52	38.3	18.4		153.3	83.7	80.1	78.9	44.1

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	90	138.3	79.6	43.4

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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						1	0	1	2		0	1	1	2	73.3
75 / 79	0	2	0	2	68.1	0	4	0	4	68.7	1	27	6	34	70.4
70 / 74	7	32	11	50	64.5	7	37	14	58	65.3	37	70	49	155	66.6
65 / 69	23	54	31	108	60.9	30	43	36	109	61.9	58	64	62	183	62.4
60 / 64	71	97	82	251	56.6	62	78	71	211	57.0	76	58	77	211	57.7
55 / 59	104	56	100	261	51.7	77	45	73	195	51.5	56	25	43	123	51.9
50 / 54	41	6	23	70	47.7	41	11	28	80	47.0	19	2	10	31	47.1
45 / 49	2	0	1	3	44.6	3	0	1	4	43.9	1	0	1	2	43.4
40 / 44	0	0	0	0		1	1	0	2		0	0	0	0	
35 / 39	0	0	0	0		1	1	0	2	36.0	0	0	0	0	
30 / 34	0	0	0	0	30.0	0	1	0	1		0	1	0	1	34.0
25 / 29	0	0	0	0		0	0	0	0	25.0	0	0	0	0	
20 / 24	0	0	0	0		0	0	0	0		0	0	0	0	
15 / 19	0	0	0	0		0	0	0	0	18.0	0	0	0	0	
10 / 14	0	0	0	0		0	1	0	1		0	0	0	0	
5 / 9	0	0	0	0		1	1	0	2		0	1	0	1	
0 / 4		0		0		0	0	0	0		0	0	0	0	
-5 / -1						0	0	0	0		0	0	0	0	
-10 / -6						0	0	0	0		0	0	0	0	
-15 / -11						0	0	0	0		0	0	0	0	
-20 / -16						0	0	0	0		0	0	0	0	
-25 / -21						0	0	0	0		0	0	0	0	
-30 / -26						0	0	0	0		0	0	0	0	
-35 / -31							0	0	0						
-40 / -36							0	0	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		
95 / 99															
90 / 94				0	0 74.0		0		0	78.5		0	9	1	10 79.6
85 / 89		1	0	1	74.7	0	6	1	7	77.4	0	64	12	76	78.8
80 / 84	0	25	3	28	74.0	4	65	16	85	75.2	81	104	104	290	77.3
75 / 79	26	63	37	126	71.3	76	114	94	284	71.8	113	49	92	255	74.2
70 / 74	81	91	89	261	66.9	128	55	113	295	67.7	42	11	28	81	69.4
65 / 69	61	38	61	161	62.4	30	7	19	56	62.9	4	2	2	8	65.1
60 / 64	53	17	39	109	57.6	10	1	6	17	59.4	0	0	0	0	62.8
55 / 59	19	4	10	33	52.4	0		0	0	55.4					
50 / 54	1		0	1	47.5										
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															

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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		
95 / 99		0		0	81.5		0		0	83.0		0		0	80.0
90 / 94	0	48	5	53	79.8	0	27	2	29	79.9		8	0	8	79.7
85 / 89	10	124	41	175	79.0	4	121	29	154	78.8	2	85	11	98	78.4
80 / 84	176	66	173	414	77.7	169	88	182	440	77.4	100	125	134	359	76.4
75 / 79	62	9	28	99	75.5	74	11	35	120	75.6	123	21	89	233	73.3
70 / 74	1	1	1	3	70.9	1	0	0	1	72.2	15	1	6	22	68.5
65 / 69											0	0		0	65.0
60 / 64															
55 / 59															
50 / 54															
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															

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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		0	0	0	79.6										
85 / 89	0	11	0	11	77.0		0		0	75.7					
80 / 84	13	107	28	148	74.0	0	19	1	20	73.1	0	0		0	70.7
75 / 79	112	104	127	343	71.0	28	83	39	149	69.4	1	16	2	19	67.9
70 / 74	97	24	79	201	66.4	88	92	91	271	65.3	17	70	28	115	63.9
65 / 69	23	2	13	38	60.8	67	33	66	166	61.0	45	75	58	178	60.5
60 / 64	3	0	1	4	58.5	54	13	41	108	56.9	106	65	108	279	56.3
55 / 59						4	0	2	6	52.9	71	19	47	137	51.5
50 / 54											8	2	6	16	48.4
45 / 49											0	0	0	0	42.5
40 / 44													0	0	
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															
-30 / -26															
-35 / -31															
-40 / -36															

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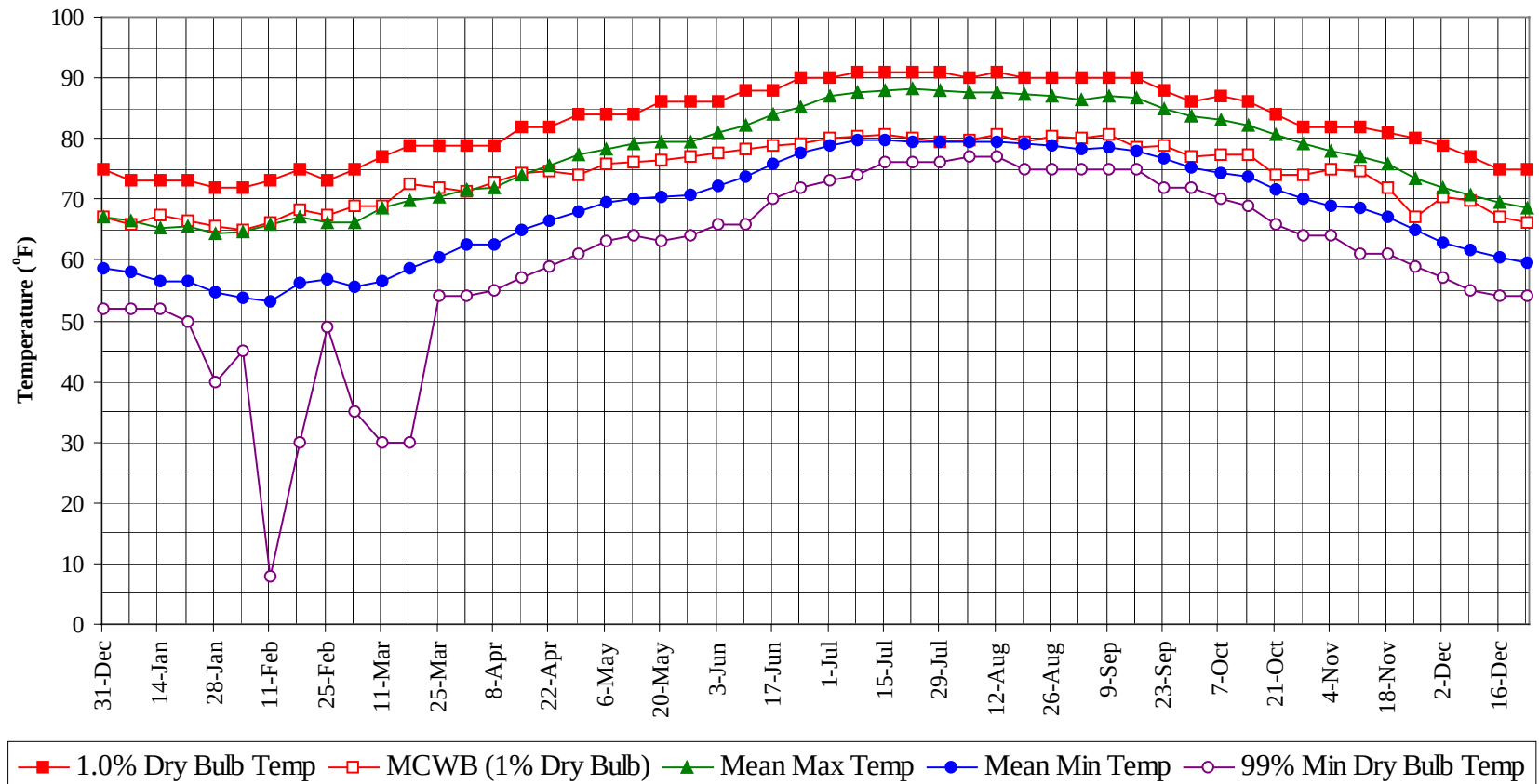
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

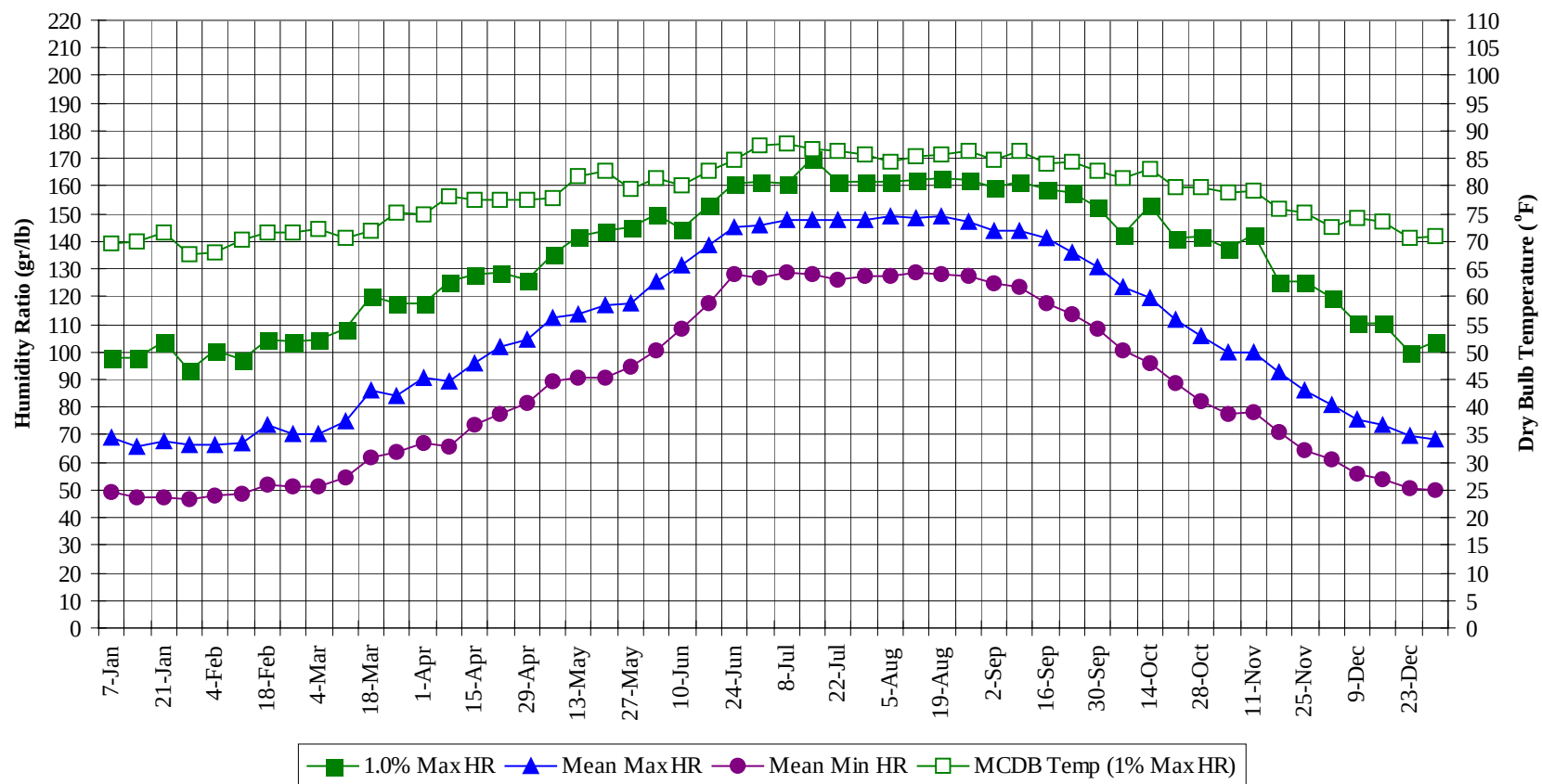
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		0		0	81.8
90 / 94	0	91	8	99	79.8
85 / 89	17	412	92	521	78.7
80 / 84	541	603	637	1781	76.7
75 / 79	615	506	551	1672	72.3
70 / 74	518	485	510	1512	66.4
65 / 69	342	319	349	1010	61.6
60 / 64	439	329	427	1196	56.9
55 / 59	330	147	273	751	51.7
50 / 54	108	21	65	194	47.4
45 / 49	6	1	3	10	44.0
40 / 44	1	1	0	2	
35 / 39	1	1	1	3	36.0
30 / 34	0	1	1	2	32.0
25 / 29	1	0	1	2	25.0
20 / 24	0	0	0	0	
15 / 19	0	0	0	0	18.0
10 / 14	0	1	1	2	
5 / 9	1	1	1	3	
0 / 4	0	0	0	0	
-5 / -1	0	0	0	0	
-10 / -6	0	0	0	0	
-15 / -11	0	0	0	0	
-20 / -16	0	0	0	0	
-25 / -21	0	0	0	0	
-30 / -26	0	0	0	0	
-35 / -31		0	0	0	
-40 / -36		0	0	0	

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Annual Summary of Temperatures

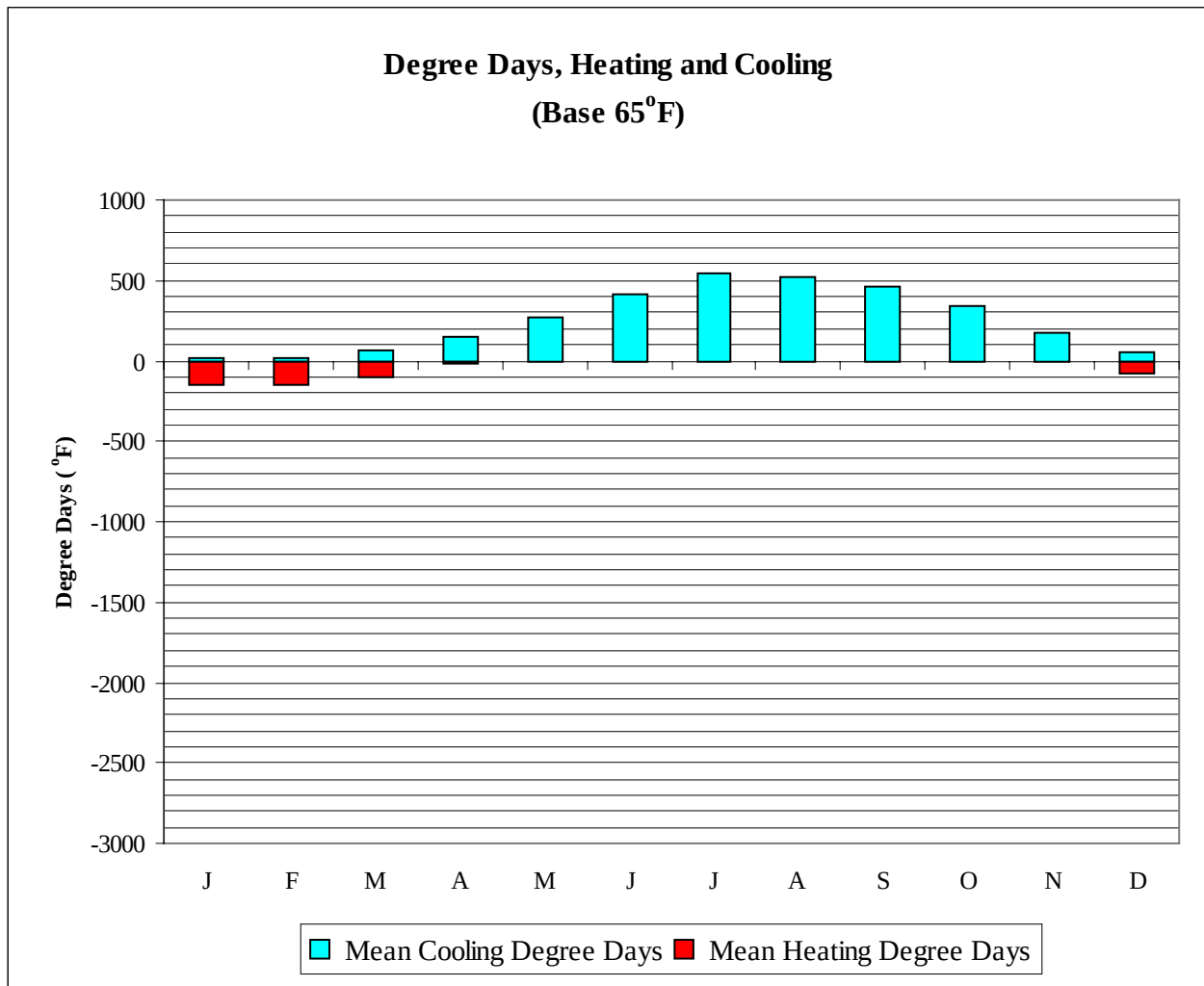


Long Term Humidity and Dry Bulb Temperature Summary

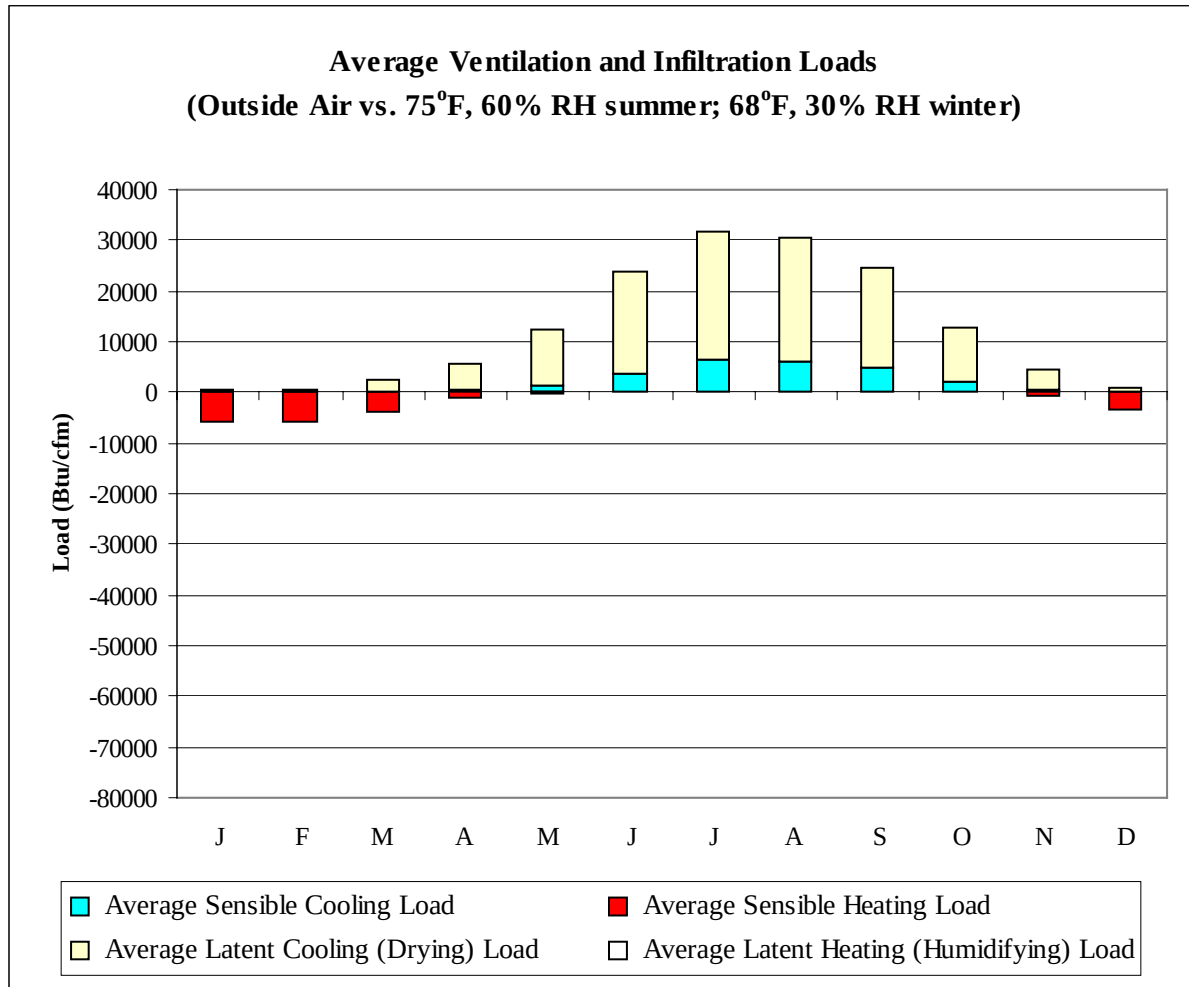


FUTENMA**JP****WMO No. 479330****Long Term Dry Bulb Temperature and Humidity Summary**

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	73.0	65.8	66.5	58.0	52.0	98.0	69.6	69.0	49.5
14-Jan	73.0	67.2	65.3	56.6	52.0	98.0	69.8	65.8	47.0
21-Jan	73.0	66.6	65.5	56.4	50.0	103.6	71.5	67.5	47.2
28-Jan	72.0	65.7	64.4	54.6	40.0	93.1	67.8	66.4	46.6
4-Feb	72.0	65.0	64.6	53.7	45.0	100.8	68.0	66.3	47.7
11-Feb	73.0	66.2	65.8	53.1	8.0	97.3	70.2	67.1	48.7
18-Feb	75.0	68.1	67.1	56.3	30.0	104.3	71.4	73.3	52.1
25-Feb	73.0	67.5	66.2	56.7	49.0	103.6	71.6	70.0	51.2
4-Mar	75.0	68.8	66.3	55.5	35.0	104.3	72.3	70.3	51.1
11-Mar	77.0	69.0	68.6	56.4	30.0	108.5	70.7	75.2	54.3
18-Mar	79.0	72.5	69.7	58.5	30.0	120.4	72.0	86.2	61.8
25-Mar	79.0	71.8	70.5	60.5	54.0	117.6	75.3	84.3	63.5
1-Apr	79.0	71.2	71.5	62.5	54.0	117.6	74.9	90.4	67.3
8-Apr	79.0	72.9	71.8	62.6	55.0	125.3	78.0	89.1	65.4
15-Apr	82.0	74.3	74.1	65.0	57.0	128.1	77.5	95.9	73.5
22-Apr	82.0	74.6	75.4	66.4	59.0	128.8	77.5	101.6	77.7
29-Apr	84.0	74.0	77.5	68.1	61.0	126.0	77.6	104.7	81.3
6-May	84.0	75.7	78.3	69.5	63.0	135.1	77.9	112.2	89.3
13-May	84.0	76.2	79.1	70.2	64.0	142.1	81.8	113.4	90.7
20-May	86.0	76.6	79.3	70.3	63.0	143.5	82.7	116.8	90.9
27-May	86.0	77.1	79.6	70.8	64.0	144.9	79.5	117.8	94.4
3-Jun	86.0	77.5	80.9	72.2	66.0	149.8	81.4	125.1	100.6
10-Jun	88.0	78.3	82.1	73.6	66.0	144.2	80.2	131.2	108.1
17-Jun	88.0	78.8	84.1	75.9	70.0	153.3	82.7	138.4	117.3
24-Jun	90.0	79.2	85.1	77.6	72.0	161.0	84.7	145.2	128.1
1-Jul	90.0	80.0	87.1	78.7	73.0	161.7	87.3	145.8	126.5
8-Jul	91.0	80.3	87.7	79.7	74.0	161.0	87.6	147.7	128.5
15-Jul	91.0	80.5	88.0	79.8	76.0	170.1	86.6	147.8	127.9
22-Jul	91.0	80.2	88.1	79.6	76.0	161.7	86.5	148.0	126.1
29-Jul	91.0	79.4	88.0	79.5	76.0	161.7	85.6	147.8	127.3
5-Aug	90.0	79.7	87.7	79.5	77.0	161.7	84.3	149.1	127.3
12-Aug	91.0	80.6	87.7	79.6	77.0	162.4	85.4	148.6	128.6
19-Aug	90.0	79.5	87.2	79.3	75.0	163.1	85.6	148.9	128.0
26-Aug	90.0	80.3	87.0	78.9	75.0	162.4	86.4	146.9	127.1
2-Sep	90.0	80.1	86.4	78.4	75.0	159.6	84.8	143.9	124.6
9-Sep	90.0	80.7	87.0	78.4	75.0	161.7	86.2	143.8	123.6
16-Sep	90.0	78.6	86.8	77.9	75.0	158.9	84.0	141.1	117.6
23-Sep	88.0	78.8	84.9	76.6	72.0	157.5	84.5	136.1	113.9
30-Sep	86.0	77.2	83.7	75.3	72.0	152.6	82.8	131.0	108.2
7-Oct	87.0	77.5	83.2	74.4	70.0	142.8	81.5	123.7	100.5
14-Oct	86.0	77.3	82.2	73.6	69.0	153.3	82.9	119.7	96.0
21-Oct	84.0	74.0	80.6	71.7	66.0	141.4	79.7	111.8	88.9
28-Oct	82.0	74.1	79.2	70.1	64.0	142.1	79.8	105.9	81.8
4-Nov	82.0	74.9	77.8	68.8	64.0	137.2	78.8	99.7	77.6
11-Nov	82.0	74.7	77.0	68.5	61.0	142.8	79.3	100.0	78.3
18-Nov	81.0	71.9	75.9	67.0	61.0	125.3	76.0	92.3	71.2
25-Nov	80.0	67.0	73.5	64.9	59.0	125.3	75.3	85.9	64.4
2-Dec	79.0	70.4	71.8	63.0	57.0	119.7	72.7	80.6	60.8
9-Dec	77.0	69.7	70.8	61.6	55.0	110.6	74.3	75.5	55.8
16-Dec	75.0	67.1	69.5	60.5	54.0	110.6	73.5	73.5	54.2
23-Dec	75.0	66.2	68.6	59.5	54.0	100.1	70.7	69.8	50.6
31-Dec	75.0	67.0	67.0	58.6	52.0	103.6	71.0	68.3	49.9



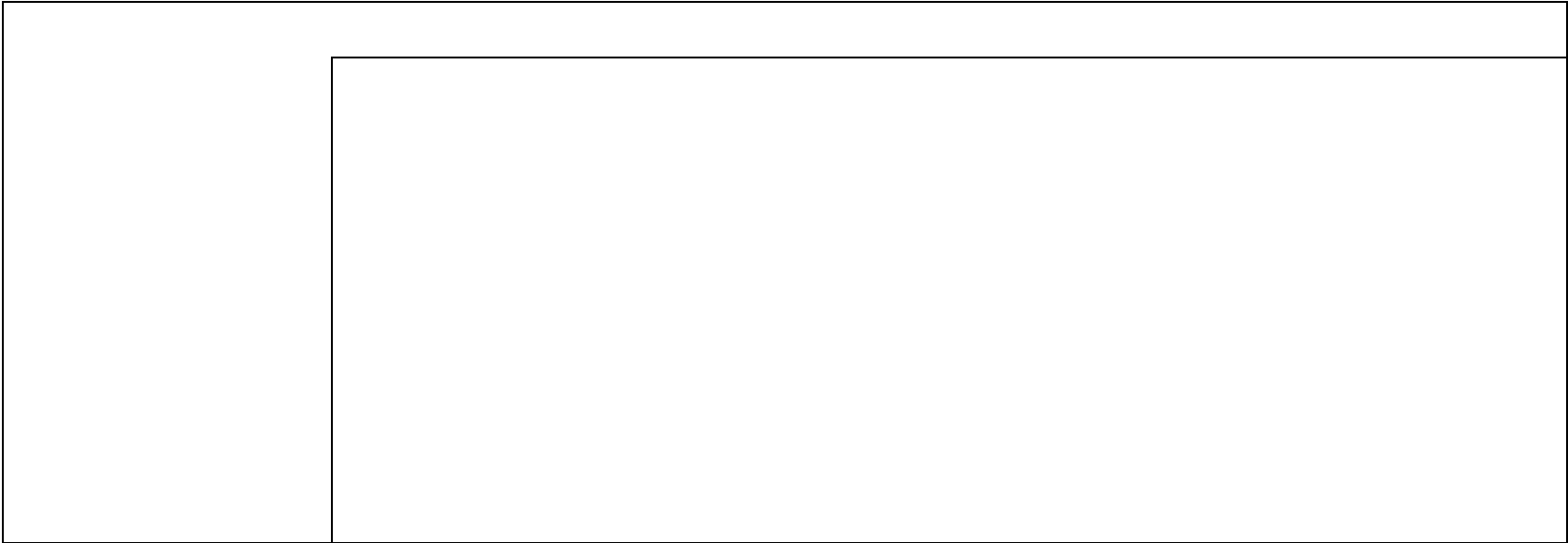
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	19	147
FEB	23	151
MAR	64	99
APR	150	20
MAY	269	1
JUN	409	0
JUL	539	0
AUG	520	0
SEP	459	0
OCT	347	0
NOV	174	10
DEC	53	77
ANN	3027	505



	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	1	-5728	422	-5
FEB	10	-5638	620	-14
MAR	50	-3973	2279	-11
APR	361	-1110	5416	0
MAY	1198	-122	11132	0
JUN	3802	-9	19893	0
JUL	6632	0	24948	0
AUG	6143	0	24499	0
SEP	4708	0	19947	0
OCT	1908	-43	10712	0
NOV	351	-803	4136	0
DEC	19	-3598	858	-1
ANN	25183	-21024	124862	-31

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

No Solar Radiation
Data Available

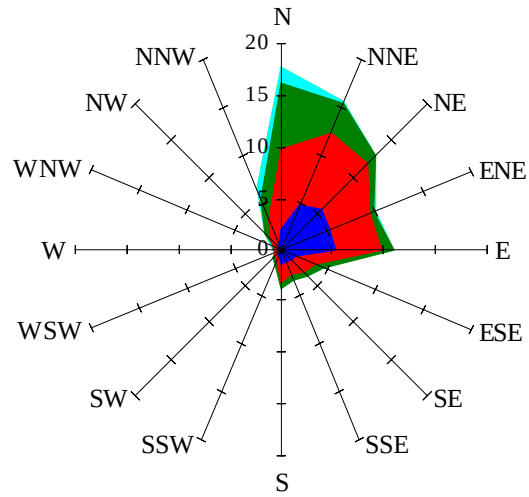


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

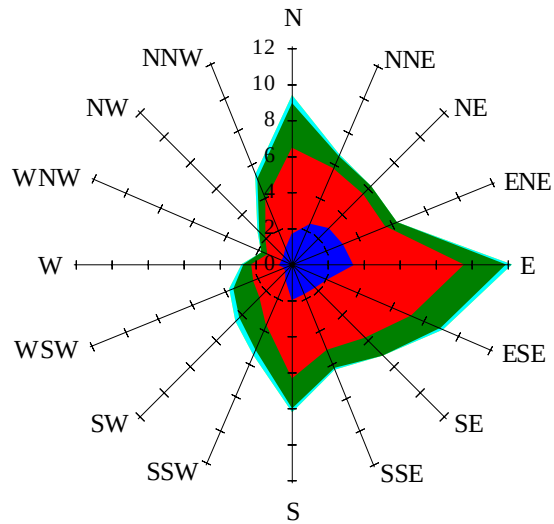
Labels of Percent Frequency on North Axis



Percent Calm = 4.60

Wind Summary - March, April, and May

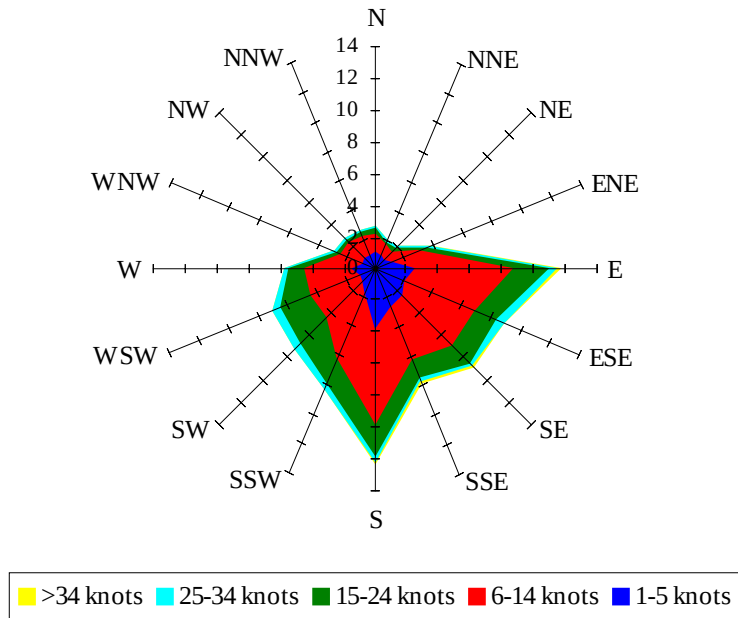
Labels of Percent Frequency on North Axis



Percent Calm = 3.99

Wind Summary - June, July, and August

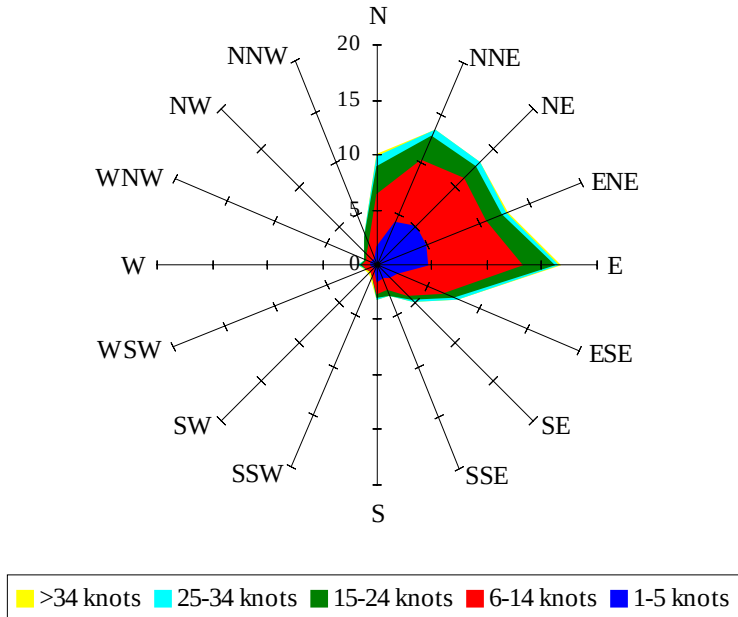
Labels of Percent Frequency on North Axis



Percent Calm = 4.40

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 5.55