

MORIOKA	JP	
Latitude = 39.70 N		WMO No. 475840
Longitude = 141.17 E		Elevation = 515 feet
Period of Record = 1973 to 1995		Average Pressure = 29.40 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	77	119	8.7	S
0.4% Occurrence	88	75	115	9.2	S
1.0% Occurrence	84	73	109	8.4	S
2.0% Occurrence	82	72	105	8.1	S
Mean Daily Range	15	-	-	-	-
97.5% Occurrence	21	20	12	4.7	SE
99.0% Occurrence	18	17	11	4.3	SE
99.6% Occurrence	14	13	9	4.3	SE
Median of Extreme Lows	9	8	7	7.4	NNE
	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	79	88	134	7.5	S
0.4% Occurrence	77	85	127	7.8	S
1.0% Occurrence	75	82	121	7.3	S
2.0% Occurrence	74	80	119	6.9	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	144	84	0.93	6.0	S
0.4% Occurrence	131	80	0.85	6.6	S
1.0% Occurrence	125	80	0.82	5.9	S
2.0% Occurrence	120	78	0.78	6.4	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		4	271	291	962

Other Site Data

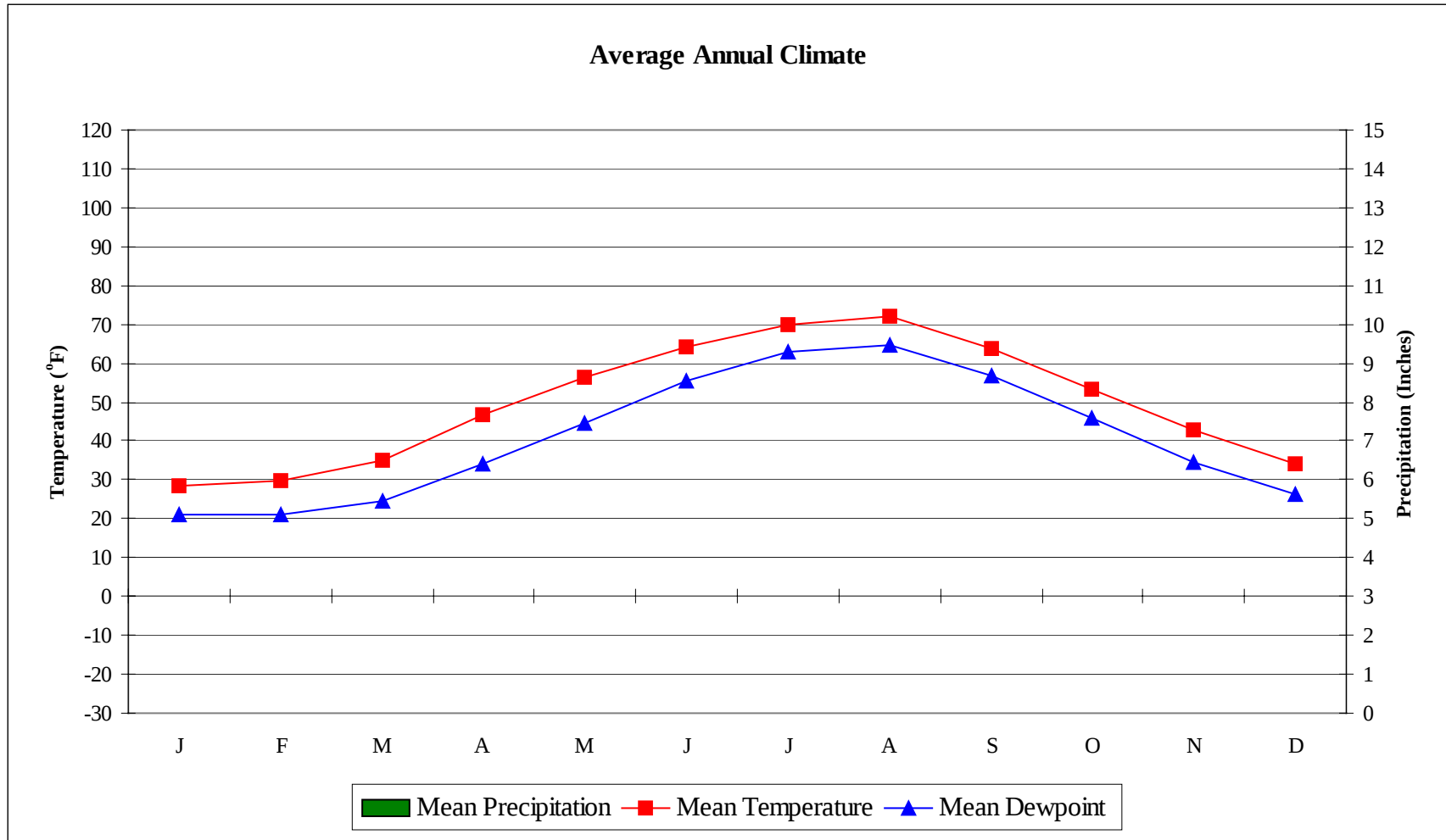
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
6	N/A	N/A	0.8 + 0.2
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
52.5	N/A	N/A	93

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

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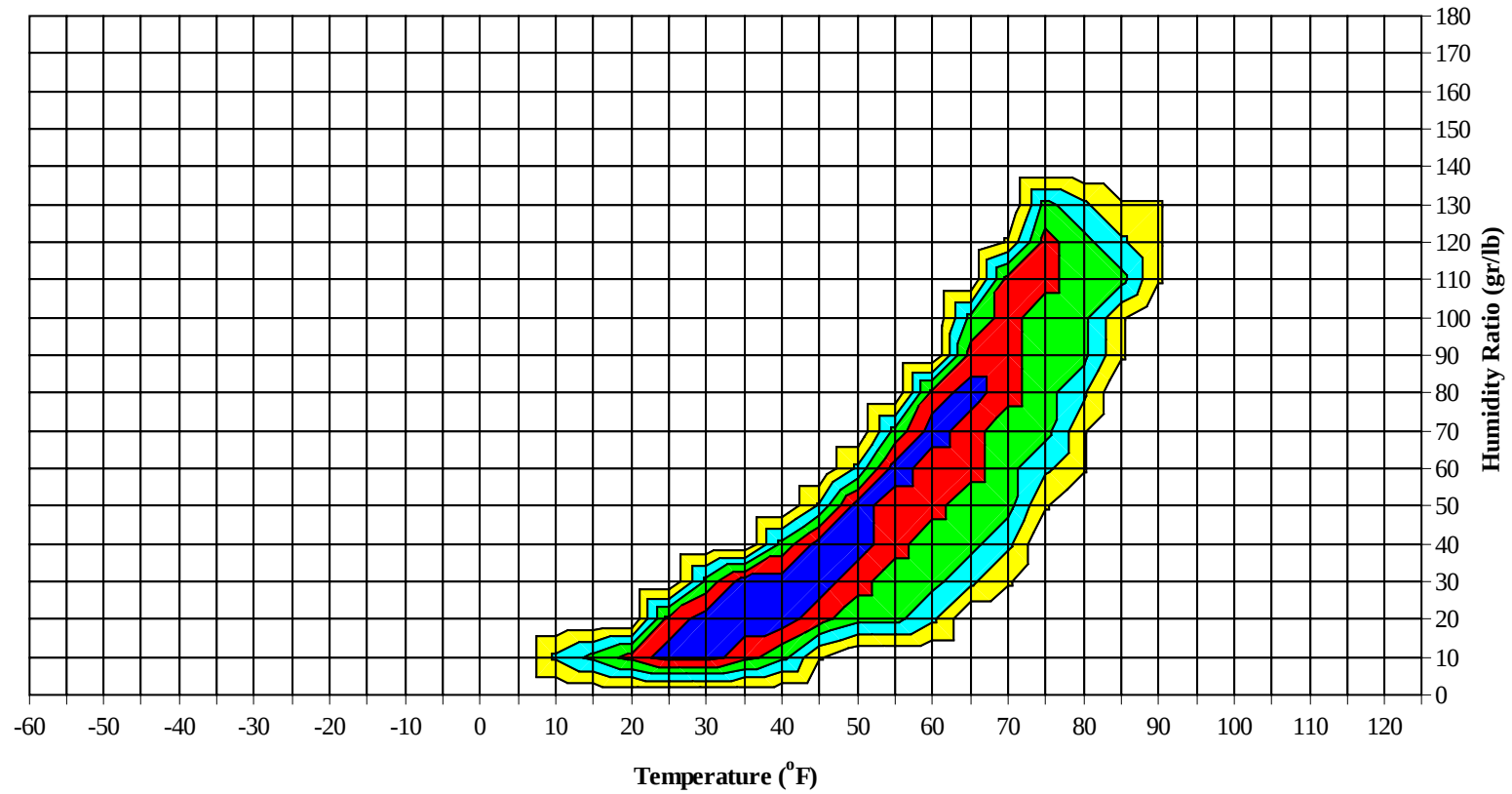
No Precipitation Data Available

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Long Term Psychrometric Summary



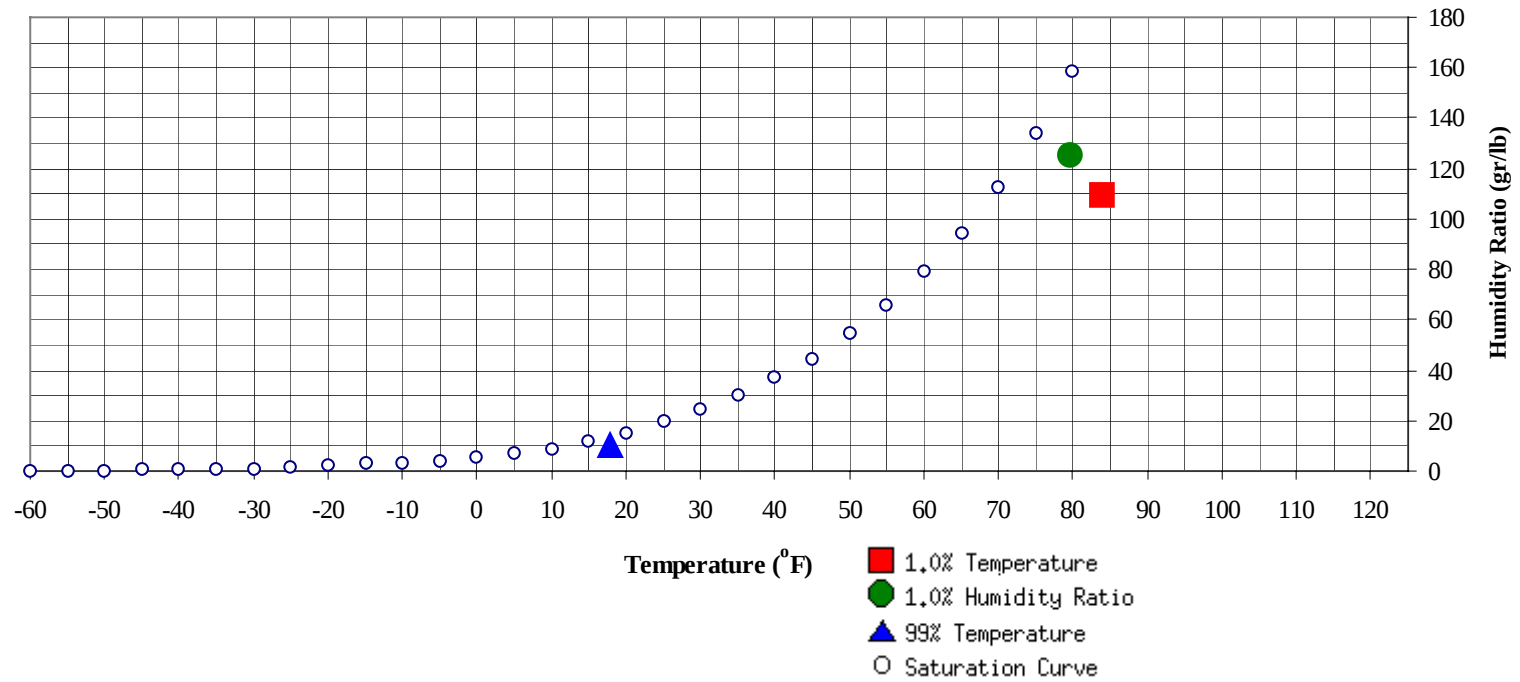
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	18	10.6	5.9		125.3	79.5	74.8	73	38.7

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	84	109.3	73.4	37.3

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

Period of Record = 1973 to 1995

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															
70 / 74															
65 / 69															
60 / 64												1		1	48.7
55 / 59		0		0	47.0							8	0	8	44.8
50 / 54		0	0	0	45.6	0	1	1	2	45.5	1	16	5	22	42.6
45 / 49	1	3	2	6	42.2	0	5	1	6	40.4	3	34	15	52	39.8
40 / 44	8	15	6	29	38.1	2	17	7	27	36.3	14	52	30	95	36.2
35 / 39	23	56	30	109	33.6	13	63	30	105	32.5	33	72	65	170	32.8
30 / 34	52	83	70	205	28.9	54	75	77	206	28.9	91	49	87	227	29.2
25 / 29	66	63	77	206	24.5	75	48	69	192	24.6	67	9	37	114	24.8
20 / 24	46	17	40	103	20.4	46	10	25	82	20.4	27	3	7	37	20.7
15 / 19	34	8	17	59	16.4	21	5	11	37	16.3	9	3	2	14	16.8
10 / 14	14	2	4	19	11.6	10	1	3	14	11.4	1	2	1	4	11.9
5 / 9	3	1	1	5	6.8	2		0	2	7.7	0	0		0	9.0
0 / 4	1	1	1	3	1.9										

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 1995

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	09	17			01	09	17			01	09	17		
	To 08	To 16	To 00			To 08	To 16	To 00			To 08	To 16	To 00		
95 / 99															
90 / 94						0 0 62.0					0 67.0				
85 / 89						0 0 60.0					1 67.4				
80 / 84	0 0 59.0					5 0 5 62.2					13 1 14 66.4				
75 / 79	1 0 1 55.7					13 2 15 59.3					0 40 11 51 65.0				
70 / 74	6 0 6 55.0					0 35 9 43 57.7					5 61 31 97 63.8				
65 / 69	12 3 15 52.2					1 42 23 66 56.3					27 58 58 143 61.8				
60 / 64	1 30 10 42 50.1					15 52 42 108 54.5					80 42 76 197 58.9				
55 / 59	5 46 28 78 48.2					48 49 68 165 51.9					78 14 46 139 54.4				
50 / 54	25 52 45 122 45.8					70 31 56 157 47.9					41 9 14 64 49.8				
45 / 49	44 46 56 146 41.6					67 17 35 119 43.8					8 3 2 13 45.4				
40 / 44	54 27 47 128 37.9					34 3 12 50 39.5					1 0 0 1 40.5				
35 / 39	63 15 36 115 34.3					11 1 2 14 35.6					0 0 37.0				
30 / 34	38 5 14 58 30.2					1 1 30.8									
25 / 29	9 0 1 10 25.7														
20 / 24	0 0 21.2														
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1995

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	79.0		1	0	1	78.2					
90 / 94		6	0	6	76.5		10	1	11	76.8		0		0	75.2
85 / 89		20	4	24	74.8		27	5	31	75.3		3	0	3	72.6
80 / 84	1	41	14	56	72.2	2	58	22	82	73.4	0	11	2	13	72.0
75 / 79	11	53	40	104	70.2	30	60	64	154	71.4	2	33	9	45	68.2
70 / 74	53	56	66	176	67.8	76	46	71	193	68.5	17	63	29	109	65.4
65 / 69	68	36	65	169	64.1	62	20	47	128	64.4	31	59	52	143	62.7
60 / 64	72	19	45	137	59.7	45	7	29	81	59.1	70	37	76	183	59.3
55 / 59	36	10	12	59	54.5	24	10	10	43	53.6	57	13	49	120	54.4
50 / 54	6	7	1	13	49.6	9	9	0	18	49.7	40	10	19	69	50.0
45 / 49	0	0	0	0	45.5	0	2		2	45.2	19	8	3	30	45.2
40 / 44											3	2	0	5	41.0
35 / 39											0	1		1	37.7
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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

Period of Record = 1973 to 1995

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															
80 / 84															
75 / 79		1		1	63.1										
70 / 74	1	14	1	16	61.1										
65 / 69	1	35	6	42	58.8		1		1	53.7					
60 / 64	10	57	27	94	56.1	1	10	1	12	53.2		0		0	56.5
55 / 59	42	64	67	173	52.8	4	25	8	38	51.0	0	2	0	2	51.0
50 / 54	68	42	67	177	49.0	16	45	26	87	47.1	1	8	2	11	45.7
45 / 49	57	26	47	129	44.4	40	62	54	157	43.0	9	21	13	43	42.6
40 / 44	39	7	24	69	40.4	52	48	57	156	38.7	17	43	26	85	38.0
35 / 39	23	2	10	34	36.3	56	37	54	148	34.4	48	70	57	175	33.6
30 / 34	8	0	1	9	31.7	52	12	34	98	30.1	82	74	85	241	29.5
25 / 29	0			0	28.0	18	1	5	24	25.9	62	25	51	138	25.0
20 / 24						1		0	1	21.6	18	5	11	34	20.7
15 / 19											9	1	2	12	16.6
10 / 14											2	0	1	3	11.7
5 / 9											0			0	7.0
0 / 4															

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WMO No. 475840

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

Period of Record = 1973 to 1995

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	78.3
90 / 94		18	1	19	76.5
85 / 89		53	8	61	74.8
80 / 84	3	131	41	175	72.0
75 / 79	46	205	129	381	69.2
70 / 74	159	281	211	651	66.0
65 / 69	197	265	255	716	62.0
60 / 64	298	255	307	860	57.7
55 / 59	296	242	291	829	52.7
50 / 54	279	228	237	743	47.9
45 / 49	251	225	229	706	43.0
40 / 44	224	213	208	645	38.2
35 / 39	270	313	281	864	33.7
30 / 34	372	293	363	1028	29.3
25 / 29	289	142	235	665	24.8
20 / 24	134	34	83	251	20.5
15 / 19	71	15	31	118	16.4
10 / 14	26	5	8	38	11.6
5 / 9	5	1	1	6	7.1
0 / 4	1	1	1	3	1.9

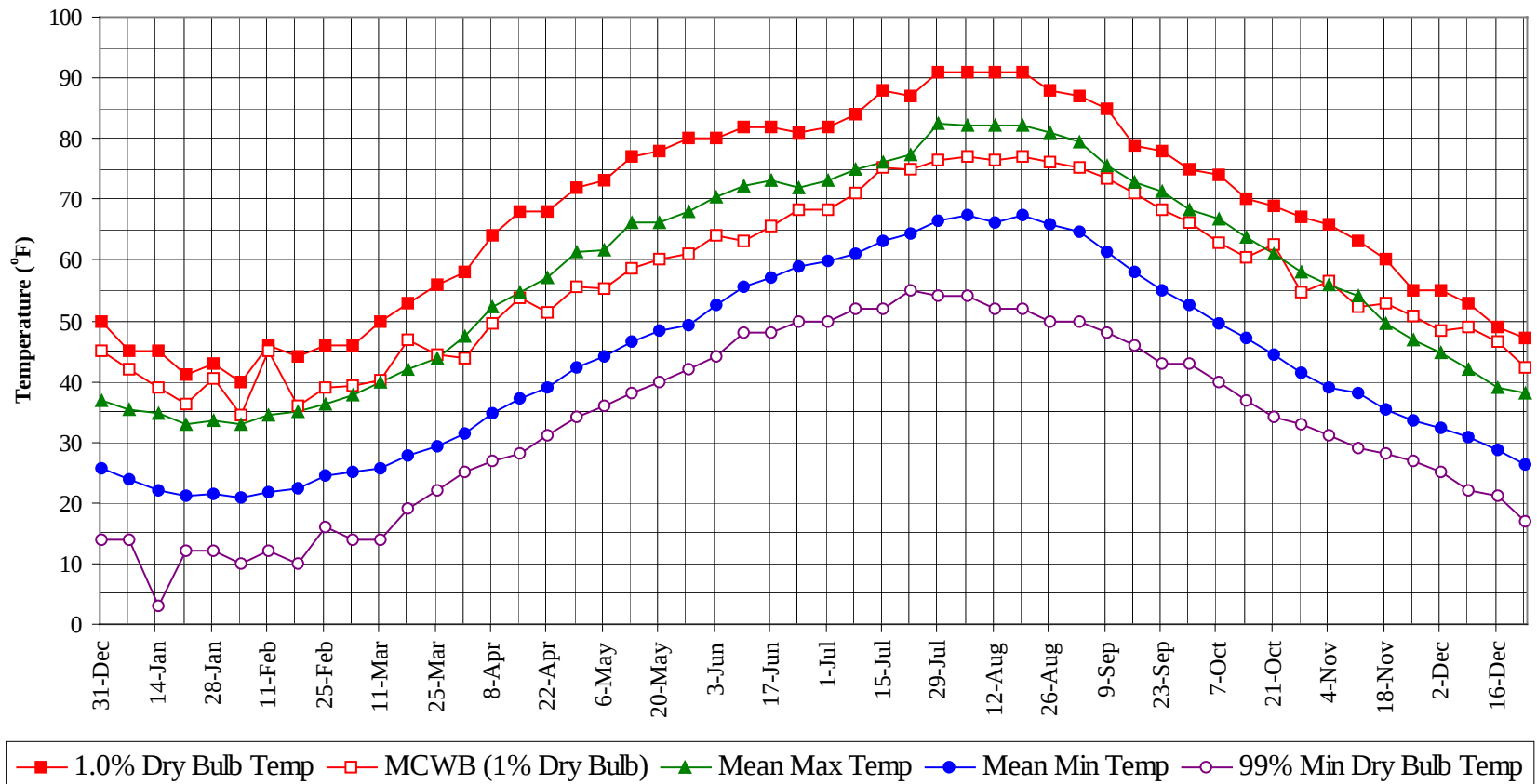
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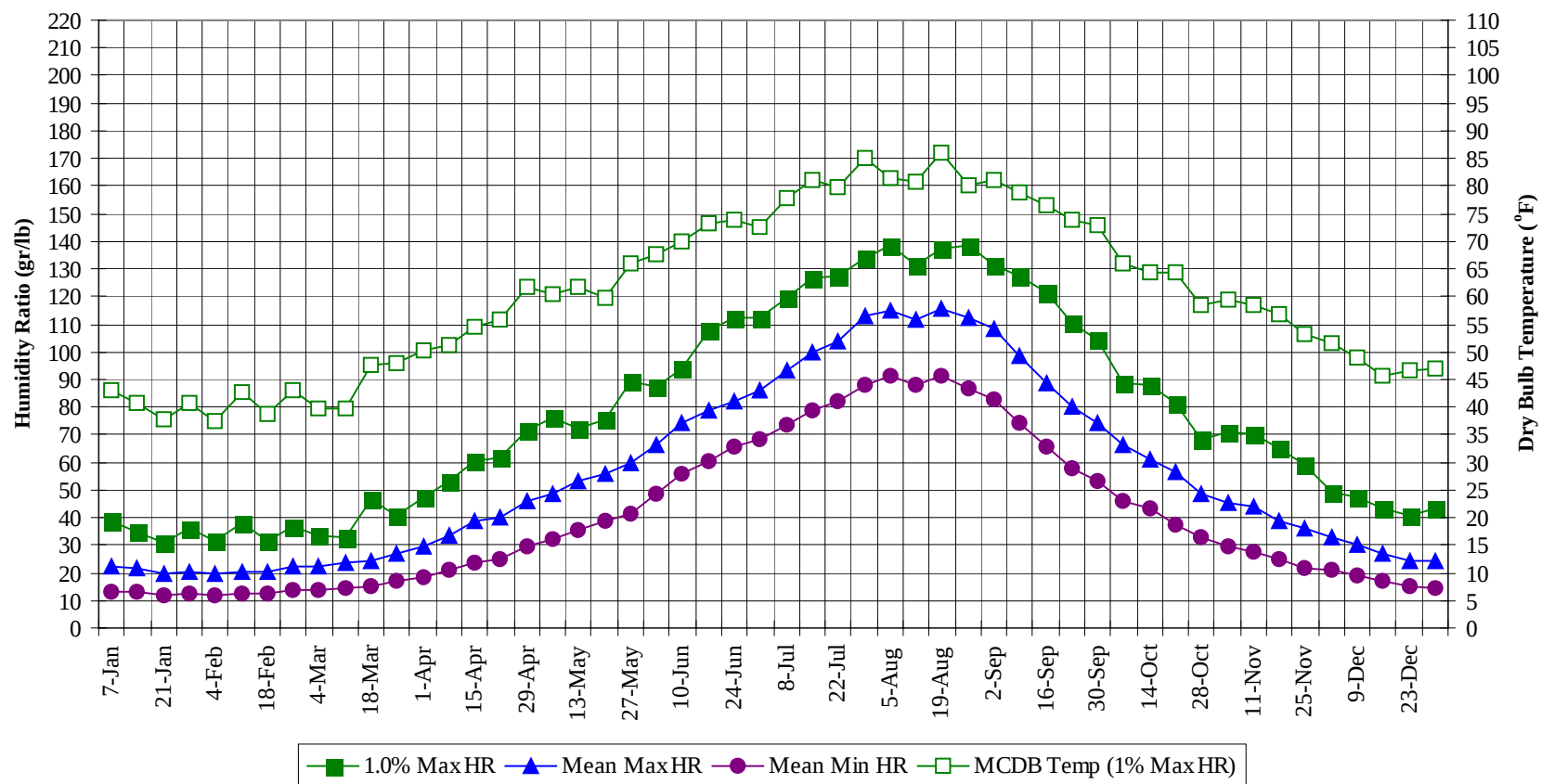
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WMO No. 475840

Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



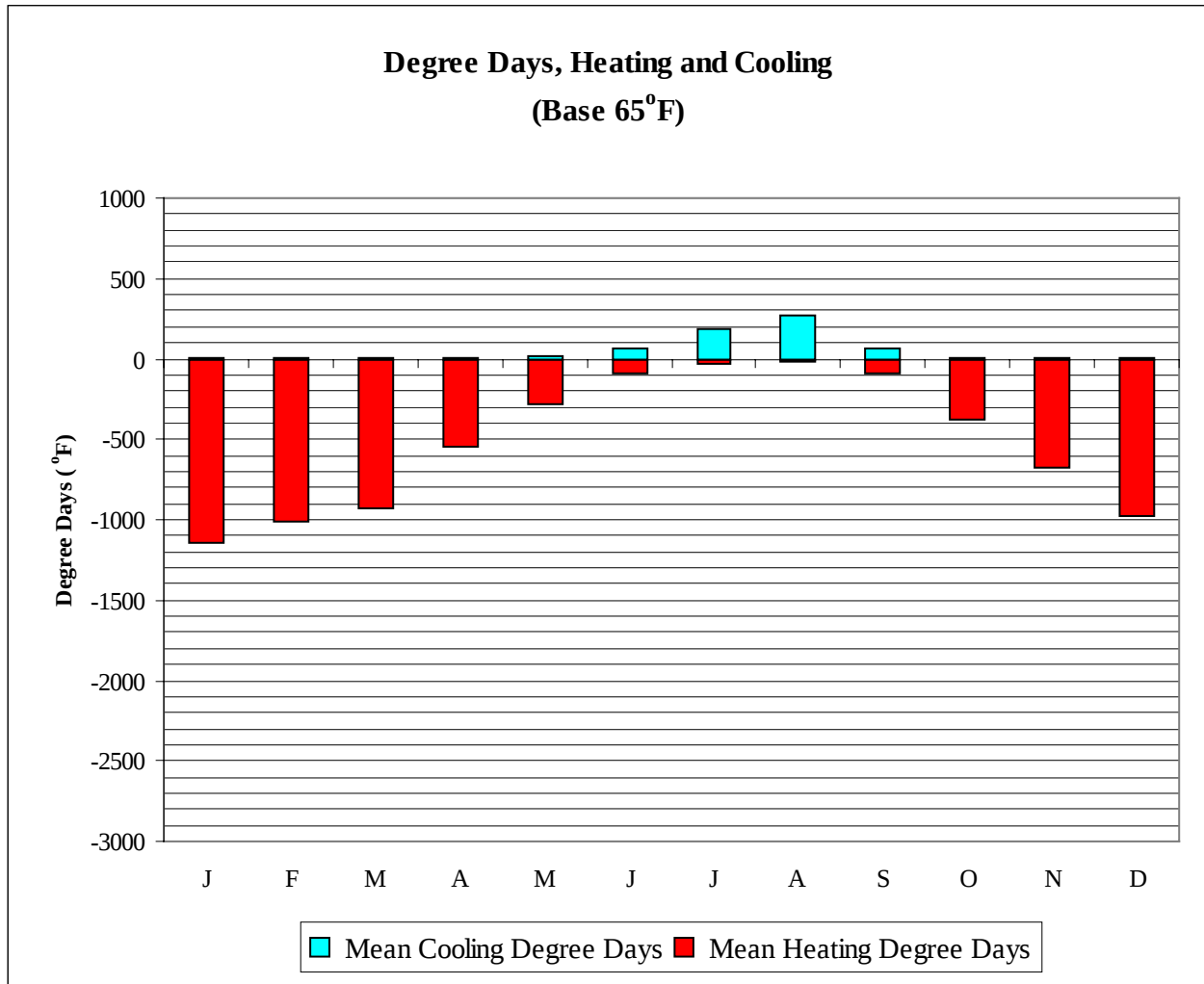
MORIOKA**JP****WMO No. 475840****Long Term Dry Bulb Temperature and Humidity Summary**

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	45.0	41.9	35.2	23.9	14.0	38.5	43.1	22.4	13.5
14-Jan	45.0	39.0	34.6	22.2	3.0	35.0	40.9	21.5	13.0
21-Jan	41.0	36.1	33.0	21.3	12.0	30.8	37.8	19.7	12.1
28-Jan	43.0	40.6	33.6	21.3	12.0	36.4	40.6	20.7	12.2
4-Feb	40.0	34.5	33.0	20.9	10.0	31.5	37.3	19.6	11.6
11-Feb	46.0	45.0	34.4	21.9	12.0	37.8	42.7	20.5	12.5
18-Feb	44.0	36.0	35.1	22.5	10.0	31.5	38.9	20.6	12.6
25-Feb	46.0	39.1	36.4	24.6	16.0	37.1	42.9	22.5	13.9
4-Mar	46.0	39.3	37.8	25.1	14.0	33.6	39.8	22.4	14.0
11-Mar	50.0	40.1	39.8	25.7	14.0	32.9	39.7	23.6	14.6
18-Mar	53.0	46.8	42.1	27.8	19.0	46.9	47.5	24.5	15.3
25-Mar	56.0	44.5	43.8	29.4	22.0	40.6	48.0	26.6	16.9
1-Apr	58.0	43.8	47.3	31.3	25.0	47.6	50.1	29.9	18.2
8-Apr	64.0	49.5	52.2	34.7	27.0	53.2	51.1	33.6	21.0
15-Apr	68.0	53.9	54.6	37.2	28.0	60.2	54.6	38.6	23.8
22-Apr	68.0	51.3	57.1	39.0	31.0	61.6	55.9	40.3	24.7
29-Apr	72.0	55.5	61.4	42.4	34.0	71.4	61.7	45.8	29.4
6-May	73.0	55.2	61.8	44.2	36.0	76.3	60.5	48.5	32.0
13-May	77.0	58.7	66.2	46.5	38.0	72.1	61.7	53.3	35.3
20-May	78.0	60.0	66.1	48.2	40.0	75.6	59.8	56.0	38.9
27-May	80.0	61.1	68.1	49.2	42.0	89.6	66.1	59.5	41.4
3-Jun	80.0	64.1	70.3	52.5	44.0	87.5	67.7	66.6	48.8
10-Jun	82.0	63.3	72.3	55.7	48.0	93.8	69.9	74.5	55.7
17-Jun	82.0	65.6	73.1	57.1	48.0	107.8	73.3	79.0	60.3
24-Jun	81.0	68.3	71.8	58.9	50.0	112.0	73.9	81.9	65.8
1-Jul	82.0	68.3	73.0	59.7	50.0	112.0	72.6	86.3	68.1
8-Jul	84.0	71.1	75.1	61.1	52.0	119.7	77.7	93.4	73.5
15-Jul	88.0	75.2	76.2	63.2	52.0	126.7	81.2	99.8	78.5
22-Jul	87.0	74.8	77.5	64.4	55.0	127.4	79.8	103.9	82.2
29-Jul	91.0	76.5	82.6	66.5	54.0	133.7	85.0	112.7	88.1
5-Aug	91.0	76.9	82.0	67.5	54.0	138.6	81.6	115.1	91.2
12-Aug	91.0	76.5	82.1	66.0	52.0	131.6	80.8	111.8	87.8
19-Aug	91.0	77.1	82.1	67.3	52.0	137.2	86.2	115.6	91.5
26-Aug	88.0	76.2	80.8	65.9	50.0	138.6	80.1	112.1	86.4
2-Sep	87.0	75.1	79.3	64.7	50.0	131.6	81.1	108.4	82.7
9-Sep	85.0	73.5	75.5	61.5	48.0	127.4	78.7	98.3	74.2
16-Sep	79.0	71.1	72.8	58.1	46.0	121.8	76.6	88.9	65.8
23-Sep	78.0	68.3	71.3	54.9	43.0	110.6	74.0	79.9	57.7
30-Sep	75.0	66.1	68.3	52.7	43.0	104.3	72.8	74.0	53.3
7-Oct	74.0	62.8	66.7	49.7	40.0	88.9	66.1	66.5	46.1
14-Oct	70.0	60.3	63.6	47.1	37.0	88.2	64.4	61.2	43.0
21-Oct	69.0	62.6	61.1	44.5	34.0	81.2	64.3	56.6	37.5
28-Oct	67.0	54.8	58.0	41.3	33.0	68.6	58.3	48.7	32.8
4-Nov	66.0	56.6	55.8	38.8	31.0	70.7	59.3	45.4	29.3
11-Nov	63.0	52.3	54.0	38.1	29.0	70.0	58.5	44.0	27.7
18-Nov	60.0	52.8	49.5	35.5	28.0	65.1	56.9	38.8	24.7
25-Nov	55.0	50.6	46.8	33.5	27.0	58.8	53.2	36.0	21.7
2-Dec	55.0	48.3	44.8	32.2	25.0	49.0	51.4	32.8	20.8
9-Dec	53.0	49.0	42.1	30.7	22.0	47.6	48.8	30.0	19.2
16-Dec	49.0	46.7	39.0	28.7	21.0	43.4	45.8	27.0	17.3
23-Dec	47.0	42.3	38.0	26.3	17.0	40.6	46.6	24.5	15.1
31-Dec	50.0	45.0	36.7	25.7	14.0	43.4	47.0	24.1	14.7

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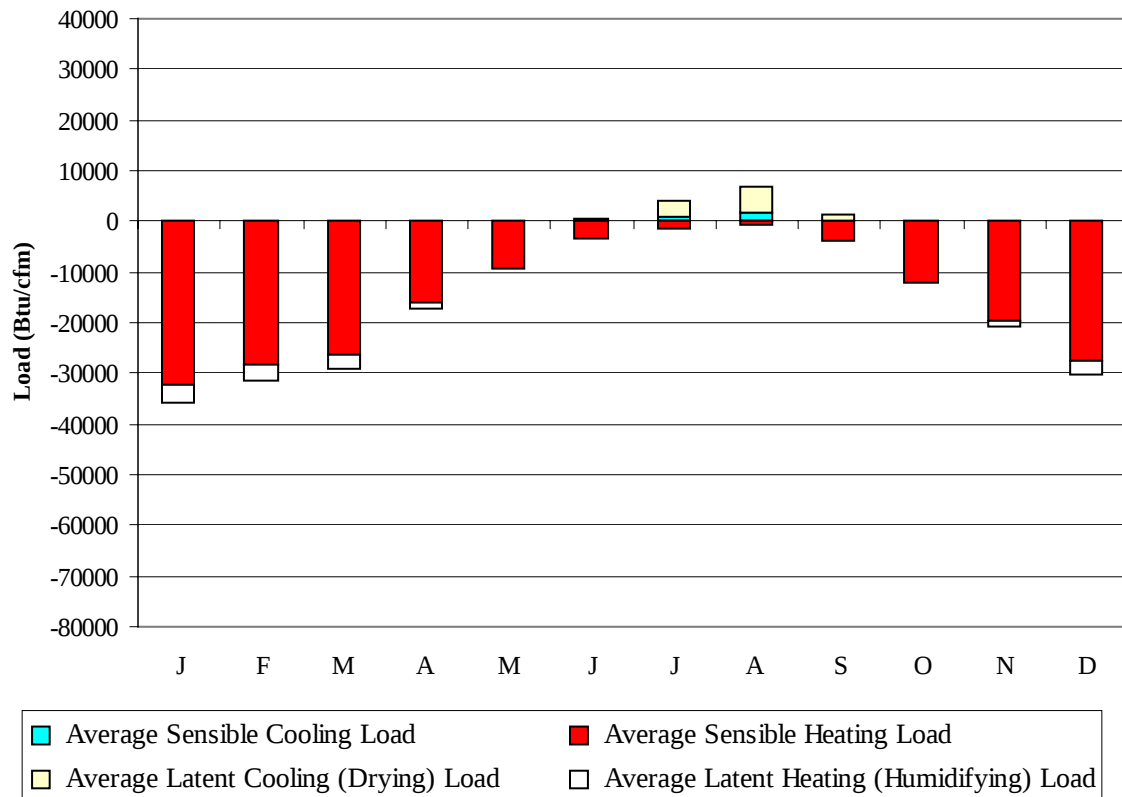
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1146
FEB	0	1010
MAR	0	933
APR	2	539
MAY	17	281
JUN	62	84
JUL	188	26
AUG	264	18
SEP	67	94
OCT	4	376
NOV	0	678
DEC	0	975
ANN	604	6160

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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	-32100	0	-3517
FEB	0	-28349	0	-2991
MAR	0	-26484	0	-2729
APR	1	-16118	0	-1093
MAY	36	-9325	15	-133
JUN	112	-3538	481	0
JUL	906	-1355	3341	0
AUG	1554	-842	5096	0
SEP	165	-3864	1204	-1
OCT	1	-11927	31	-91
NOV	0	-19769	0	-1079
DEC	0	-27612	0	-2601
ANN	2775	-181283	10168	-14235

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

No Solar Radiation
Data Available

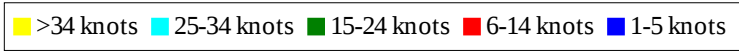
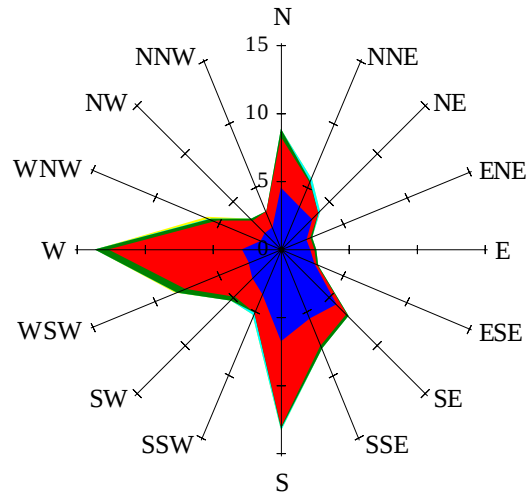


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

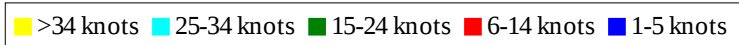
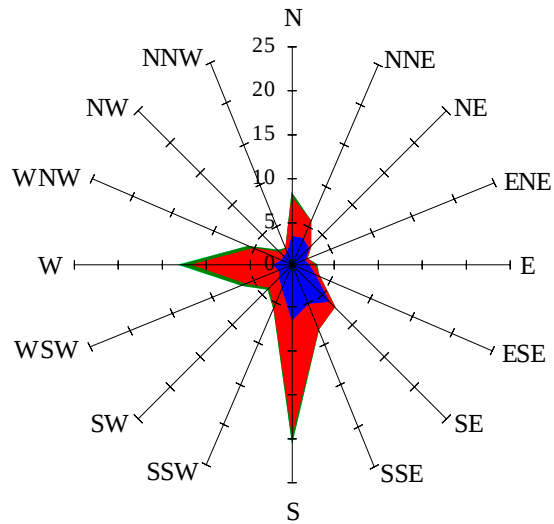
Labels of Percent Frequency on North Axis



Percent Calm = 3.38

Wind Summary - March, April, and May

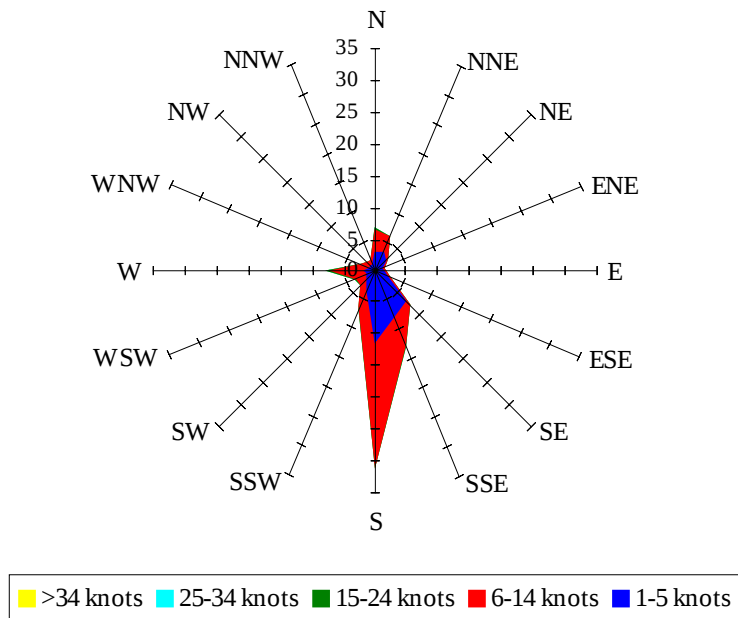
Labels of Percent Frequency on North Axis



Percent Calm = 2.23

Wind Summary - June, July, and August

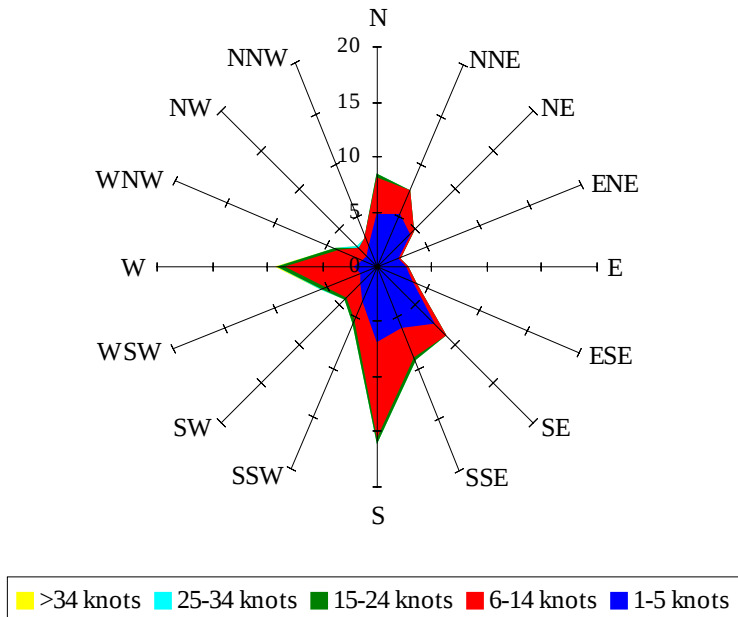
Labels of Percent Frequency on North Axis



Percent Calm = 3.00

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 3.49