

FUKUOKA	JP	
Latitude = 33.58 N		WMO No. 478070
Longitude = 130.38 E		Elevation = 46 feet
Period of Record = 1973 to 1995		Average Pressure = 29.91 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	95	79	122	10.3	NNW
0.4% Occurrence	92	79	126	9.8	N
1.0% Occurrence	91	78	127	9.7	NNW
2.0% Occurrence	89	78	126	9.3	NNW
Mean Daily Range	11	-	-	-	-
97.5% Occurrence	37	33	21	6.7	SE
99.0% Occurrence	34	30	19	6.9	SE
99.6% Occurrence	32	29	18	7.3	SE
Median of Extreme Lows	29	26	15	8.1	SE
	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	82	90	148	9.3	N
0.4% Occurrence	80	88	138	8.4	N
1.0% Occurrence	79	87	135	7.7	N
2.0% Occurrence	78	86	131	7.3	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	153	86	1.01	8.2	NNW
0.4% Occurrence	144	85	0.95	7.5	N
1.0% Occurrence	141	85	0.93	7.2	N
2.0% Occurrence	137	83	0.90	6.6	N
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		34	1166	1482	2505

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	N/A	N/A	2.3 + 1.1
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 (#)
64.7	N/A	N/A	3

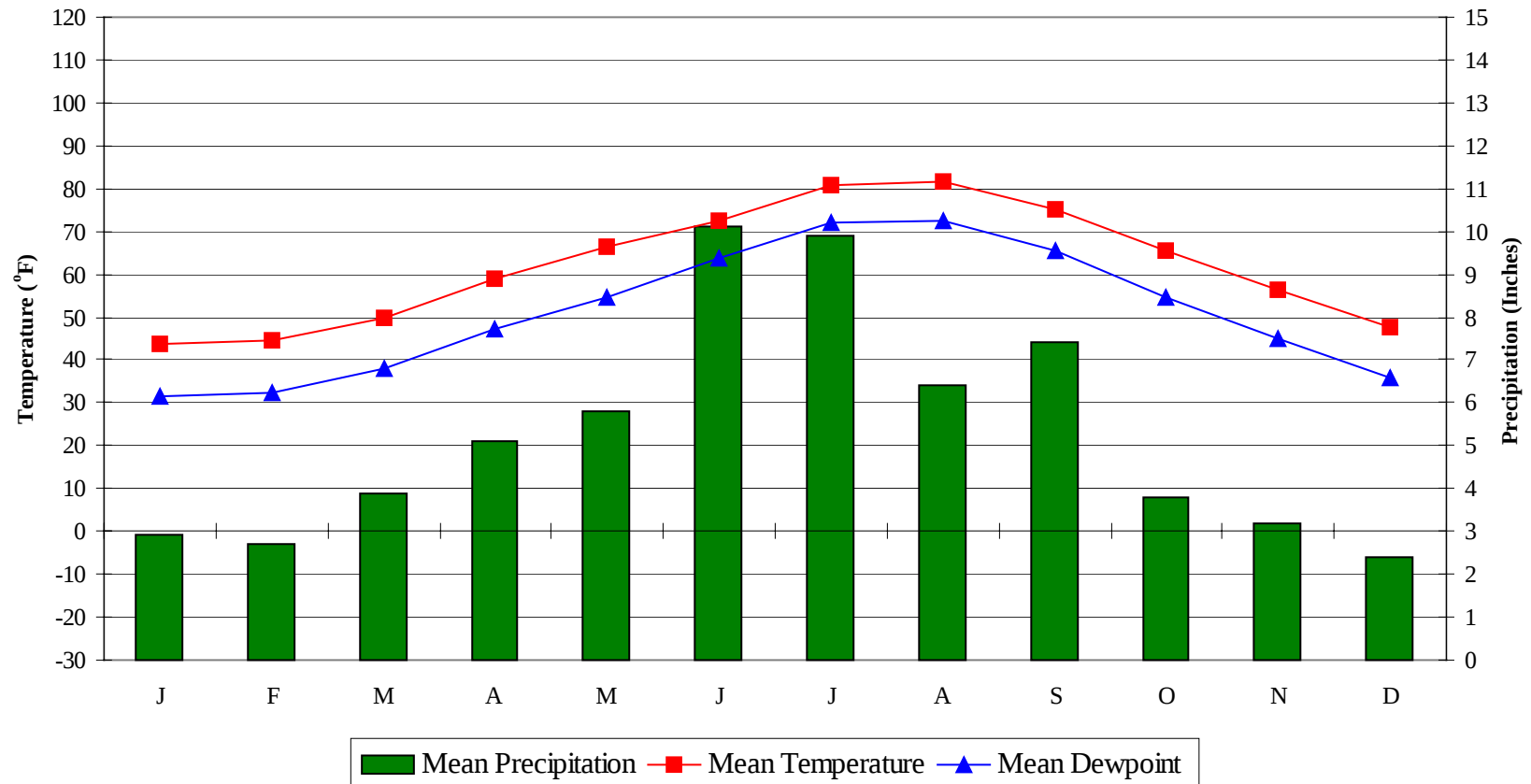
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

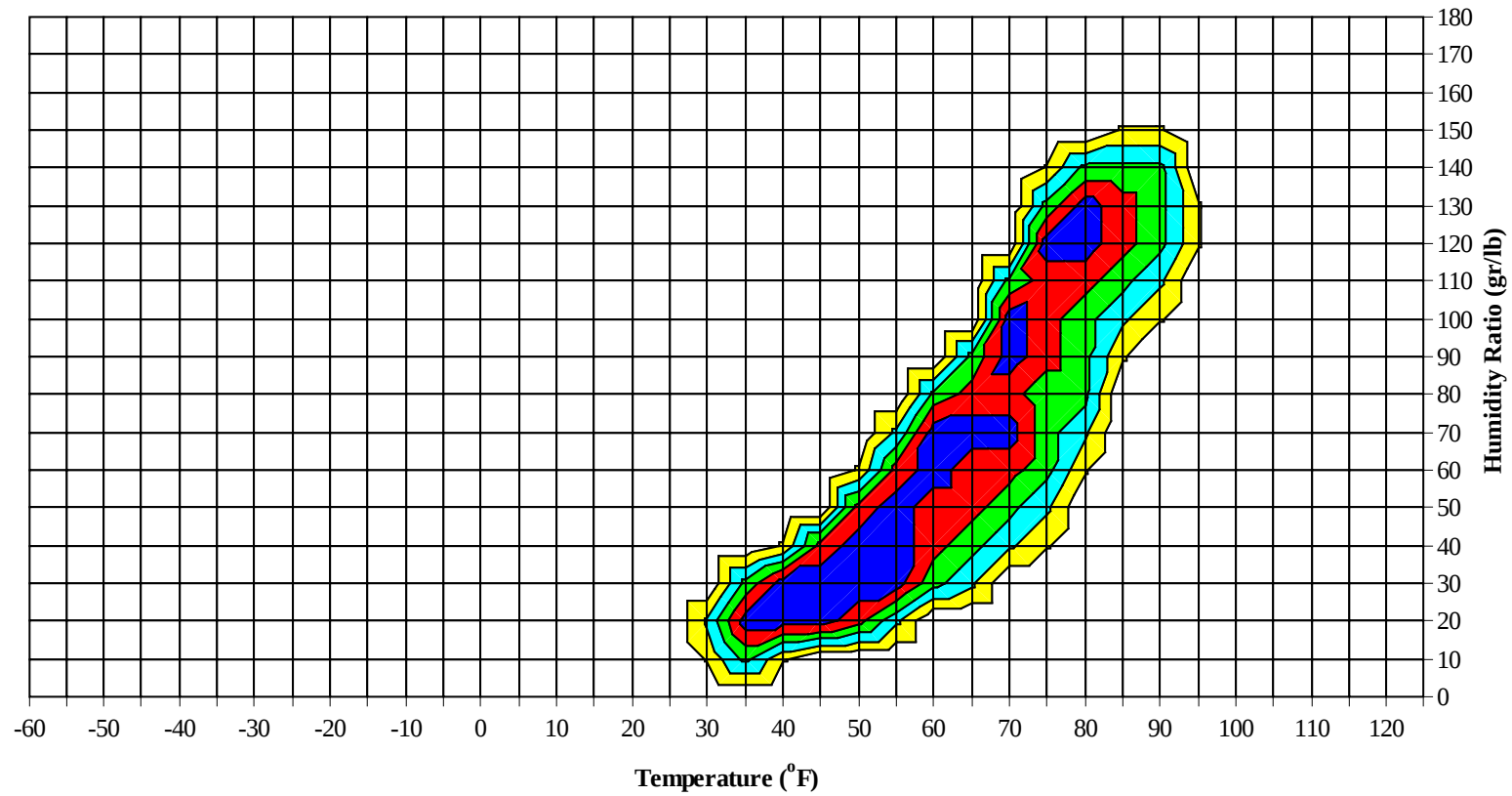


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Long Term Psychrometric Summary



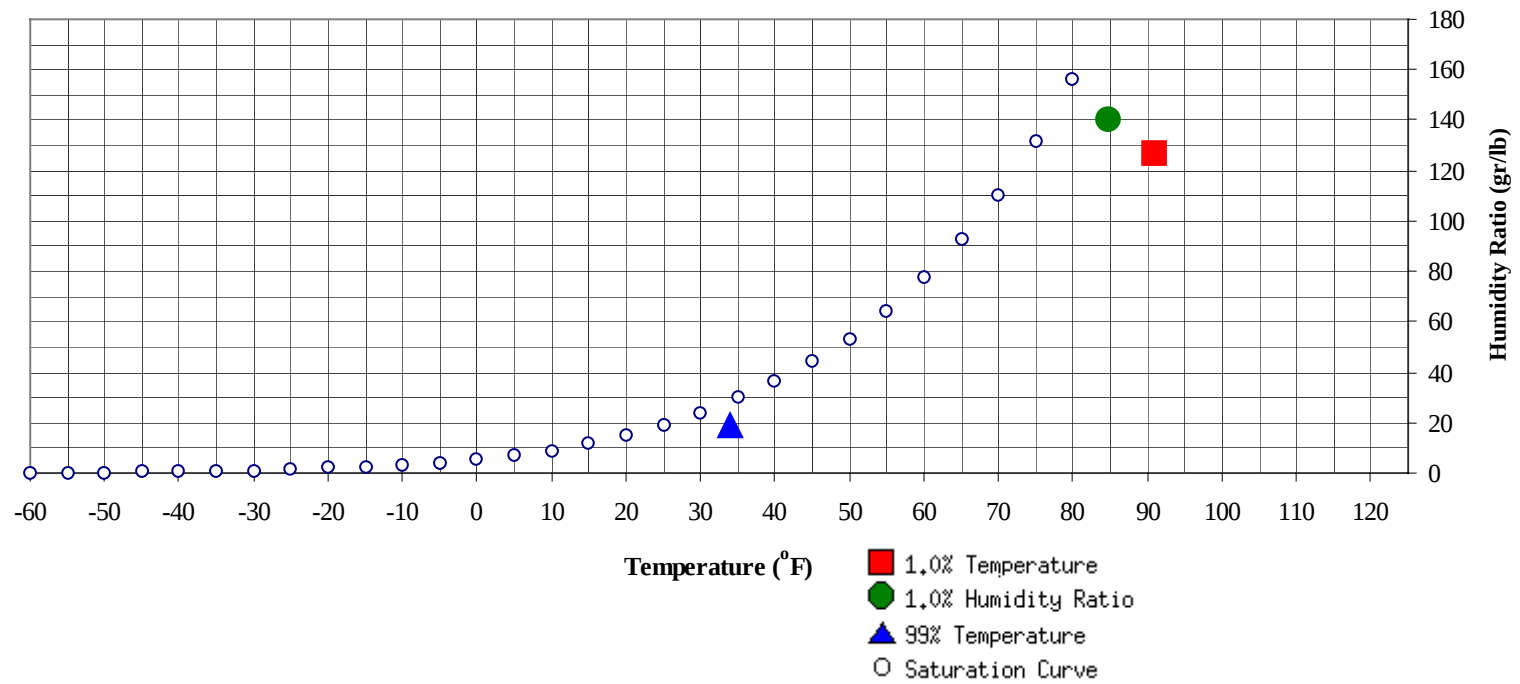
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	34	18.7	11.0		140.7	84.6	78.8	76.8	42.4

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	91	126.5	78.4	41.7

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74							1		1	59.7	0	2	0	2	62.0
65 / 69						1	2	1	4	58.4	0	6	1	7	56.7
60 / 64	0	4	1	5	54.6	2	4	3	9	55.4	4	27	10	41	53.9
55 / 59	2	18	7	28	50.5	5	22	7	34	49.9	13	63	39	116	50.3
50 / 54	17	51	35	102	46.2	17	54	37	108	45.8	51	84	80	215	46.6
45 / 49	50	68	66	184	41.4	39	64	66	169	41.2	75	48	73	195	42.0
40 / 44	73	61	76	209	36.7	63	45	60	168	37.1	64	14	33	111	37.8
35 / 39	77	40	53	169	32.8	71	26	40	138	32.9	36	5	10	51	34.1
30 / 34	28	6	11	45	29.1	22	6	9	36	29.0	6	0	1	7	30.6
25 / 29	1	0	0	1	26.0	4	1	1	5	24.3	0	0	0	0	24.2
20 / 24						0			0	20.0					

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 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 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		
100 / 104															
95 / 99															
90 / 94															
85 / 89							1		1	69.8		1		1	76.0
80 / 84		2	0	2	65.3		13	1	14	66.3		10	2	12	74.5
75 / 79	0	8	2	10	63.6		48	13	62	64.6	8	38	16	62	72.1
70 / 74	4	26	9	39	60.7	1	73	49	135	62.5	18	90	47	155	69.5
65 / 69	8	48	23	80	58.4	13	69	78	197	60.8	73	78	106	257	67.0
60 / 64	37	76	69	182	55.9	50	69	78	197	60.8	95	20	59	174	63.7
55 / 59	69	57	78	204	52.0	95	38	79	212	57.7	43	2	9	54	59.3
50 / 54	70	19	43	132	47.1	66	7	25	98	53.1	4		1	4	54.8
45 / 49	37	4	14	54	42.2	21	0	3	24	48.8					
40 / 44	12	0	2	14	38.5	1			1	44.5					
35 / 39	4	0		4	35.5										
30 / 34															
25 / 29															
20 / 24															

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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		
100 / 104			0	0	80.0										
95 / 99		3	0	3	78.4		6	0	6	78.1		0		0	77.3
90 / 94		49	6	55	78.6		55	7	61	78.4		6	1	7	77.7
85 / 89	5	75	46	125	77.3	7	77	49	134	77.1	0	27	5	32	76.0
80 / 84	76	55	90	221	75.5	72	68	104	244	75.6	14	64	34	112	73.4
75 / 79	97	45	64	206	73.3	126	37	75	238	73.7	53	86	83	221	70.4
70 / 74	56	20	38	113	69.6	40	6	13	59	70.3	80	46	82	207	66.9
65 / 69	15	2	5	22	66.1	2		0	2	65.6	60	11	31	102	63.5
60 / 64	0			0	61.7						30	1	6	37	59.3
55 / 59											4		0	4	54.8
50 / 54											0			0	50.3
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															

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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		
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84	0	7	1	7	69.1										
75 / 79	2	40	9	52	66.5		2	0	2	62.8					
70 / 74	14	90	47	152	63.6	0	16	3	19	62.5		1		1	62.0
65 / 69	44	67	80	191	60.4	4	42	16	61	59.3	0	3	0	3	57.6
60 / 64	88	34	71	194	56.9	30	67	53	149	55.7	2	19	6	27	54.4
55 / 59	68	8	32	109	52.7	50	57	68	176	51.3	12	45	26	83	50.7
50 / 54	26	1	6	34	49.1	70	38	62	170	46.9	35	66	58	159	45.8
45 / 49	5		1	6	44.6	61	17	30	108	42.4	74	65	86	225	41.4
40 / 44	0			0	39.5	21	2	7	31	38.7	71	34	48	153	37.5
35 / 39						5		1	6	35.3	48	13	21	82	33.5
30 / 34											6	2	3	11	29.5
25 / 29												0		0	25.0
20 / 24															

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 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		
100 / 104			0	0	80.0
95 / 99		9	0	9	78.2
90 / 94		114	13	127	78.4
85 / 89	13	194	104	311	77.0
80 / 84	176	249	251	676	74.6
75 / 79	307	359	298	964	70.9
70 / 74	287	360	351	998	65.9
65 / 69	284	272	298	853	61.3
60 / 64	334	273	307	913	56.6
55 / 59	294	275	284	854	51.6
50 / 54	305	310	321	936	46.6
45 / 49	335	260	330	924	41.7
40 / 44	294	151	220	665	37.3
35 / 39	228	80	121	429	33.1
30 / 34	58	14	22	94	29.2
25 / 29	5	1	1	7	24.7
20 / 24	0			0	20.0

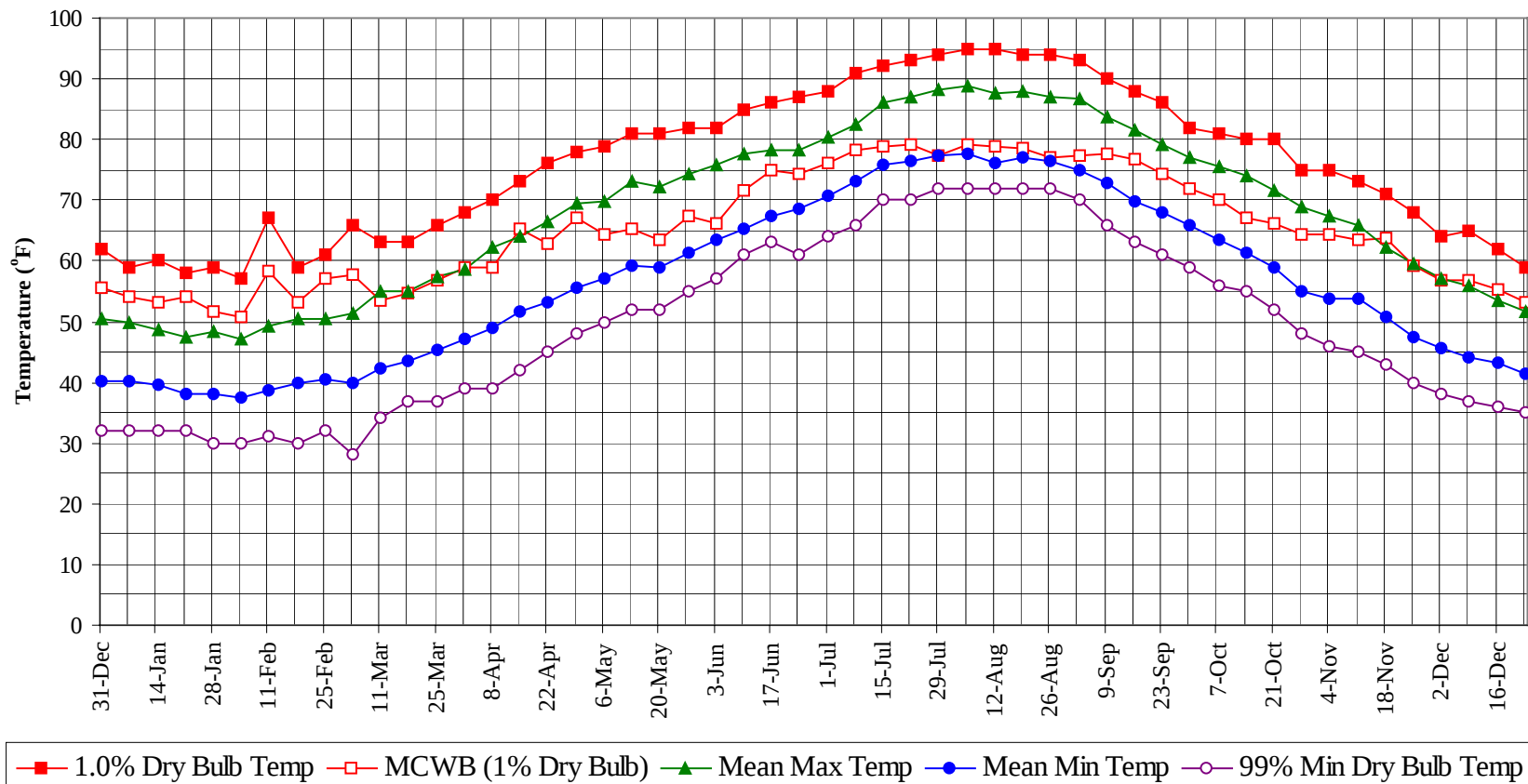
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary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

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Annual Summary of Temperatures

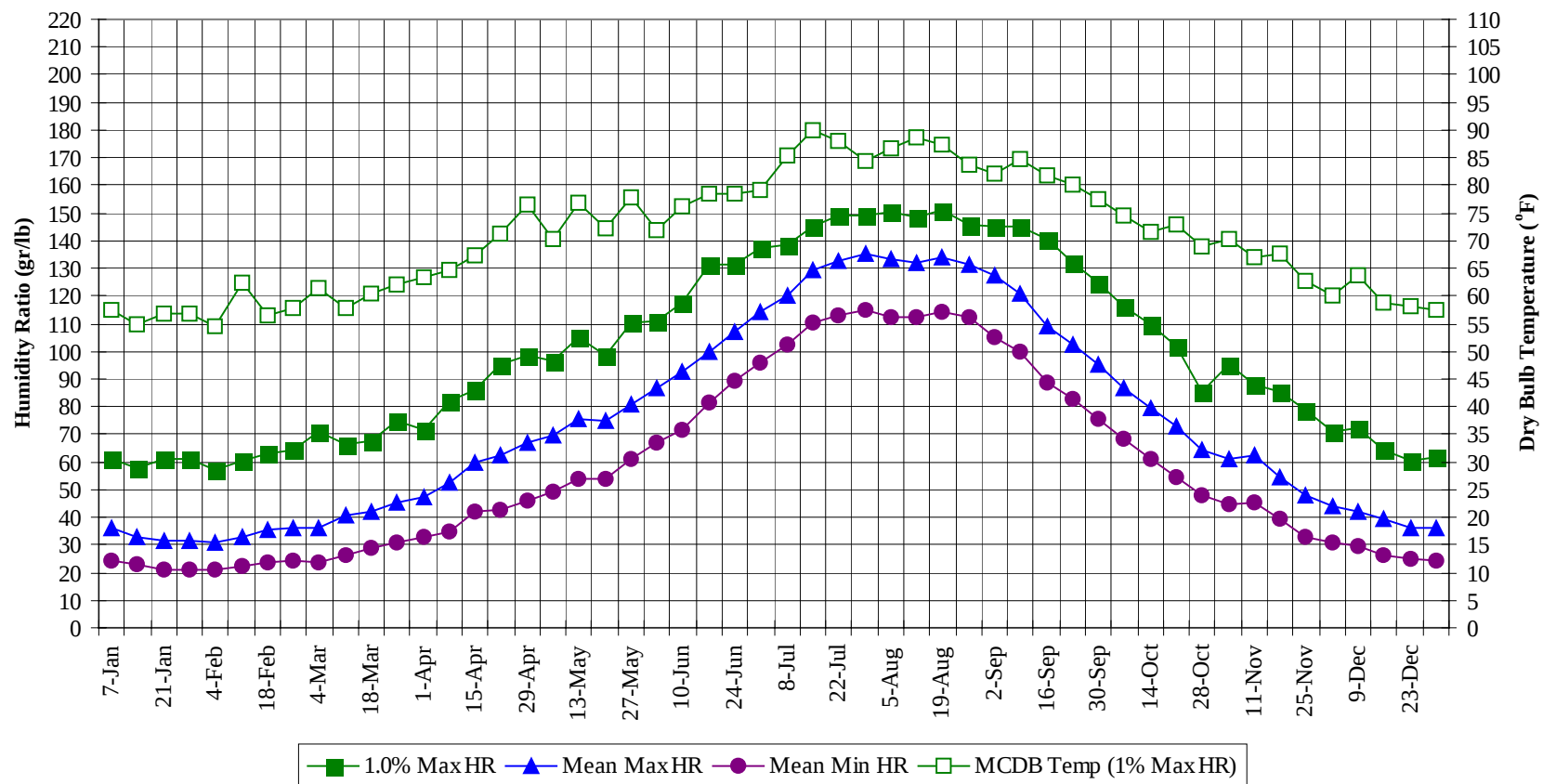


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Long Term Humidity and Dry Bulb Temperature Summary



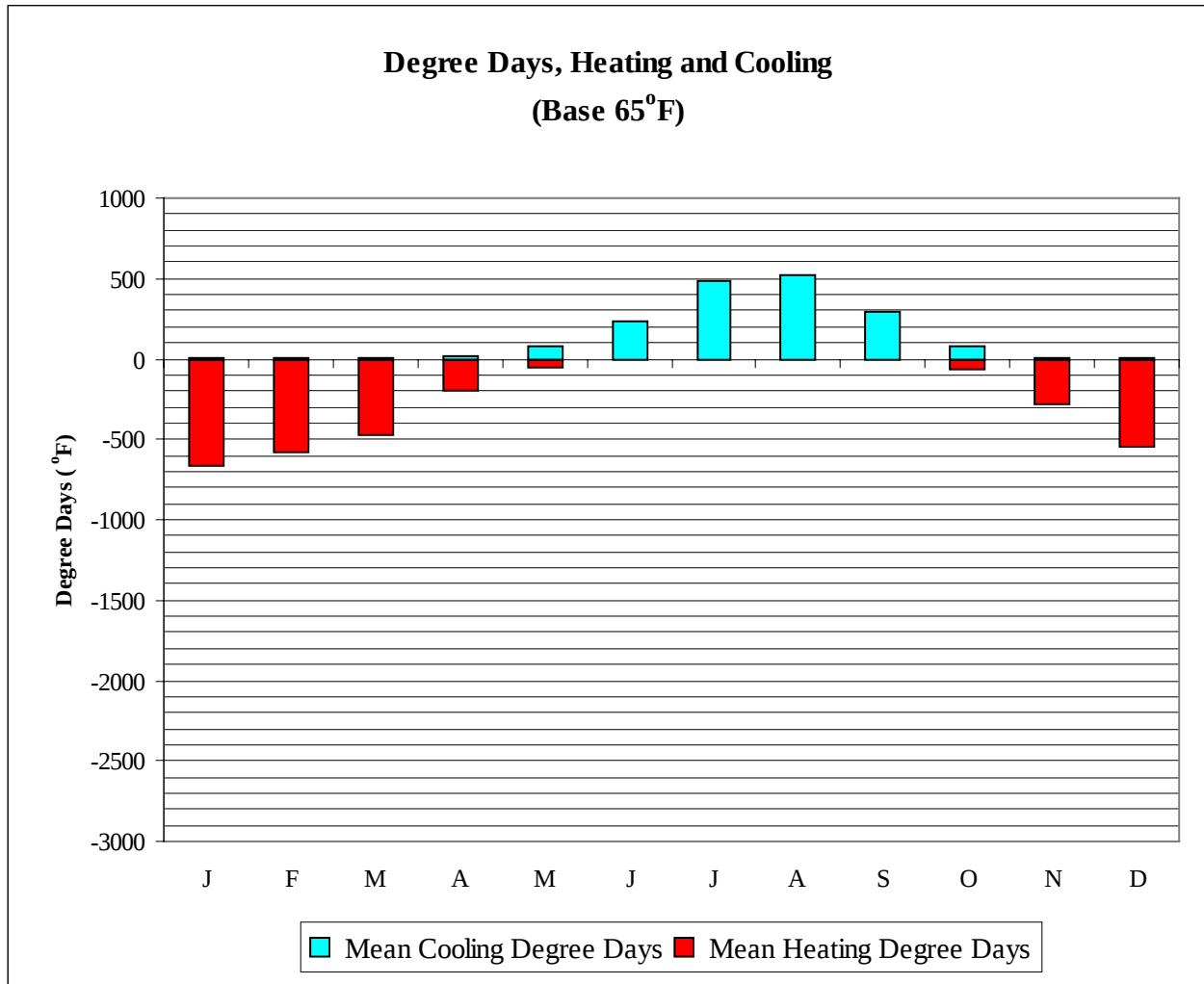
FUKUOKA**JP****WMO No. 478070****Long Term Dry Bulb Temperature and Humidity Summary**

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	54.1	49.8	40.2	32.0	60.9	57.6	36.0	24.1
14-Jan	60.0	53.2	48.7	39.6	32.0	58.1	54.9	32.8	22.7
21-Jan	58.0	54.0	47.4	38.1	32.0	60.9	56.8	31.4	20.9
28-Jan	59.0	51.6	48.3	38.1	30.0	60.9	56.9	31.3	21.1
4-Feb	57.0	50.9	47.2	37.6	30.0	57.4	54.6	30.9	20.8
11-Feb	67.0	58.2	49.2	38.8	31.0	60.2	62.3	32.7	22.1
18-Feb	59.0	53.1	50.4	39.8	30.0	63.0	56.4	35.6	23.7
25-Feb	61.0	57.1	50.5	40.6	32.0	64.4	57.7	36.3	24.2
4-Mar	66.0	57.6	51.4	39.9	28.0	70.7	61.3	36.1	23.9
11-Mar	63.0	53.3	54.9	42.3	34.0	66.5	57.8	40.6	26.6
18-Mar	63.0	54.8	55.1	43.6	37.0	67.9	60.5	42.2	29.0
25-Mar	66.0	56.9	57.4	45.3	37.0	74.9	62.2	45.5	30.8
1-Apr	68.0	58.8	58.6	47.1	39.0	71.4	63.3	47.5	32.9
8-Apr	70.0	59.1	62.2	48.8	39.0	81.9	64.7	52.4	35.1
15-Apr	73.0	65.4	64.0	51.5	42.0	86.1	67.4	59.6	42.1
22-Apr	76.0	62.8	66.5	53.3	45.0	95.2	71.3	62.2	43.0
29-Apr	78.0	67.0	69.5	55.5	48.0	98.7	76.4	67.2	46.0
6-May	79.0	64.4	69.7	57.1	50.0	96.6	70.4	69.5	49.3
13-May	81.0	65.4	73.1	59.3	52.0	105.0	77.0	75.7	54.0
20-May	81.0	63.5	72.1	59.0	52.0	98.7	72.3	75.1	53.6
27-May	82.0	67.3	74.4	61.4	55.0	110.6	77.9	80.7	60.8
3-Jun	82.0	66.1	75.8	63.6	57.0	111.3	72.0	86.5	67.1
10-Jun	85.0	71.6	77.7	65.3	61.0	117.6	76.3	92.3	71.8
17-Jun	86.0	75.0	78.4	67.3	63.0	131.6	78.4	99.9	81.7
24-Jun	87.0	74.3	78.3	68.7	61.0	131.6	78.5	107.4	89.0
1-Jul	88.0	76.3	80.3	70.8	64.0	137.2	79.0	114.5	95.8
8-Jul	91.0	78.1	82.4	73.0	66.0	138.6	85.4	120.3	102.7
15-Jul	92.0	78.8	86.1	75.9	70.0	144.9	89.9	129.6	110.1
22-Jul	93.0	79.2	86.9	76.4	70.0	149.1	87.9	132.4	112.9
29-Jul	94.0	77.4	88.3	77.3	72.0	149.1	84.5	135.1	115.0
5-Aug	95.0	79.3	88.8	77.5	72.0	150.5	86.7	133.3	112.6
12-Aug	95.0	78.9	87.6	76.3	72.0	148.4	88.5	132.1	112.0
19-Aug	94.0	78.4	88.0	77.1	72.0	151.2	87.2	134.1	114.4
26-Aug	94.0	77.0	87.1	76.3	72.0	145.6	83.7	131.3	112.1
2-Sep	93.0	77.4	86.8	75.0	70.0	144.9	82.0	127.6	104.8
9-Sep	90.0	77.5	83.8	72.8	66.0	144.9	84.6	120.6	99.8
16-Sep	88.0	76.8	81.6	69.9	63.0	140.7	81.8	109.2	88.5
23-Sep	86.0	74.2	79.2	68.1	61.0	132.3	80.0	102.3	82.6
30-Sep	82.0	72.0	77.1	65.8	59.0	124.6	77.4	95.0	75.5
7-Oct	81.0	70.1	75.6	63.4	56.0	116.2	74.7	86.6	68.0
14-Oct	80.0	67.2	73.9	61.3	55.0	109.9	71.6	79.5	61.2
21-Oct	80.0	66.2	71.7	58.8	52.0	101.5	72.9	72.8	54.3
28-Oct	75.0	64.2	69.0	55.1	48.0	85.4	68.9	64.4	47.8
4-Nov	75.0	64.5	67.5	53.7	46.0	95.2	70.1	61.2	45.0
11-Nov	73.0	63.4	66.0	53.7	45.0	88.2	66.9	62.1	45.6
18-Nov	71.0	63.6	62.4	50.6	43.0	85.4	67.5	54.6	39.2
25-Nov	68.0	59.1	59.6	47.3	40.0	79.1	62.7	47.9	33.0
2-Dec	64.0	56.8	57.1	45.7	38.0	70.7	60.0	43.8	31.0
9-Dec	65.0	56.8	56.0	44.2	37.0	72.1	63.8	41.8	29.4
16-Dec	62.0	55.3	53.4	43.1	36.0	64.4	58.9	39.1	26.2
23-Dec	59.0	53.1	51.8	41.4	35.0	60.2	58.1	36.4	24.9
31-Dec	62.0	55.5	50.5	40.2	32.0	61.6	57.6	36.1	24.3

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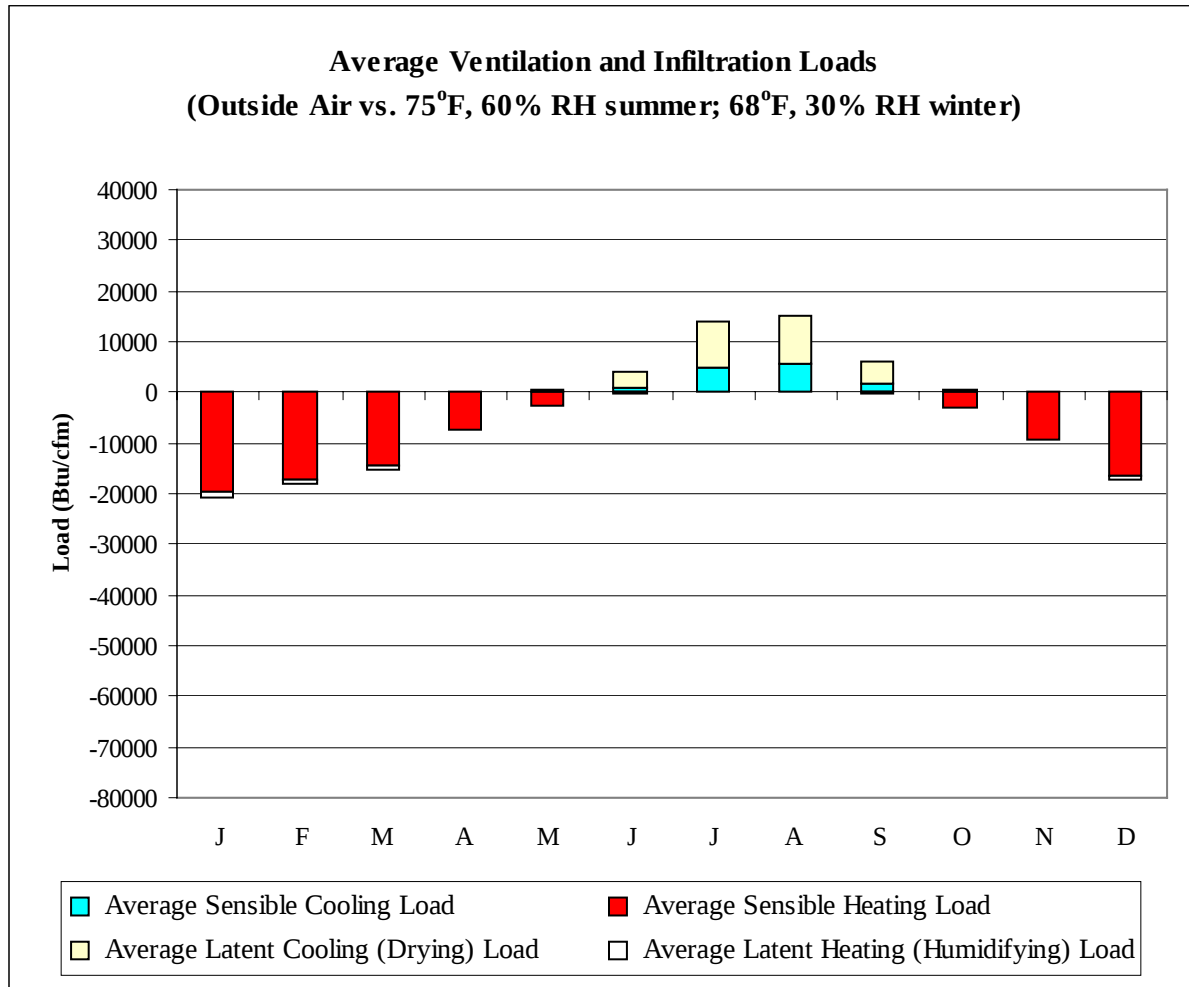


	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	668
FEB	0	578
MAR	1	475
APR	15	202
MAY	82	48
JUN	231	2
JUL	480	0
AUG	518	0
SEP	299	2
OCT	78	60
NOV	6	278
DEC	0	546
ANN	1710	2859

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	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	-19624	0	-1289
FEB	0	-17063	0	-1092
MAR	0	-14611	3	-575
APR	12	-7315	75	-138
MAY	107	-2523	443	-9
JUN	792	-252	3090	0
JUL	4886	-4	9008	0
AUG	5589	0	9702	0
SEP	1669	-174	4348	0
OCT	73	-2857	515	-2
NOV	1	-9327	38	-153
DEC	0	-16404	0	-789
ANN	13129	-90154	27222	-4047

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

No Solar Radiation
Data Available

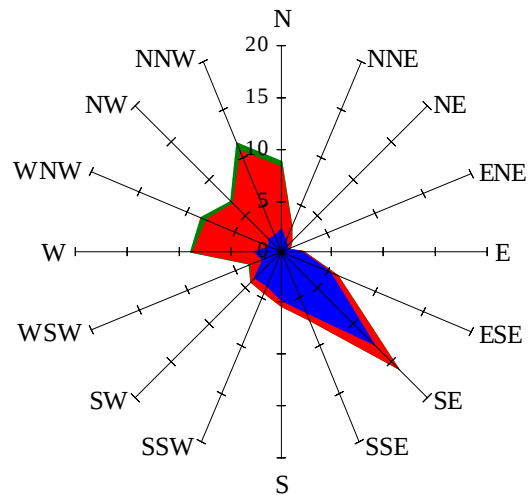


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

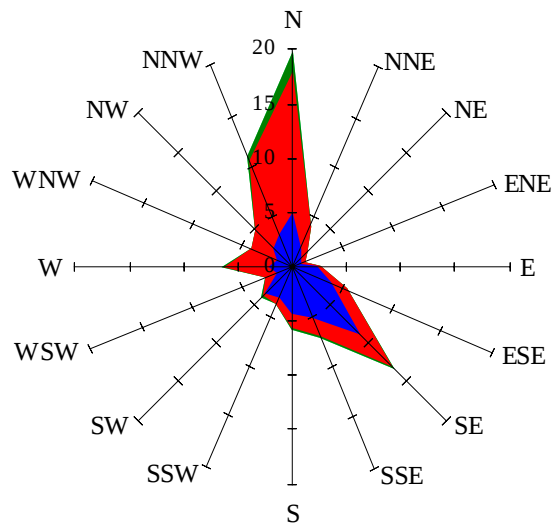
Labels of Percent Frequency on North Axis



Percent Calm = 2.90

Wind Summary - March, April, and May

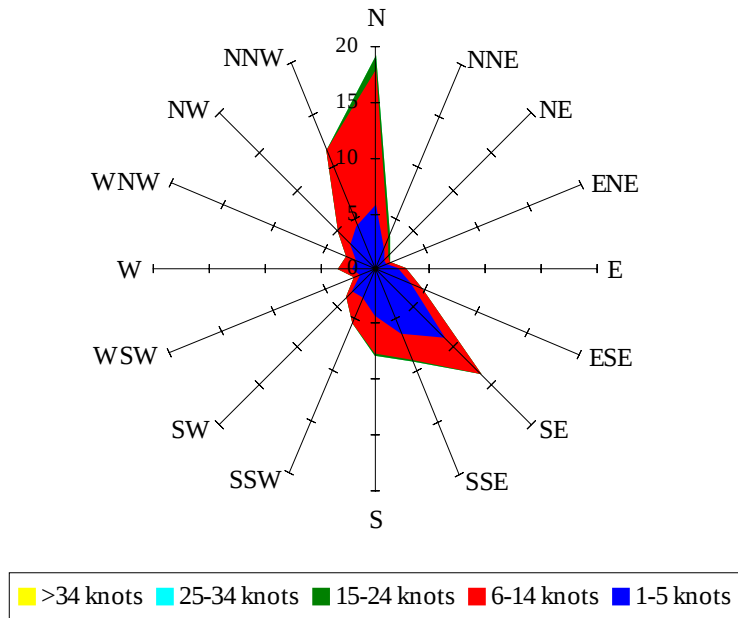
Labels of Percent Frequency on North Axis



Percent Calm = 4.29

Wind Summary - June, July, and August

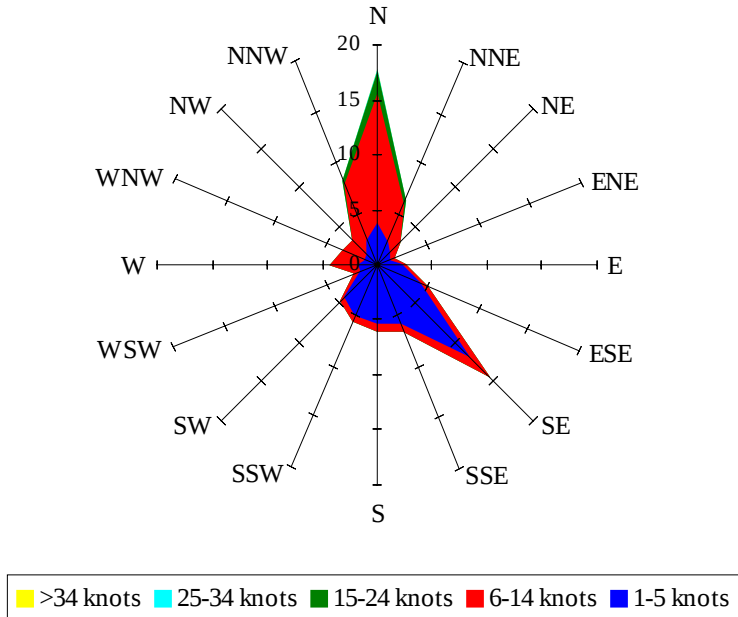
Labels of Percent Frequency on North Axis



Percent Calm = 4.81

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.56