

KWANGJU KO

Latitude = 35.12 N

Longitude = 126.82 E

Period of Record = 1967 to 1996

WMO No. 471580

Elevation = 43 feet

Average Pressure = 29.93 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	97	81	133	6.2	WSW
0.4% Occurrence	93	80	137	6.9	S
1.0% Occurrence	91	79	130	6.8	S
2.0% Occurrence	89	78	127	6.7	S
Mean Daily Range	18	-	-	-	-
97.5% Occurrence	23	22	14	3.6	N
99.0% Occurrence	19	18	12	3.1	N
99.6% Occurrence	18	18	12	3.0	N
Median of Extreme Lows	10	9	7	0.8	NE
	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	92	161	6.8	SW
0.4% Occurrence	82	90	150	6.7	SW
1.0% Occurrence	80	88	141	6.4	S
2.0% Occurrence	79	85	138	5.7	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	162	86	1.06	6.8	SSW
0.4% Occurrence	153	85	1.00	6.9	SSW
1.0% Occurrence	148	86	0.98	6.5	S
2.0% Occurrence	142	83	0.94	4.3	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		54	886	1177	2136

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	3.5 + 0.9
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 (#)
58.8	N/A	N/A	66

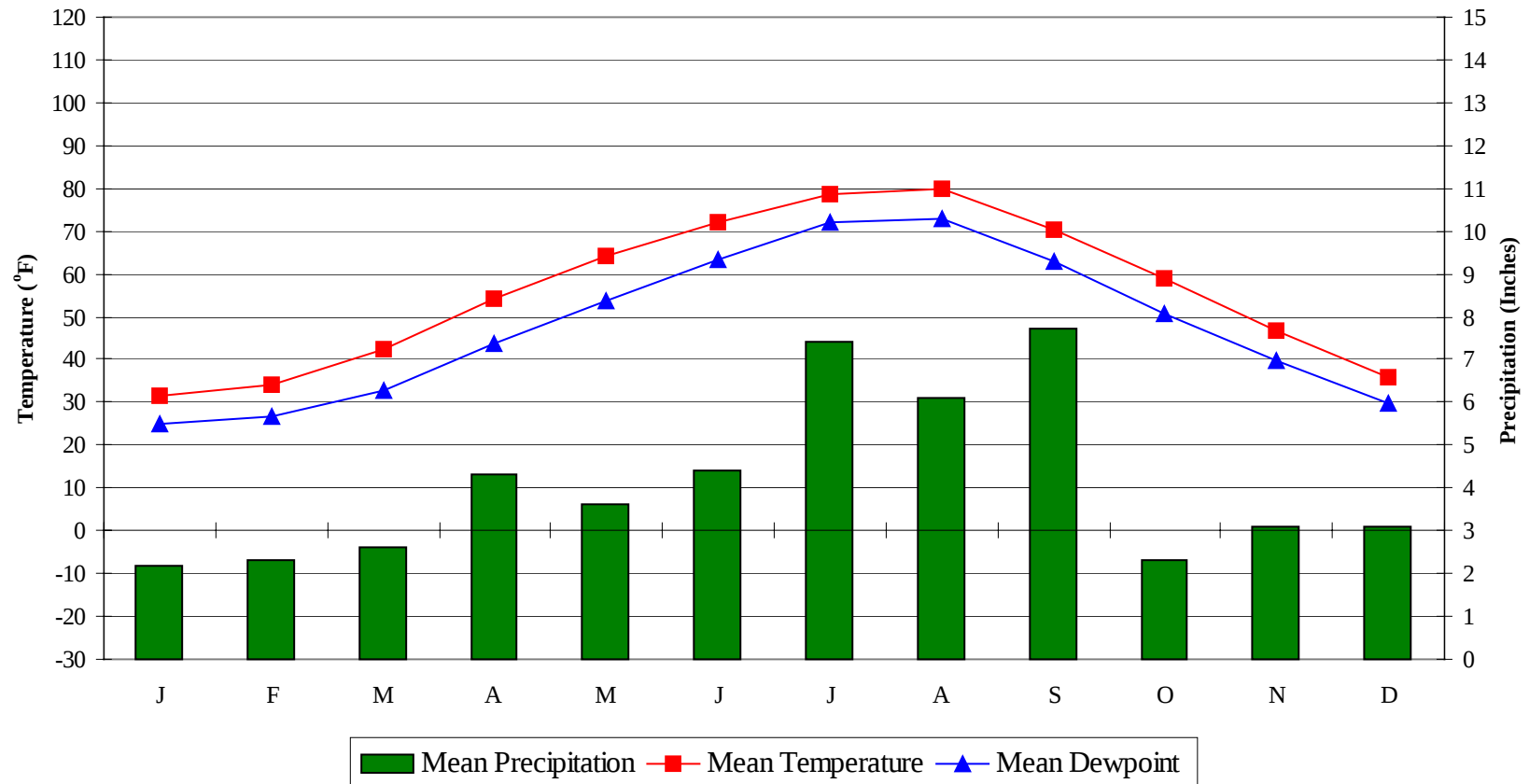
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

KWANGJU

KO

WMO No. 471580

Average Annual Climate

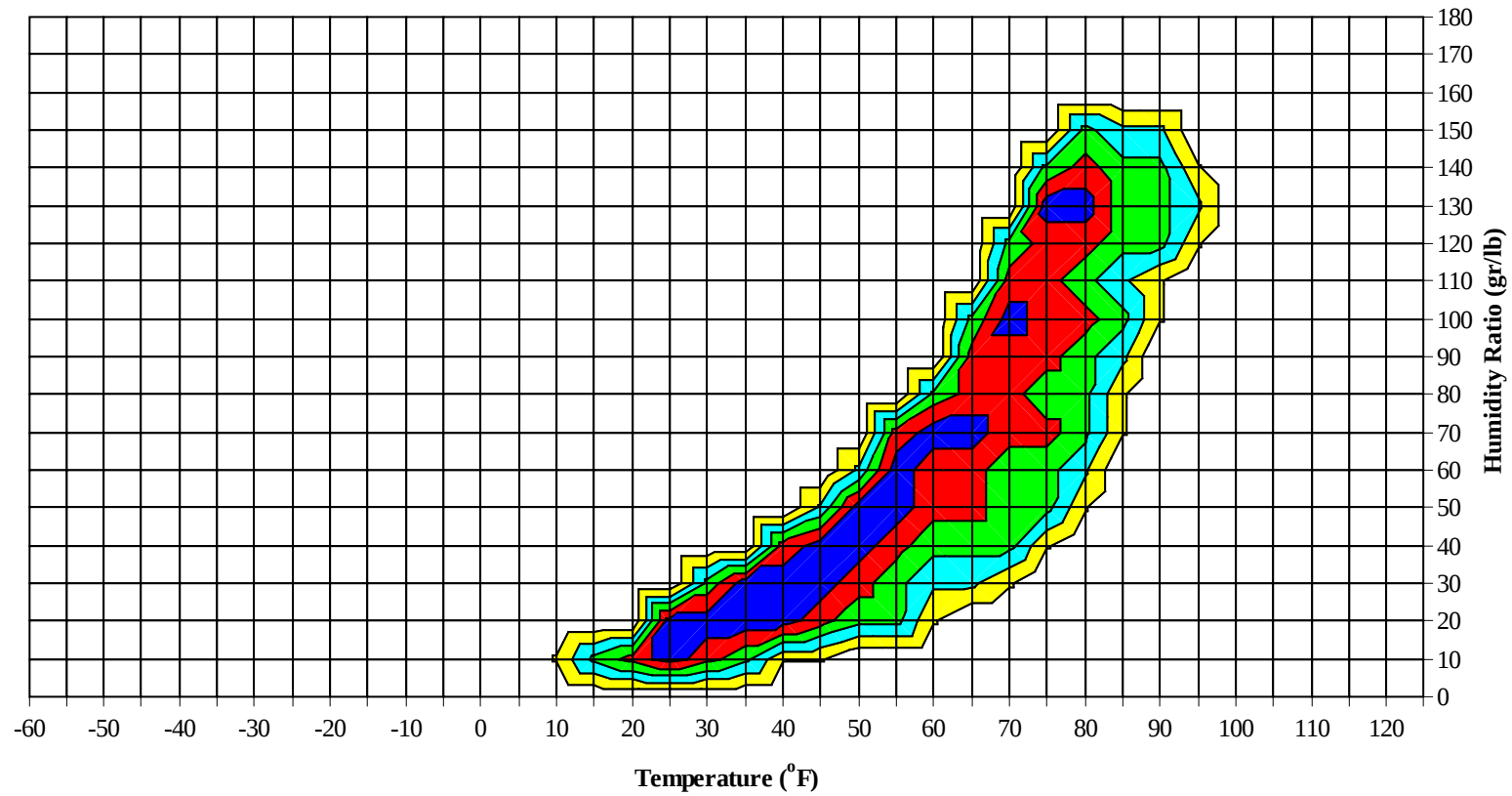


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WMO No. 471580

Long Term Psychrometric Summary



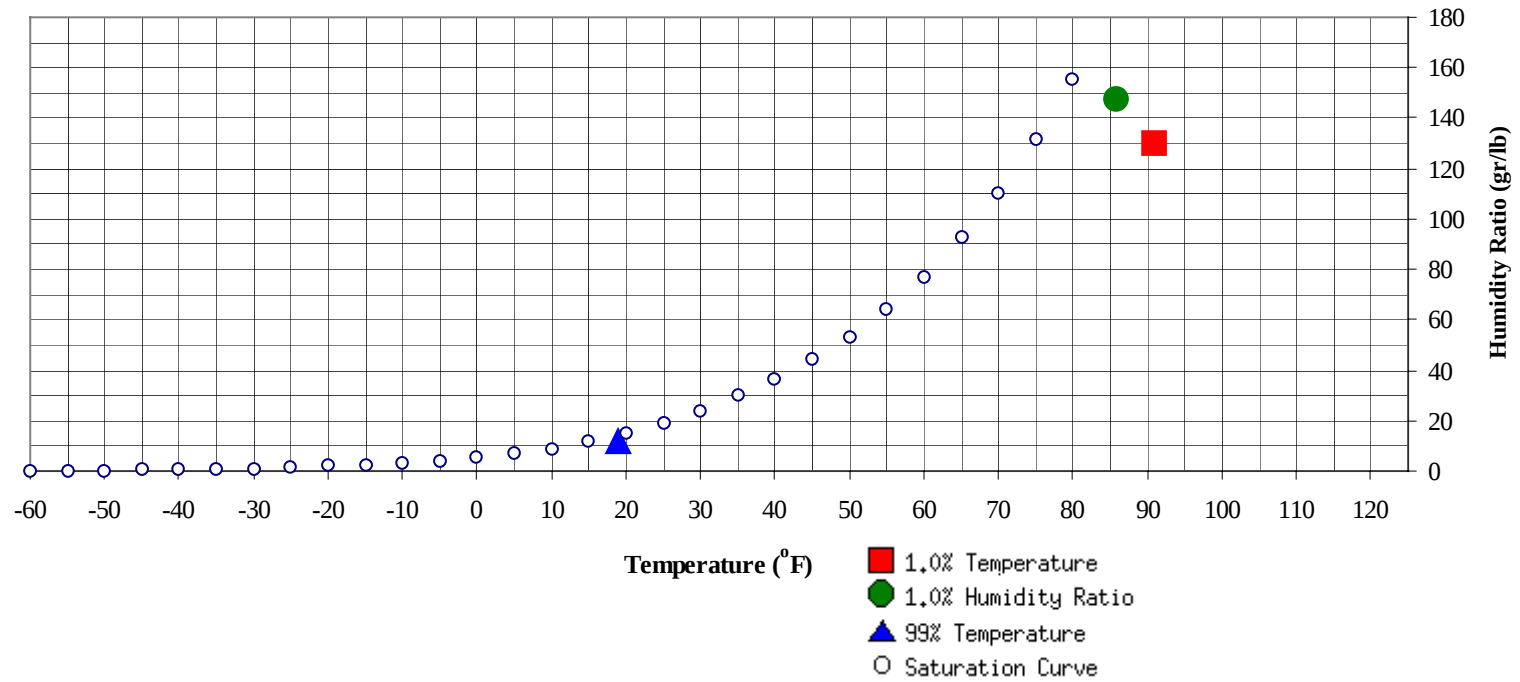
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

KWANGJU

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WMO No. 471580

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)
	19	12	6.4		147.7	85.7	80.3	78.3	43.8

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	91	130.4	79	42.4

KWANGJU KO

WMO No. 471580

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

Period of Record = 1967 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		
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79												0		0	55.0
70 / 74												2	0	2	56.7
65 / 69												5	1	6	54.5
60 / 64		0	0	0	50.5	0	1	1	2	54.0	1	17	6	24	51.8
55 / 59	0	2	1	3	49.5	1	7	3	11	49.5	2	36	17	54	48.8
50 / 54	0	8	3	11	46.2	3	17	11	31	45.5	9	45	38	93	45.6
45 / 49	4	23	11	38	41.8	6	32	23	61	41.4	25	53	54	132	42.0
40 / 44	9	34	23	66	38.1	13	36	29	78	38.1	32	37	42	111	38.3
35 / 39	24	59	49	132	33.9	29	47	46	121	34.0	57	36	51	143	34.4
30 / 34	53	61	75	189	29.7	48	45	56	148	29.5	72	15	32	119	30.1
25 / 29	82	41	56	179	25.3	69	28	41	137	25.1	44	3	6	53	25.9
20 / 24	44	14	22	80	21.1	33	8	11	51	21.1	5	0	0	5	21.7
15 / 19	26	6	7	39	17.1	19	3	4	26	17.2	1	0	0	1	17.9
10 / 14	5	1	1	7	11.9	3	1	0	4	12.2	0			0	14.0
5 / 9	1	0	0	1	7.1	0	0		0	6.2					
0 / 4	0			0	1.0										

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.

KWANGJU KO

WMO No. 471580

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1967 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		
100 / 104															
95 / 99															
90 / 94							0	0	0	68.0		4	1	5	71.5
85 / 89							5	1	6	69.1	0	20	6	26	71.4
80 / 84		1	0	1	62.5		27	8	35	66.6	0	59	26	85	70.5
75 / 79	0	12	3	15	61.4	0	50	24	73	64.2	8	73	57	138	69.3
70 / 74	0	27	11	38	58.6	4	56	43	103	62.3	55	55	83	192	67.3
65 / 69	2	33	17	52	57.4	19	43	49	110	61.0	80	22	44	146	64.7
60 / 64	9	53	42	105	55.2	57	43	63	162	58.3	71	7	20	98	61.0
55 / 59	30	55	59	144	51.9	79	21	43	143	54.3	23	1	3	27	56.4
50 / 54	48	34	54	136	48.0	63	4	16	83	50.2	3			3	52.0
45 / 49	62	17	33	112	43.6	23	0	2	25	45.2					
40 / 44	41	6	13	60	39.6	4	0	0	4	40.7					
35 / 39	34	2	7	43	35.5	0			0	37.8					
30 / 34	13	0	1	14	31.0										
25 / 29	1		0	1	26.8										
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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KWANGJU KO

WMO No. 471580

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

Period of Record = 1967 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		
100 / 104		2	0	2	78.6										
95 / 99		9	2	11	80.2		12	3	15	80.7					
90 / 94		38	15	53	79.5	0	53	18	71	79.4		3	1	4	78.4
85 / 89	0	45	24	68	78.0	1	59	29	89	77.9		15	4	19	76.2
80 / 84	24	66	71	160	76.1	23	69	80	171	76.3	2	54	20	75	72.1
75 / 79	105	55	79	239	74.1	135	41	86	262	74.5	20	75	52	147	70.0
70 / 74	82	29	49	160	70.0	69	13	29	111	70.1	38	52	70	160	67.3
65 / 69	32	4	8	44	66.4	16	2	3	20	66.1	55	24	47	125	64.5
60 / 64	5	1	1	7	62.7	4		0	4	62.3	61	14	34	109	60.5
55 / 59											42	4	11	57	55.7
50 / 54											20	0	2	22	51.4
45 / 49											2			2	46.6
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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KWANGJU KO

WMO No. 471580

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

Period of Record = 1967 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		
100 / 104															
95 / 99															
90 / 94															
85 / 89		0	0	0	71.8										
80 / 84		4	1	5	67.4		0		0	69.0					
75 / 79		26	6	32	64.3		1	0	1	63.7					
70 / 74	1	56	21	78	61.8		5	1	6	60.6					
65 / 69	6	48	29	83	60.2	0	13	3	16	58.3	0	0	0	0	59.1
60 / 64	25	52	62	139	57.8	2	30	13	45	55.4	0	5	1	6	55.5
55 / 59	51	36	64	151	54.0	15	46	31	92	52.2	0	9	4	13	50.9
50 / 54	64	19	41	124	49.6	25	52	49	126	47.9	4	26	14	44	46.7
45 / 49	62	7	18	86	45.1	37	42	54	132	43.4	10	39	27	76	42.1
40 / 44	26	1	5	32	41.0	44	27	37	108	39.5	15	38	32	84	38.4
35 / 39	12	0	1	13	37.1	65	18	36	119	35.7	39	55	66	160	34.4
30 / 34	1		0	1	32.0	41	7	13	60	31.2	73	45	61	179	30.4
25 / 29						11	1	2	14	26.5	73	23	34	130	25.8
20 / 24						1	0	0	1	21.5	22	5	6	33	21.5
15 / 19						0			0	18.0	8	2	3	13	17.2
10 / 14											3	1	1	5	12.1
5 / 9											0	0	0	0	7.4
0 / 4															

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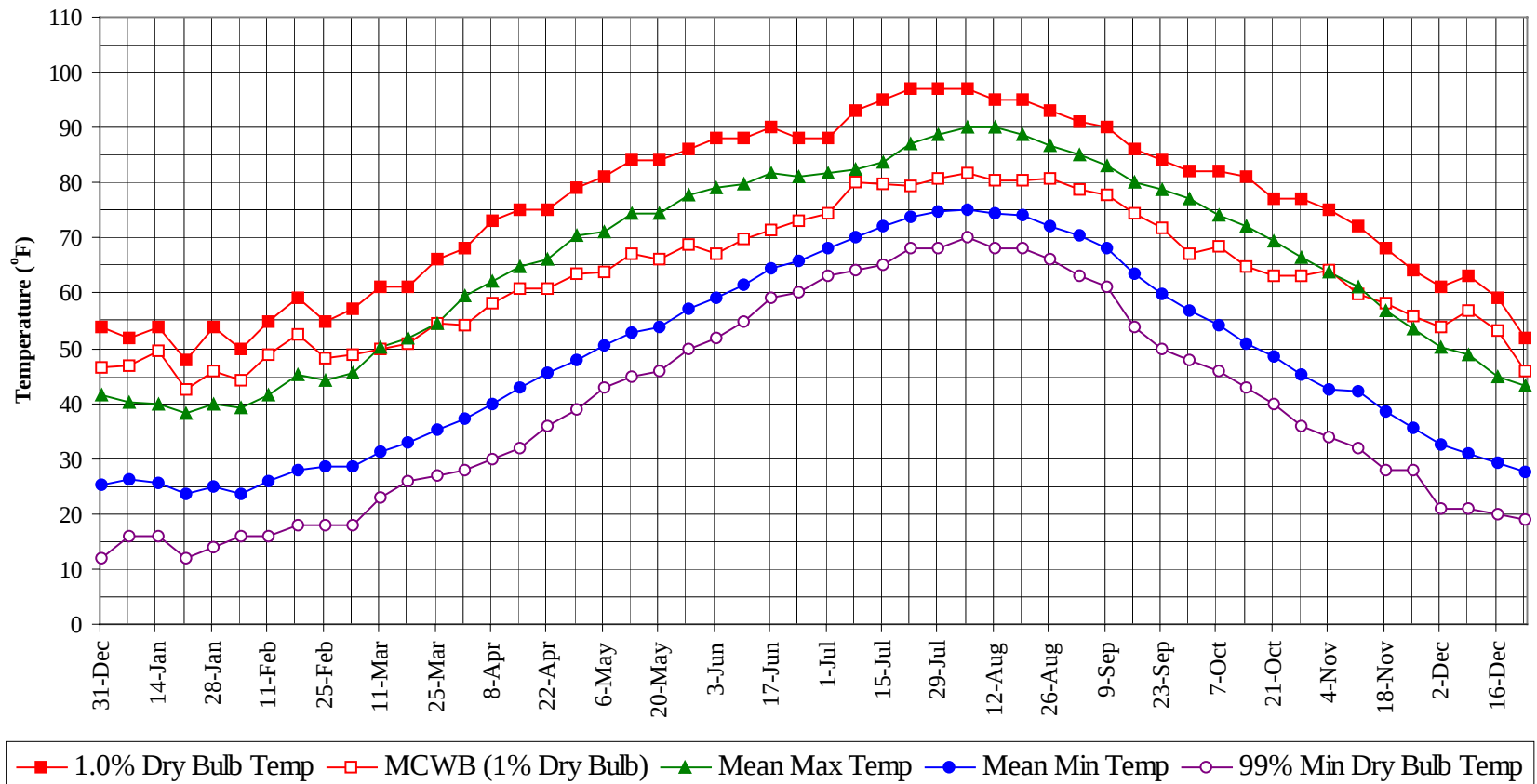
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1967 to 1996

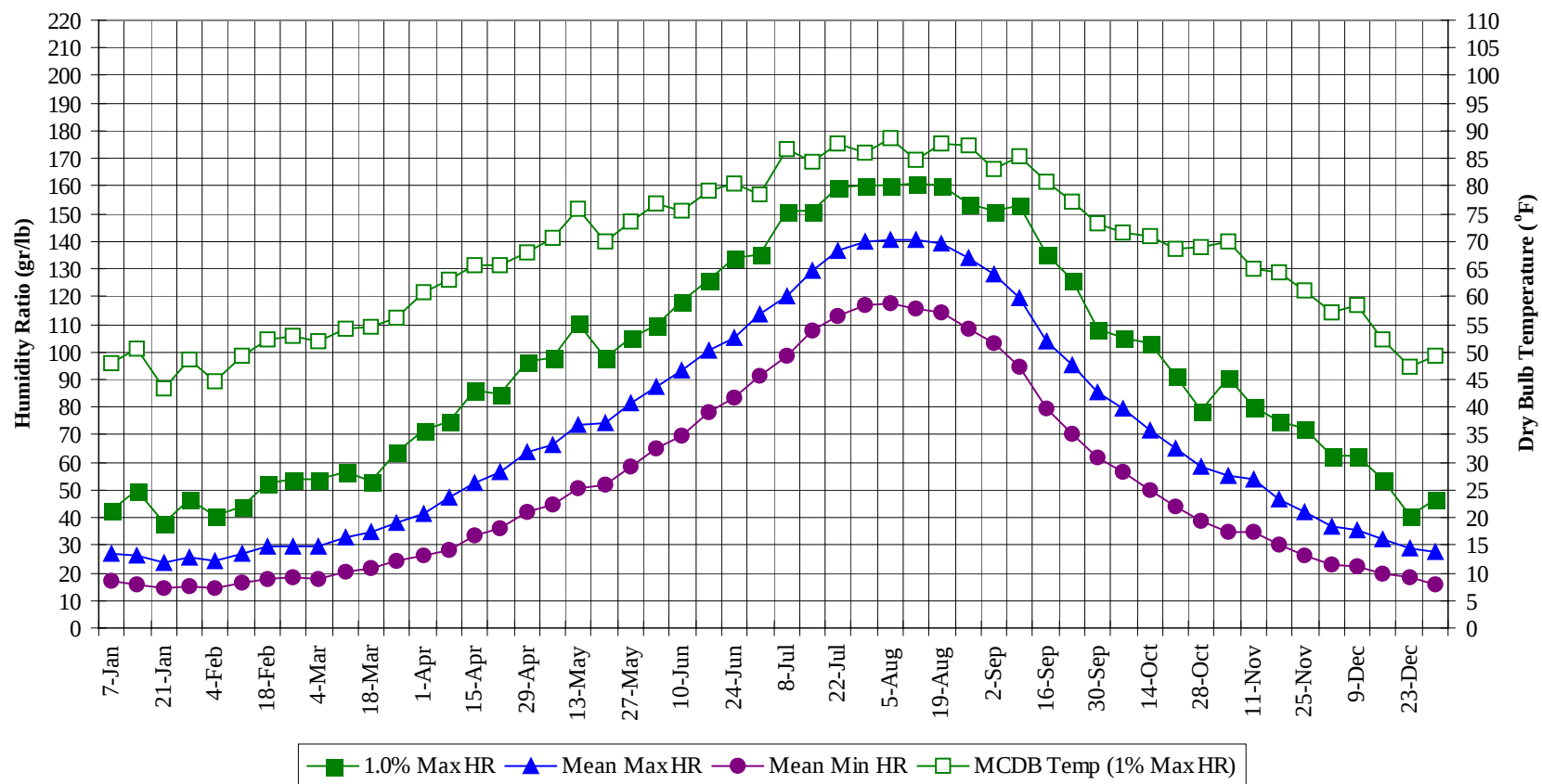
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104		2	0	2	78.6
95 / 99		22	5	27	80.5
90 / 94	0	103	36	139	79.1
85 / 89	1	149	67	217	76.7
80 / 84	51	288	213	551	74.0
75 / 79	281	339	316	936	71.5
70 / 74	257	294	314	864	66.6
65 / 69	212	193	204	608	62.6
60 / 64	237	221	242	700	58.1
55 / 59	246	211	234	691	53.1
50 / 54	239	201	225	665	48.1
45 / 49	228	208	218	653	43.0
40 / 44	180	174	176	530	38.8
35 / 39	254	212	250	716	34.6
30 / 34	292	170	231	694	30.1
25 / 29	272	95	135	503	25.4
20 / 24	104	27	38	169	21.2
15 / 19	54	11	13	77	17.2
10 / 14	11	2	3	16	12.1
5 / 9	2	0	0	2	7.1
0 / 4	0			0	1.0

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.

Annual Summary of Temperatures

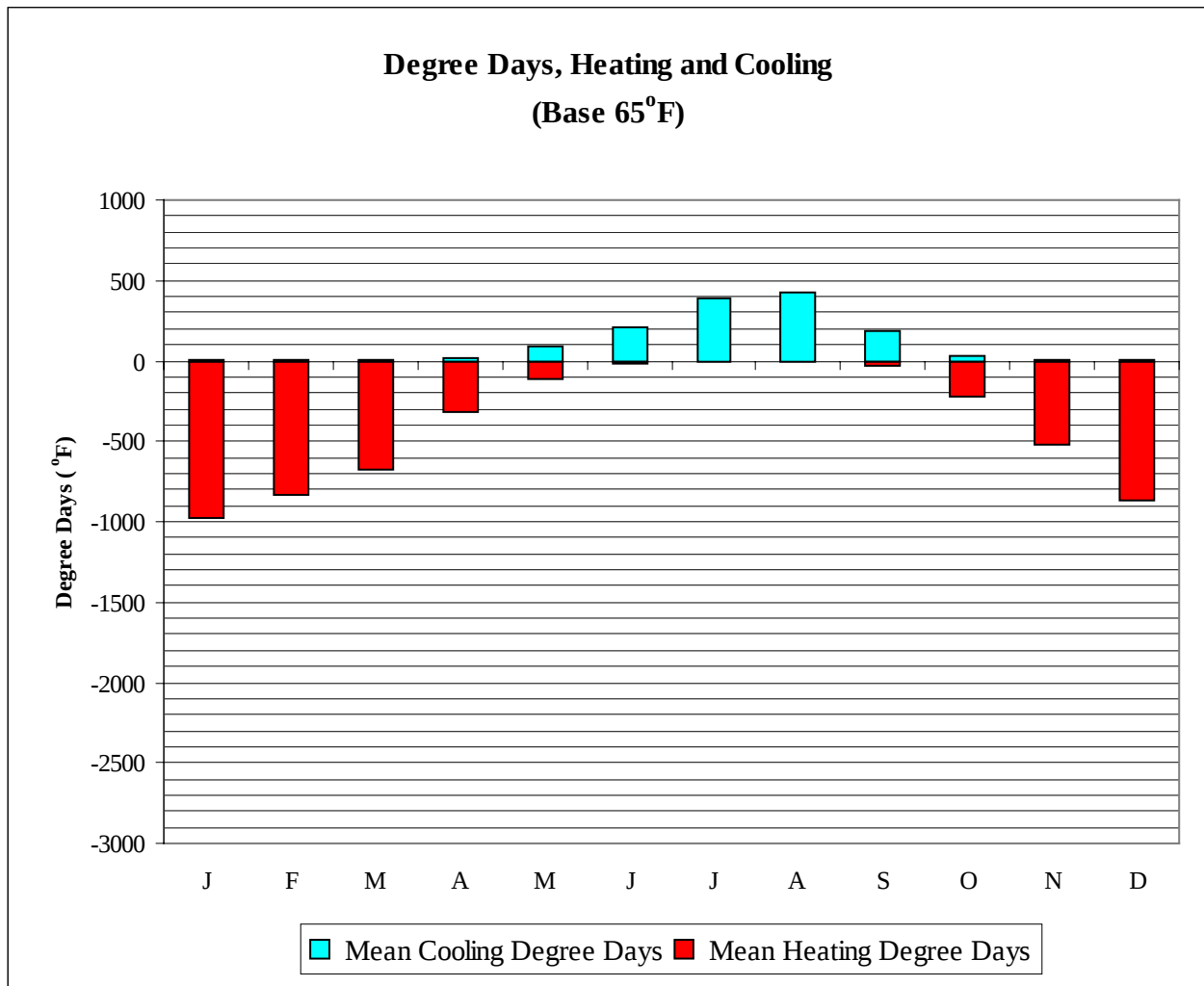


Long Term Humidity and Dry Bulb Temperature Summary



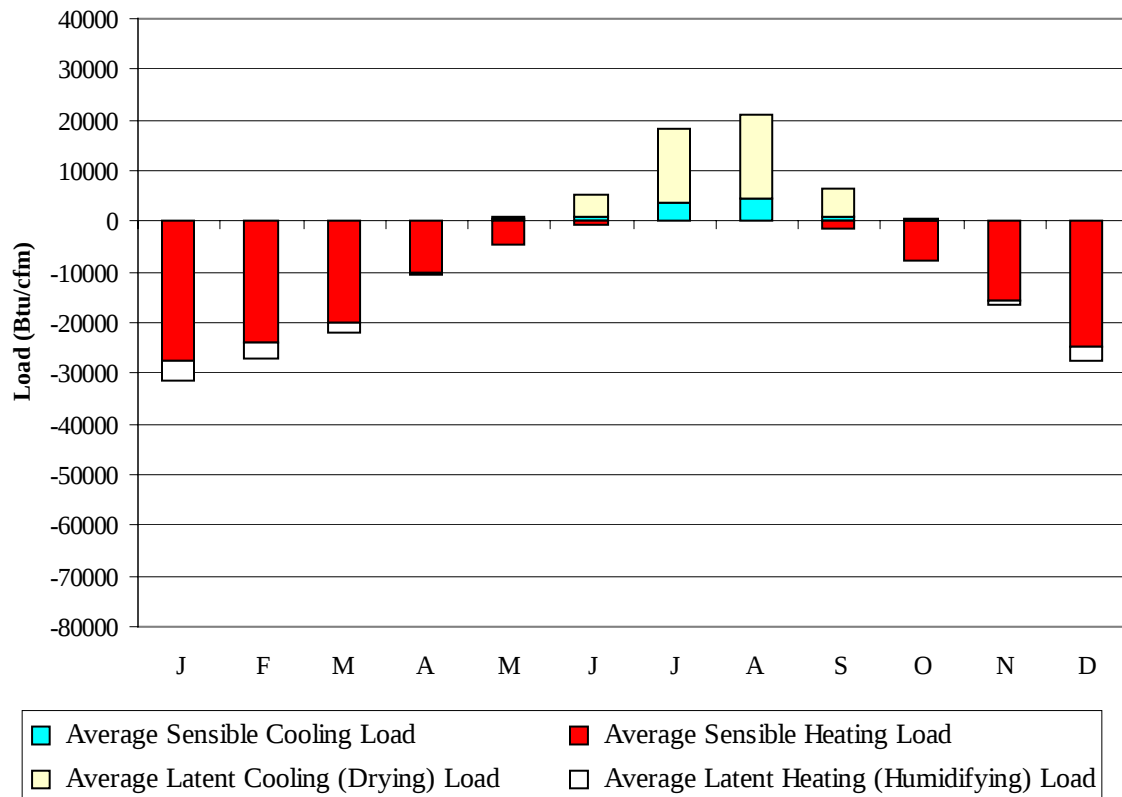
KWANGJU**KO****WMO No. 471580****Long Term Dry Bulb Temperature and Humidity Summary**

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	52.0	46.8	40.3	26.2	16.0	42.7	47.9	26.8	16.8
14-Jan	54.0	49.4	39.8	25.8	16.0	49.7	50.5	26.4	15.9
21-Jan	48.0	42.6	38.3	23.6	12.0	37.8	43.4	23.9	14.2
28-Jan	54.0	45.9	40.0	24.8	14.0	46.9	48.6	25.6	15.4
4-Feb	50.0	44.1	39.1	23.7	16.0	40.6	44.8	24.2	14.6
11-Feb	55.0	49.0	41.6	25.9	16.0	44.1	49.4	26.9	16.3
18-Feb	59.0	52.5	45.1	27.9	18.0	52.5	52.2	29.2	18.1
25-Feb	55.0	48.2	44.1	28.5	18.0	53.9	52.8	29.4	18.7
4-Mar	57.0	49.0	45.6	28.7	18.0	53.9	51.9	29.8	18.1
11-Mar	61.0	49.9	50.1	31.1	23.0	56.7	54.2	33.0	20.2
18-Mar	61.0	50.8	51.8	33.0	26.0	53.2	54.4	34.8	21.6
25-Mar	66.0	54.6	54.6	35.1	27.0	63.7	56.0	38.1	24.1
1-Apr	68.0	54.2	59.4	37.2	28.0	71.4	60.8	41.6	26.1
8-Apr	73.0	58.2	62.1	39.9	30.0	74.9	63.1	47.0	28.4
15-Apr	75.0	60.9	64.8	42.8	32.0	86.1	65.7	52.8	33.3
22-Apr	75.0	60.7	66.2	45.4	36.0	84.7	65.7	56.4	36.1
29-Apr	79.0	63.5	70.4	48.0	39.0	96.6	68.1	63.5	41.8
6-May	81.0	63.9	71.1	50.5	43.0	98.0	70.5	66.1	44.6
13-May	84.0	67.1	74.4	52.8	45.0	110.6	75.8	73.6	50.3
20-May	84.0	66.0	74.4	53.9	46.0	98.0	69.8	74.5	52.0
27-May	86.0	68.9	77.7	57.1	50.0	105.0	73.4	81.4	58.2
3-Jun	88.0	67.2	79.0	59.3	52.0	109.9	76.9	87.0	65.0
10-Jun	88.0	69.7	79.9	61.6	55.0	118.3	75.6	93.3	69.8
17-Jun	90.0	71.3	81.7	64.4	59.0	126.0	79.3	100.3	78.4
24-Jun	88.0	73.1	81.1	65.9	60.0	133.7	80.5	104.9	83.6
1-Jul	88.0	74.3	81.8	68.1	63.0	135.1	78.6	113.4	91.3
8-Jul	93.0	80.2	82.5	70.1	64.0	151.2	86.8	120.3	98.3
15-Jul	95.0	79.6	83.7	72.0	65.0	151.2	84.3	129.4	107.6
22-Jul	97.0	79.3	87.1	73.6	68.0	159.6	87.6	136.7	113.2
29-Jul	97.0	80.7	88.9	74.9	68.0	160.3	86.0	139.7	116.6
5-Aug	97.0	81.8	90.2	75.2	70.0	160.3	88.8	140.3	117.7
12-Aug	95.0	80.3	90.0	74.3	68.0	161.0	84.7	140.8	115.7
19-Aug	95.0	80.4	88.9	74.0	68.0	160.3	87.7	139.5	114.0
26-Aug	93.0	80.8	86.7	72.2	66.0	154.0	87.3	133.8	108.1
2-Sep	91.0	78.6	85.1	70.6	63.0	151.2	82.9	128.1	102.8
9-Sep	90.0	77.8	83.2	68.0	61.0	153.3	85.4	119.2	94.5
16-Sep	86.0	74.5	80.0	63.4	54.0	135.1	80.8	104.1	79.4
23-Sep	84.0	71.9	78.8	59.9	50.0	126.0	77.0	95.2	70.0
30-Sep	82.0	67.1	77.2	56.8	48.0	108.5	73.3	85.6	61.5
7-Oct	82.0	68.5	74.0	54.3	46.0	105.0	71.5	79.6	56.5
14-Oct	81.0	64.8	72.1	51.0	43.0	102.9	70.8	71.5	49.7
21-Oct	77.0	63.1	69.4	48.4	40.0	91.0	68.5	64.9	44.3
28-Oct	77.0	63.1	66.6	45.1	36.0	79.1	69.0	58.6	39.0
4-Nov	75.0	64.1	63.7	42.4	34.0	90.3	69.9	55.2	35.1
11-Nov	72.0	59.9	61.2	42.1	32.0	79.8	65.2	53.6	34.7
18-Nov	68.0	58.3	56.9	38.4	28.0	74.9	64.4	46.6	30.0
25-Nov	64.0	55.9	53.4	35.5	28.0	72.1	60.9	41.9	26.1
2-Dec	61.0	53.8	50.3	32.5	21.0	62.3	57.2	36.9	23.1
9-Dec	63.0	56.7	48.7	30.9	21.0	62.3	58.5	35.3	22.0
16-Dec	59.0	53.3	45.0	29.3	20.0	53.9	52.1	32.0	20.0
23-Dec	52.0	46.0	43.3	27.7	19.0	40.6	47.1	28.8	18.3
31-Dec	54.0	46.4	41.4	25.2	12.0	46.9	49.4	27.5	16.0



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	978
FEB	0	837
MAR	1	680
APR	16	320
MAY	87	115
JUN	204	13
JUL	385	0
AUG	424	0
SEP	180	33
OCT	33	223
NOV	2	524
DEC	0	869
ANN	1332	4592

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	-27612	0	-3718
FEB	0	-23811	0	-3171
MAR	0	-19940	0	-1979
APR	23	-10273	75	-418
MAY	378	-4434	677	-11
JUN	1082	-791	4275	0
JUL	3682	-42	14777	0
AUG	4437	-25	16594	0
SEP	1005	-1490	5302	0
OCT	68	-7644	327	-44
NOV	1	-15749	6	-728
DEC	0	-24814	0	-2562
ANN	10676	-136625	42033	-12631

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

No Solar Radiation
Data Available

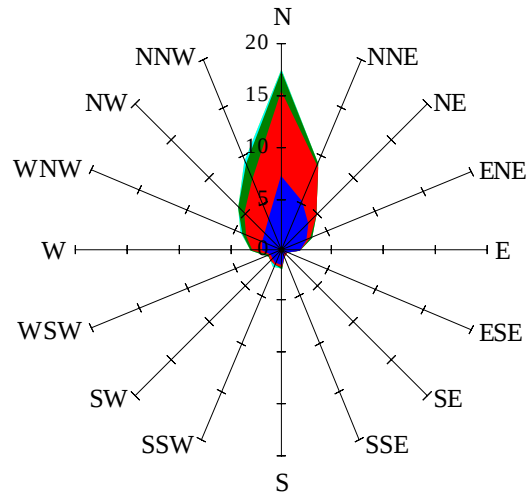


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

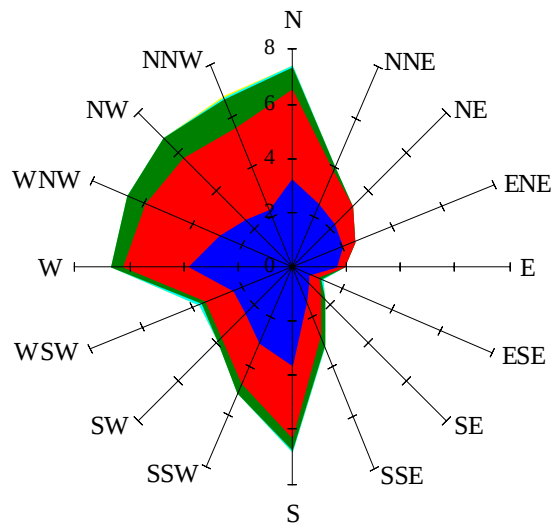
Labels of Percent Frequency on North Axis



Percent Calm = 34.38

Wind Summary - March, April, and May

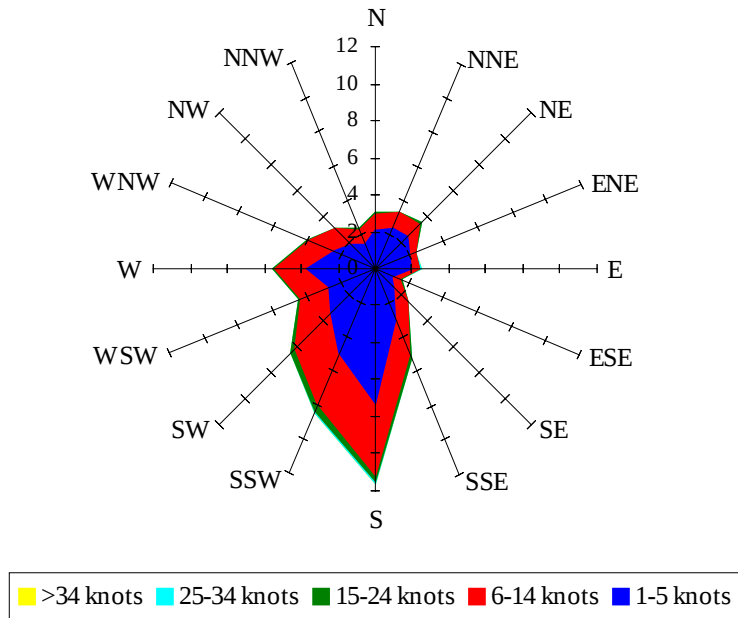
Labels of Percent Frequency on North Axis



Percent Calm = 29.32

Wind Summary - June, July, and August

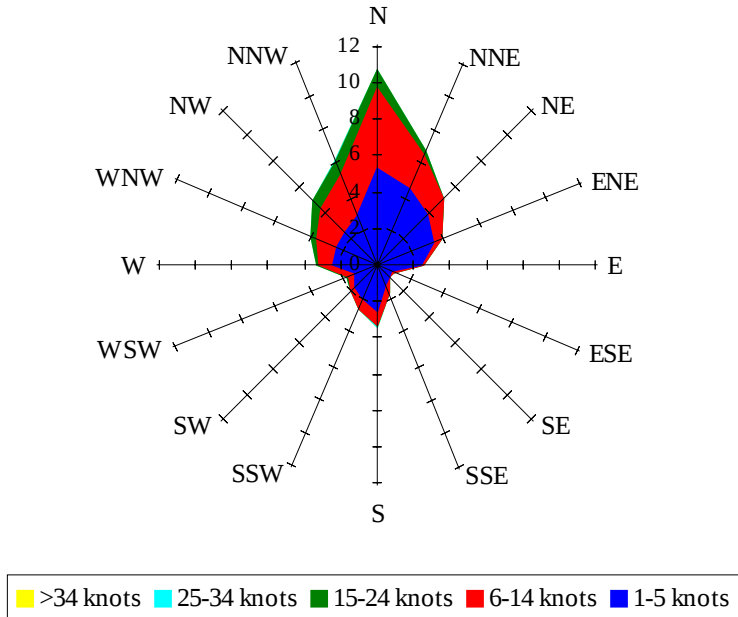
Labels of Percent Frequency on North Axis



Percent Calm = 29.99

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 39.40