

KUNSAN KO

Latitude = 35.90 N

Longitude = 126.62 E

Period of Record = 1967 to 1996

WMO No. 471410

Elevation = 30 feet

Average Pressure = 29.95 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	80	133	9.2	NE
0.4% Occurrence	90	79	135	9.2	WNW
1.0% Occurrence	88	79	136	9.2	WNW
2.0% Occurrence	85	78	133	8.4	SSW
Mean Daily Range	12	-	-	-	-
97.5% Occurrence	25	22	12	7.4	E
99.0% Occurrence	21	19	11	6.9	E
99.6% Occurrence	18	17	9	7.1	E
Median of Extreme Lows	12	11	8	6.2	E
	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	166	9.1	SW
0.4% Occurrence	81	86	150	8.8	SSW
1.0% Occurrence	80	85	145	8.8	SSW
2.0% Occurrence	79	84	141	8.2	SSW
	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	170	87	1.12	7.6	W
0.4% Occurrence	152	84	1.00	9.5	SSW
1.0% Occurrence	151	84	0.99	8.0	SSW
2.0% Occurrence	141	83	0.94	7.7	SSW
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		7	737	1114	2035

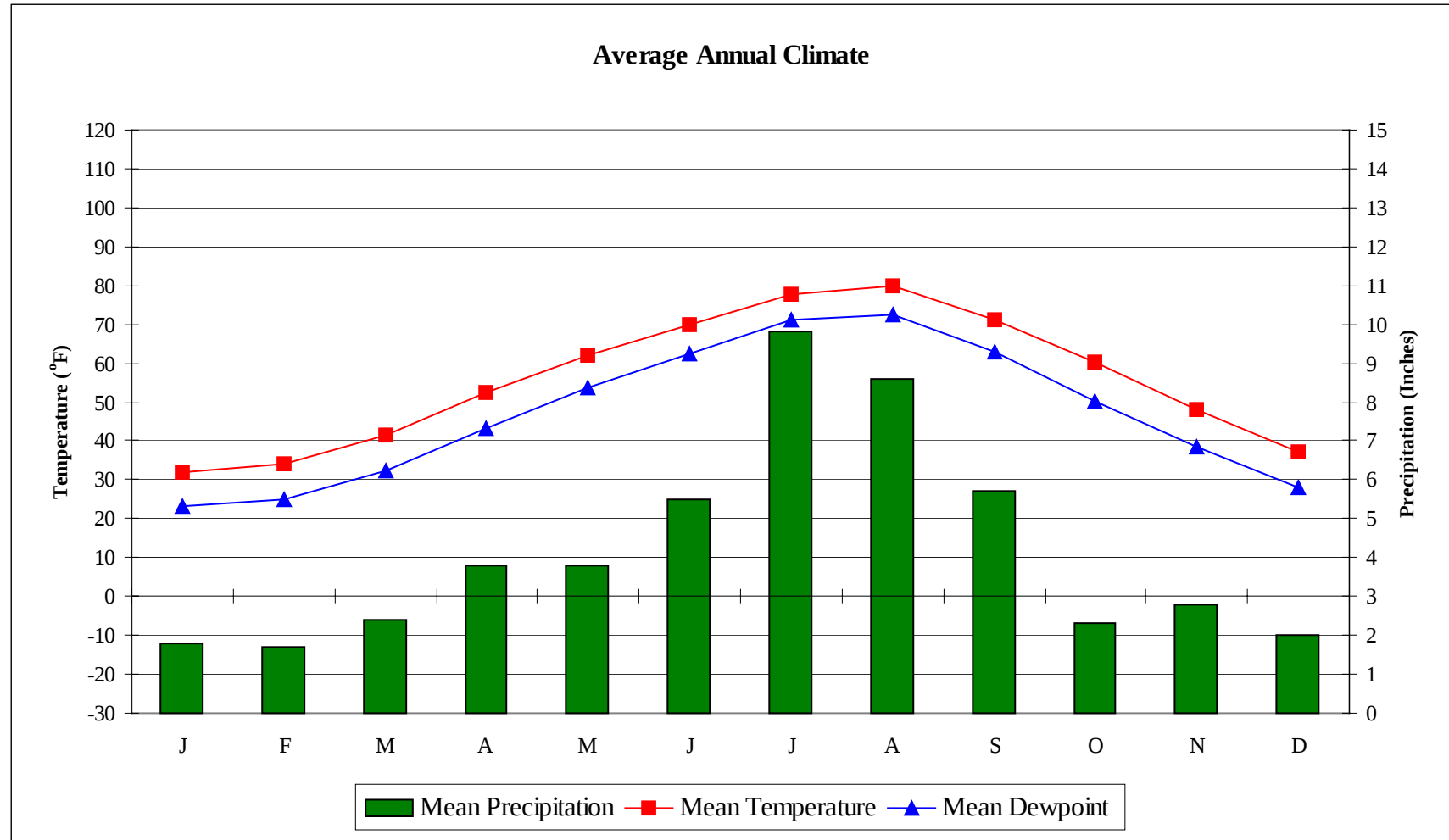
Other Site Data

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	4.0 + 0.7
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 (#)
58.1	N/A	N/A	50

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

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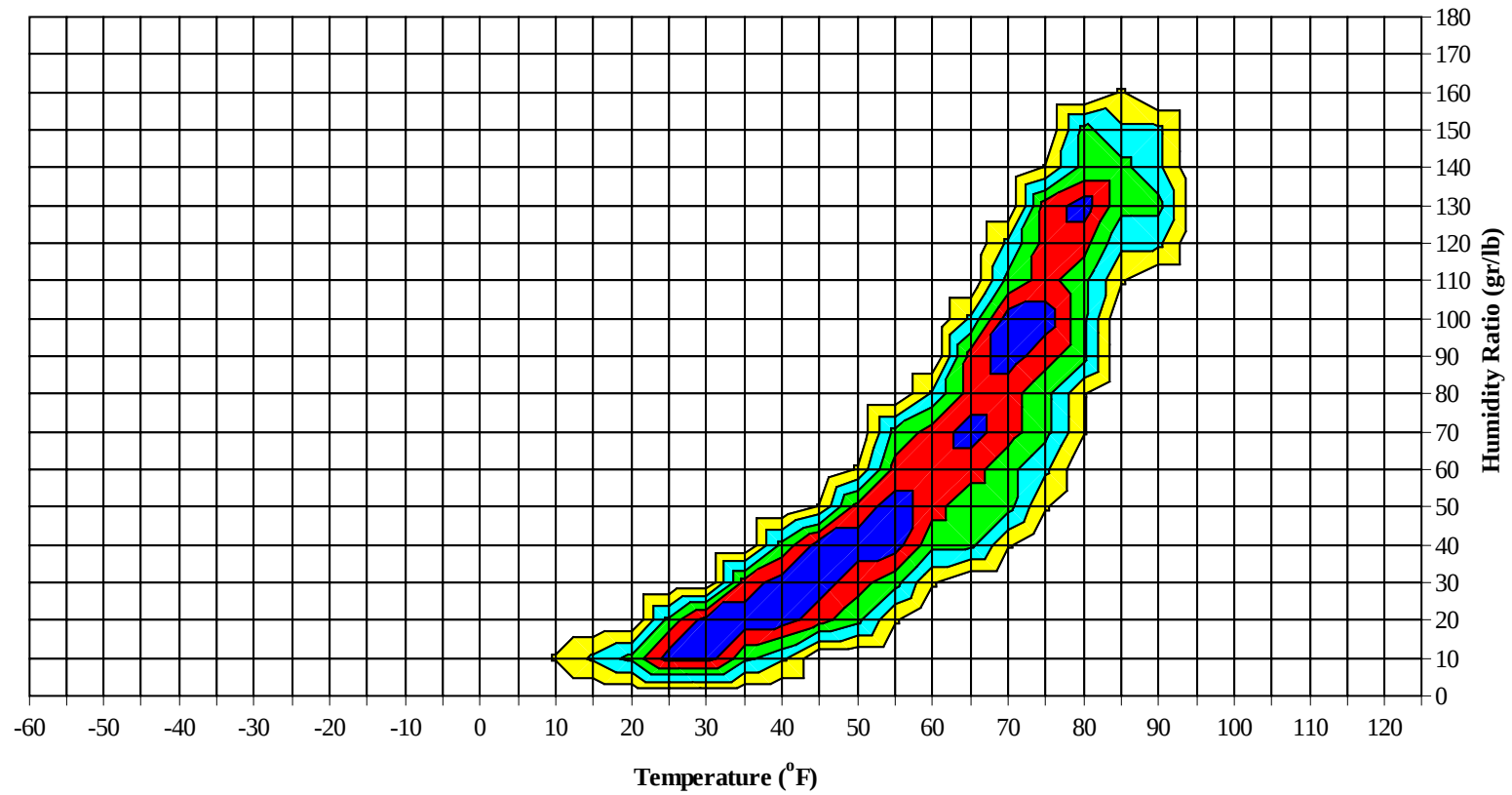
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Long Term Psychrometric Summary

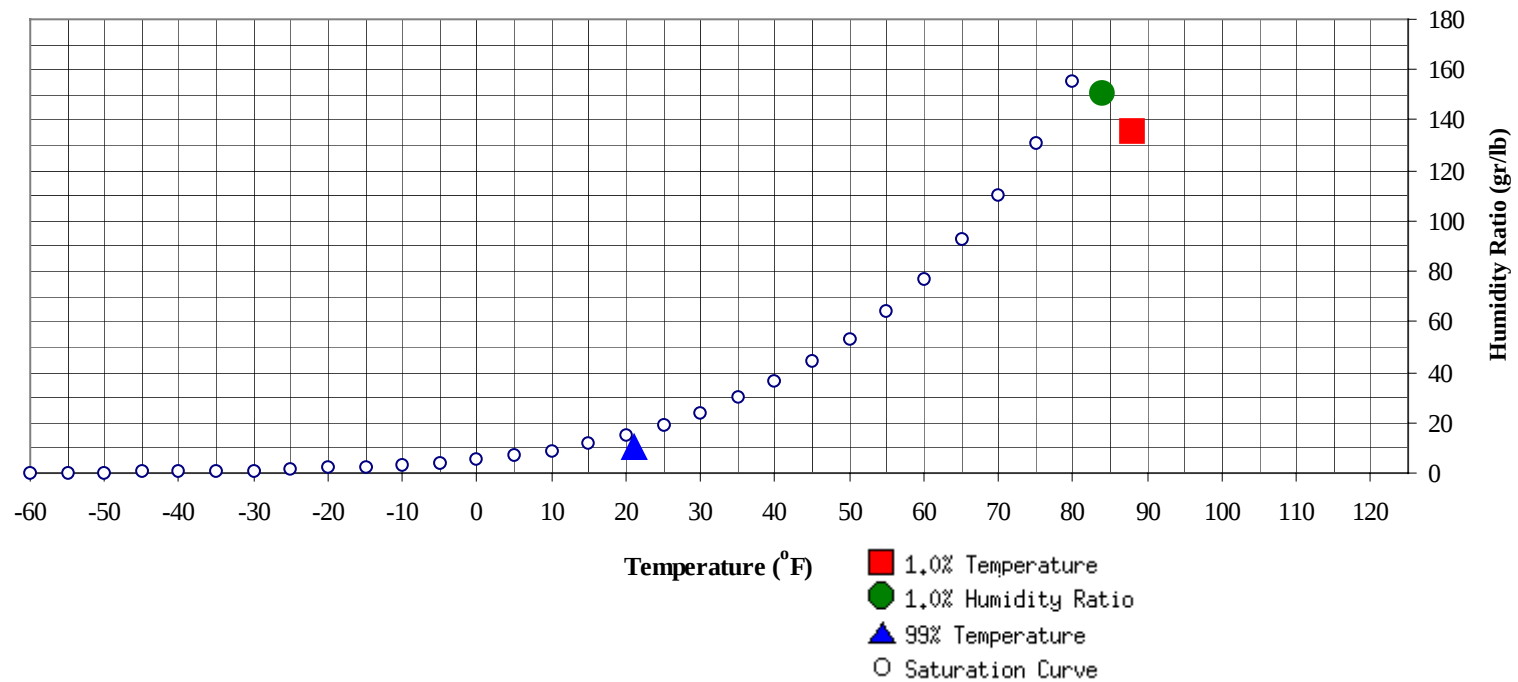


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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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)
	21	10.6	6.7		150.5	84	80.2	78.8	43.8

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	88	135.6	78.9	42.4

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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		
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69												0		0	57.8
60 / 64						0	0		0	54.3	0	3	1	4	52.5
55 / 59						0	2	1	3	50.8	1	14	4	19	49.5
50 / 54	0	4	1	5	45.9	2	7	2	11	46.4	5	37	17	59	46.0
45 / 49	4	20	11	35	41.8	5	26	14	45	42.2	32	84	63	179	42.2
40 / 44	13	31	23	67	38.4	13	38	27	78	38.4	45	51	62	158	38.6
35 / 39	40	68	71	179	33.6	50	67	72	189	33.8	89	45	73	207	34.3
30 / 34	67	59	74	200	28.7	64	45	63	172	28.7	60	11	26	97	29.4
25 / 29	70	41	46	157	24.2	61	28	34	123	24.2	14	2	3	19	24.8
20 / 24	26	14	13	53	19.8	18	7	8	33	20.0	1	0	0	1	19.8
15 / 19	20	9	9	38	16.1	10	3	2	15	16.1	0			0	17.3
10 / 14	6	2	1	9	11.1	2	0		2	11.0					
5 / 9	1	0	0	1	7.9										

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 = 1967 to 1996

April						May					June				
Temperature Range (°F)	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 68.0					0 0 71.6				
85 / 89						0 0 68.8					1 0 1 70.6				
80 / 84	0 0 62.7					2 0 2 67.6					0 17 4 21 71.3				
75 / 79	2 0 2 63.2					0 12 2 14 65.1					8 75 30 113 69.4				
70 / 74	0 8 2 10 60.8					4 61 20 85 62.8					71 102 105 278 66.5				
65 / 69	1 16 4 21 58.4					17 57 39 113 60.8					79 32 65 176 63.6				
60 / 64	10 48 24 82 55.5					82 79 100 261 58.0					73 13 34 120 60.4				
55 / 59	29 68 51 148 51.8					89 31 66 186 53.7					8 1 2 11 55.8				
50 / 54	62 65 77 204 47.9					48 5 20 73 49.8									
45 / 49	81 29 61 171 43.5					8 0 1 9 45.1									
40 / 44	34 3 17 54 39.2														
35 / 39	20 1 4 25 35.0														
30 / 34	3 0 3 30.0														
25 / 29															
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 = 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		
95 / 99		1	0	1	81.5		1	0	1	79.8					
90 / 94	0	16	3	19	80.2		23	4	27	79.2		1	0	1	79.9
85 / 89	0	33	12	45	79.1	1	59	20	80	78.4	0	6	1	7	78.0
80 / 84	44	82	74	200	76.5	64	102	110	276	76.2	7	38	17	62	73.8
75 / 79	98	77	92	267	73.1	120	50	92	262	73.4	23	88	59	170	69.9
70 / 74	88	36	61	185	68.9	56	11	20	87	69.3	66	77	95	238	66.4
65 / 69	16	2	5	23	64.8	6	1	2	9	65.3	55	19	42	116	63.0
60 / 64	2	1	0	3	60.7	1	0	0	1	61.4	65	11	24	100	59.3
55 / 59											22	0	2	24	54.6
50 / 54											3	0	0	3	50.4
45 / 49											0			0	47.0
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 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 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		
95 / 99															
90 / 94															
85 / 89															
80 / 84		1	0	1	66.5										
75 / 79	0	12	2	14	66.0										
70 / 74	4	52	21	77	62.7		1	0	1	61.1					
65 / 69	13	54	37	104	60.2	0	5	1	6	58.3					
60 / 64	51	72	90	213	56.9	4	32	12	48	55.7		1	0	1	54.6
55 / 59	74	37	59	170	52.5	18	52	40	110	51.7	0	7	1	8	51.0
50 / 54	61	16	28	105	48.2	46	55	64	165	47.4	7	21	11	39	47.1
45 / 49	34	5	9	48	43.8	59	45	56	160	42.4	21	49	39	109	42.1
40 / 44	8	0	1	9	39.8	38	21	28	87	38.2	28	39	43	110	37.9
35 / 39	3	0	0	3	36.2	45	21	29	95	34.0	61	59	74	194	33.7
30 / 34	0			0	33.0	24	6	8	38	30.2	65	40	46	151	29.1
25 / 29						6	1	1	8	25.2	45	22	24	91	24.6
20 / 24						0	0	0	0	20.2	13	6	6	25	20.5
15 / 19						0			0	17.3	6	3	3	12	16.4
10 / 14											1	0	1	2	11.6
5 / 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 5 of 5)

Period of Record = 1967 to 1996

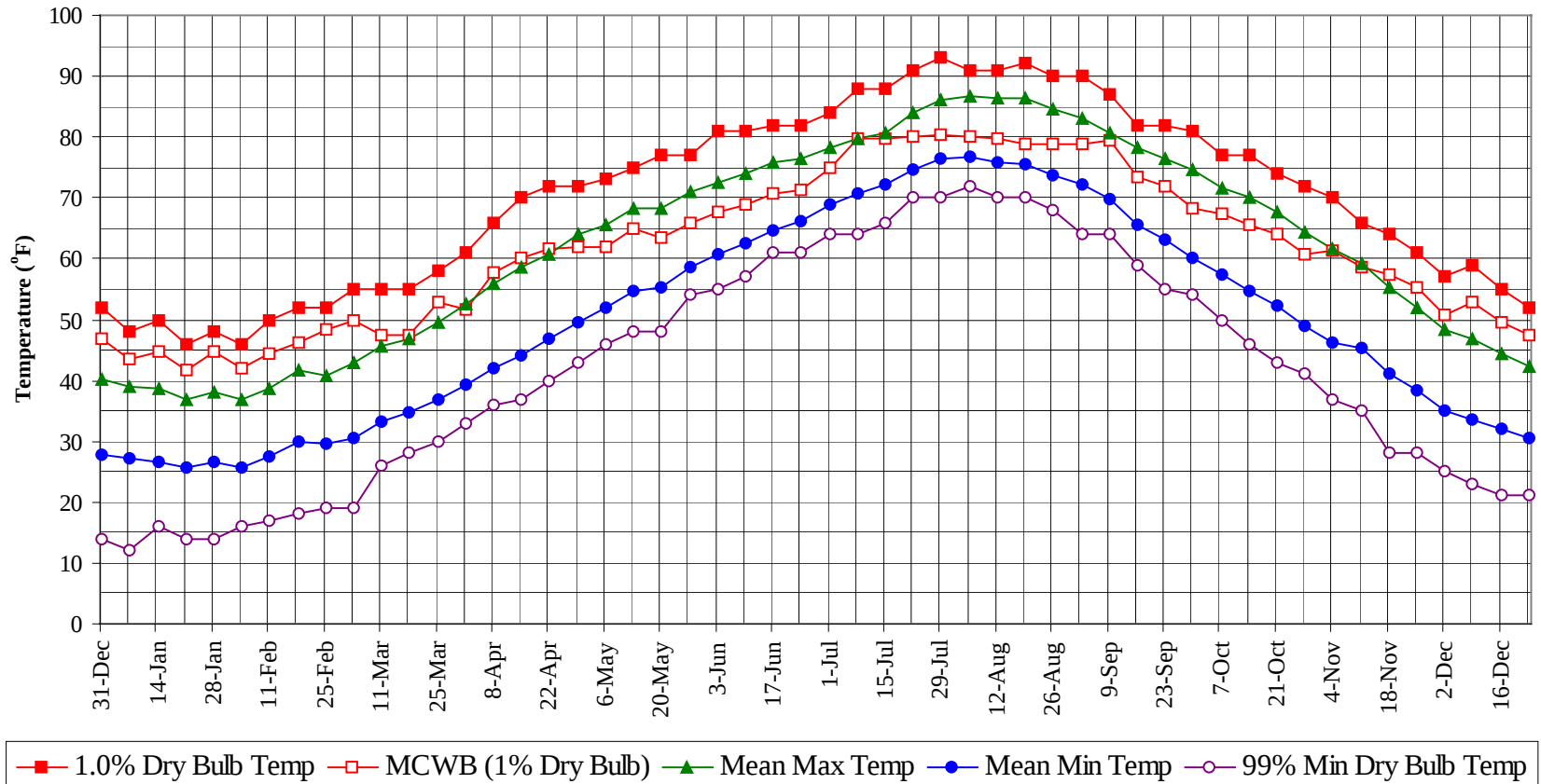
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		2	0	2	80.6
90 / 94	0	40	7	47	79.5
85 / 89	2	98	34	134	78.6
80 / 84	113	240	203	556	75.8
75 / 79	245	314	276	835	71.7
70 / 74	287	347	322	956	66.5
65 / 69	188	187	195	570	62.1
60 / 64	289	260	285	834	57.8
55 / 59	241	212	228	681	52.6
50 / 54	234	210	222	666	47.8
45 / 49	246	259	254	759	42.6
40 / 44	179	185	202	566	38.4
35 / 39	310	262	325	897	33.9
30 / 34	284	162	217	663	29.0
25 / 29	195	94	110	399	24.3
20 / 24	58	28	27	113	20.0
15 / 19	37	16	14	67	16.2
10 / 14	10	3	2	15	11.2
5 / 9	1	0	0	1	7.9

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.

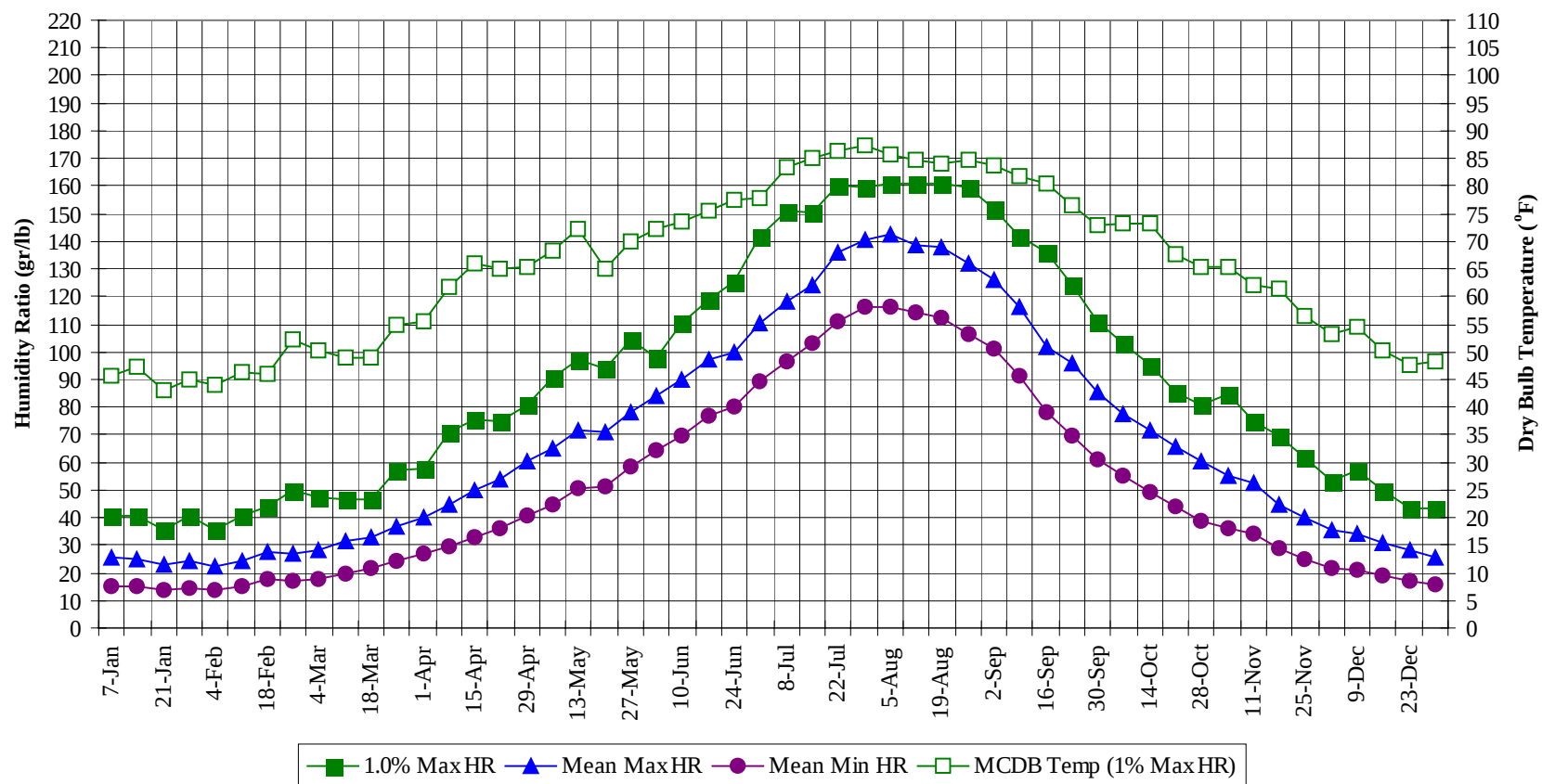
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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

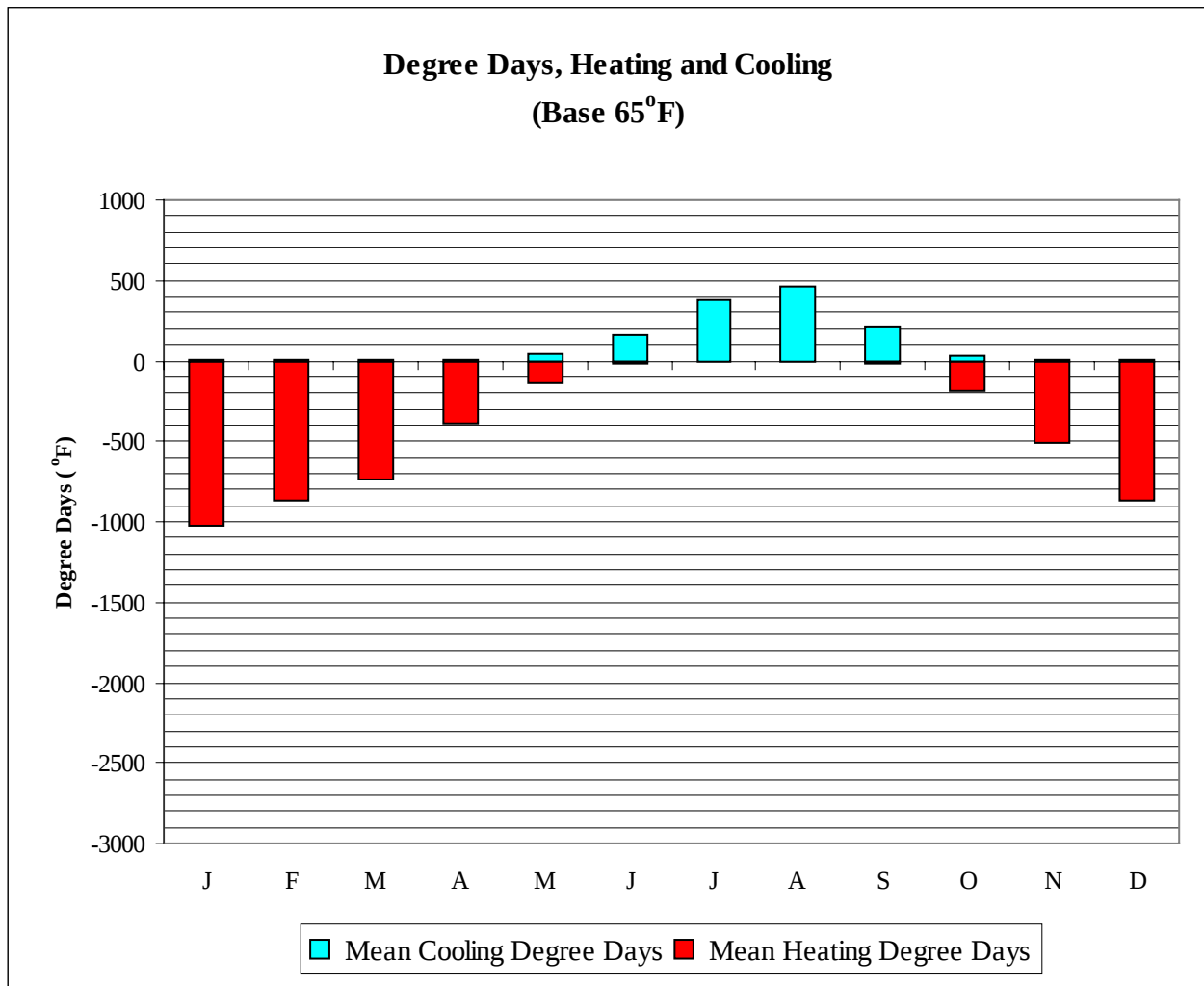


KUNSAN KO**WMO No. 471410****Long Term Dry Bulb Temperature and Humidity Summary**

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	48.0	43.4	39.1	27.3	12.0	40.6	45.6	25.3	15.2
14-Jan	50.0	44.7	38.6	26.7	16.0	40.6	47.2	24.8	14.8
21-Jan	46.0	41.6	37.0	25.5	14.0	35.7	43.0	22.8	13.6
28-Jan	48.0	44.7	38.1	26.7	14.0	40.6	45.1	24.3	14.6
4-Feb	46.0	42.0	36.8	25.6	16.0	35.7	43.9	22.6	13.7
11-Feb	50.0	44.4	38.7	27.5	17.0	40.6	46.4	24.5	15.3
18-Feb	52.0	46.3	41.6	30.0	18.0	44.1	45.8	27.6	17.6
25-Feb	52.0	48.4	40.7	29.6	19.0	49.7	52.3	26.7	17.0
4-Mar	55.0	49.9	42.9	30.6	19.0	47.6	50.3	28.5	17.8
11-Mar	55.0	47.5	45.5	33.1	26.0	46.9	49.0	31.5	20.0
18-Mar	55.0	47.4	46.9	34.7	28.0	46.9	49.0	32.9	21.5
25-Mar	58.0	52.8	49.4	37.0	30.0	57.4	55.0	36.7	24.2
1-Apr	61.0	51.8	52.6	39.2	33.0	58.1	55.6	40.1	26.7
8-Apr	66.0	57.6	55.9	42.0	36.0	70.7	61.6	45.0	29.3
15-Apr	70.0	60.2	58.5	44.2	37.0	75.6	65.9	49.9	32.7
22-Apr	72.0	61.8	60.8	46.8	40.0	74.9	64.9	53.9	36.2
29-Apr	72.0	62.1	64.0	49.6	43.0	80.5	65.3	60.6	40.9
6-May	73.0	62.0	65.5	52.0	46.0	90.3	68.4	64.7	44.8
13-May	75.0	64.9	68.3	54.6	48.0	97.3	72.1	71.3	50.8
20-May	77.0	63.5	68.4	55.3	48.0	93.8	65.0	70.9	51.3
27-May	77.0	65.8	70.9	58.6	54.0	104.3	70.0	78.1	58.4
3-Jun	81.0	67.7	72.4	60.7	55.0	98.0	72.3	84.1	64.5
10-Jun	81.0	68.8	74.0	62.4	57.0	110.6	73.4	90.2	69.7
17-Jun	82.0	70.7	75.9	64.7	61.0	119.0	75.6	96.9	76.6
24-Jun	82.0	71.2	76.3	66.3	61.0	125.3	77.3	99.9	80.4
1-Jul	84.0	74.9	78.3	68.8	64.0	142.1	77.9	110.1	89.5
8-Jul	88.0	79.7	79.9	70.6	64.0	151.2	83.4	118.4	96.6
15-Jul	88.0	79.8	80.7	72.2	66.0	150.5	85.1	124.1	103.4
22-Jul	91.0	80.1	84.0	74.5	70.0	160.3	86.3	135.7	111.2
29-Jul	93.0	80.5	86.1	76.3	70.0	159.6	87.3	140.3	116.5
5-Aug	91.0	80.0	86.6	76.7	72.0	161.0	85.7	142.7	116.0
12-Aug	91.0	79.7	86.4	75.9	70.0	161.0	84.7	138.5	114.4
19-Aug	92.0	79.0	86.4	75.4	70.0	161.0	84.1	137.6	112.2
26-Aug	90.0	78.8	84.6	73.8	68.0	159.6	84.8	131.9	106.6
2-Sep	90.0	78.9	83.0	72.4	64.0	151.9	83.7	126.3	101.0
9-Sep	87.0	79.5	80.8	69.6	64.0	142.1	81.6	116.4	91.0
16-Sep	82.0	73.5	78.3	65.7	59.0	135.8	80.5	101.5	78.0
23-Sep	82.0	71.9	76.5	63.0	55.0	123.9	76.6	95.8	69.9
30-Sep	81.0	68.2	74.7	60.3	54.0	111.3	72.9	85.5	61.4
7-Oct	77.0	67.3	71.7	57.5	50.0	102.9	73.1	77.6	55.1
14-Oct	77.0	65.5	69.9	54.7	46.0	95.2	73.4	71.9	49.4
21-Oct	74.0	63.9	67.7	52.3	43.0	85.4	67.7	65.4	43.9
28-Oct	72.0	60.7	64.2	48.9	41.0	80.5	65.2	60.1	38.7
4-Nov	70.0	61.3	61.7	46.3	37.0	84.7	65.5	55.3	36.1
11-Nov	66.0	58.6	59.2	45.3	35.0	74.9	62.1	52.3	34.1
18-Nov	64.0	57.3	55.2	41.2	28.0	69.3	61.4	44.7	28.9
25-Nov	61.0	55.2	52.1	38.3	28.0	61.6	56.4	39.8	24.8
2-Dec	57.0	50.8	48.4	35.0	25.0	53.2	53.2	35.7	21.8
9-Dec	59.0	52.9	46.7	33.7	23.0	57.4	54.6	34.1	20.9
16-Dec	55.0	49.5	44.5	31.9	21.0	49.7	50.2	31.1	19.0
23-Dec	52.0	47.6	42.3	30.4	21.0	43.4	47.5	28.0	17.0
31-Dec	52.0	46.7	40.1	27.9	14.0	43.4	48.4	25.9	15.5

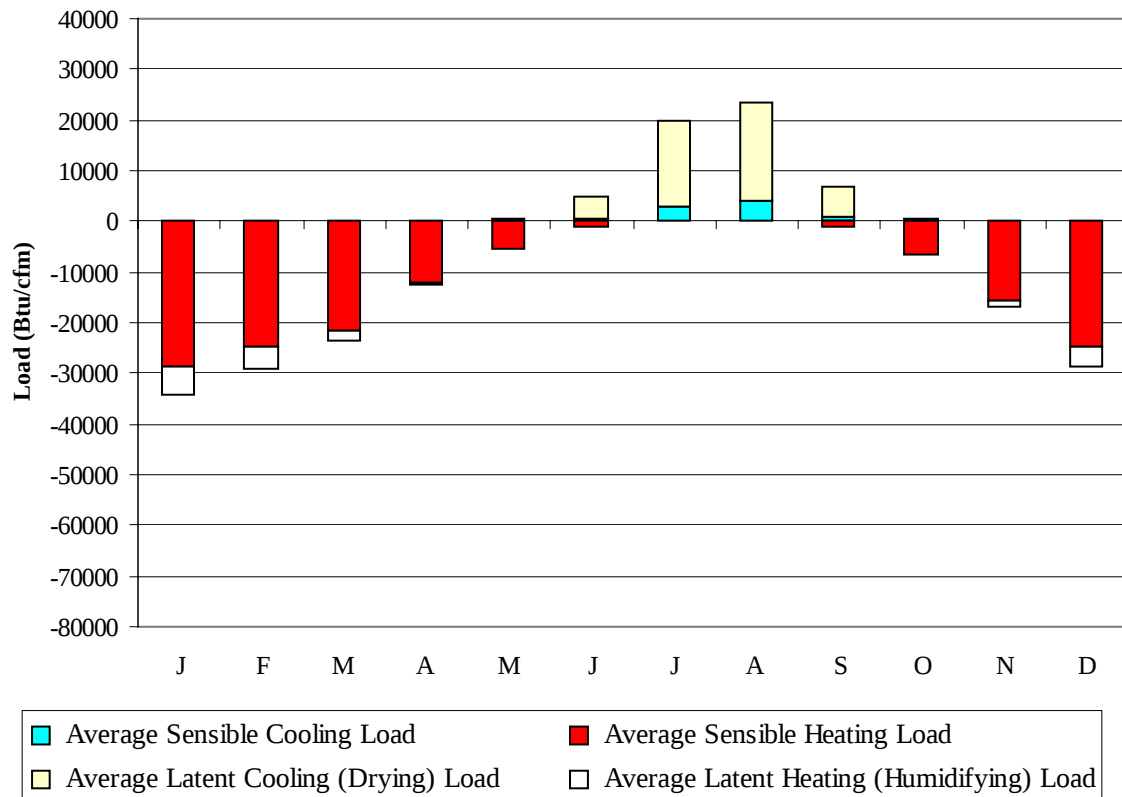
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	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1019
FEB	0	870
MAR	0	733
APR	5	386
MAY	39	133
JUN	160	13
JUL	381	0
AUG	460	0
SEP	209	18
OCT	35	182
NOV	1	514
DEC	0	865
ANN	1289	4733

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	-28829	0	-5438
FEB	0	-24750	0	-4403
MAR	0	-21421	0	-2269
APR	2	-12271	21	-379
MAY	40	-5306	429	-9
JUN	339	-952	4714	0
JUL	2911	-32	17087	0
AUG	4246	-14	19255	0
SEP	854	-991	6084	0
OCT	21	-6631	354	-103
NOV	0	-15647	7	-1264
DEC	0	-24844	0	-3873
ANN	8413	-141688	47951	-17738

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

No Solar Radiation
Data Available

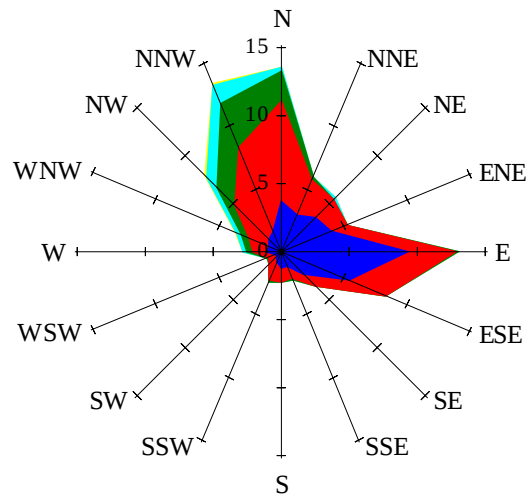


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

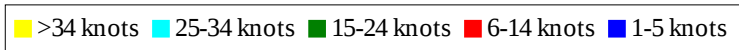
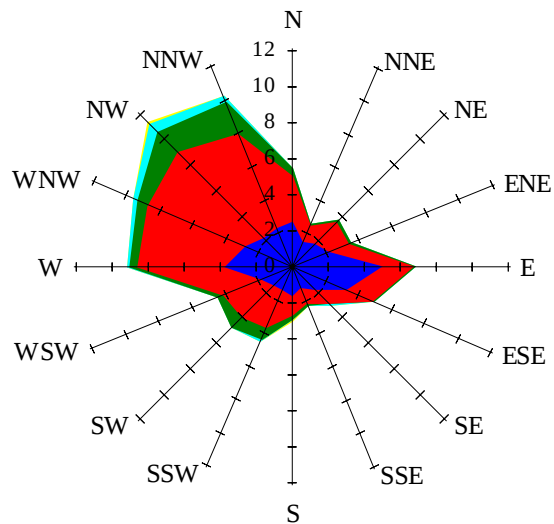
Labels of Percent Frequency on North Axis



Percent Calm = 8.76

Wind Summary - March, April, and May

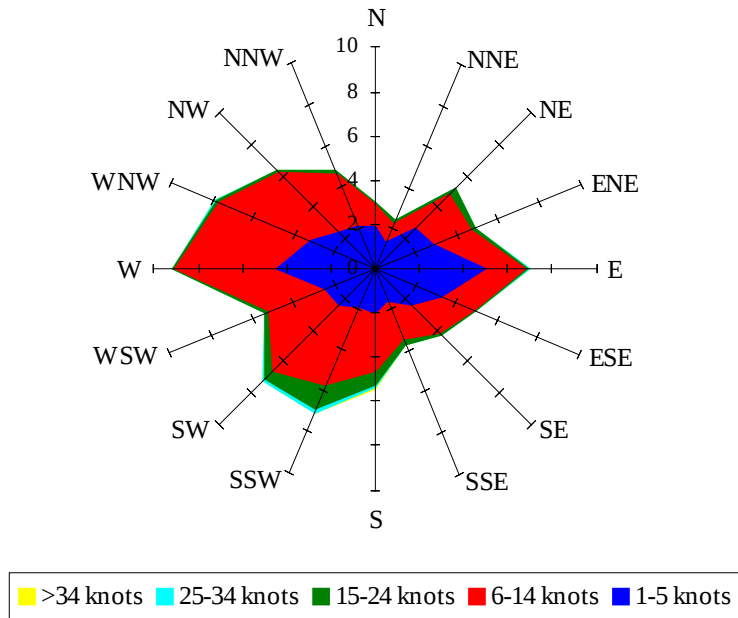
Labels of Percent Frequency on North Axis



Percent Calm = 11.74

Wind Summary - June, July, and August

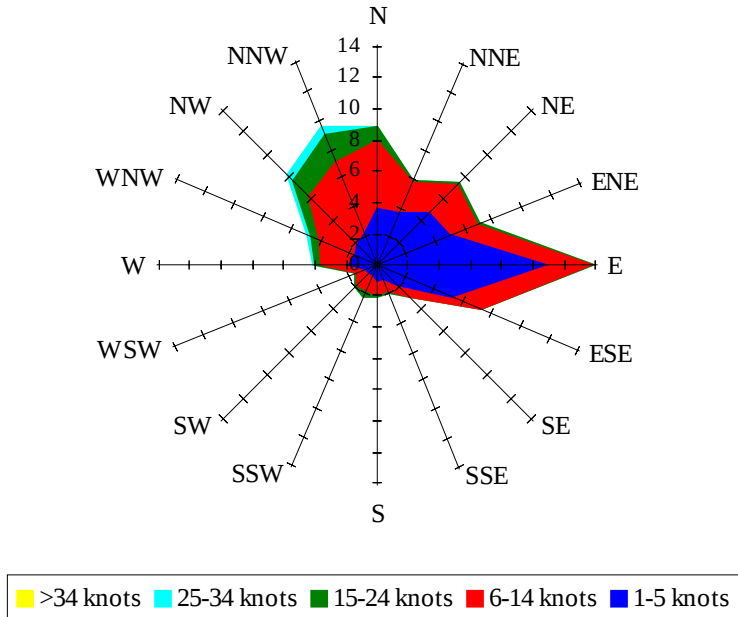
Labels of Percent Frequency on North Axis



Percent Calm = 12.25

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 10.84