DHAHRAN (MIL) SD	
Latitude = 26.27 N	WMO No. 404160
Longitude = 50.15 E	Elevation = 56 feet
Period of Record = 1973 to 1996	Average Pressure = 29.70 inches Hg

Design Criteria Data

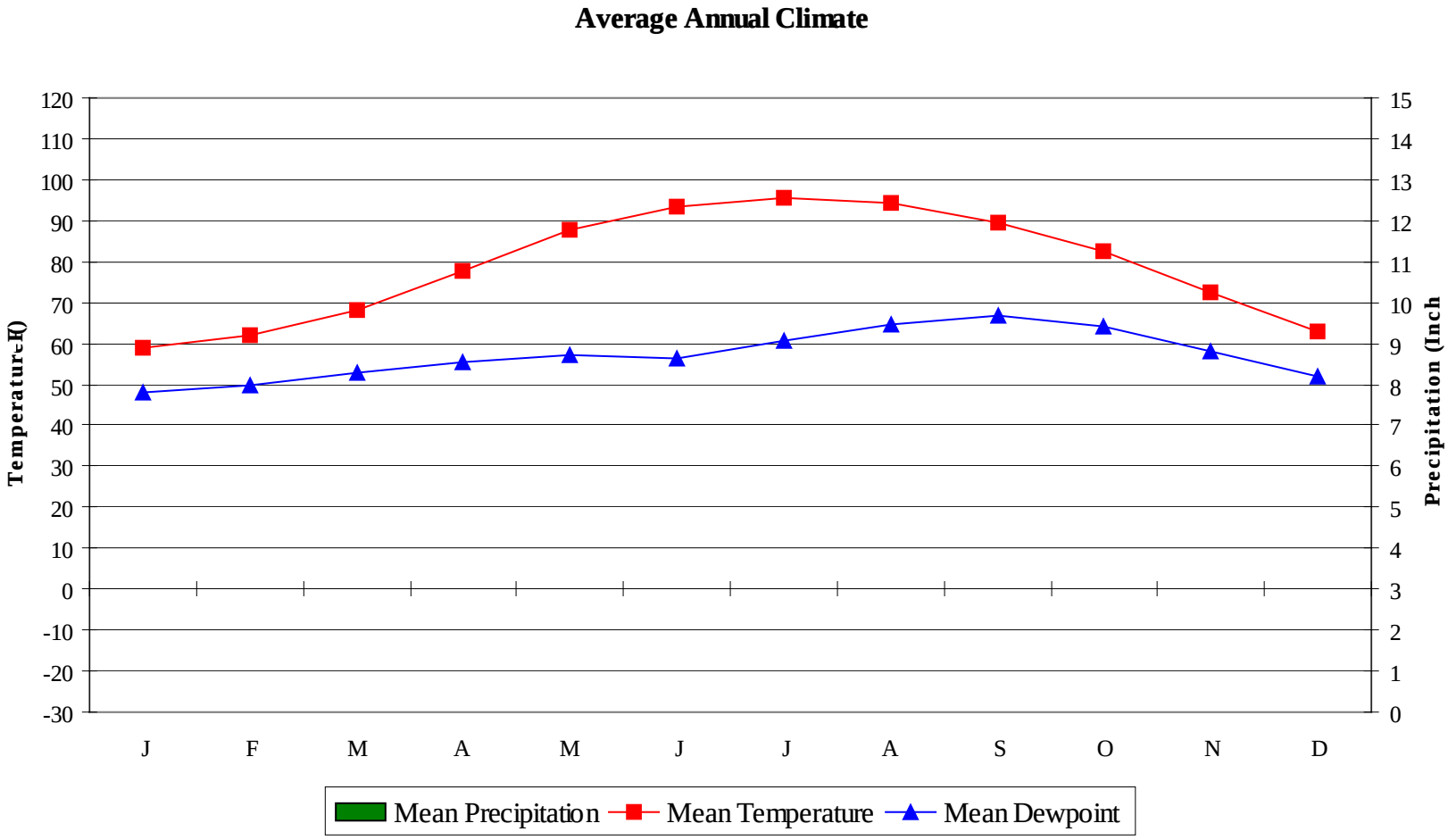
		Mean Coincident (Average) Values			
Dry Bulb Temperature (T)	**Design Value (^oF)**	Wet Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	117	73	56	12.7	N
0.4% Occurrence	111	72	58	13.4	N
1.0% Occurrence	109	72	58	13.7	N
2.0% Occurrence	108	72	64	14.2	N
Mean Daily Range	21	-	-	-	-
97.5% Occurrence	51	47	40	8.2	WNW
99.0% Occurrence	48	45	38	8.2	WNW
99.6% Occurrence	45	41	32	9.0	WNW
Median of Extreme Lows	41	37	26	8.7	WNW
		Mean Coincident (Average) Values			
Wet Bulb Temperature (T_{wb})	**Design Value (^oF)**	Dry Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	90	96	210	9.1	E
0.4% Occurrence	87	95	186	8.5	E
1.0% Occurrence	85	92	174	6.7	E
2.0% Occurrence	84	93	164	7.2	E
		Mean Coincident (Average) Values			
Humidity Ratio (HR)	**Design Value (gr/lb)**	Dry Bulb Temperature (^oF)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	206	93	1.33	8.0	E
0.4% Occurrence	183	91	1.19	6.2	E
1.0% Occurrence	173	91	1.12	5.6	E
2.0% Occurrence	162	91	1.06	5.8	E
Air Conditioning/		$T \geq 93^oF$	$T \geq 80^oF$	$T_{wb} \geq 73^oF$	$T_{wb} \geq 67^oF$
Humid Area Criteria	# of Hours	1864	4315	1901	4073

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^oF-RH 60% Latent + Sensible
10	N/A	N/A	5.0 + 6.8
Ground Water Temperature (^oF) 50 Foot Depth *	**Frost Depth 50 Year Recurrence (in.)**	**Ground Snow Load 50 Year Recurrence (lb/ft^2)**	**Average Annual Freeze-Thaw Cycles (#)**
81.4	N/A	N/A	0

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

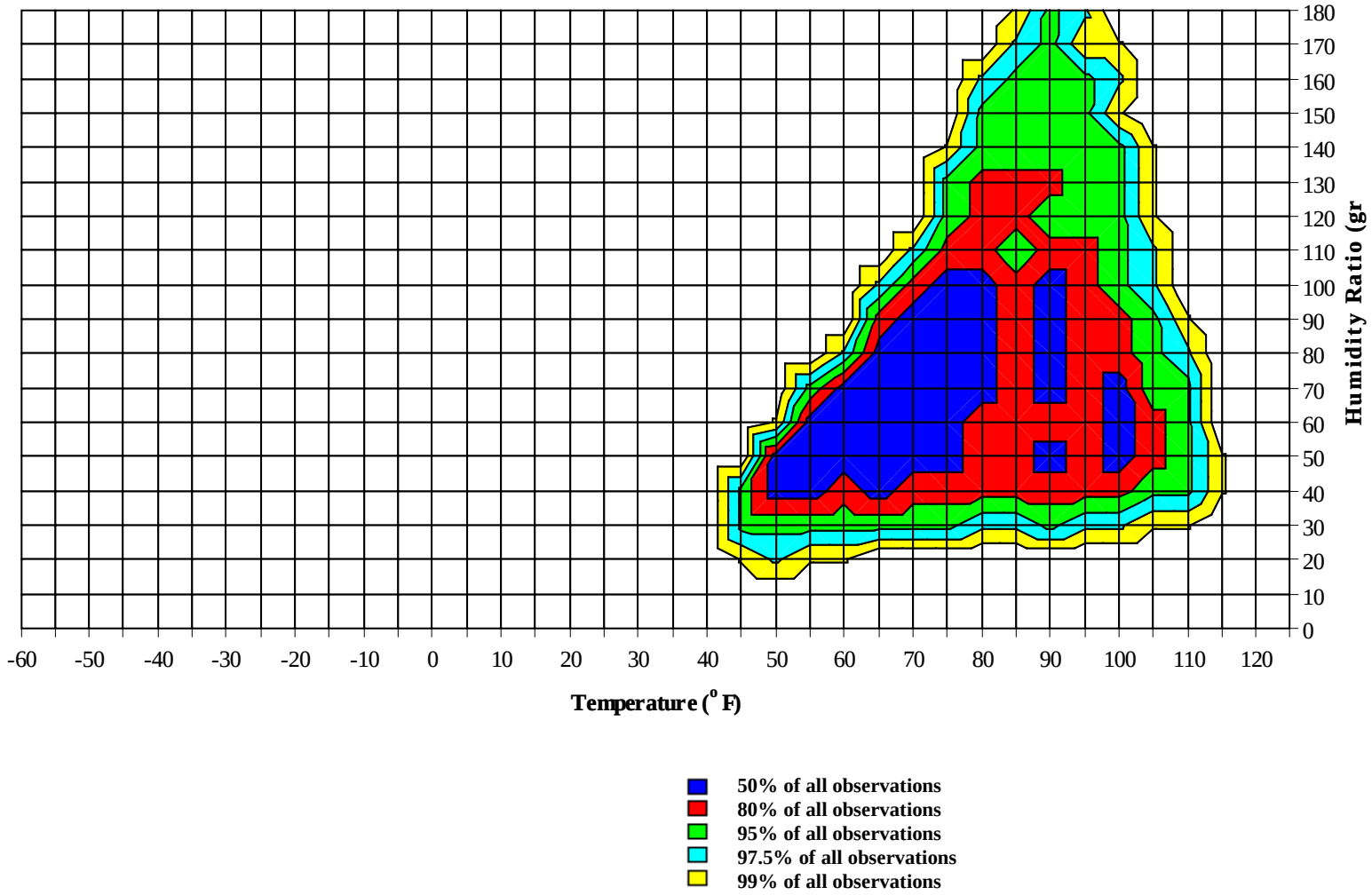
DHAHRAN (MIL) SD WMO No. 404160



No Precipitation Data Available

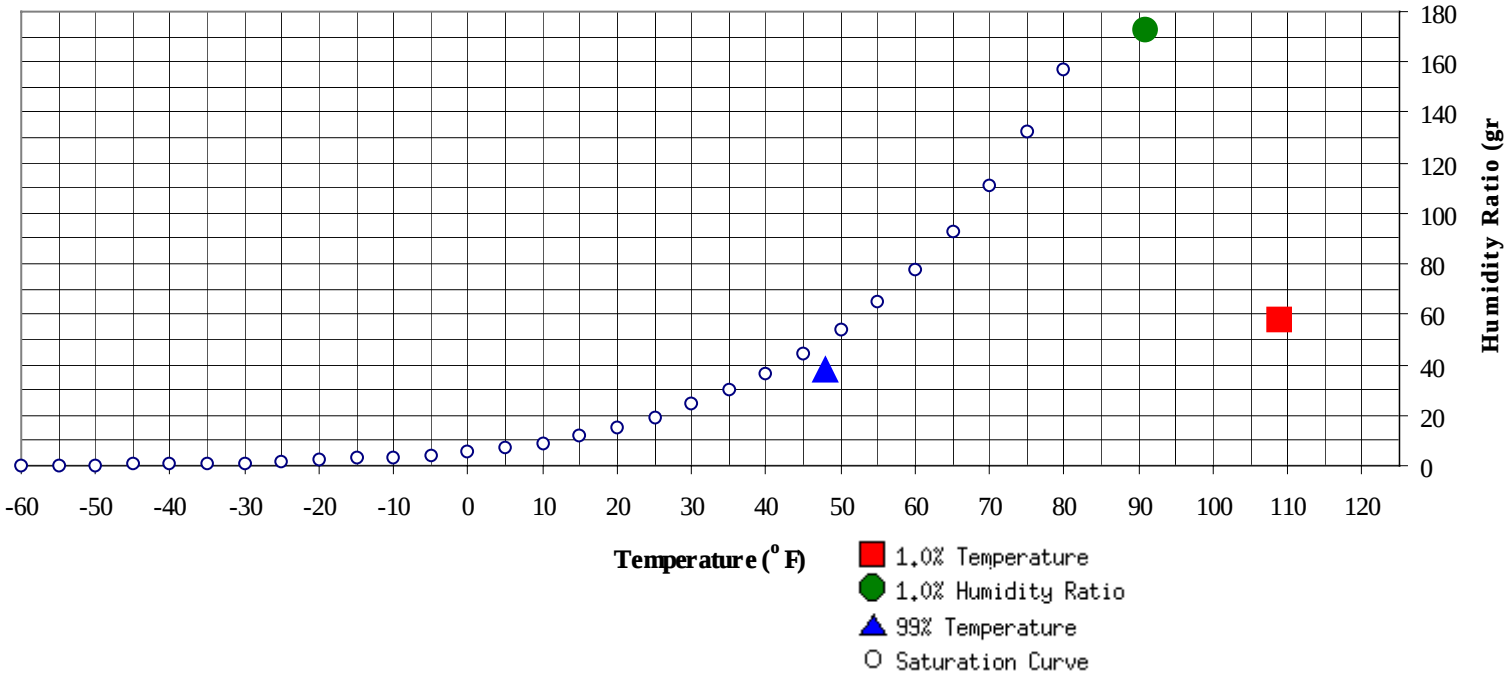
DHAHRAN (MIL) SD WMO No. 404160

Long Term Psychrometric Summary



DHAHRAN (MIL) SD WMO No. 404160

Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
99% Dry Bulb	48	38.2	17.4

	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
1.0% Humidity Ratio	172.9	90.8	84.4	82.4	49.0

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	109	57.9	71.7	35.3

DHAHRAN (MIL) SD WMO No. 404160

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)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
115 / 119															
110 / 114															
105 / 109															
100 / 104															
95 / 99							0		0	65.5		1	0	1	65.5
90 / 94							0	0	0	63.0		4	0	4	65.2
85 / 89							0	0	0	61.3		9	1	10	64.6
80 / 84		1	0	1	61.3		4	0	4	61.4	0	35	7	42	63.7
75 / 79		7	0	7	61.6		20	2	22	60.7	3	67	23	93	62.3
70 / 74	0	45	9	54	60.2	1	66	18	85	59.6	32	78	71	180	61.5
65 / 69	5	62	28	96	58.6	11	60	40	112	58.9	52	35	61	149	60.1
60 / 64	35	71	78	184	56.5	50	49	86	186	57.0	71	16	57	144	57.4
55 / 59	63	43	84	190	52.5	70	19	58	147	52.8	61	4	23	88	53.2
50 / 54	78	14	37	130	48.2	60	4	17	81	48.5	23	0	4	28	48.5
45 / 49	55	4	10	69	43.7	28	1	3	32	43.7	5		0	5	43.4
40 / 44	10	0	1	11	38.0	4		0	4	39.0	0			0	40.0
35 / 39	2	0		2	34.7	0			0	35.2					

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.

DHAHRAN (MIL) SD WMO No. 404160

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

Period of Record = 1973 to 1996

Temperature Range (°F)	April Hour Group (LST) 01 To 08	April 09 To 16	April 17 To 00	April Total Obs	April MCWB (°F)	May Hour Group (LST) 01 To 08	May 09 To 16	May 17 To 00	May Total Obs	May MCWB (°F)	June Hour Group (LST) 01 To 08	June 09 To 16	June 17 To 00	June Total Obs	June MCWB (°F)
115 / 119							1	0	1	71.1		1		1	72.7
110 / 114							2	0	2	71.2		9	0	9	72.0
105 / 109		1		1	70.8		18	1	19	70.6		57	3	60	71.0
100 / 104		5	0	5	68.9	0	53	6	60	70.5	0	93	24	117	70.9
95 / 99		18	2	20	68.4	3	82	26	111	69.8	14	69	69	152	70.4
90 / 94	0	40	6	46	67.2	16	55	52	124	69.2	57	11	76	144	69.9
85 / 89	2	50	15	67	66.3	35	24	57	116	69.0	63	1	41	105	68.9
80 / 84	17	77	51	145	65.7	88	11	73	172	68.2	79	0	25	104	68.5
75 / 79	51	36	80	166	64.9	71	1	26	99	66.2	23		2	25	67.6
70 / 74	89	12	61	162	63.0	30	0	5	35	63.3	3		0	3	65.1
65 / 69	43	2	19	64	60.1	4		1	5	59.8	0			0	66.0
60 / 64	31	0	6	37	57.2	1		0	1	57.2					
55 / 59	6	0	0	6	53.8	0			0	59.0					
50 / 54	1		0	1	48.4										
45 / 49															
40 / 44															
35 / 39															

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.

DHAHRAN (MIL) SD WMO No. 404160

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

Period of Record = 1973 to 1996

Temperature Range (°F)	July Hour Group (LST) 01 To 08	July 09 To 16	July 17 To 00	July Total Obs	July MCWB (°F)	August Hour Group (LST) 01 To 08	August 09 To 16	August 17 To 00	August Total Obs	August MCWB (°F)	September Hour Group (LST) 01 To 08	September 09 To 16	September 17 To 00	September Total Obs	September MCWB (°F)
115 / 119		2	0	2	72.5		1		1	73.8		0		0	70.0
110 / 114		18	0	18	72.3	0	9	0	9	73.2		2	0	2	70.0
105 / 109	0	98	8	106	72.7	0	71	2	73	73.2		21	0	21	71.4
100 / 104	2	90	39	131	73.6	0	110	26	136	74.8		78	5	83	73.3
95 / 99	28	36	76	140	73.6	14	50	74	139	75.7	1	94	32	127	75.2
90 / 94	73	4	77	154	73.3	65	7	90	161	76.2	14	36	72	122	76.3
85 / 89	73	0	35	108	71.9	80	0	39	119	74.1	36	7	69	111	76.4
80 / 84	66		11	77	70.7	78	0	16	94	71.9	108	2	52	162	73.8
75 / 79	5		1	6	68.0	11		1	12	68.6	72	0	9	81	70.8
70 / 74	0			0	63.0	0			0	61.3	9		1	10	66.4
65 / 69											0			0	53.0
60 / 64															
55 / 59															
50 / 54															
45 / 49															
40 / 44															
35 / 39															

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.

DHAHRAN (MIL) SD WMO No. 404160

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

Period of Record = 1973 to 1996

Temperature Range (°F)	October Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	November Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	December Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
115 / 119															
110 / 114															
105 / 109		1		1	69.2										
100 / 104		11	0	11	68.9										
95 / 99		52	3	55	70.7		1		1	67.4					
90 / 94	0	87	16	103	72.2		8	0	8	68.2					
85 / 89	4	54	46	104	73.1	0	25	1	26	68.8		0		0	63.2
80 / 84	44	33	100	177	72.8	2	86	19	107	68.3	0	8		8	65.2
75 / 79	86	9	57	152	70.1	17	67	64	149	67.2	0	40	4	44	64.3
70 / 74	79	2	22	103	66.5	51	37	86	175	64.7	10	79	38	127	62.4
65 / 69	25	0	4	29	62.4	62	11	38	110	61.5	23	48	54	125	60.6
60 / 64	9		1	10	58.4	69	5	24	98	57.2	56	44	74	174	57.3
55 / 59	0		0	0	55.3	33	1	7	41	51.7	74	22	56	153	52.7
50 / 54						6		0	6	46.3	61	7	19	87	48.1
45 / 49						0			0	40.0	23	1	2	26	43.2
40 / 44											1		0	1	37.2
35 / 39											0			0	31.5

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.

DHAHRAN (MIL) SD WMO No. 404160

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

Period of Record = 1973 to 1996

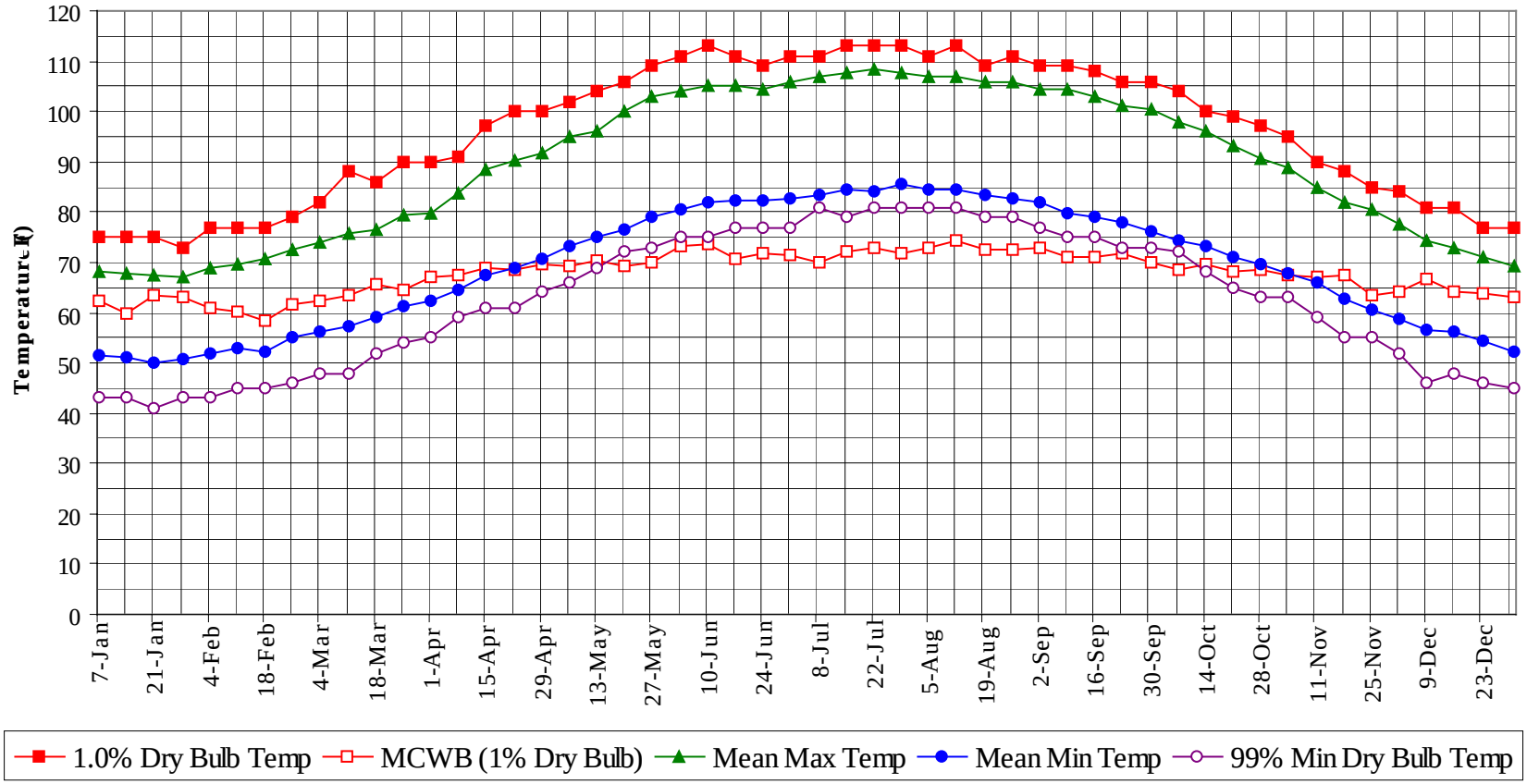
Annual Totals

Temperature Range (°F)	Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
115 / 119		5	0	5	72.7
110 / 114	0	40	1	41	72.3
105 / 109	0	268	14	282	72.2
100 / 104	3	438	101	543	72.8
95 / 99	60	402	284	747	72.7
90 / 94	227	252	393	872	72.5
85 / 89	295	172	307	774	71.5
80 / 84	486	256	356	1098	69.7
75 / 79	343	247	269	859	66.6
70 / 74	306	317	308	931	62.9
65 / 69	225	217	245	687	60.1
60 / 64	320	185	322	827	57.0
55 / 59	305	90	226	620	52.7
50 / 54	226	25	76	328	48.2
45 / 49	107	5	15	127	43.6
40 / 44	15	0	1	16	38.2
35 / 39	2	0		2	34.6

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.

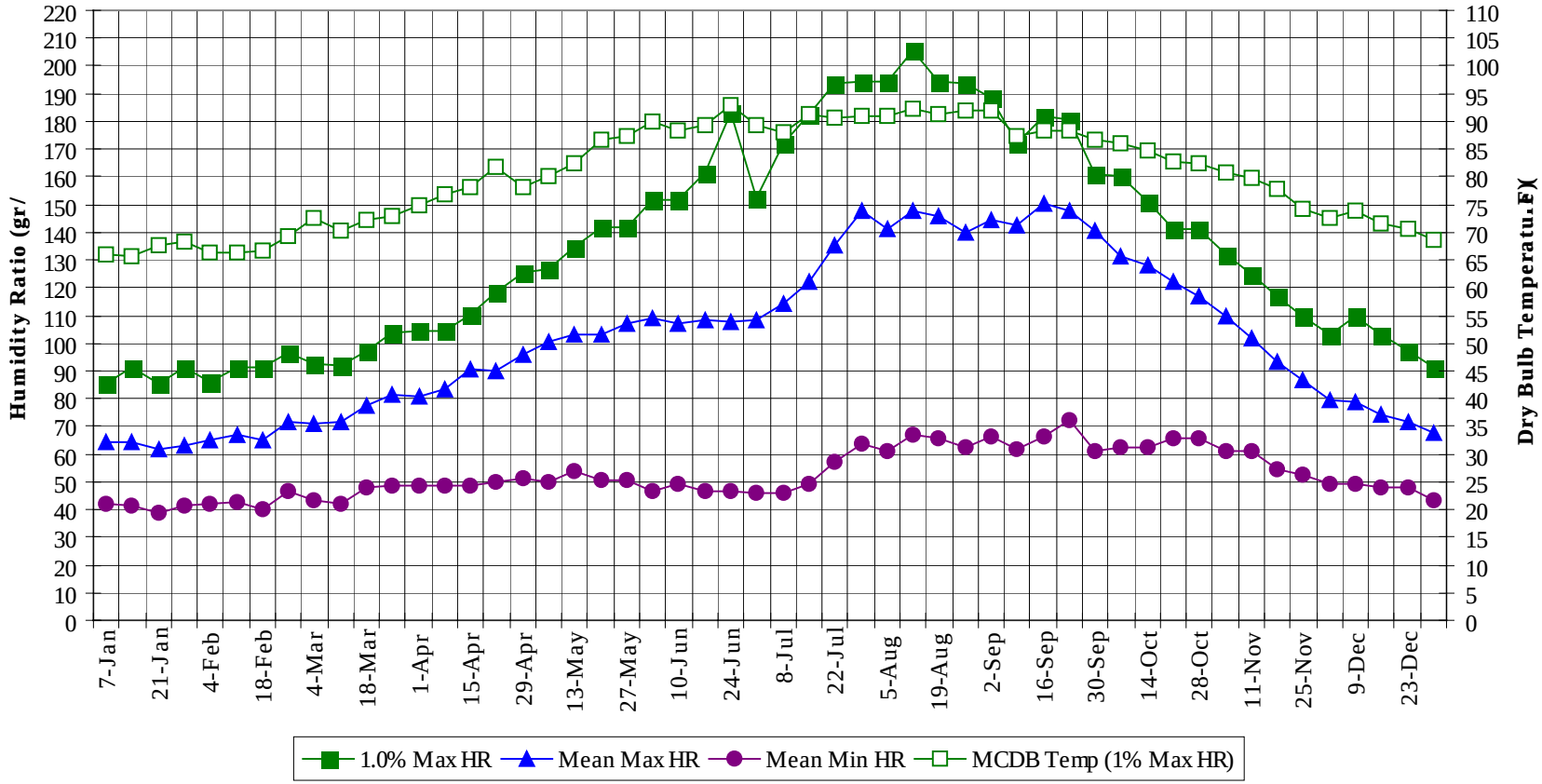
DHAHRAN (MIL) SD WMO No. 404160

Annual Summary of Temperatures



DHAHRAN (MIL) SD WMO No. 404160

Long Term Humidity and Dry Bulb Temperature Summary



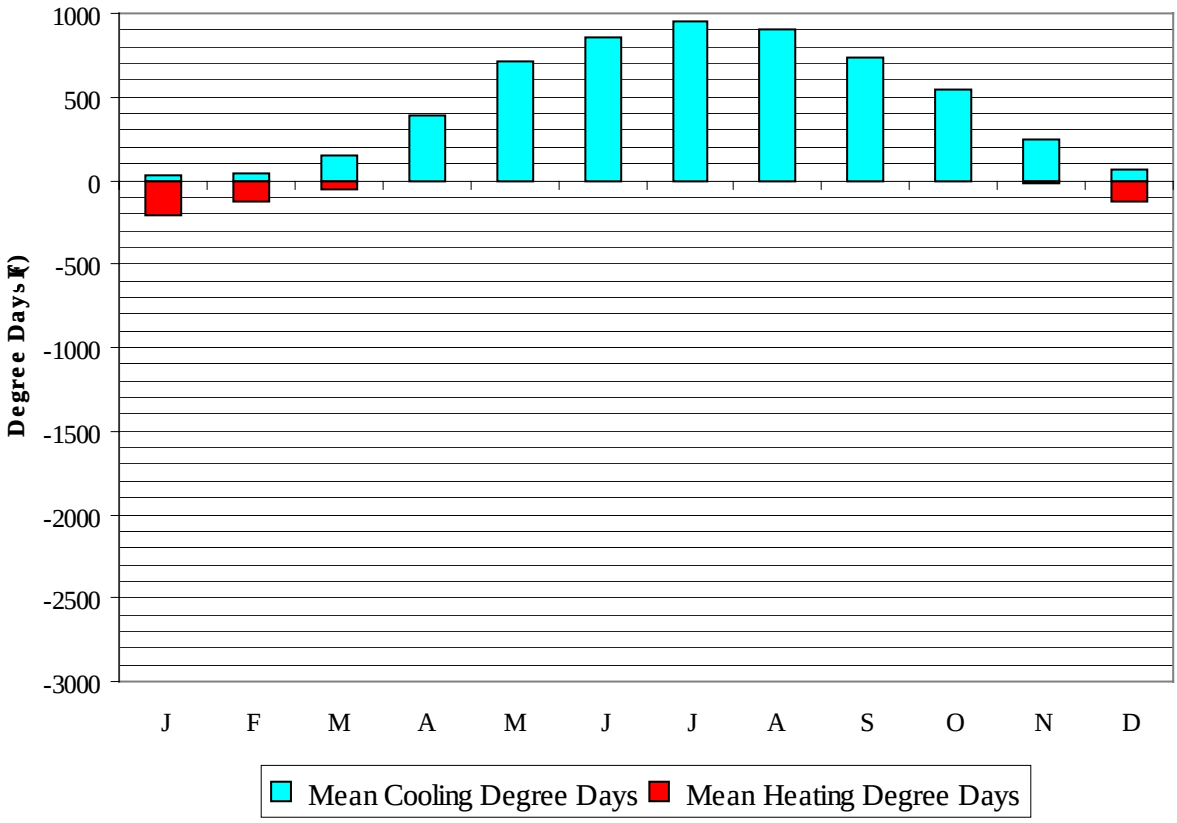
DHAHRAN (MIL) SD WMO No. 404160

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	75.0	62.5	68.3	51.5	43.0	85.4	66.2	64.6	42.0
14-Jan	75.0	59.7	67.8	51.1	43.0	91.0	65.7	64.2	41.5
21-Jan	75.0	63.3	67.3	50.0	41.0	85.4	67.5	61.9	38.8
28-Jan	73.0	62.9	67.2	50.9	43.0	91.0	68.2	63.0	41.1
4-Feb	77.0	60.9	68.9	52.0	43.0	86.1	66.5	65.1	42.2
11-Feb	77.0	60.2	69.7	52.8	45.0	91.0	66.4	67.1	42.5
18-Feb	77.0	58.4	70.7	52.2	45.0	91.0	66.7	64.8	39.8
25-Feb	79.0	61.7	72.6	55.1	46.0	96.6	69.4	71.3	46.3
4-Mar	82.0	62.4	73.9	56.2	48.0	92.4	72.6	70.7	43.2
11-Mar	88.0	63.3	75.9	57.3	48.0	91.7	70.4	71.7	42.3
18-Mar	86.0	65.7	76.5	59.3	52.0	97.3	72.3	77.6	47.9
25-Mar	90.0	64.7	79.4	61.3	54.0	103.6	73.0	81.4	48.4
1-Apr	90.0	67.1	79.9	62.4	55.0	104.3	74.7	80.8	48.3
8-Apr	91.0	67.6	83.7	64.6	59.0	104.3	76.9	83.5	48.6
15-Apr	97.0	68.9	88.4	67.4	61.0	110.6	78.0	90.6	48.5
22-Apr	100.0	68.4	90.2	68.8	61.0	118.3	81.7	90.0	50.1
29-Apr	100.0	69.8	91.8	70.9	64.0	125.3	78.0	95.9	51.3
6-May	102.0	69.2	95.1	73.4	66.0	126.7	80.3	100.3	50.1
13-May	104.0	70.2	96.1	75.1	69.0	134.4	82.3	103.2	53.7
20-May	106.0	69.4	99.9	76.5	72.0	142.1	86.7	102.9	50.3
27-May	109.0	70.1	103.0	78.9	73.0	142.1	87.5	106.9	50.7
3-Jun	111.0	73.2	104.0	80.7	75.0	151.9	90.0	109.2	46.6
10-Jun	113.0	73.5	105.3	81.8	75.0	151.9	88.4	107.2	48.9
17-Jun	111.0	70.8	105.2	82.2	77.0	161.7	89.5	108.5	46.4
24-Jun	109.0	71.6	104.4	82.3	77.0	183.4	92.9	107.8	46.5
1-Jul	111.0	71.6	106.0	82.6	77.0	152.6	89.4	108.6	46.2
8-Jul	111.0	70.0	107.0	83.3	81.0	172.2	88.2	114.3	46.2
15-Jul	113.0	72.2	107.5	84.4	79.0	182.7	91.2	122.1	49.5
22-Jul	113.0	72.7	108.3	84.2	81.0	193.9	90.5	135.2	57.0
29-Jul	113.0	71.8	107.7	85.4	81.0	194.6	91.0	147.5	64.0
5-Aug	111.0	72.9	106.9	84.6	81.0	194.6	91.1	141.2	60.8
12-Aug	113.0	74.5	106.9	84.3	81.0	205.8	92.1	148.0	66.7
19-Aug	109.0	72.3	106.0	83.3	79.0	194.6	91.4	146.0	65.4
26-Aug	111.0	72.6	105.8	82.7	79.0	193.9	92.0	140.0	62.1
2-Sep	109.0	72.8	104.5	81.8	77.0	188.3	92.0	144.2	66.1
9-Sep	109.0	70.9	104.4	79.6	75.0	172.2	87.4	142.4	61.5
16-Sep	108.0	71.1	103.0	78.9	75.0	182.0	88.3	150.1	66.6
23-Sep	106.0	71.8	101.1	77.9	73.0	180.6	88.2	147.6	72.3
30-Sep	106.0	70.1	100.6	76.1	73.0	161.0	86.6	140.5	61.0
7-Oct	104.0	68.6	97.9	74.5	72.0	160.3	86.0	131.1	62.5
14-Oct	100.0	69.5	95.9	73.3	68.0	151.2	84.7	128.3	62.2
21-Oct	99.0	68.0	93.2	71.2	65.0	141.4	82.7	122.2	65.5
28-Oct	97.0	68.4	90.6	69.5	63.0	141.4	82.4	116.7	65.5
4-Nov	95.0	67.4	88.8	67.7	63.0	132.3	80.7	110.0	60.9
11-Nov	90.0	67.0	85.0	65.9	59.0	124.6	79.8	101.8	60.8
18-Nov	88.0	67.4	81.9	62.8	55.0	116.9	78.0	93.0	54.8
25-Nov	85.0	63.5	80.5	60.7	55.0	109.9	74.3	86.8	52.5
2-Dec	84.0	64.1	77.5	58.9	52.0	102.9	72.5	79.6	49.3
9-Dec	81.0	66.8	74.4	56.7	46.0	109.9	73.9	78.5	49.1
16-Dec	81.0	64.0	72.8	56.1	48.0	102.9	71.5	74.4	47.9
23-Dec	77.0	64.0	70.9	54.3	46.0	97.3	70.5	71.8	47.7
31-Dec	77.0	63.0	69.3	52.1	45.0	91.0	68.7	67.6	43.2

DHAHRAN (MIL) SD WMO No. 404160

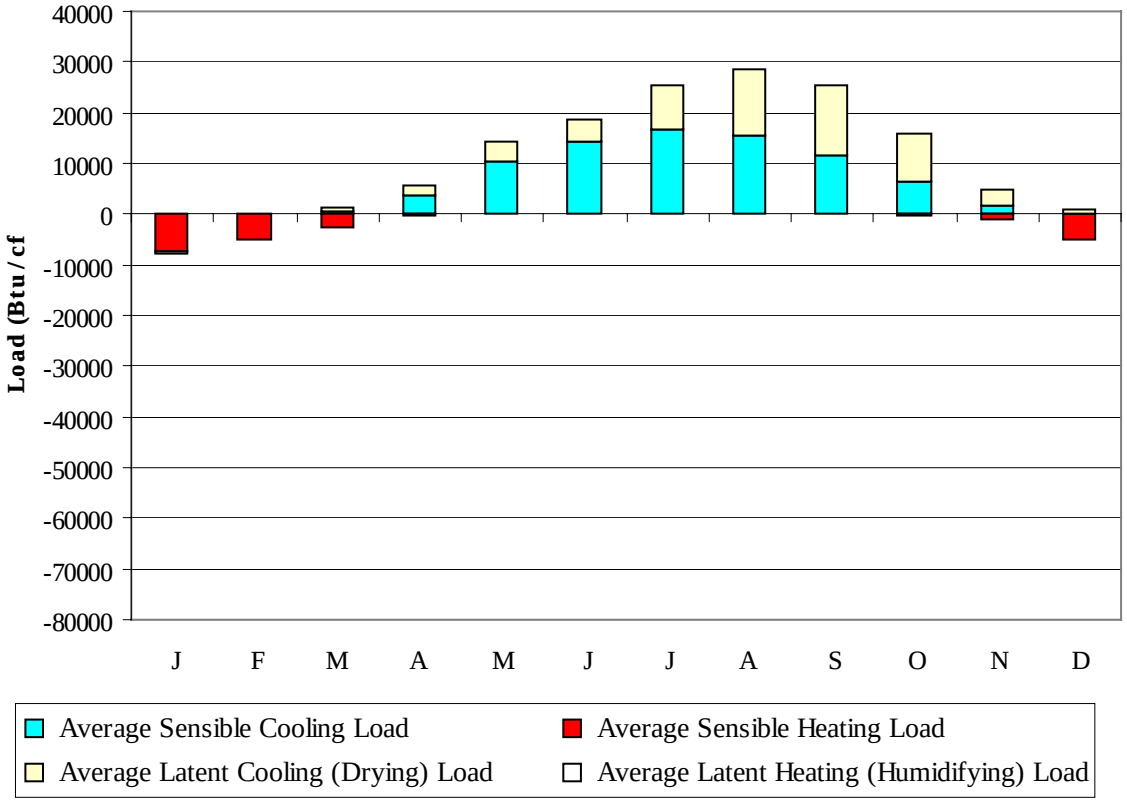
Degree Days, Heating and Cooling
(Base 65°F)



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	24	210
FEB	45	131
MAR	151	56
APR	387	5
MAY	708	0
JUN	855	0
JUL	948	0
AUG	906	0
SEP	741	0
OCT	539	1
NOV	242	23
DEC	70	126
ANN	5615	552

DHAHRAN (MIL) SD WMO No. 404160

Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	17	-7475	122	-170
FEB	68	-5014	206	-102
MAR	683	-2465	792	-45
APR	3749	-325	1891	-27
MAY	10457	-10	3831	-21
JUN	14387	0	4108	-34
JUL	16549	0	8708	-10
AUG	15469	0	13062	-11
SEP	11450	0	13771	-5
OCT	6532	-71	9232	-14
NOV	1547	-1155	3128	-41
DEC	123	-4862	675	-77
ANN	81031	-21377	59526	-557

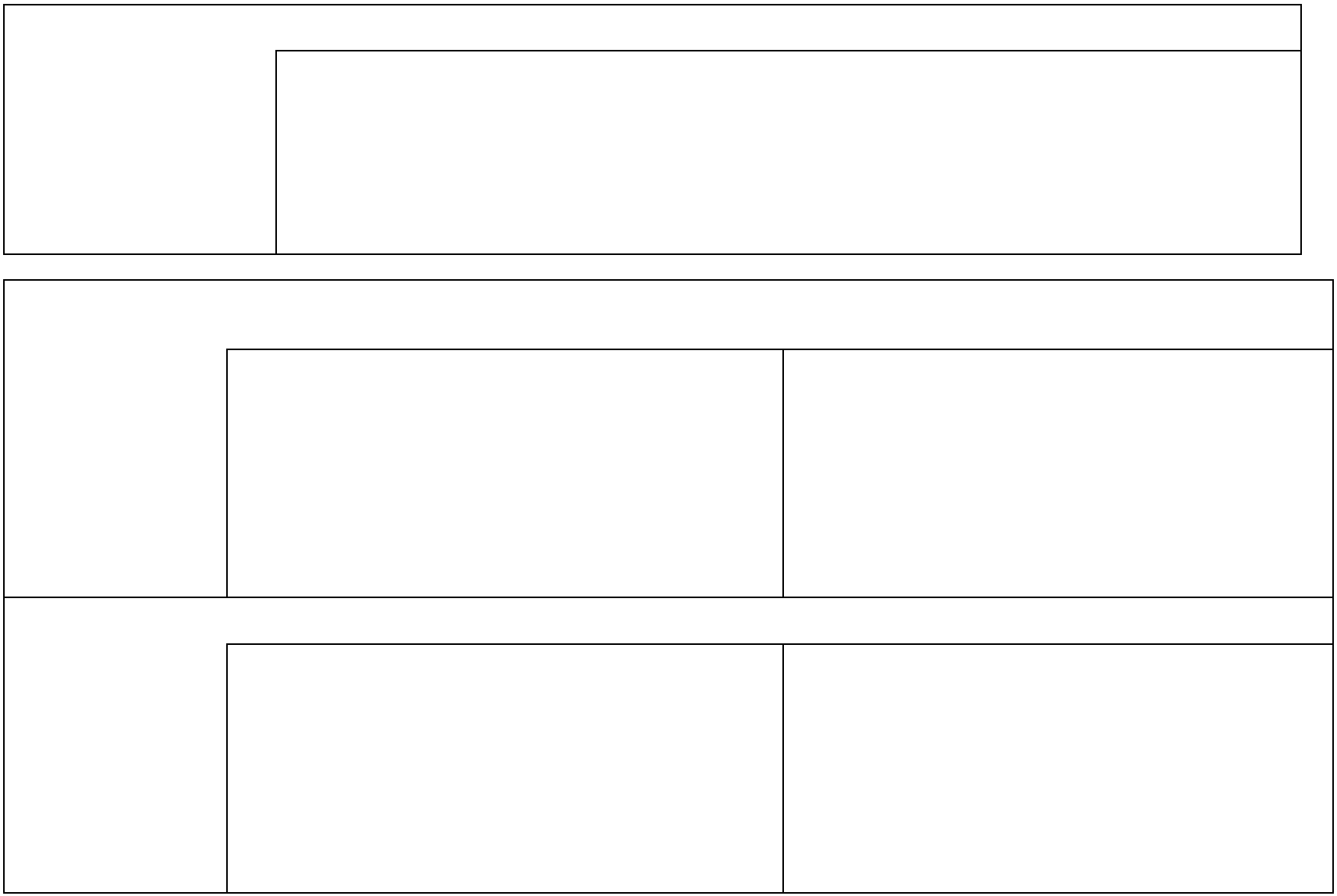
Average Annual Solar Radiation – Nearest Available Site

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

No Solar Radiation
Data Available

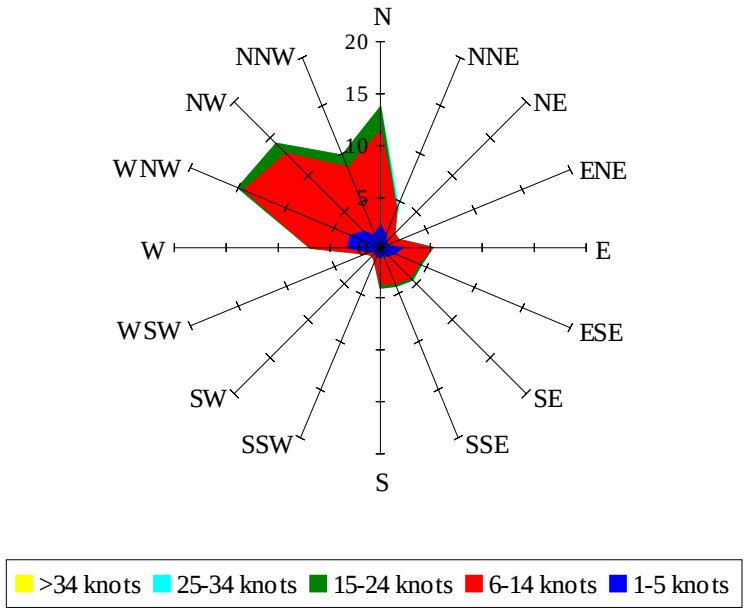
Average Annual Solar Heat and Illumination – Nearest Available Site

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



Wind Summary - December, January, and February

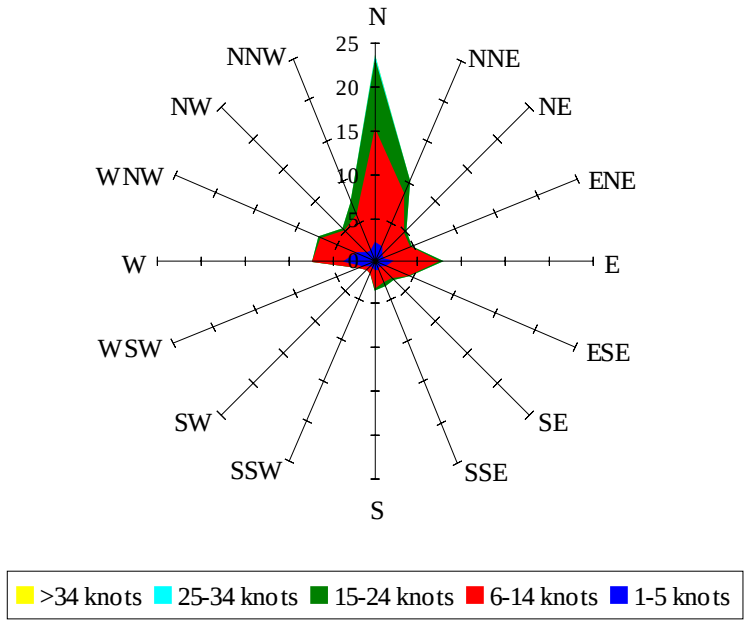
Labels of Percent Frequency on North Axis



Percent Calm = 6.59

Wind Summary - March, April, and May

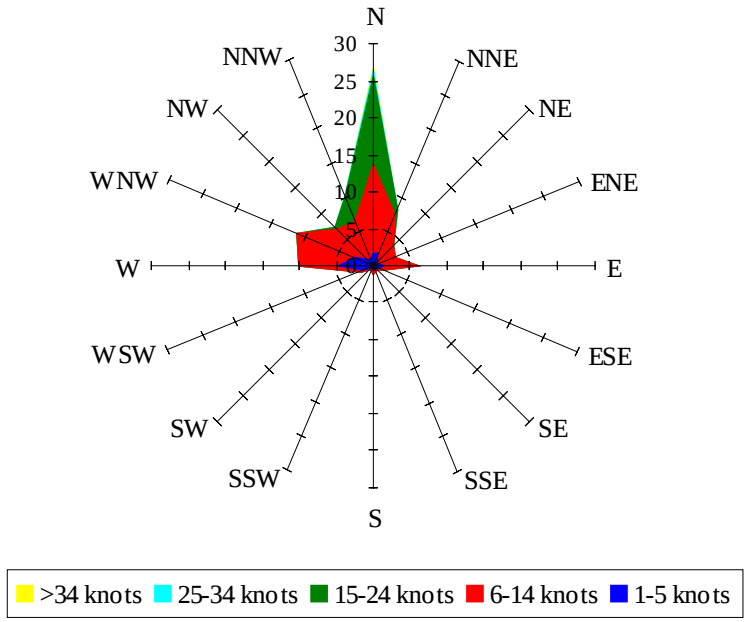
Labels of Percent Frequency on North Axis



Percent Calm = 5.88

Wind Summary - June, July, and August

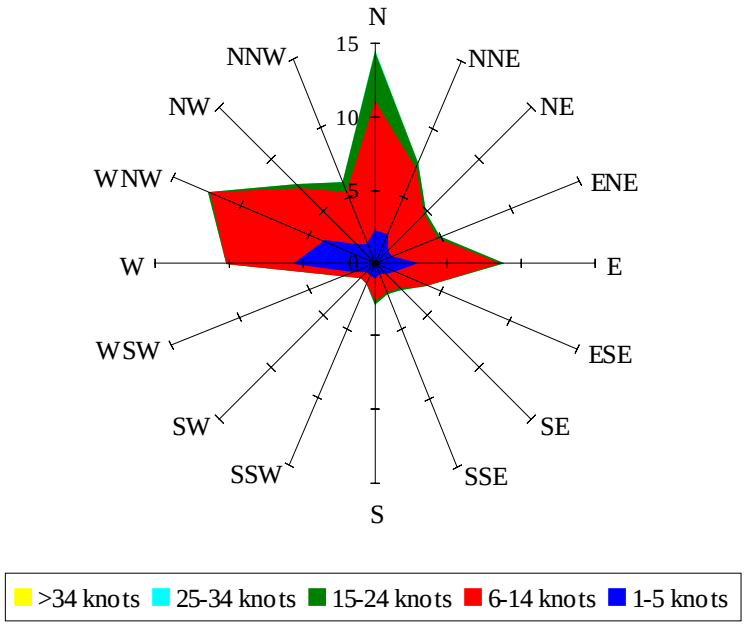
Labels of Percent Frequency on North Axis



Percent Calm = 6.46

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 8.49