

ISTANBUL, TURKEY

Latitude = 40.97 N

Longitude = 28.82 E

Period of Record = 1973 to 1996

WMO No. 170600

Elevation = 121 feet

Average Pressure = 29.85 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	71	78	9.3	NE
0.4% Occurrence	87	70	82	12.6	NNE
1.0% Occurrence	84	69	84	12.9	NE
2.0% Occurrence	82	68	82	12.6	NE
Mean Daily Range	12	-	-	-	-
97.5% Occurrence	34	32	23	11.3	N
99.0% Occurrence	30	28	19	12.4	N
99.6% Occurrence	27	26	17	12.0	N
Median of Extreme Lows	25	23	15	14.6	N
	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	75	82	116	12.4	NNE
0.4% Occurrence	74	81	113	12.1	NNE
1.0% Occurrence	72	79	105	11.6	NNE
2.0% Occurrence	71	78	101	11.4	NNE
	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	127	81	0.83	11.6	NNE
0.4% Occurrence	118	77	0.78	10.2	NNE
1.0% Occurrence	111	76	0.74	10.1	NNE
2.0% Occurrence	104	75	0.69	9.7	NNE
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		3	387	73	921

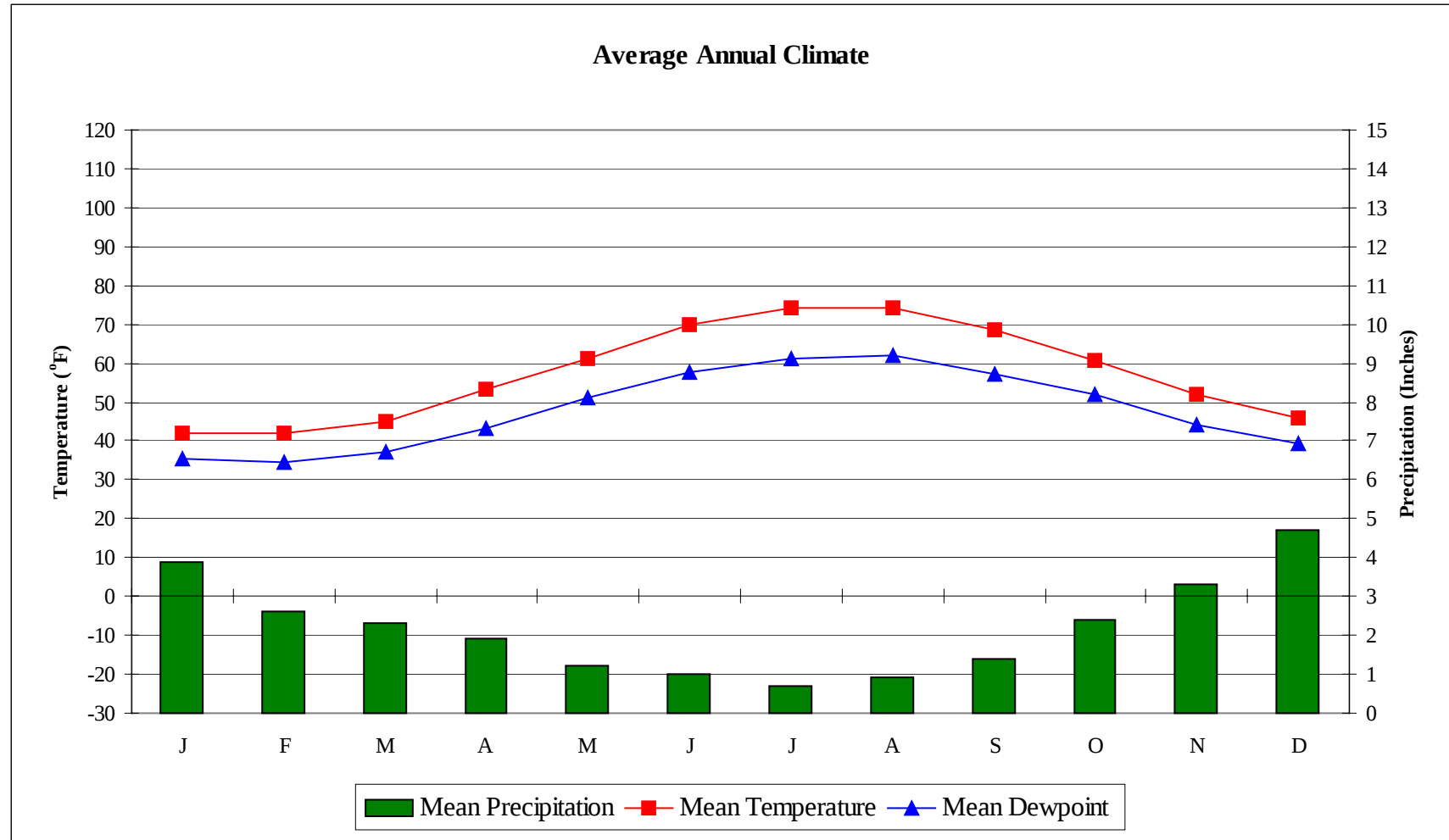
Other Site Data

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	1.0 + 0.4
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 (#)
59.9	N/A	N/A	9

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

ISTANBUL, TURKEY

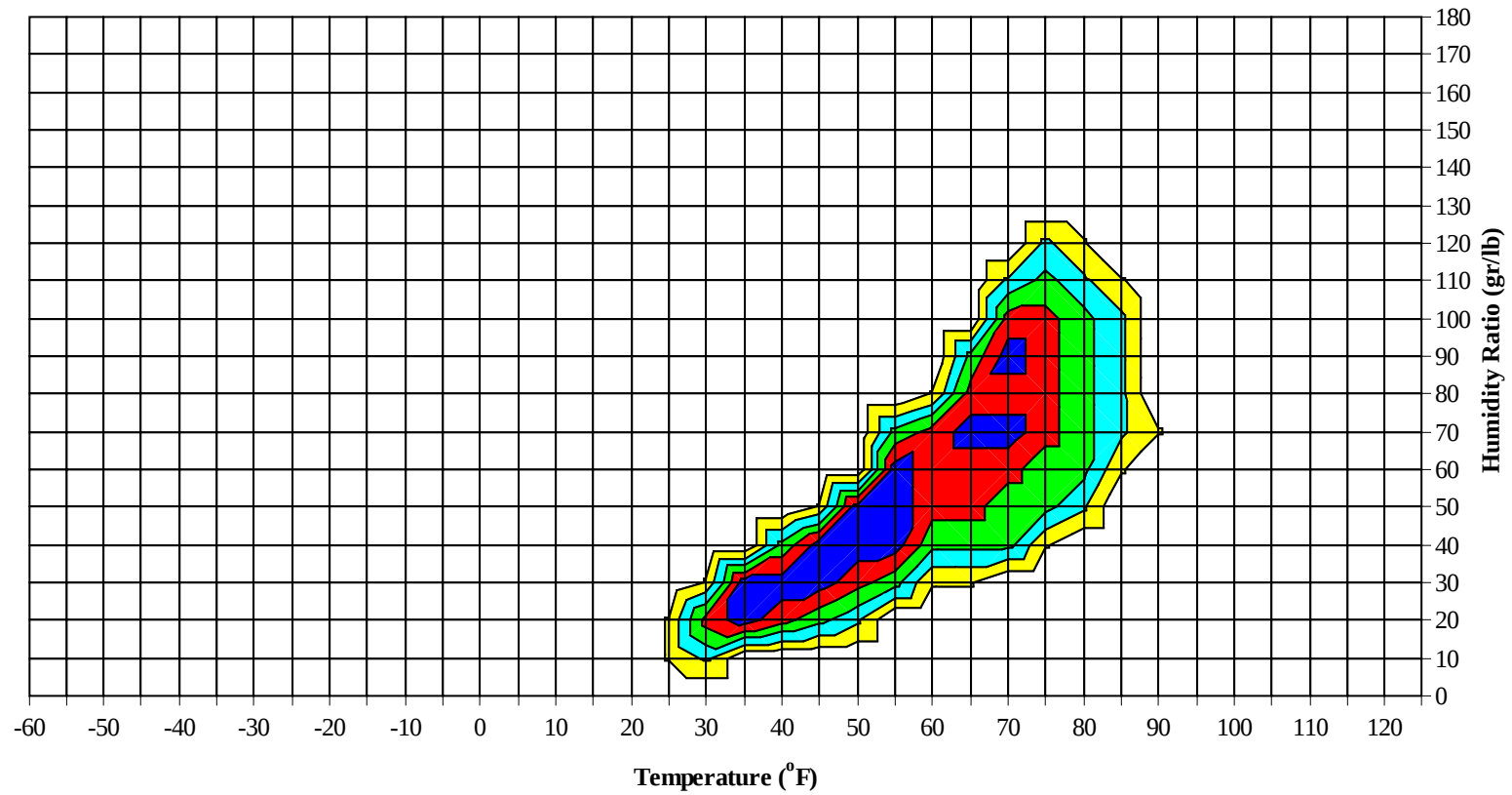
WMO No. 170600



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Long Term Psychrometric Summary

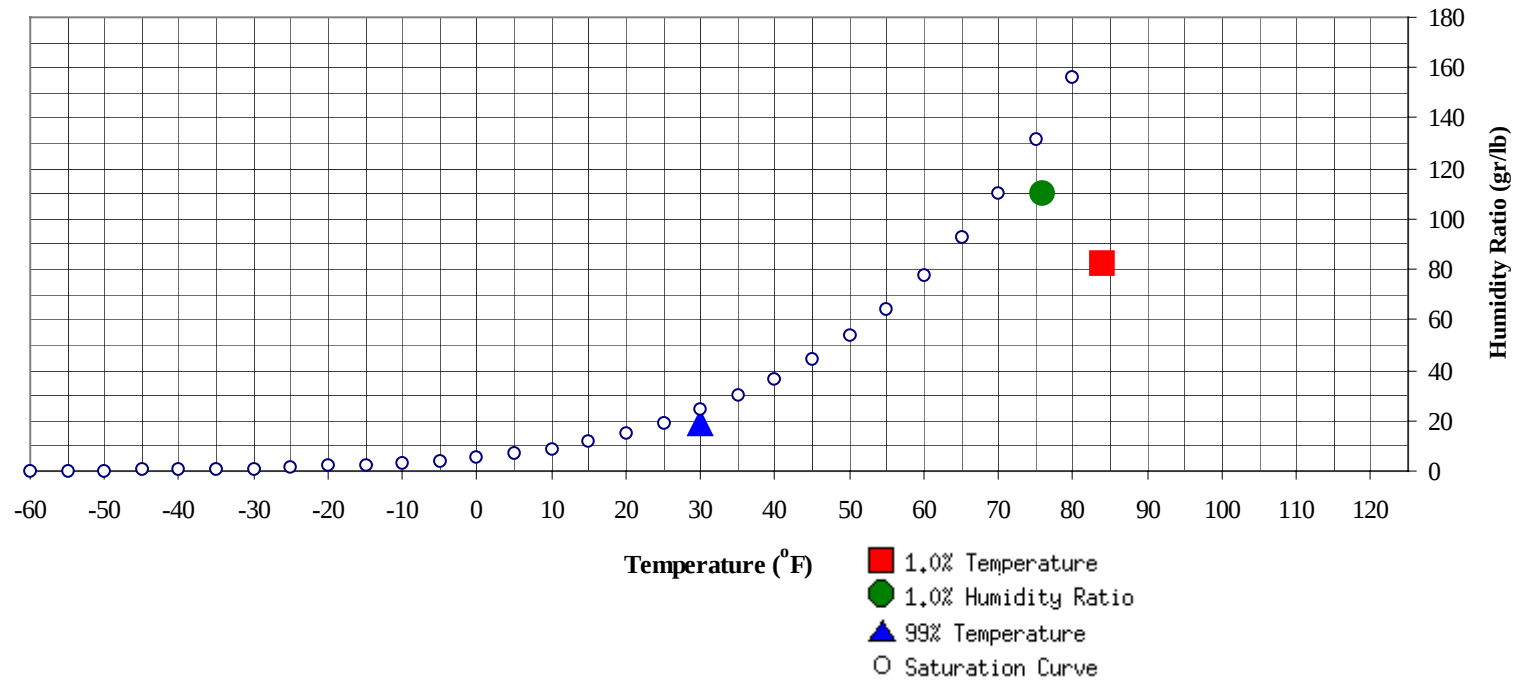


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

ISTANBUL, TURKEY

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR	Enthalpy	1.0% Humidity Ratio	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	30	19.1	10.1		110.6	75.8	71.6	69.8	35.5

	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
1.0% Dry Bulb	84	82.5	69.1	33.1

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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)			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												0		0	57.5
70 / 74												1	0	1	55.3
65 / 69							0		0	50.0		4	2	6	54.6
60 / 64		1	0	1	53.2	0	5	1	6	51.1	1	13	7	21	52.1
55 / 59	3	11	5	19	50.4	3	17	11	31	49.4	6	29	16	51	49.7
50 / 54	22	36	30	88	47.0	19	33	27	79	46.7	27	51	40	118	46.8
45 / 49	45	67	49	160	43.2	36	55	44	135	43.0	57	74	64	195	43.0
40 / 44	54	59	65	179	39.2	52	46	54	152	39.3	69	43	66	179	39.5
35 / 39	80	51	68	200	35.3	64	40	53	156	35.1	60	24	40	124	35.4
30 / 34	36	19	27	82	30.7	33	20	27	80	30.1	23	6	10	39	30.6
25 / 29	7	3	4	14	25.6	13	6	8	27	25.1	5	2	2	9	25.6
20 / 24	1	0	0	1	20.4	2	1	1	4	20.5	1	0	1	2	21.7
15 / 19	0	0		0	16.9	1	0	0	1	16.3					

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 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		
95 / 99												0	0	0	71.1
90 / 94							0		0	68.0		2	1	3	69.9
85 / 89							0	0	0	68.8		6	4	10	68.2
80 / 84		1	0	1	64.8	0	5	1	6	65.3	0	35	16	51	67.5
75 / 79		3	1	4	61.8	0	19	8	27	63.4	6	76	41	123	65.3
70 / 74	0	11	4	15	58.1	4	49	26	79	61.0	41	80	77	198	63.6
65 / 69	1	18	10	29	56.2	14	52	36	102	59.0	69	28	54	151	61.8
60 / 64	7	46	30	83	53.8	51	72	72	194	56.6	91	10	39	140	58.7
55 / 59	30	62	50	142	51.0	94	37	67	199	53.4	29	2	8	39	54.9
50 / 54	76	60	73	209	47.8	67	12	34	114	49.7	4	0	1	5	50.2
45 / 49	84	34	57	175	44.0	16	1	4	21	44.9	0			0	48.0
40 / 44	32	4	14	50	40.0	2		0	2	40.8					
35 / 39	10	0	2	12	36.3	0			0	38.0					
30 / 34	0			0	31.6										
25 / 29															
20 / 24															
15 / 19															

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

Period of Record = 1973 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		0	0	0	69.6		0	0	0	70.4					
90 / 94	0	4	2	6	71.0		4	1	5	69.8		0		0	69.5
85 / 89	0	19	5	24	70.0		21	4	25	70.2		3	1	4	67.3
80 / 84	1	86	30	117	68.3	1	86	27	114	69.0		24	6	30	67.5
75 / 79	20	102	80	201	66.9	23	96	82	201	67.7	2	80	27	109	65.5
70 / 74	108	31	97	236	65.8	108	33	94	234	66.3	30	84	73	186	63.7
65 / 69	80	5	27	113	63.2	74	5	32	111	63.1	66	29	68	163	61.7
60 / 64	36	1	7	44	59.4	40	2	9	51	59.7	92	15	49	156	58.6
55 / 59	3		0	3	55.3	3		0	3	55.0	44	4	16	64	54.1
50 / 54			0	0	48.0						7	1	1	9	49.4
45 / 49															
40 / 44															
35 / 39															
30 / 34															
25 / 29															
20 / 24															
15 / 19															

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

Period of Record = 1973 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		0		0	67.0										
85 / 89		0	0	0	66.0										
80 / 84		3	0	3	65.3										
75 / 79	0	14	3	17	64.3		0		0	61.3					
70 / 74	5	43	17	65	62.6		3	0	3	59.7					
65 / 69	17	55	31	103	60.4	1	7	2	10	58.5	0	0	0	0	54.0
60 / 64	63	66	79	207	57.8	11	48	21	79	55.8	1	3	2	6	53.5
55 / 59	84	43	71	198	53.6	52	66	61	179	52.8	16	38	21	74	51.4
50 / 54	58	18	35	111	49.1	68	59	68	195	48.5	45	62	52	159	48.0
45 / 49	20	5	11	36	44.2	57	38	53	149	43.6	72	74	74	220	43.5
40 / 44	2	0	1	3	39.7	30	13	22	65	39.3	51	38	50	139	39.5
35 / 39	0	0	0	0	35.4	19	5	12	36	34.9	45	25	36	106	35.3
30 / 34						3	1	1	5	30.1	16	7	11	34	30.8
25 / 29						0			0	27.0	3	1	2	6	26.6
20 / 24															
15 / 19															

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

Period of Record = 1973 to 1996

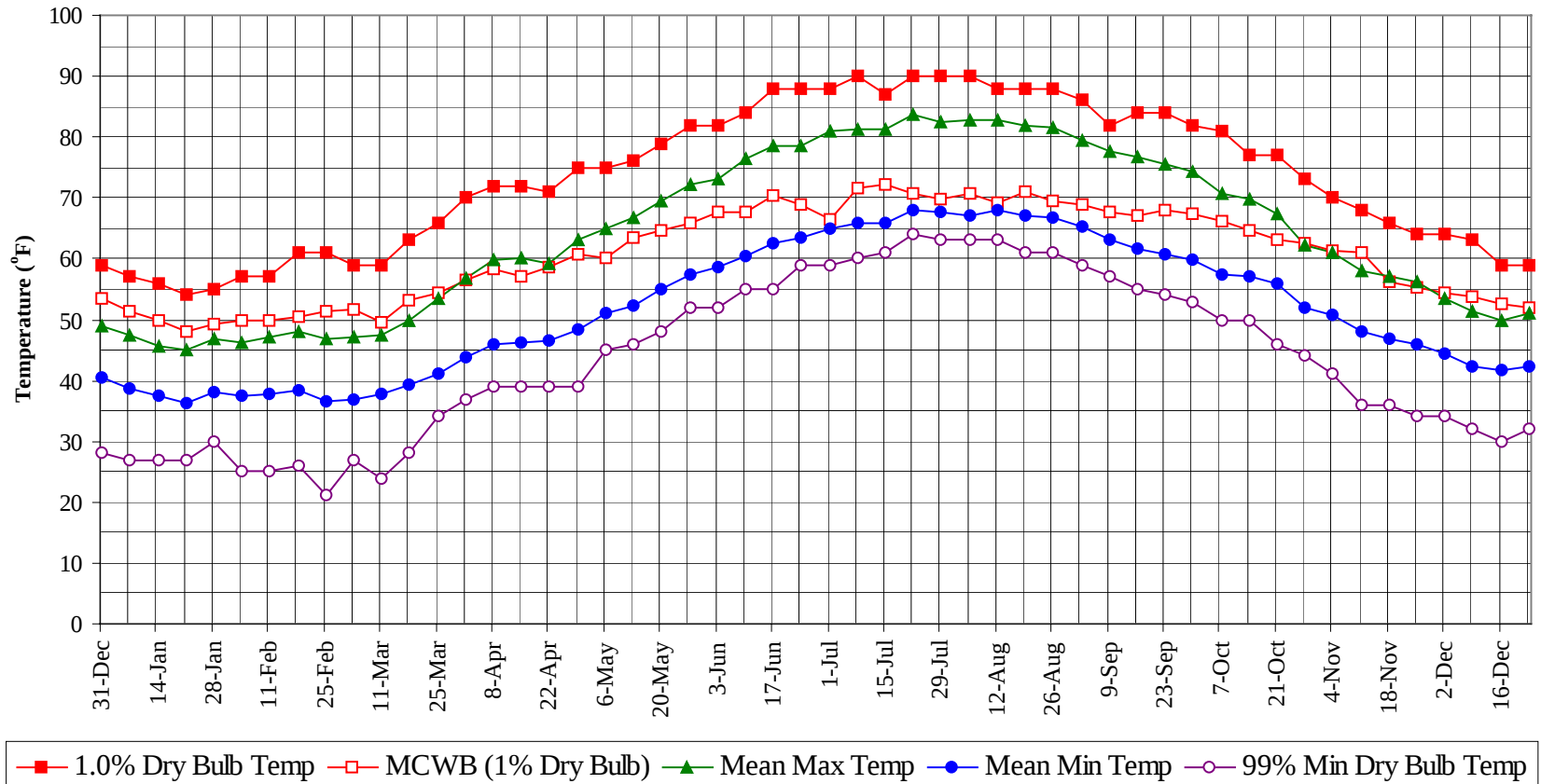
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
95 / 99		1	1	2	70.3
90 / 94	0	10	3	13	70.4
85 / 89	0	49	14	63	69.6
80 / 84	2	240	81	323	68.3
75 / 79	52	389	240	681	66.4
70 / 74	295	337	385	1017	64.4
65 / 69	320	207	262	788	61.3
60 / 64	392	281	315	987	57.3
55 / 59	367	309	327	1003	52.6
50 / 54	393	332	360	1084	48.1
45 / 49	388	348	356	1091	43.5
40 / 44	292	204	273	768	39.4
35 / 39	277	146	212	635	35.3
30 / 34	111	54	75	240	30.5
25 / 29	29	12	16	57	25.5
20 / 24	4	1	2	7	20.8
15 / 19	1	0	0	1	16.4

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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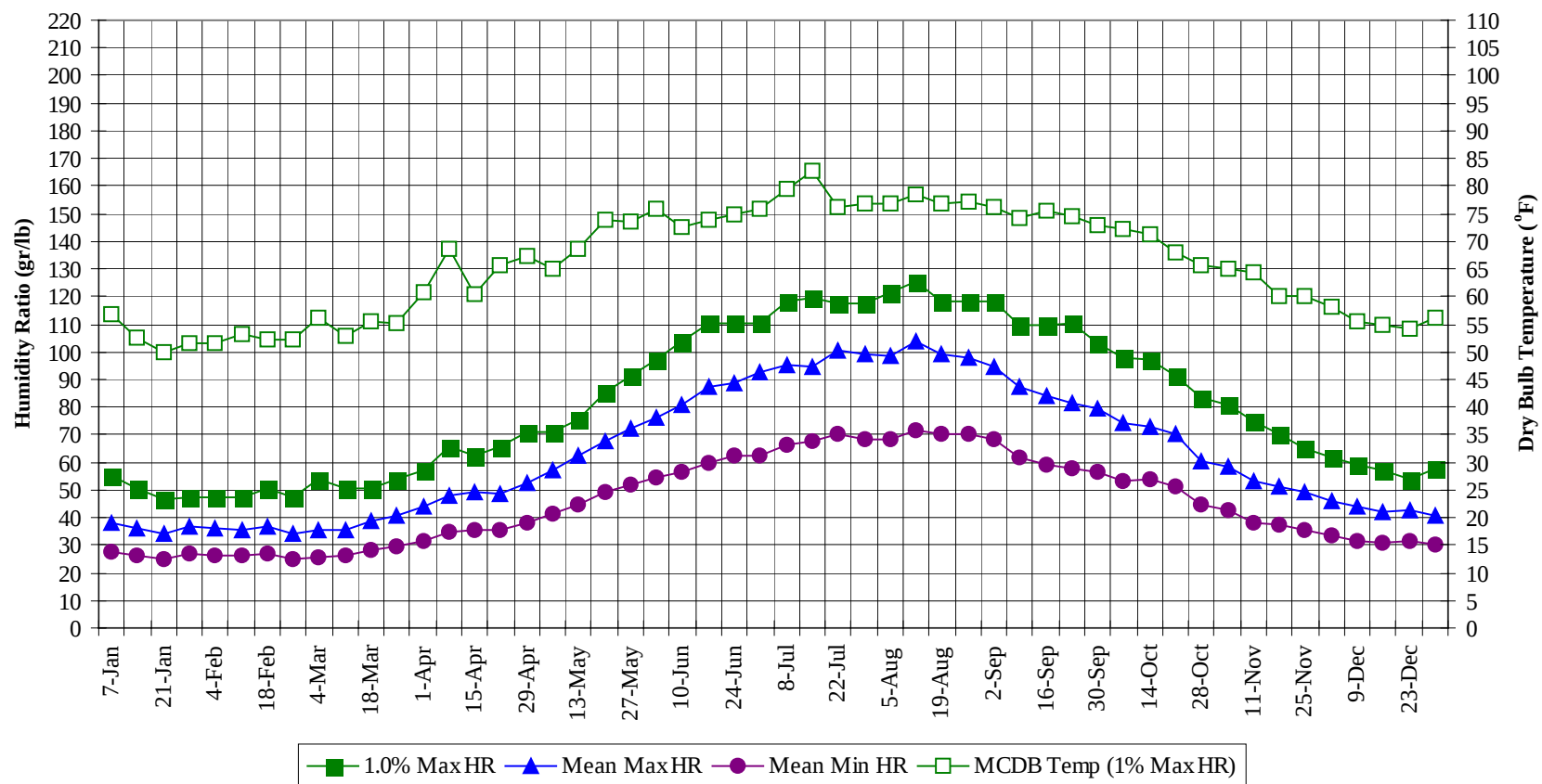
Annual Summary of Temperatures



ISTANBUL, TURKEY

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Long Term Humidity and Dry Bulb Temperature Summary



ISTANBUL, TURKEY

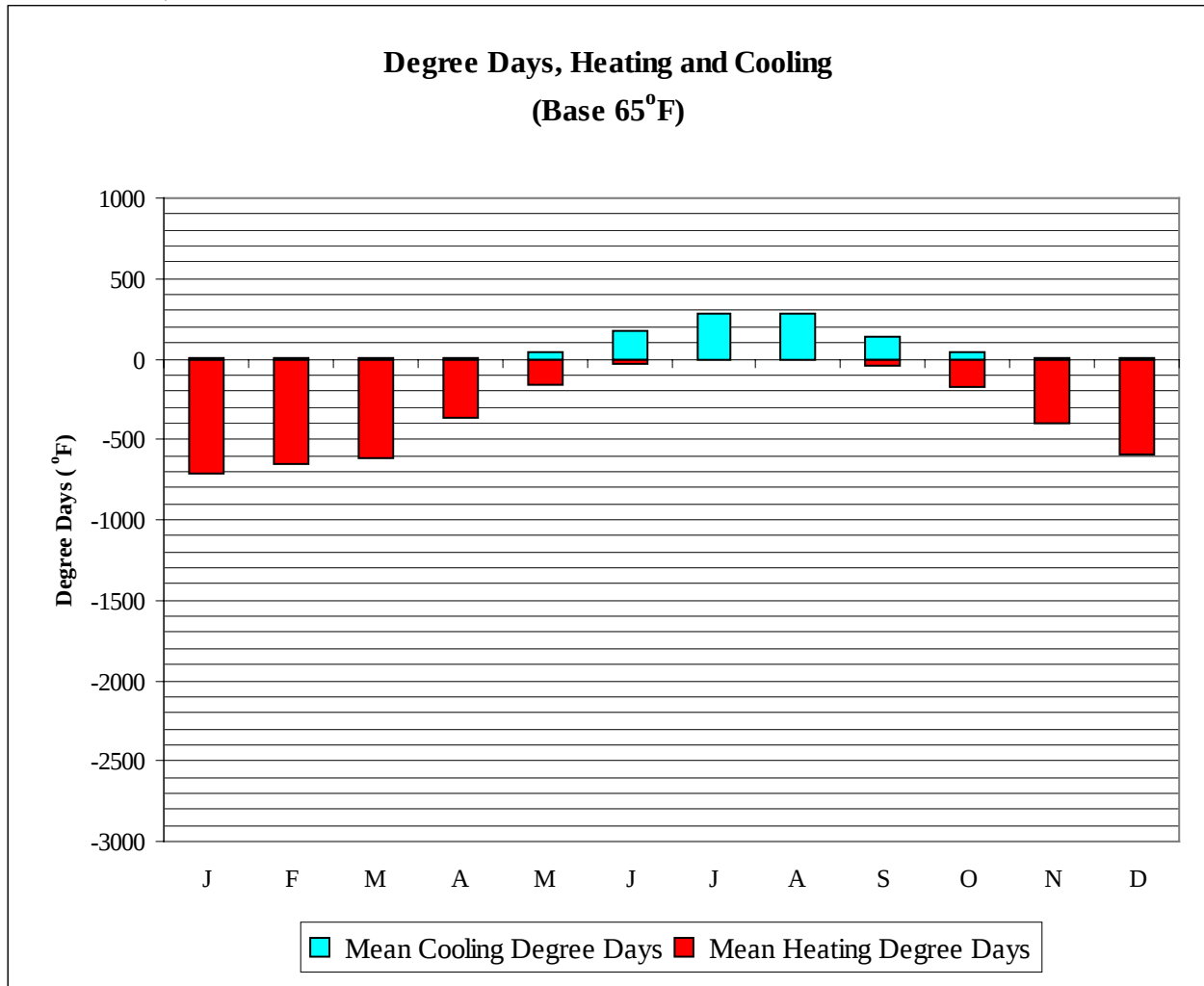
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Long Term Dry Bulb Temperature and Humidity Summary

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	57.0	51.5	47.4	38.6	27.0	55.3	56.8	38.3	27.6
14-Jan	56.0	50.0	45.7	37.3	27.0	50.4	52.6	36.1	26.5
21-Jan	54.0	48.1	45.0	36.1	27.0	46.9	49.9	34.0	24.7
28-Jan	55.0	49.2	46.7	38.2	30.0	47.6	51.6	36.5	27.1
4-Feb	57.0	49.8	46.2	37.5	25.0	47.6	51.6	36.0	26.0
11-Feb	57.0	49.8	47.1	37.7	25.0	47.6	53.2	35.5	26.2
18-Feb	61.0	50.5	48.0	38.3	26.0	50.4	52.1	37.1	26.9
25-Feb	61.0	51.4	46.9	36.7	21.0	47.6	52.2	34.4	24.8
4-Mar	59.0	51.6	47.3	36.9	27.0	53.9	56.3	35.7	25.3
11-Mar	59.0	49.7	47.4	37.9	24.0	50.4	53.0	35.7	26.4
18-Mar	63.0	53.1	49.7	39.4	28.0	50.4	55.4	38.6	28.1
25-Mar	66.0	54.3	53.3	41.1	34.0	53.9	55.2	40.8	29.5
1-Apr	70.0	56.5	56.7	43.9	37.0	57.4	60.7	44.2	31.9
8-Apr	72.0	58.4	59.7	45.9	39.0	65.8	68.7	48.2	35.1
15-Apr	72.0	57.3	60.1	46.2	39.0	62.3	60.5	49.1	35.4
22-Apr	71.0	58.5	59.4	46.5	39.0	65.8	65.5	48.9	35.2
29-Apr	75.0	60.8	63.2	48.4	39.0	70.7	67.3	52.8	37.9
6-May	75.0	60.0	64.8	51.0	45.0	70.7	64.9	56.9	41.7
13-May	76.0	63.3	66.7	52.3	46.0	75.6	68.6	62.1	44.5
20-May	79.0	64.6	69.5	55.0	48.0	85.4	73.8	67.5	49.5
27-May	82.0	65.8	72.3	57.3	52.0	91.0	73.6	72.3	52.2
3-Jun	82.0	67.8	73.0	58.6	52.0	97.3	75.8	76.3	54.7
10-Jun	84.0	67.6	76.3	60.4	55.0	103.6	72.4	80.5	56.5
17-Jun	88.0	70.4	78.5	62.5	55.0	110.6	73.9	87.1	60.0
24-Jun	88.0	68.9	78.6	63.5	59.0	110.6	74.8	88.5	62.6
1-Jul	88.0	66.6	80.9	65.0	59.0	110.6	76.0	92.6	62.5
8-Jul	90.0	71.6	81.2	65.9	60.0	118.3	79.4	95.5	66.6
15-Jul	87.0	72.3	81.1	66.0	61.0	119.7	82.8	94.6	67.6
22-Jul	90.0	70.7	83.6	68.0	64.0	117.6	76.3	100.6	70.2
29-Jul	90.0	69.9	82.6	67.8	63.0	117.6	77.0	99.1	68.4
5-Aug	90.0	70.8	82.8	67.2	63.0	121.8	77.0	98.7	68.2
12-Aug	88.0	69.3	82.9	67.9	63.0	125.3	78.5	104.0	71.6
19-Aug	88.0	70.9	81.8	67.1	61.0	118.3	76.7	98.9	70.4
26-Aug	88.0	69.6	81.6	66.8	61.0	118.3	77.0	97.6	70.4
2-Sep	86.0	69.0	79.5	65.4	59.0	118.3	76.2	94.8	68.5
9-Sep	82.0	67.7	77.6	63.1	57.0	109.9	74.1	87.6	61.7
16-Sep	84.0	67.0	76.6	61.7	55.0	109.9	75.4	84.3	58.8
23-Sep	84.0	68.0	75.5	60.8	54.0	110.6	74.6	81.5	58.1
30-Sep	82.0	67.4	74.2	60.0	53.0	102.9	72.9	79.8	56.7
7-Oct	81.0	66.3	70.7	57.3	50.0	98.0	72.1	74.0	53.3
14-Oct	77.0	64.6	69.8	57.0	50.0	97.3	71.4	73.1	53.6
21-Oct	77.0	63.0	67.4	55.9	46.0	91.0	67.8	70.0	51.0
28-Oct	73.0	62.7	62.4	51.9	44.0	83.3	65.6	60.6	44.8
4-Nov	70.0	61.4	61.1	50.7	41.0	80.5	65.2	58.4	42.8
11-Nov	68.0	61.2	57.9	48.0	36.0	74.9	64.5	53.3	38.4
18-Nov	66.0	56.1	57.0	46.9	36.0	70.0	60.0	51.4	37.6
25-Nov	64.0	55.4	56.2	46.0	34.0	65.1	59.9	49.4	35.5
2-Dec	64.0	54.3	53.4	44.4	34.0	61.6	58.2	46.2	33.6
9-Dec	63.0	53.7	51.2	42.3	32.0	58.8	55.5	44.0	31.3
16-Dec	59.0	52.6	49.8	41.7	30.0	57.4	55.0	42.0	30.7
23-Dec	59.0	51.9	51.0	42.2	32.0	53.9	54.2	42.5	31.3
31-Dec	59.0	53.4	48.9	40.5	28.0	58.1	56.3	41.0	30.2

ISTANBUL, TURKEY

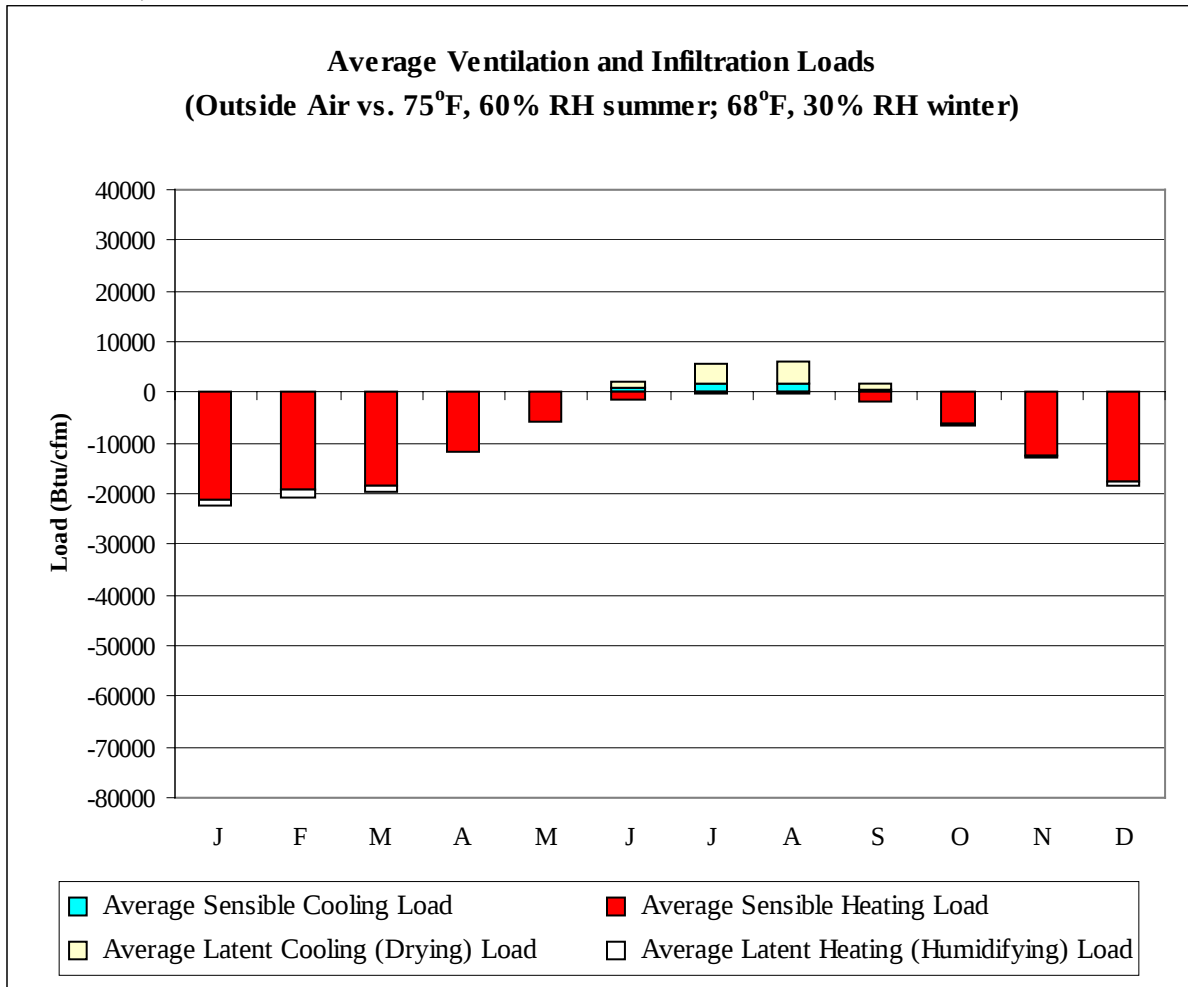
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	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	717
FEB	0	655
MAR	1	619
APR	8	366
MAY	46	159
JUN	175	26
JUL	286	4
AUG	283	4
SEP	140	37
OCT	36	172
NOV	1	398
DEC	0	591
ANN	977	3748

ISTANBUL, TURKEY

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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	-21001	0	-1428
FEB	0	-19186	0	-1517
MAR	0	-18442	0	-981
APR	10	-11715	2	-175
MAY	90	-5958	89	-13
JUN	743	-1414	1489	-1
JUL	1640	-333	3914	0
AUG	1578	-371	4660	0
SEP	420	-1857	1429	-1
OCT	55	-6368	262	-21
NOV	0	-12627	4	-351
DEC	0	-17743	0	-738
ANN	4536	-117015	11849	-5226

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

No Solar Radiation
Data Available

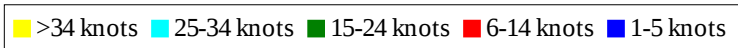
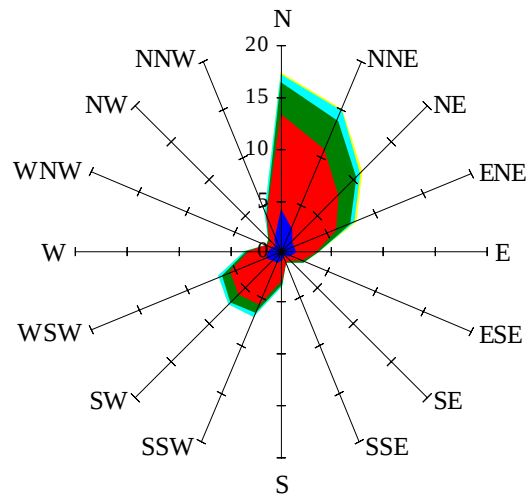


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

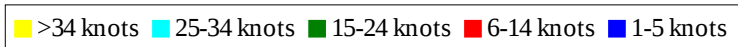
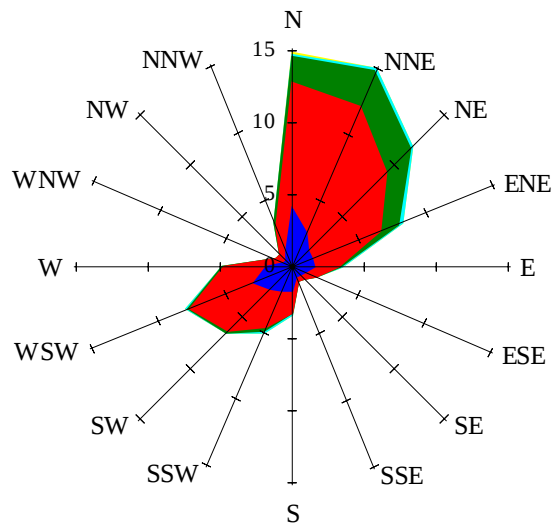
Labels of Percent Frequency on North Axis



Percent Calm = 6.71

Wind Summary - March, April, and May

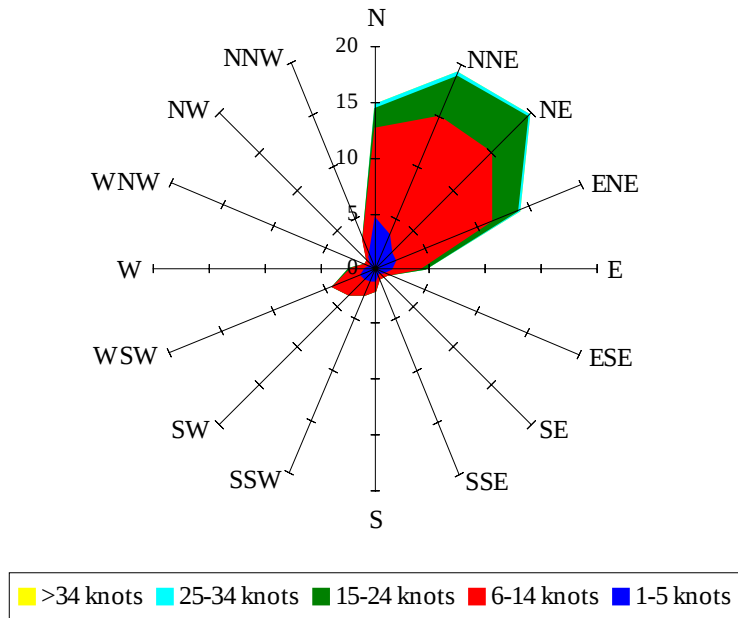
Labels of Percent Frequency on North Axis



Percent Calm = 9.91

Wind Summary - June, July, and August

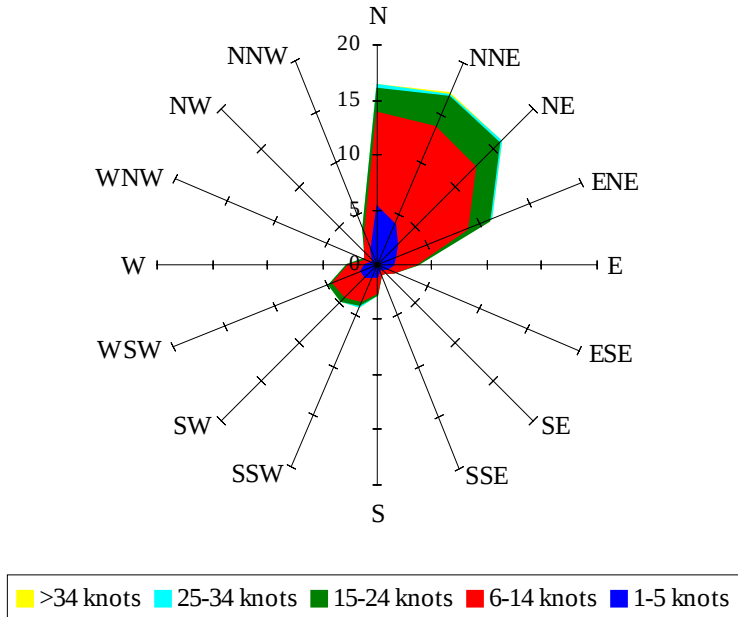
Labels of Percent Frequency on North Axis



Percent Calm = 5.63

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.80