

STOCKHOLM, SWEDEN

Latitude = 59.35 N

Longitude = 17.95 E

Period of Record = 1977 to 1996

WMO No. 024640

Elevation = 36 feet

Average Pressure = 29.80 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	83	65	62	8.3	W
0.4% Occurrence	80	63	61	8.6	SSW
1.0% Occurrence	77	62	59	8.8	W
2.0% Occurrence	73	60	58	8.5	W
Mean Daily Range	12	-	-	-	-
97.5% Occurrence	14	13	10	5.6	NW
99.0% Occurrence	7	7	7	4.9	N
99.6% Occurrence	0	0	5	3.3	W
Median of Extreme Lows	-2	-2	4	3.2	W
	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	69	79	85	7.0	W
0.4% Occurrence	66	75	80	7.3	W
1.0% Occurrence	64	72	74	7.4	S
2.0% Occurrence	63	71	72	7.5	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	97	72	0.65	5.5	ENE
0.4% Occurrence	85	68	0.57	6.5	S
1.0% Occurrence	80	67	0.54	6.3	SSE
2.0% Occurrence	76	65	0.51	7.3	S
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		0	37	0	26

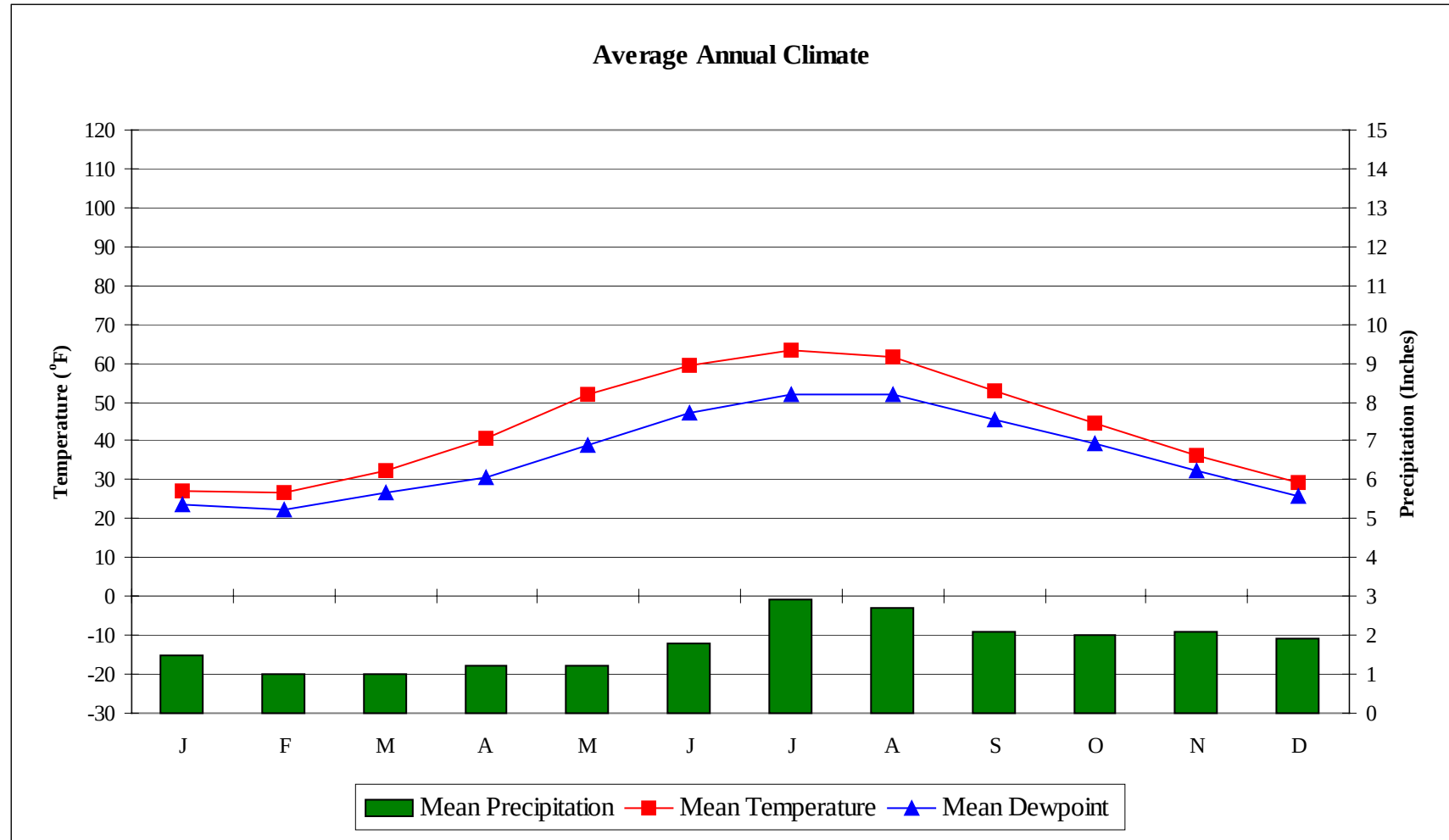
Other Site Data

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
5	N/A	N/A	0.0 + 0.0
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 (#)
46.5	N/A	N/A	55

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

STOCKHOLM, SWEDEN

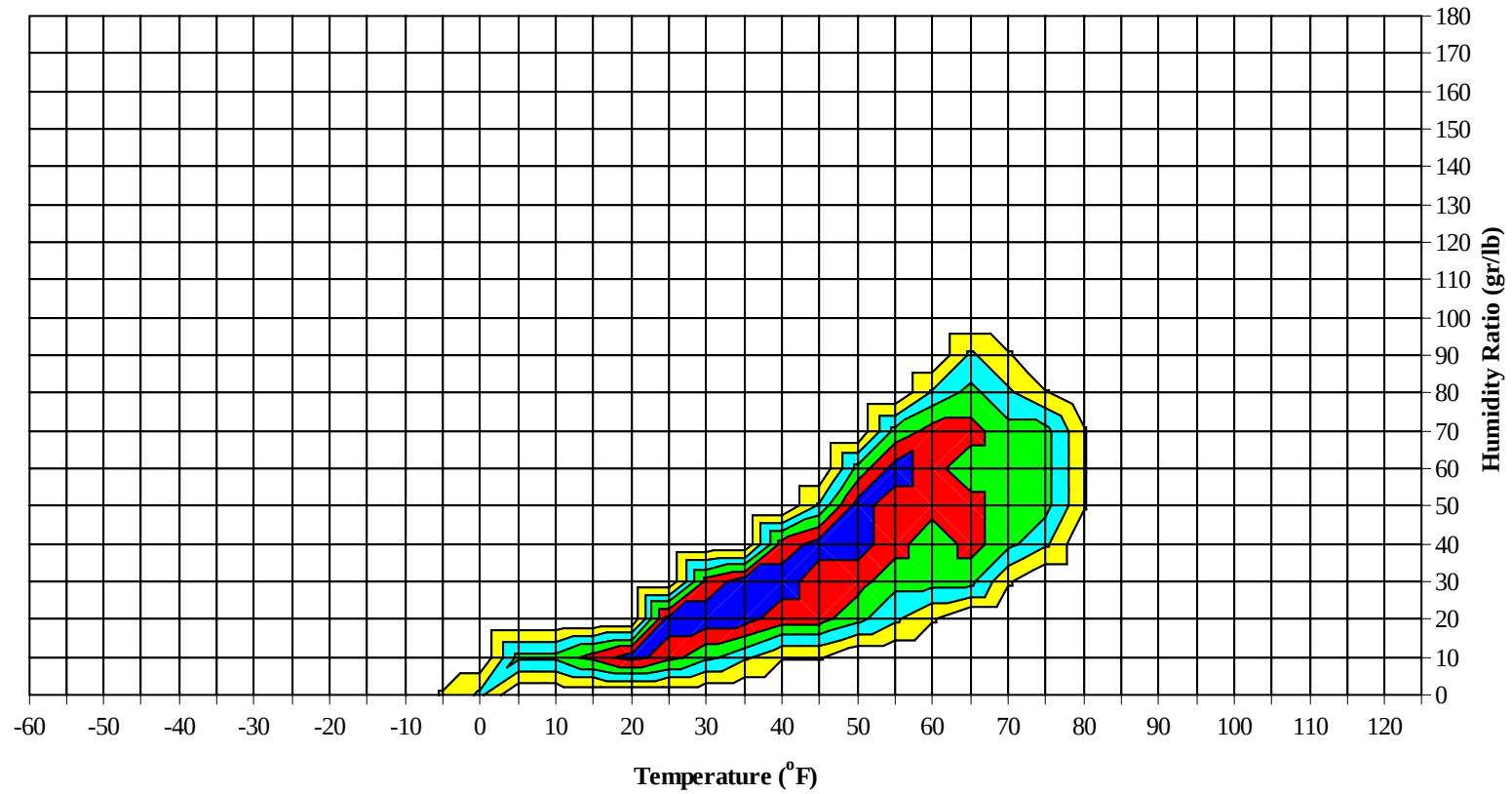
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STOCKHOLM, SWEDEN

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Long Term Psychrometric Summary

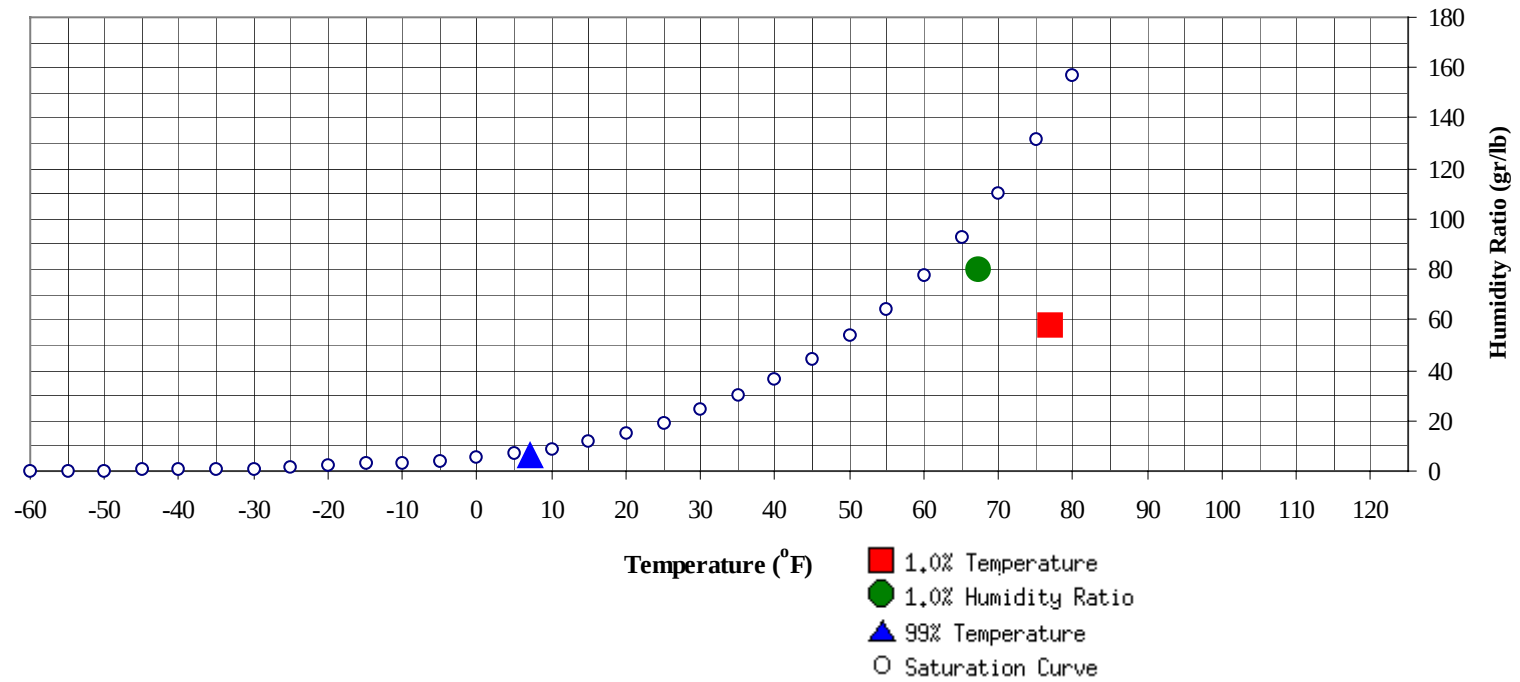


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

STOCKHOLM, SWEDEN

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
99% Dry Bulb	7	6.6	2.7		79.8	67.4	63.2	60.8	28.6

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	77	58	61.9	27.6

STOCKHOLM, SWEDEN

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

Period of Record = 1977 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		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69															
60 / 64												0	0	0	52.0
55 / 59												1	1	2	49.5
50 / 54		0	0	0	47.2		2	1	3	47.5	0	5	2	7	44.3
45 / 49	2	3	4	9	42.7	3	6	4	14	43.7	2	16	9	27	41.1
40 / 44	11	15	9	34	39.1	5	11	7	22	39.6	9	33	20	61	38.0
35 / 39	40	50	47	136	35.5	25	43	35	103	35.5	46	77	63	187	34.7
30 / 34	66	63	60	189	31.0	42	47	51	140	30.7	89	73	92	253	30.8
25 / 29	43	48	51	142	25.8	49	50	50	150	25.5	48	26	35	109	25.3
20 / 24	28	25	27	80	21.4	30	28	29	88	21.1	22	9	10	41	21.1
15 / 19	21	19	19	59	16.8	29	22	22	73	16.7	17	5	11	33	16.8
10 / 14	15	12	12	38	11.8	18	8	12	38	11.8	10	3	3	16	11.7
5 / 9	9	7	9	25	6.4	10	4	7	21	6.4	3	0	2	5	6.8
0 / 4	5	4	4	14	1.4	6	2	4	13	1.2	2	0	0	2	1.4
-5 / -1	2	2	2	6	-3.0	3	1	1	5	-3.1	0			0	-3.5
-10 / -6	3	1	3	7	-7.4	2	0	1	3	-7.4					
-15 / -11	1	0	1	2	-12.3	1	0	0	1	-12.2					
-20 / -16	1	0		1	-16.5	0			0	-15.0					

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 = 1977 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	09	17			01	09	17			01	09	17		
	To 08	To 16	To 00			To 08	To 16	To 00			To 08	To 16	To 00		
90 / 94											0 66.3				
85 / 89											3 1 4 63.5				
80 / 84	0 0 0 57.8					0 0 61.6					7 26 61.1				
75 / 79	0 0 57.8					8 2 10 59.5					0 19 7 26 61.1				
70 / 74	1 1 2 56.0					0 19 7 26 57.1					3 34 21 58 58.4				
65 / 69	3 0 3 53.3					2 23 11 36 54.5					7 41 28 76 56.5				
60 / 64	0 7 2 9 50.3					7 42 29 78 51.8					31 64 61 156 54.3				
55 / 59	1 20 9 30 47.1					24 55 47 125 49.0					74 50 67 191 52.2				
50 / 54	4 38 22 65 44.0					50 50 61 160 45.9					79 25 43 147 49.3				
45 / 49	18 53 45 116 40.9					69 34 48 151 42.7					33 4 11 49 45.2				
40 / 44	32 50 48 130 37.8					43 12 26 81 39.3					9 0 1 11 40.7				
35 / 39	77 49 65 190 34.6					37 5 16 58 35.7					2 0 2 37.2				
30 / 34	70 19 41 131 30.5					13 0 2 16 31.6					0 0 33.0				
25 / 29	30 1 7 38 25.9					2 0 2 26.9									
20 / 24	6 0 6 21.6					0 0 24.0									
15 / 19	1 1 17.5														
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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

Period of Record = 1977 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		
90 / 94		1	0	1	67.8										
85 / 89		3	1	4	67.7		1	0	1	64.9					
80 / 84	0	9	4	13	64.7		8	2	10	64.7					
75 / 79	1	30	13	45	61.9	0	19	8	27	63.3		1	0	1	62.9
70 / 74	8	51	34	93	60.0	4	41	23	69	61.0		4	1	5	61.3
65 / 69	19	58	46	122	58.3	16	55	38	108	59.2	0	12	3	15	57.6
60 / 64	60	64	82	206	57.1	51	72	72	195	57.2	4	43	19	66	55.2
55 / 59	103	28	55	186	54.5	90	41	69	200	54.2	38	90	65	194	52.5
50 / 54	49	4	12	65	50.7	62	10	31	102	50.4	82	66	82	230	49.0
45 / 49	8	0	1	9	46.2	20	1	6	26	46.0	63	22	48	133	44.6
40 / 44	0			0	43.7	4		0	4	41.6	29	2	15	47	40.6
35 / 39						1			1	38.0	18	0	5	23	36.7
30 / 34											5		1	6	32.2
25 / 29											0		0	0	27.5
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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STOCKHOLM, SWEDEN

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

Period of Record = 1977 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		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74															
65 / 69		1	0	1	59.6										
60 / 64	0	3	1	4	55.1										
55 / 59	5	25	9	39	52.3										
50 / 54	38	73	50	161	48.6	6	10	8	24	47.6	1	0	1	2	47.1
45 / 49	70	77	79	226	44.3	25	33	31	89	44.0	3	5	3	12	43.5
40 / 44	53	39	43	135	40.1	37	48	41	126	40.4	15	18	14	47	40.0
35 / 39	40	20	42	103	35.5	62	69	61	191	35.8	48	56	56	160	35.8
30 / 34	28	8	16	52	30.7	59	49	57	166	30.9	72	74	61	208	31.1
25 / 29	11	2	6	19	25.8	29	22	27	78	25.8	43	41	50	134	25.8
20 / 24	3	0	1	4	21.8	11	6	9	25	21.4	21	21	20	63	21.4
15 / 19	0		0	0	17.0	6	3	5	14	17.1	21	18	17	56	16.9
10 / 14	0			0	13.0	3	1	1	5	12.5	13	10	12	34	11.9
5 / 9						1	0	0	1	7.0	6	4	8	17	6.6
0 / 4						0			0	3.3	3	1	3	7	1.5
-5 / -1											1	1	1	3	-2.8
-10 / -6											0	0	1	1	-8.1
-15 / -11											0	0		0	-11.3
-20 / -16															

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

Period of Record = 1977 to 1996

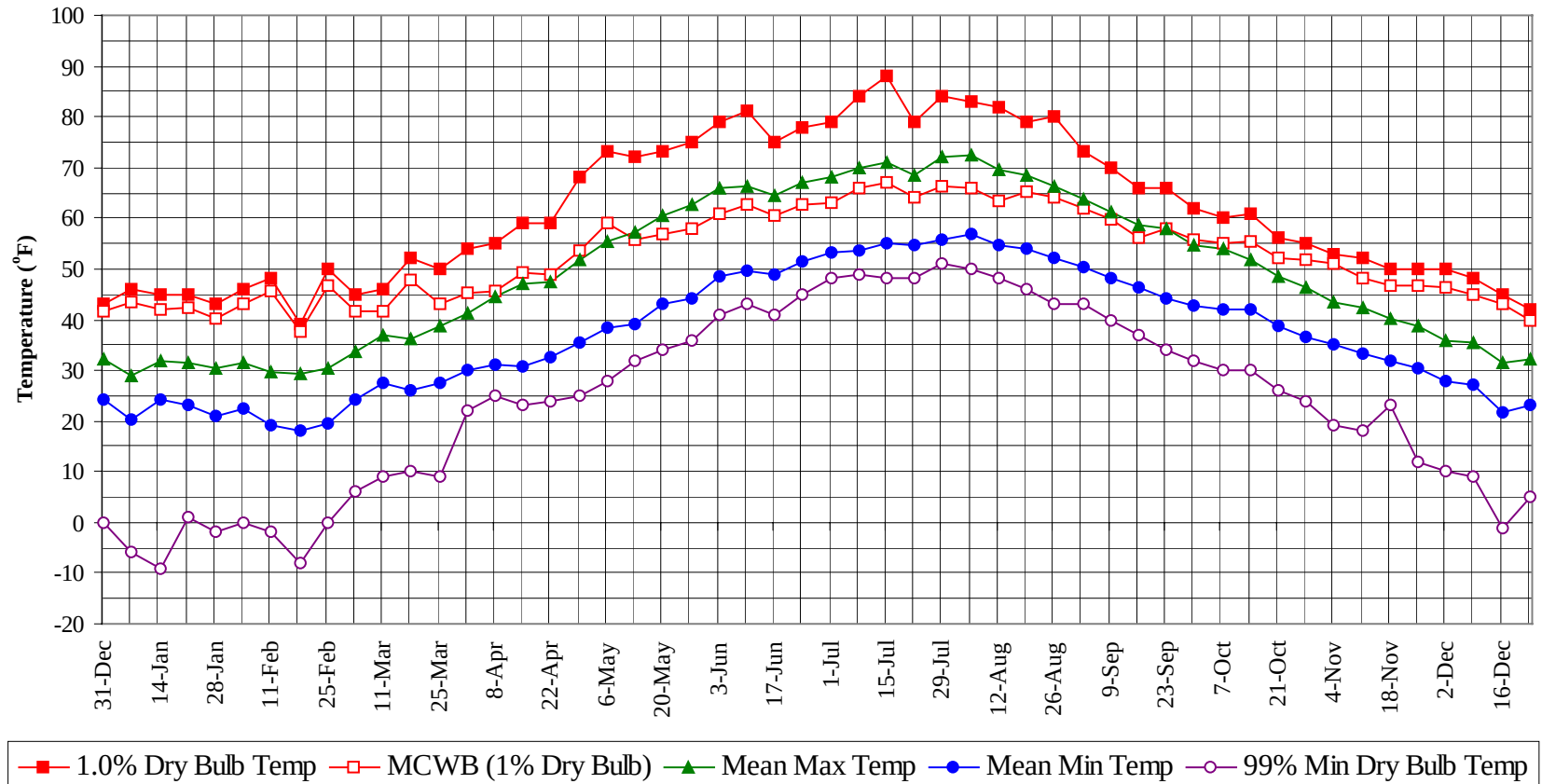
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
90 / 94		1	0	1	67.8
85 / 89		4	1	5	66.9
80 / 84	0	20	8	28	64.5
75 / 79	2	77	30	109	61.9
70 / 74	16	151	85	253	59.6
65 / 69	44	189	125	358	57.8
60 / 64	157	294	262	712	55.7
55 / 59	336	311	319	966	52.5
50 / 54	375	284	313	973	48.3
45 / 49	319	256	291	866	43.6
40 / 44	249	228	226	703	39.4
35 / 39	394	369	392	1155	35.3
30 / 34	441	333	381	1154	30.9
25 / 29	253	188	227	669	25.7
20 / 24	121	88	99	308	21.3
15 / 19	95	65	76	235	16.8
10 / 14	57	33	41	130	11.8
5 / 9	29	15	24	69	6.5
0 / 4	18	7	12	37	1.4
-5 / -1	6	3	4	13	-3.0
-10 / -6	5	2	4	11	-7.5
-15 / -11	1	1	1	3	-12.2
-20 / -16	1	0		1	-16.2

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.

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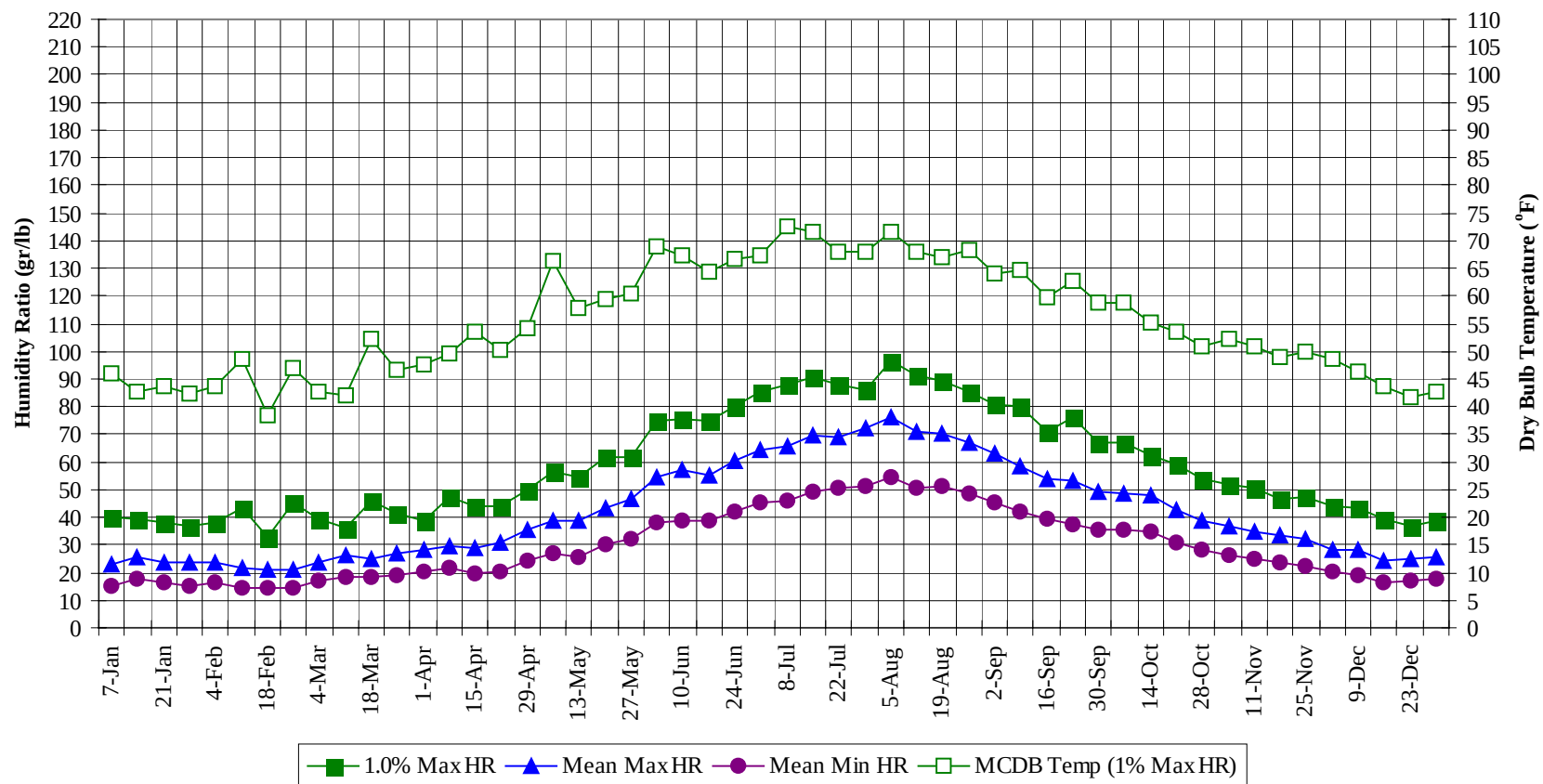
Annual Summary of Temperatures



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Long Term Humidity and Dry Bulb Temperature Summary



STOCKHOLM, SWEDEN

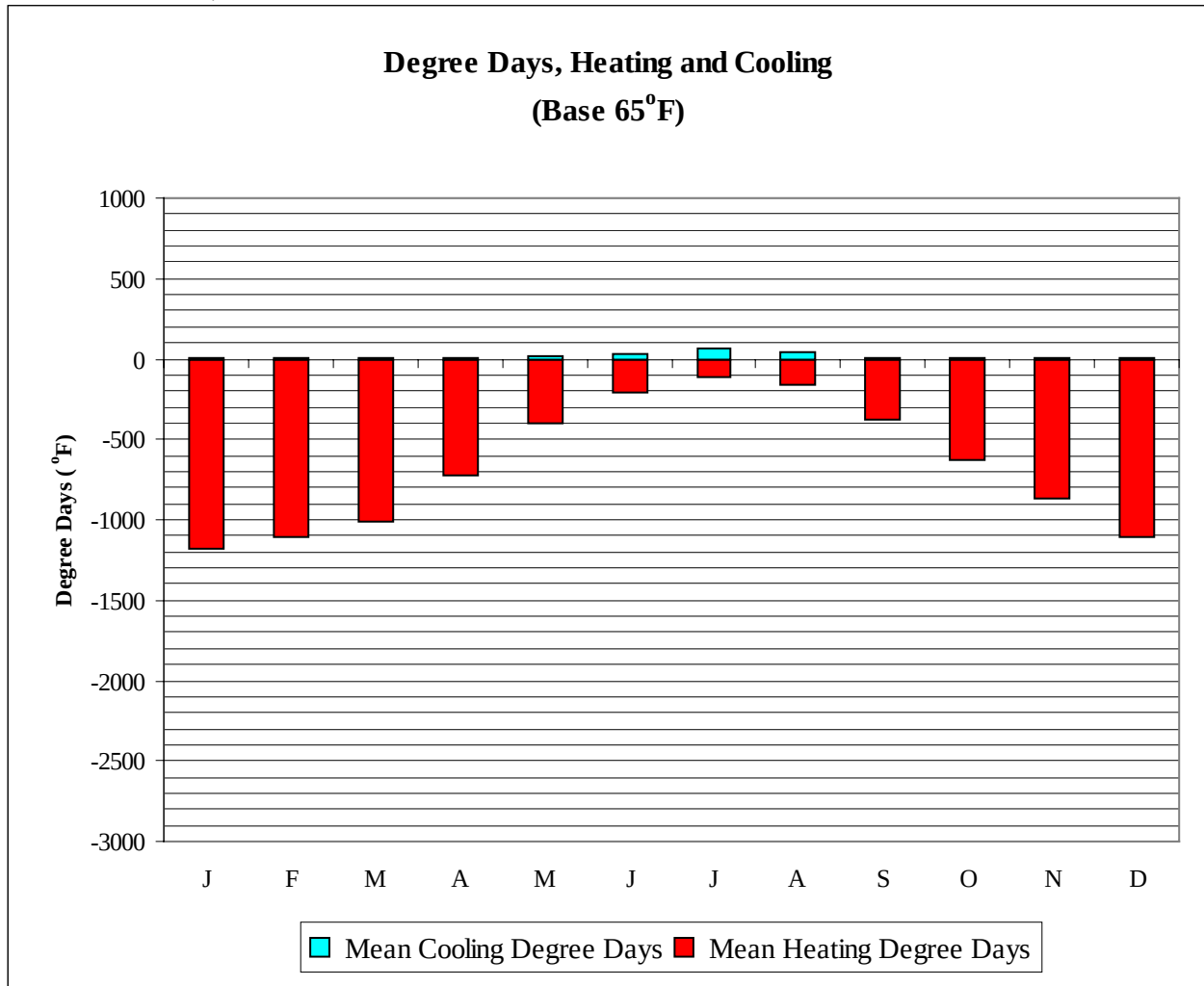
WMO No. 024640

Long Term Dry Bulb Temperature and Humidity Summary

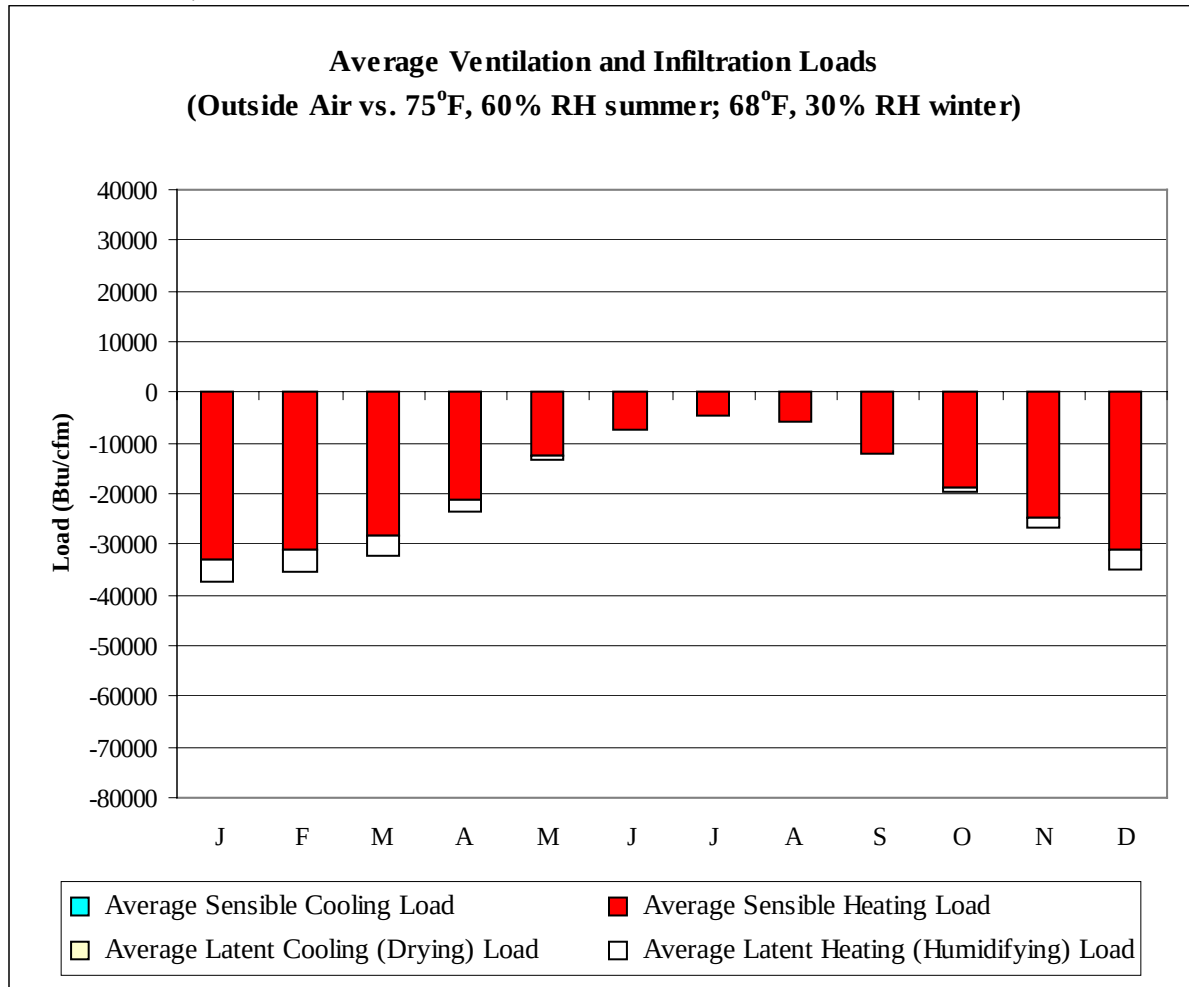
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	46.0	43.6	29.1	20.1	-6.0	39.9	46.0	22.7	15.4
14-Jan	45.0	42.0	31.9	24.2	-9.0	39.2	42.6	25.4	17.9
21-Jan	45.0	42.3	31.6	23.0	1.0	37.8	43.5	23.9	16.2
28-Jan	43.0	40.1	30.5	21.0	-2.0	37.1	42.4	23.3	15.3
4-Feb	46.0	43.0	31.6	22.3	0.0	37.8	43.8	23.5	16.4
11-Feb	48.0	45.7	29.7	19.3	-2.0	43.4	48.6	21.7	14.5
18-Feb	39.0	37.5	29.4	18.2	-8.0	32.9	38.6	20.8	14.3
25-Feb	50.0	46.6	30.4	19.5	0.0	45.5	46.9	21.0	14.3
4-Mar	45.0	41.7	33.6	24.2	6.0	39.2	42.9	23.9	17.2
11-Mar	46.0	41.6	36.8	27.4	9.0	36.4	42.1	26.3	18.6
18-Mar	52.0	47.9	36.2	26.1	10.0	46.2	52.2	25.2	18.1
25-Mar	50.0	42.9	38.7	27.6	9.0	41.3	46.6	26.8	19.2
1-Apr	54.0	45.1	41.4	30.0	22.0	38.5	47.5	28.3	20.2
8-Apr	55.0	45.7	44.6	31.3	25.0	47.6	49.4	29.7	21.6
15-Apr	59.0	49.2	47.3	30.8	23.0	44.1	53.6	29.2	19.4
22-Apr	59.0	48.8	47.6	32.7	24.0	44.1	50.1	30.7	20.7
29-Apr	68.0	53.6	51.8	35.6	25.0	49.7	54.3	35.3	24.2
6-May	73.0	58.9	55.6	38.4	28.0	56.7	66.3	38.7	26.8
13-May	72.0	55.7	57.2	38.9	32.0	54.6	57.9	38.7	25.6
20-May	73.0	56.8	60.6	43.0	34.0	61.6	59.6	43.6	30.3
27-May	75.0	58.0	62.5	44.2	36.0	61.6	60.5	46.7	32.0
3-Jun	79.0	61.0	65.9	48.4	41.0	74.9	69.1	54.4	38.1
10-Jun	81.0	62.7	66.1	49.7	43.0	75.6	67.3	57.2	38.5
17-Jun	75.0	60.4	64.4	48.7	41.0	74.9	64.4	55.5	38.7
24-Jun	78.0	62.6	67.0	51.3	45.0	79.8	66.6	60.5	42.0
1-Jul	79.0	62.9	68.0	53.1	48.0	85.4	67.4	64.4	45.6
8-Jul	84.0	65.9	69.8	53.7	49.0	88.2	72.5	65.4	46.0
15-Jul	88.0	66.9	70.8	55.2	48.0	90.3	71.6	69.4	49.1
22-Jul	79.0	63.9	68.4	54.6	48.0	88.2	68.0	69.2	50.5
29-Jul	84.0	66.1	72.1	55.8	51.0	86.1	67.9	72.4	51.2
5-Aug	83.0	66.0	72.5	56.7	50.0	96.6	71.7	76.1	54.6
12-Aug	82.0	63.4	69.7	54.8	48.0	91.0	67.9	71.0	50.3
19-Aug	79.0	65.1	68.4	54.1	46.0	89.6	67.1	70.6	51.1
26-Aug	80.0	64.0	66.3	52.3	43.0	85.4	68.3	67.2	48.6
2-Sep	73.0	62.0	63.9	50.3	43.0	80.5	64.0	63.0	45.2
9-Sep	70.0	59.8	61.2	48.2	40.0	79.8	64.8	58.6	42.2
16-Sep	66.0	56.0	58.5	46.3	37.0	70.7	59.9	54.0	39.2
23-Sep	66.0	58.0	58.0	44.2	34.0	76.3	62.7	53.0	37.4
30-Sep	62.0	55.8	54.6	42.8	32.0	67.2	58.7	49.4	35.7
7-Oct	60.0	55.2	53.9	42.1	30.0	67.2	58.9	48.8	35.5
14-Oct	61.0	55.3	51.8	42.0	30.0	62.3	55.3	48.0	34.6
21-Oct	56.0	52.3	48.6	38.8	26.0	58.8	53.7	42.7	30.7
28-Oct	55.0	51.7	46.4	36.4	24.0	53.9	50.9	38.8	28.3
4-Nov	53.0	51.0	43.3	35.1	19.0	51.8	52.2	36.7	26.3
11-Nov	52.0	48.3	42.3	33.5	18.0	50.4	50.8	35.1	24.8
18-Nov	50.0	46.8	40.2	31.8	23.0	46.9	48.8	33.3	23.8
25-Nov	50.0	46.7	38.7	30.3	12.0	47.6	49.8	32.0	22.3
2-Dec	50.0	46.3	36.0	27.7	10.0	44.1	48.5	28.6	20.2
9-Dec	48.0	45.0	35.3	27.0	9.0	43.4	46.4	28.1	19.3
16-Dec	45.0	43.0	31.6	21.8	-1.0	39.2	43.6	24.4	16.1
23-Dec	42.0	40.0	32.3	23.2	5.0	37.1	41.8	25.2	17.4
31-Dec	43.0	41.6	32.2	24.4	0.0	38.5	42.7	25.3	17.7

STOCKHOLM, SWEDEN

WMO No. 024640



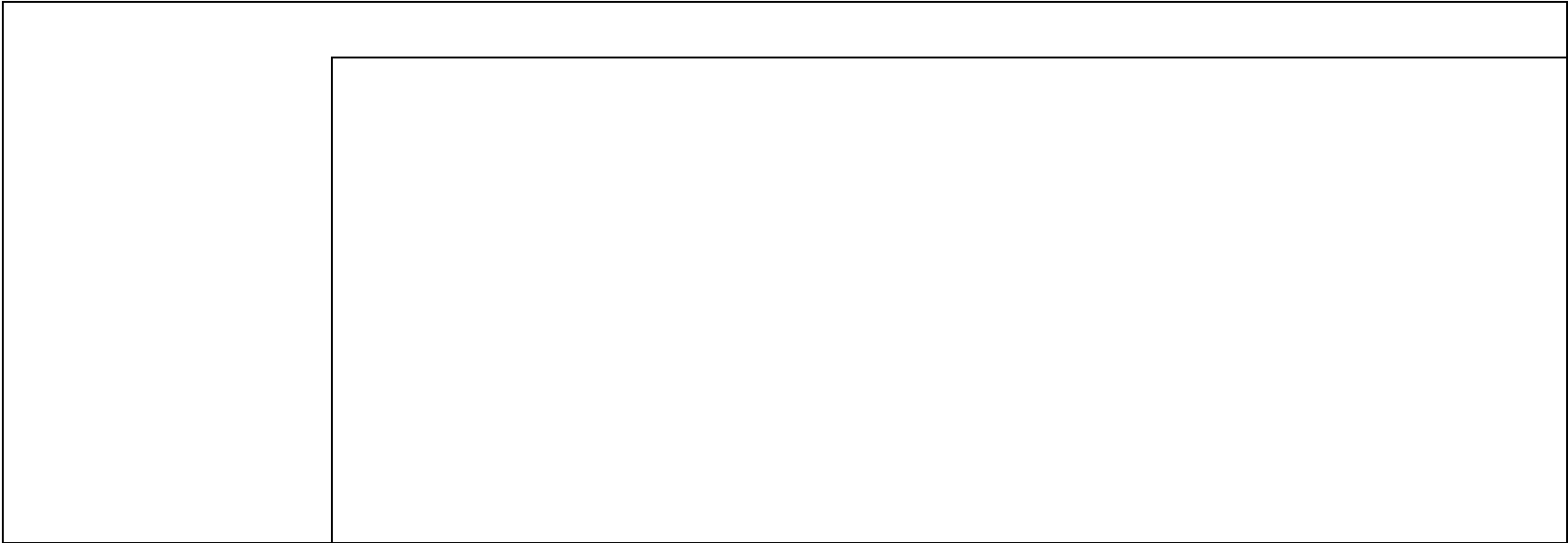
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1183
FEB	0	1106
MAR	0	1006
APR	1	730
MAY	12	403
JUN	32	205
JUL	64	116
AUG	45	156
SEP	2	380
OCT	0	625
NOV	0	865
DEC	0	1111
ANN	157	7886



	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	-33102	0	-4402
FEB	0	-30909	0	-4375
MAR	0	-28484	0	-3608
APR	1	-21230	0	-2463
MAY	14	-12625	0	-784
JUN	62	-7244	17	-104
JUL	215	-4726	104	-11
AUG	122	-5941	168	-8
SEP	1	-12138	5	-157
OCT	0	-18627	0	-801
NOV	0	-24766	0	-1941
DEC	0	-31225	0	-3708
ANN	415	-231017	294	-22362

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

No Solar Radiation
Data Available

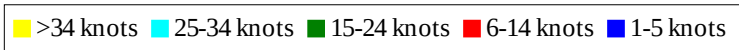
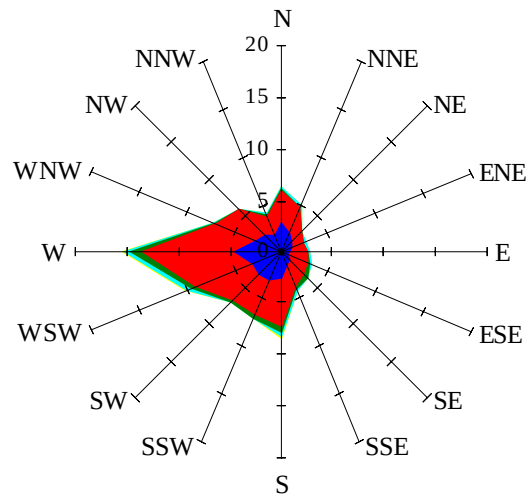


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

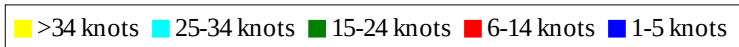
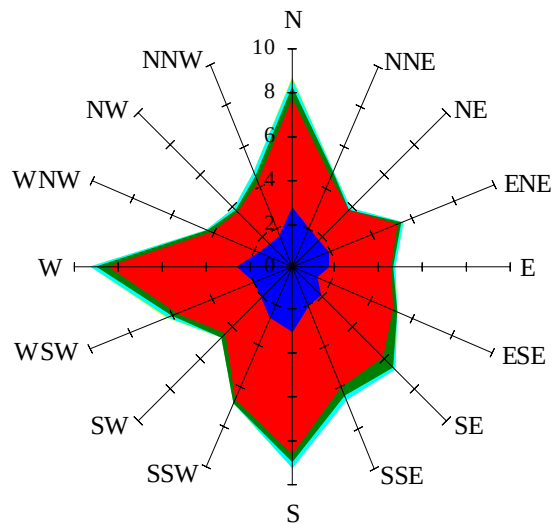
Labels of Percent Frequency on North Axis



Percent Calm = 5.55

Wind Summary - March, April, and May

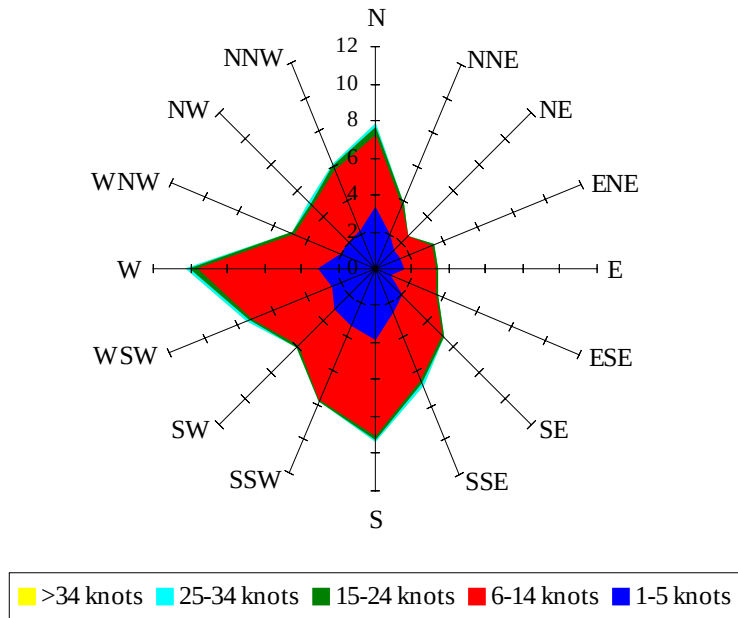
Labels of Percent Frequency on North Axis



Percent Calm = 5.67

Wind Summary - June, July, and August

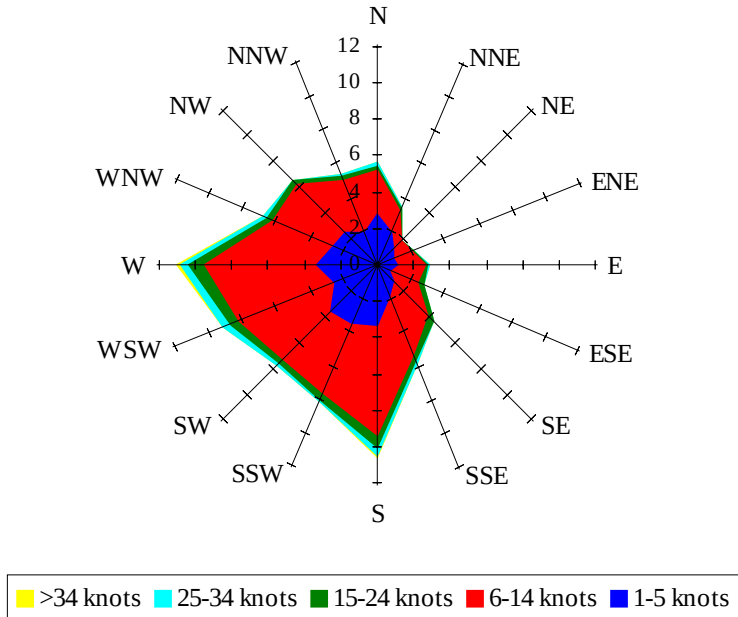
Labels of Percent Frequency on North Axis



Percent Calm = 6.81

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.32