

BERLIN/TEMPELHOF DL

Latitude = 52.47 N

WMO No. 103840

Longitude = 13.40 E

Elevation = 161 feet

Period of Record = 1973 to 1996

Average Pressure = 29.78 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	91	68	65	7.7	VARIABLE
0.4% Occurrence	86	66	63	8.0	E
1.0% Occurrence	82	65	63	8.2	E
2.0% Occurrence	79	63	62	8.4	E
Mean Daily Range	12	-	-	-	-
97.5% Occurrence	21	20	13	7.6	E
99.0% Occurrence	16	15	10	8.1	E
99.6% Occurrence	12	11	8	8.1	E
Median of Extreme Lows	8	7	7	7.8	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	71	85	92	8.3	SW
0.4% Occurrence	68	81	82	8.0	W
1.0% Occurrence	66	77	77	7.5	E
2.0% Occurrence	65	76	75	7.6	E
	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	102	74	0.68	10.4	ENE
0.4% Occurrence	90	73	0.61	7.5	W
1.0% Occurrence	85	70	0.57	6.6	E
2.0% Occurrence	80	70	0.54	6.7	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		3	150	1	86

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
6	N/A	N/A	0.1 + 0.1
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 (#)
51.6	N/A	N/A	34

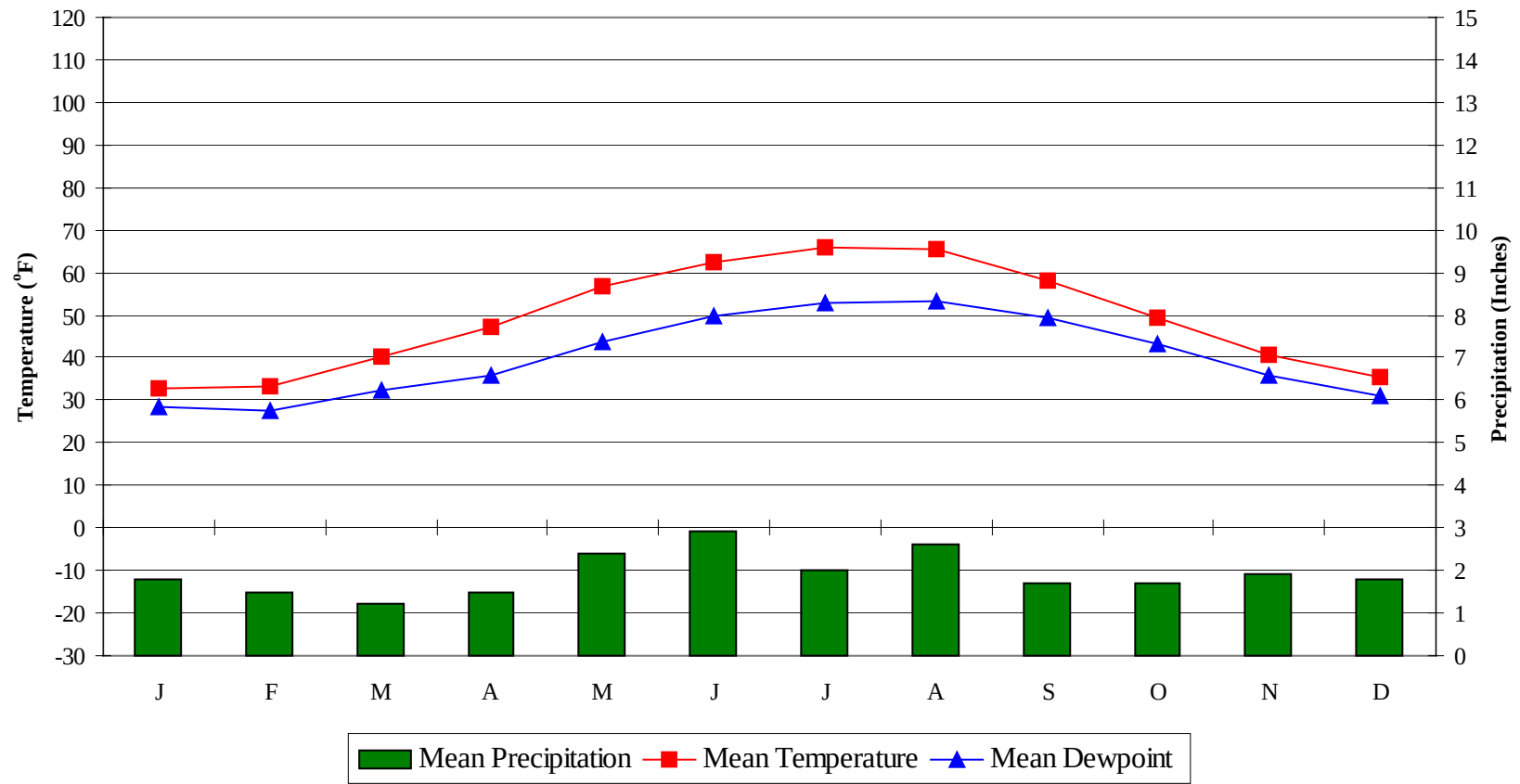
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

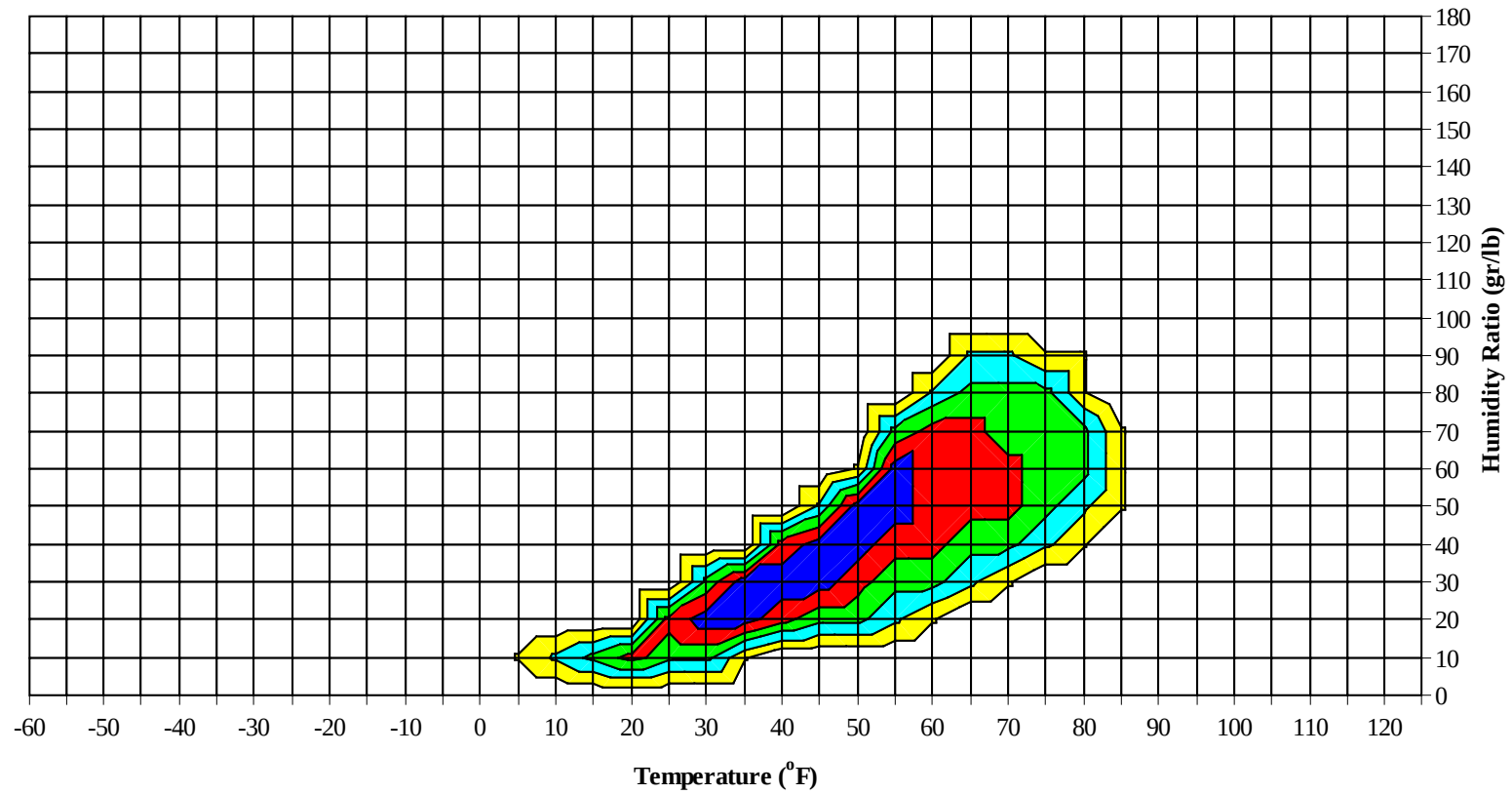


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WMO No. 103840

Long Term Psychrometric Summary

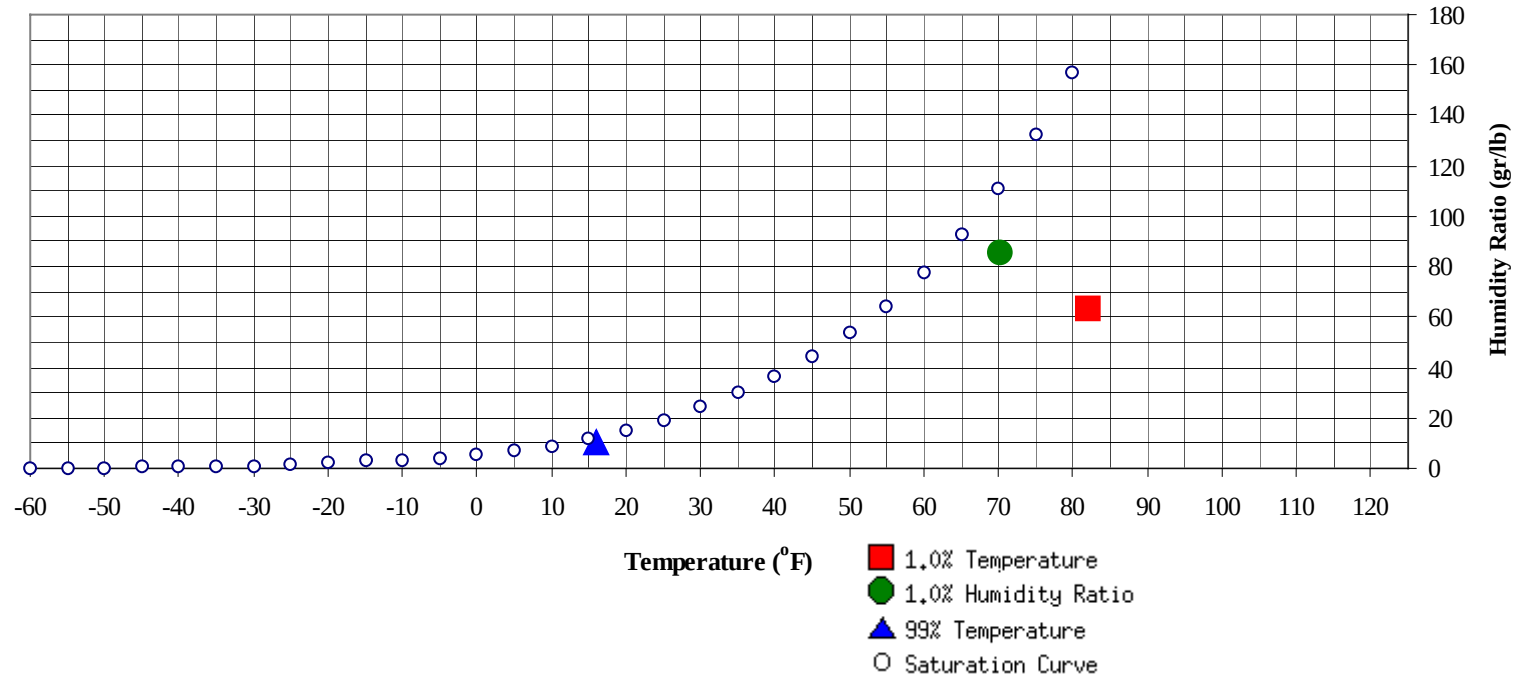


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

BERLIN/TEMPELHOF DL

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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	16	10	5.4		85.4	70.3	65.2	62.6	30.2

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	82	63.1	64.6	29.6

BERLIN/TEMPELHOF DL

WMO No. 103840

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															
70 / 74															
65 / 69							0		0	55.0		0	0	0	53.2
60 / 64		0		0	53.0		0	0	1	51.9		1	1	2	51.8
55 / 59	0	1	0	2	49.1	0	3	1	4	49.3		5	2	7	51.0
50 / 54	3	5	4	11	47.1	2	8	5	14	46.1	8	30	27	66	46.0
45 / 49	18	23	20	60	43.3	8	21	17	45	42.8	26	52	47	125	42.3
40 / 44	31	37	39	107	39.3	20	31	31	82	38.9	50	53	54	158	38.6
35 / 39	51	61	58	169	35.3	49	51	52	152	35.0	64	54	57	175	34.7
30 / 34	67	56	59	183	30.9	57	54	57	169	30.4	65	28	38	131	30.4
25 / 29	29	26	27	82	25.6	43	33	35	111	25.3	24	7	10	41	25.2
20 / 24	20	16	16	52	20.8	20	12	16	48	20.6	7	2	2	11	20.6
15 / 19	14	13	13	40	16.3	14	7	8	29	16.2	2	1	1	4	16.2
10 / 14	10	6	8	24	11.6	7	3	2	12	11.4	1	0		1	12.5
5 / 9	4	2	2	8	6.6	3	1	0	4	6.6					
0 / 4	2	1	1	3	1.2	1	0	0	1	2.0					
-5 / -1	1	0	0	1	-2.6										
-10 / -6	0	0		0	-5.0										

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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WMO No. 103840

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															
90 / 94												1	0	1	67.5
85 / 89							0	0	1	64.3		5	2	7	66.0
80 / 84		1	0	1	58.1		4	2	6	62.0		13	7	19	64.7
75 / 79		2	2	4	57.6		18	10	27	59.8	1	25	17	43	62.4
70 / 74		6	3	9	55.4	0	29	18	48	57.8	7	38	31	76	60.1
65 / 69	0	10	6	16	53.5	4	32	28	64	55.9	19	44	40	103	58.0
60 / 64	2	22	15	39	51.0	22	51	45	119	53.7	49	53	57	160	55.8
55 / 59	8	35	28	72	48.3	56	54	57	167	51.1	74	46	57	177	52.5
50 / 54	25	51	47	123	45.4	66	36	49	151	47.5	70	15	25	110	49.3
45 / 49	49	57	58	164	42.0	62	19	28	108	43.5	18	1	2	21	45.3
40 / 44	63	39	46	148	38.8	28	4	7	40	39.9	2		0	2	40.2
35 / 39	66	16	26	108	35.0	10	1	2	12	35.7	0			0	36.0
30 / 34	22	2	6	30	30.6	1		0	1	30.7					
25 / 29	4	0	1	5	26.0										
20 / 24	0			0	22.8										
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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WMO No. 103840

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	1	68.9		1	0	1	68.9					
90 / 94		3	1	4	67.8		2	1	3	68.4					
85 / 89		12	7	19	66.1		7	4	11	66.8		0		0	67.7
80 / 84		24	16	40	64.9	0	20	12	32	64.7		4	1	5	65.7
75 / 79	2	35	26	63	63.0	1	36	24	62	63.1		8	3	11	63.5
70 / 74	17	50	45	112	61.2	10	55	47	112	61.3	0	22	13	35	61.0
65 / 69	35	47	49	131	59.4	35	52	52	139	59.5	5	34	25	65	58.8
60 / 64	76	52	59	187	56.9	77	50	63	191	57.1	27	70	58	155	56.2
55 / 59	87	23	37	148	53.8	85	21	37	143	54.0	67	70	74	211	52.8
50 / 54	30	2	5	37	50.3	36	3	6	46	50.3	90	29	51	170	49.4
45 / 49	1		0	1	46.5	4		0	4	46.4	40	3	13	56	45.3
40 / 44											10	0	1	11	41.0
35 / 39											1			1	36.5
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															

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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															
85 / 89															
80 / 84		0		0	65.0										
75 / 79		0	0	1	64.4										
70 / 74		5	1	6	60.9										
65 / 69	0	10	5	15	58.2										
60 / 64	3	28	18	49	55.6	0	1	0	1	53.8					
55 / 59	24	51	46	121	52.6	2	10	5	17	51.5	0	2	1	3	50.5
50 / 54	59	66	62	188	48.7	15	27	21	63	48.0	8	11	10	29	48.1
45 / 49	64	51	59	173	44.3	38	54	49	141	44.0	21	27	23	71	44.0
40 / 44	47	24	36	108	40.1	54	59	61	174	39.9	34	43	43	120	39.7
35 / 39	37	10	16	64	36.0	65	52	57	174	35.7	60	61	61	182	35.5
30 / 34	12	2	3	17	31.1	42	27	32	101	30.8	60	54	55	169	31.0
25 / 29	1			1	27.4	18	9	11	37	26.1	35	30	33	98	25.8
20 / 24						4	2	3	9	22.0	15	10	12	38	21.3
15 / 19						1	0	1	2	17.4	10	6	6	21	16.7
10 / 14											3	2	3	8	11.9
5 / 9											1	1	1	3	6.3
0 / 4											0	0	0	1	0.6
-5 / -1															
-10 / -6															

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WMO No. 103840

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	68.9
90 / 94		6	2	8	68.0
85 / 89		24	13	37	66.3
80 / 84	0	65	38	103	64.6
75 / 79	4	124	82	210	62.4
70 / 74	34	205	158	397	60.4
65 / 69	98	230	205	533	58.4
60 / 64	256	332	316	904	55.8
55 / 59	405	329	352	1087	52.3
50 / 54	412	285	313	1010	48.1
45 / 49	349	309	317	975	43.5
40 / 44	341	293	320	954	39.4
35 / 39	404	307	331	1042	35.3
30 / 34	327	224	251	801	30.7
25 / 29	156	105	116	377	25.6
20 / 24	67	42	48	157	20.9
15 / 19	42	27	28	96	16.4
10 / 14	21	11	13	45	11.6
5 / 9	8	5	3	15	6.6
0 / 4	3	1	1	5	1.3
-5 / -1	1	0	0	1	-2.6
-10 / -6	0	0		0	-5.0

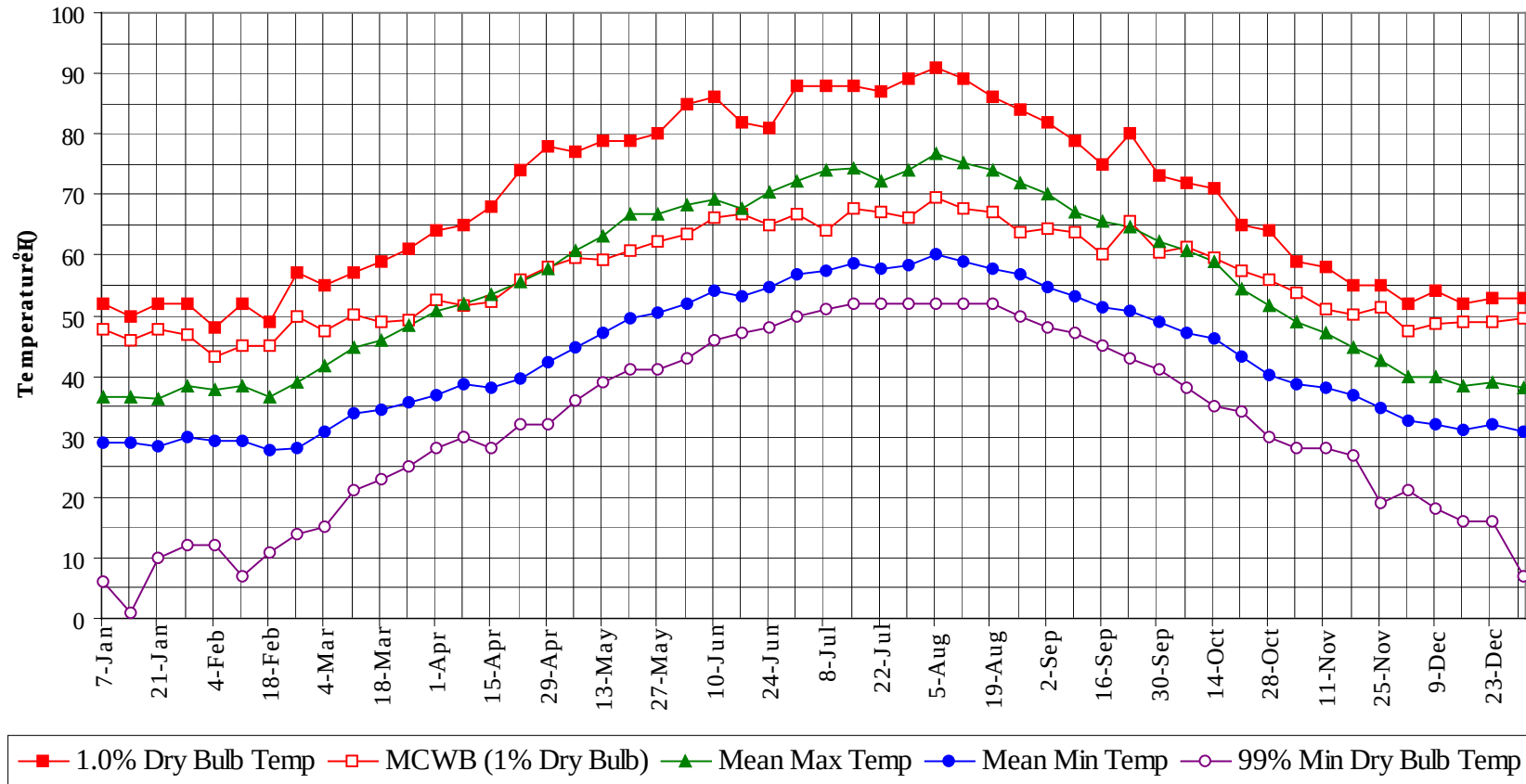
Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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WMO No. 103840

Annual Summary of Temperatures

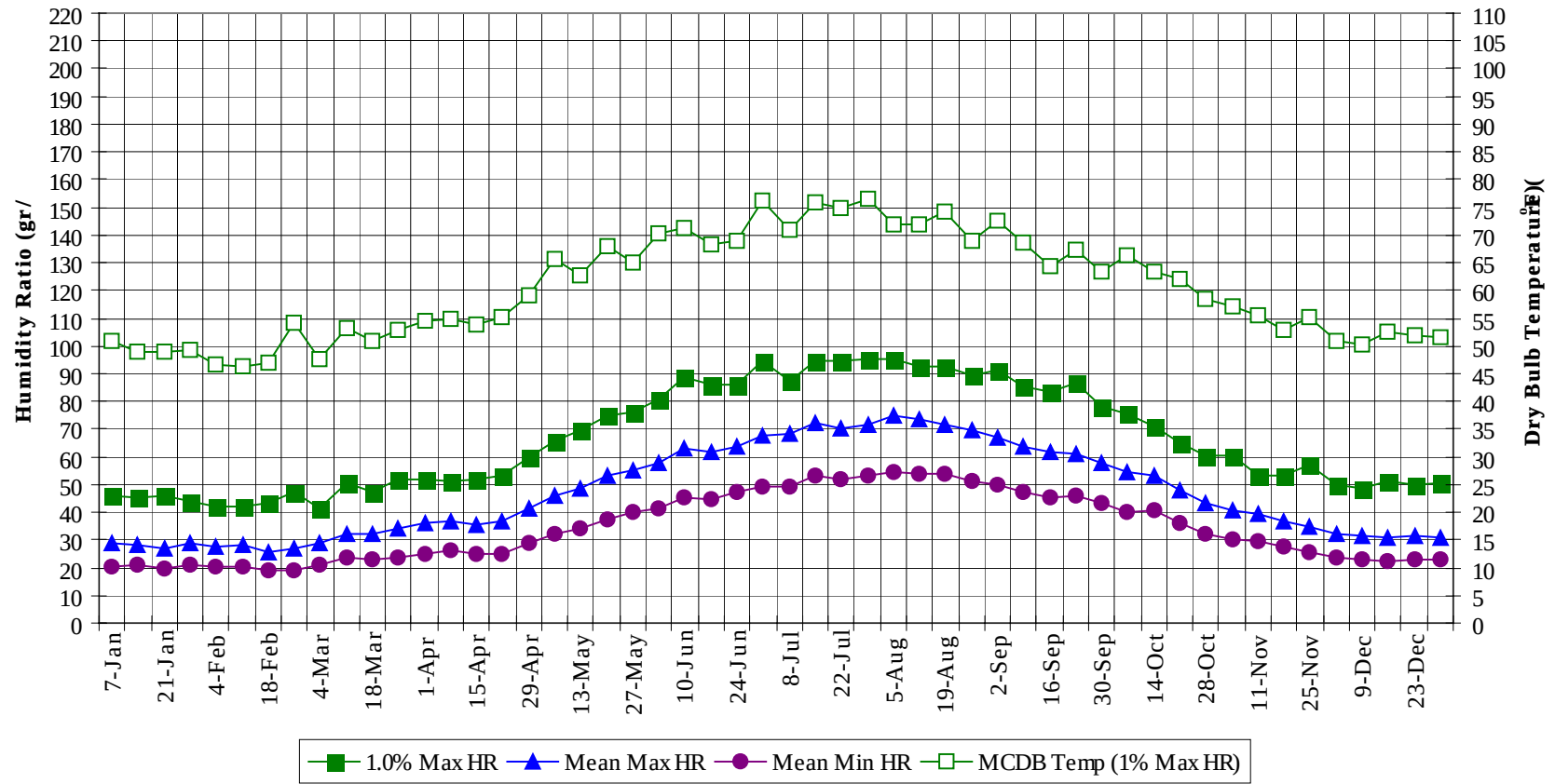


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WMO No. 103840

Long Term Humidity and Dry Bulb Temperature Summary



BERLIN/TEMPELHOF**DL****WMO No. 103840****Long Term Dry Bulb Temperature and Humidity Summary**

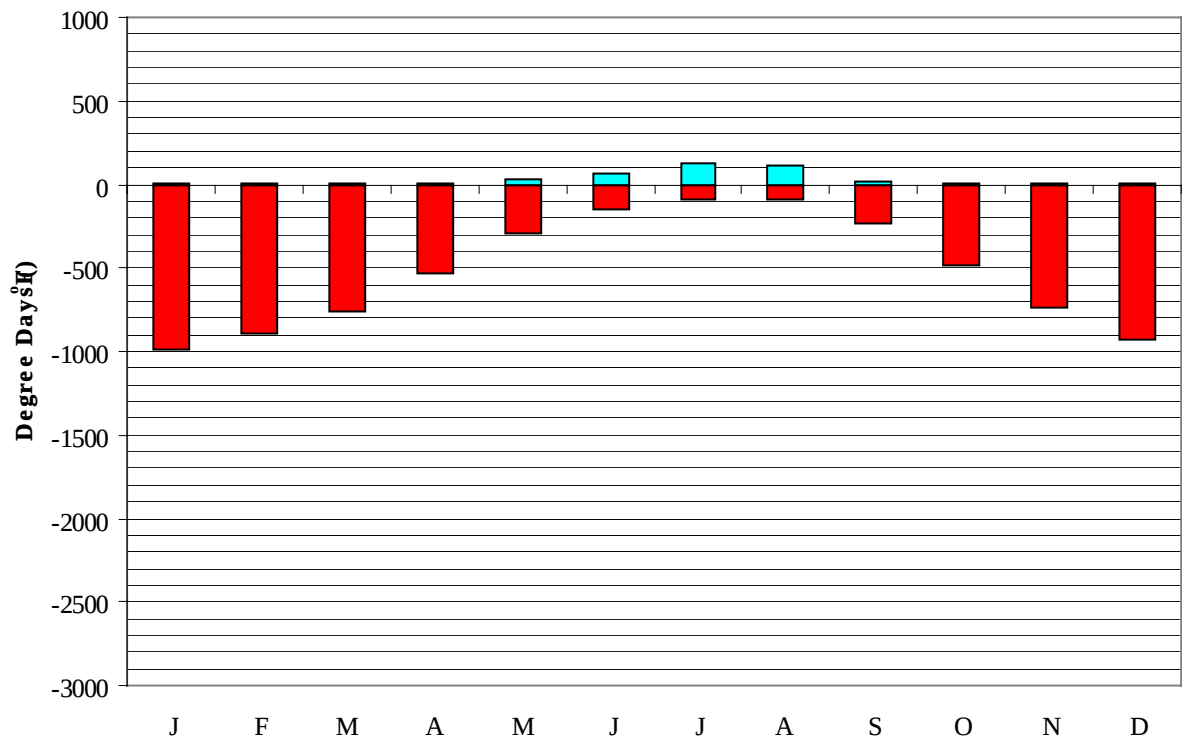
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	52.0	47.8	36.6	28.9	6.0	46.2	50.8	28.7	20.3
14-Jan	50.0	45.9	36.6	29.0	1.0	45.5	49.0	28.5	21.0
21-Jan	52.0	47.8	36.4	28.5	10.0	46.2	48.8	27.2	19.5
28-Jan	52.0	46.7	38.2	30.0	12.0	44.1	49.3	29.2	21.0
4-Feb	48.0	43.1	37.9	29.4	12.0	42.0	46.7	27.6	20.3
11-Feb	52.0	45.1	38.3	29.3	7.0	42.0	46.3	28.2	20.7
18-Feb	49.0	44.9	36.4	27.8	11.0	43.4	46.8	25.9	19.0
25-Feb	57.0	49.8	38.9	28.1	14.0	47.6	54.2	26.7	19.0
4-Mar	55.0	47.3	41.8	30.8	15.0	41.3	47.6	29.1	21.2
11-Mar	57.0	50.2	44.8	33.8	21.0	50.4	53.1	31.9	23.4
18-Mar	59.0	48.9	45.8	34.3	23.0	47.6	50.7	32.2	23.2
25-Mar	61.0	49.2	48.2	35.6	25.0	51.8	52.8	33.8	23.7
1-Apr	64.0	52.6	50.8	37.0	28.0	51.8	54.4	35.9	25.0
8-Apr	65.0	51.6	52.0	38.6	30.0	51.1	54.7	36.9	26.5
15-Apr	68.0	52.3	53.4	38.2	28.0	51.8	53.7	35.3	24.7
22-Apr	74.0	55.9	55.7	39.7	32.0	53.2	55.1	37.0	25.2
29-Apr	78.0	58.0	57.9	42.2	32.0	59.5	59.1	41.2	29.0
6-May	77.0	59.4	60.8	44.6	36.0	65.8	65.6	46.0	32.4
13-May	79.0	59.2	63.3	47.3	39.0	69.3	62.9	48.7	34.4
20-May	79.0	60.8	66.8	49.5	41.0	74.9	68.1	53.0	37.5
27-May	80.0	62.3	66.8	50.4	41.0	76.3	64.9	55.5	39.8
3-Jun	85.0	63.5	68.1	51.9	43.0	80.5	70.3	57.8	41.7
10-Jun	86.0	66.2	69.1	54.0	46.0	88.9	71.2	63.0	45.4
17-Jun	82.0	66.7	67.8	53.1	47.0	86.1	68.2	61.7	44.6
24-Jun	81.0	64.9	70.4	54.7	48.0	86.1	69.1	63.4	47.4
1-Jul	88.0	66.7	72.3	56.7	50.0	94.5	76.2	67.5	49.5
8-Jul	88.0	64.1	73.9	57.4	51.0	87.5	71.0	68.3	49.0
15-Jul	88.0	67.8	74.5	58.5	52.0	94.5	75.9	72.3	53.2
22-Jul	87.0	67.0	72.1	57.8	52.0	94.5	75.0	70.2	52.0
29-Jul	89.0	66.2	74.1	58.2	52.0	95.2	76.6	71.5	53.1
5-Aug	91.0	69.4	76.6	60.0	52.0	95.2	71.9	74.9	54.2
12-Aug	89.0	67.6	75.1	59.0	52.0	92.4	71.8	73.3	53.9
19-Aug	86.0	67.2	74.0	57.8	52.0	92.4	74.2	71.6	53.7
26-Aug	84.0	63.7	71.8	56.7	50.0	89.6	69.1	69.9	51.3
2-Sep	82.0	64.3	70.1	54.6	48.0	91.0	72.6	67.0	50.1
9-Sep	79.0	63.7	67.2	53.1	47.0	85.4	68.7	63.7	47.0
16-Sep	75.0	60.1	65.5	51.5	45.0	83.3	64.3	61.8	45.2
23-Sep	80.0	65.5	64.6	50.9	43.0	86.5	67.2	61.2	46.2
30-Sep	73.0	60.3	62.1	49.1	41.0	78.4	63.4	58.0	43.3
7-Oct	72.0	61.2	60.7	47.1	38.0	75.6	66.2	54.6	40.3
14-Oct	71.0	59.5	58.9	46.1	35.0	70.7	63.5	53.4	40.7
21-Oct	65.0	57.3	54.4	43.1	34.0	65.1	62.0	47.8	36.2
28-Oct	64.0	55.9	51.6	40.3	30.0	60.2	58.6	43.2	32.4
4-Nov	59.0	53.7	48.8	38.8	28.0	60.2	57.1	40.9	30.4
11-Nov	58.0	51.0	47.3	38.1	28.0	53.2	55.5	39.3	29.5
18-Nov	55.0	50.0	44.6	36.7	27.0	53.2	53.0	36.5	27.6
25-Nov	55.0	51.4	42.7	34.8	19.0	57.4	55.3	35.1	25.7
2-Dec	52.0	47.5	40.0	32.7	21.0	49.7	50.8	31.9	23.7
9-Dec	54.0	48.8	39.8	32.1	18.0	48.3	50.3	31.7	23.1
16-Dec	52.0	48.8	38.2	31.2	16.0	51.1	52.4	31.0	22.5
23-Dec	53.0	48.9	39.1	31.9	16.0	49.7	51.8	31.4	23.0
31-Dec	53.0	49.6	38.0	30.9	7.0	50.4	51.4	30.8	22.7

BERLIN/TEMPELHOF

DL

WMO No. 103840

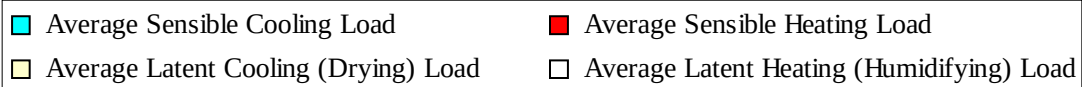
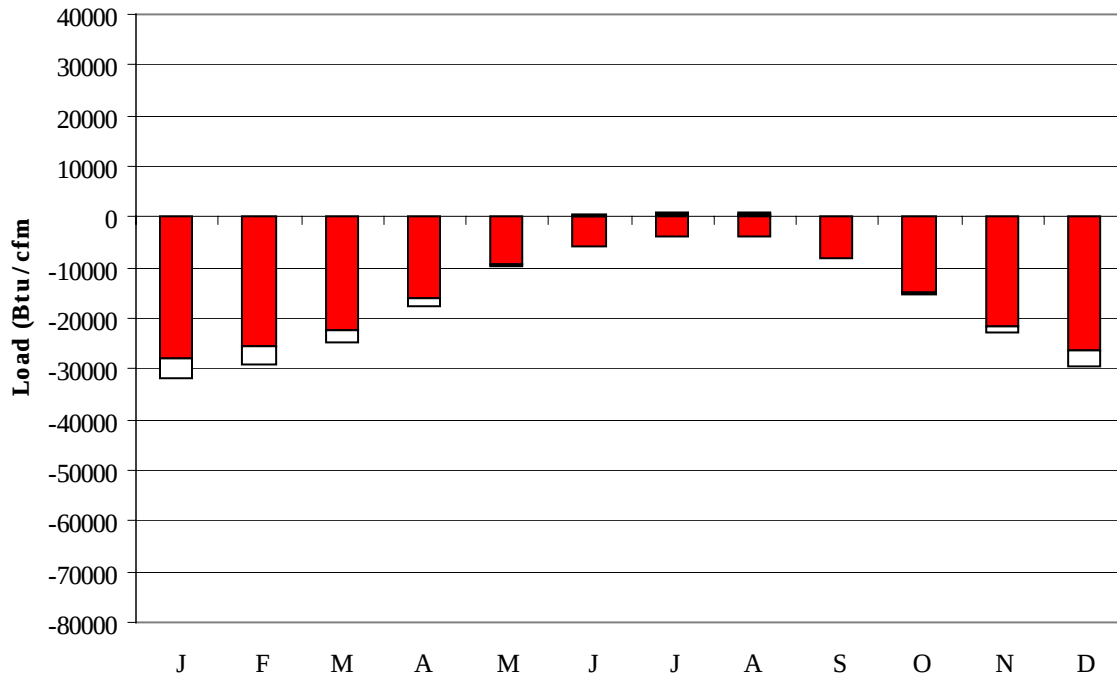
Degree Days, Heating and Cooling
(Base 65°F)



Mean Cooling Degree Days Mean Heating Degree Days

	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	987
FEB	0	894
MAR	0	764
APR	6	536
MAY	35	288
JUN	69	153
JUL	120	89
AUG	108	92
SEP	23	232
OCT	3	485
NOV	0	736
DEC	0	925
ANN	364	6181

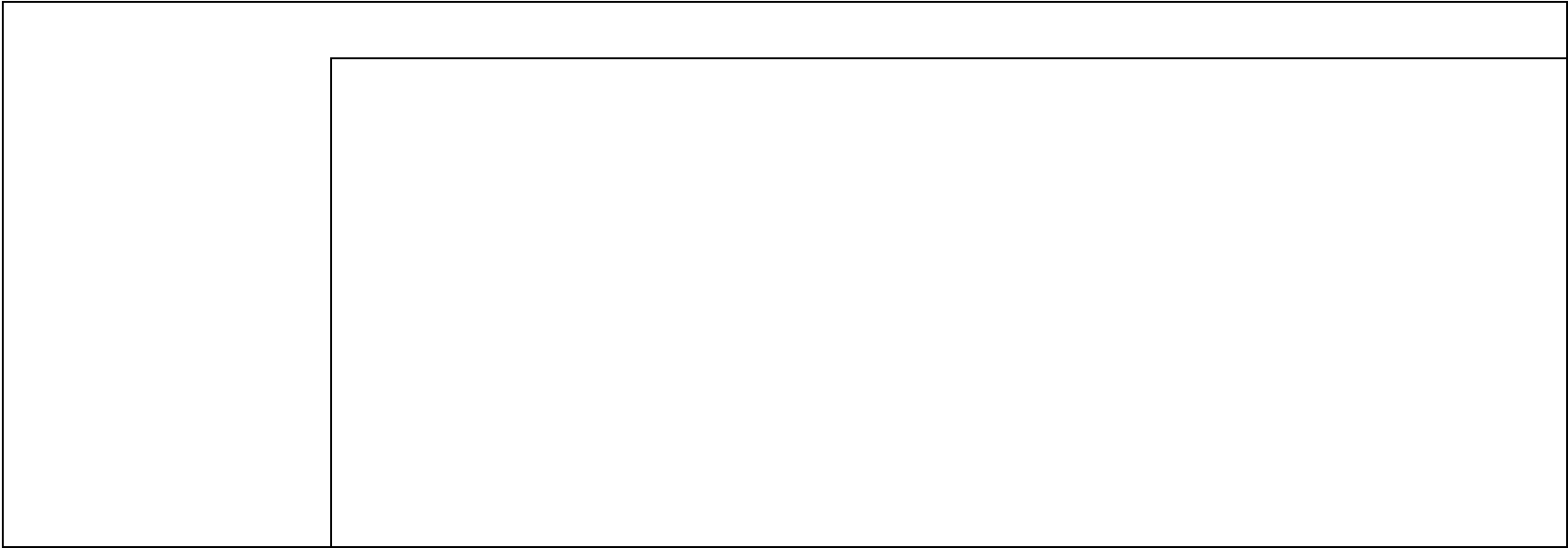
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	0	-28002	0	-3833
FEB	0	-25369	0	-3773
MAR	0	-22205	0	-2566
APR	17	-16153	0	-1452
MAY	94	-9496	6	-266
JUN	321	-5632	125	-16
JUL	713	-3692	287	-3
AUG	547	-3827	257	-2
SEP	55	-8053	65	-16
OCT	1	-14939	1	-350
NOV	0	-21402	0	-1472
DEC	0	-26398	0	-2979
ANN	1748	-185168	741	-16728

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

No Solar Radiation
Data Available

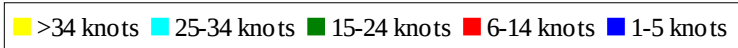
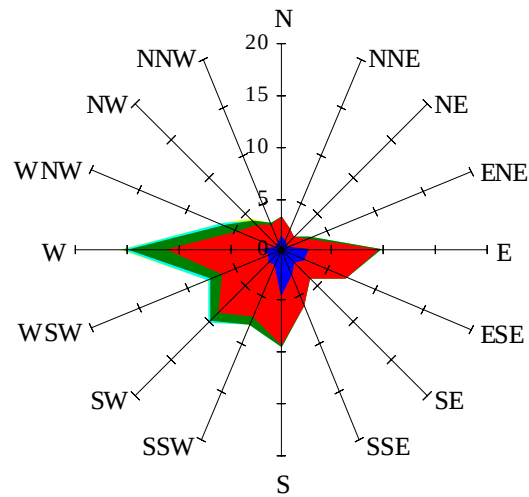


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

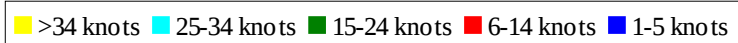
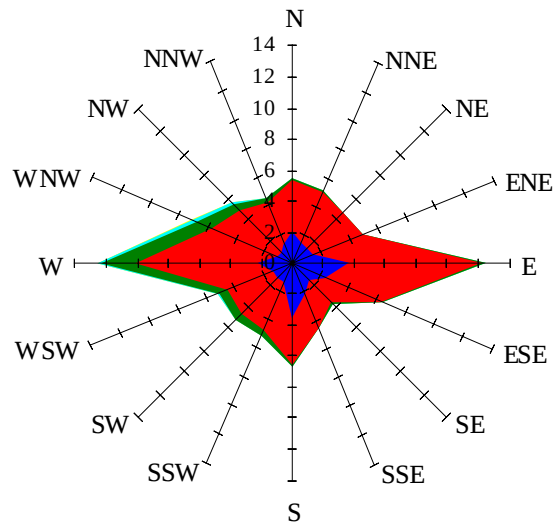
Labels of Percent Frequency on North Axis



Percent Calm = 1.35

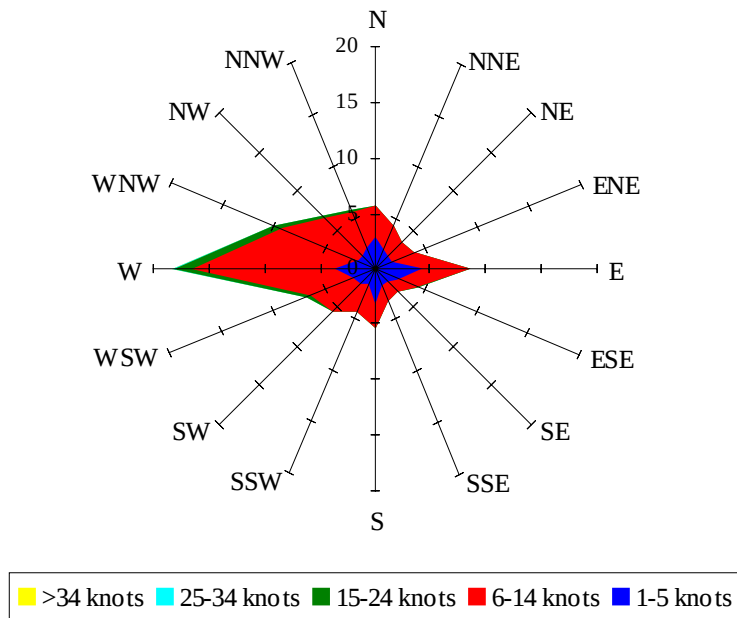
Wind Summary - March, April, and May

Labels of Percent Frequency on North Axis



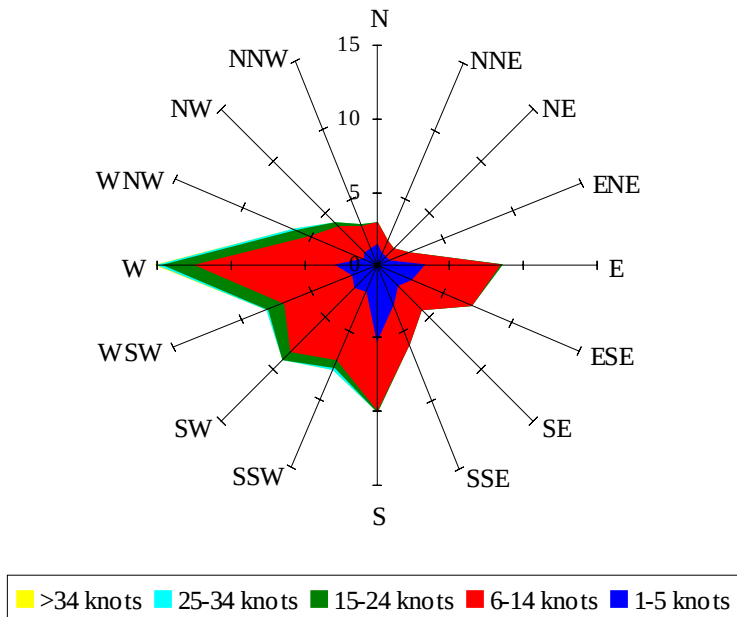
Percent Calm = 2.27

Wind Summary - June, July, and August **Labels of Percent Frequency on North Axis**



Percent Calm = 3.51

Wind Summary - September, October, and November **Labels of Percent Frequency on North Axis**



Percent Calm = 3.05