TOLEDO OH	
Latitude = 41.60 N	WMO No. 725360
Longitude = 83.80 W	Elevation = 692 feet
Period of Record = 1973 to 1996	Average Pressure = 29.26 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	96	76	105	11.6	SW
0.4% Occurrence	91	74	104	10.9	SW
1.0% Occurrence	88	73	99	10.4	SW
2.0% Occurrence	85	71	95	10.1	SW
Mean Daily Range	18	-	-	-	-
97.5% Occurrence	10	9	7	9.8	WSW
99.0% Occurrence	3	2	5	9.6	WSW
99.6% Occurrence	-3	-4	3	9.4	WSW
Median of Extreme Lows	-10	-10	2	12.8	WSW
		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	80	90	138	10.6	WSW
0.4% Occurrence	77	86	126	9.9	SW
1.0% Occurrence	75	84	118	9.4	SW
2.0% Occurrence	74	82	115	9.1	SW
		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	148	88	0.97	9.4	WSW
0.4% Occurrence	130	83	0.85	8.9	SW
1.0% Occurrence	125	81	0.82	8.1	SW
2.0% Occurrence	118	79	0.77	8.4	SSW
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	20	537	276	1049

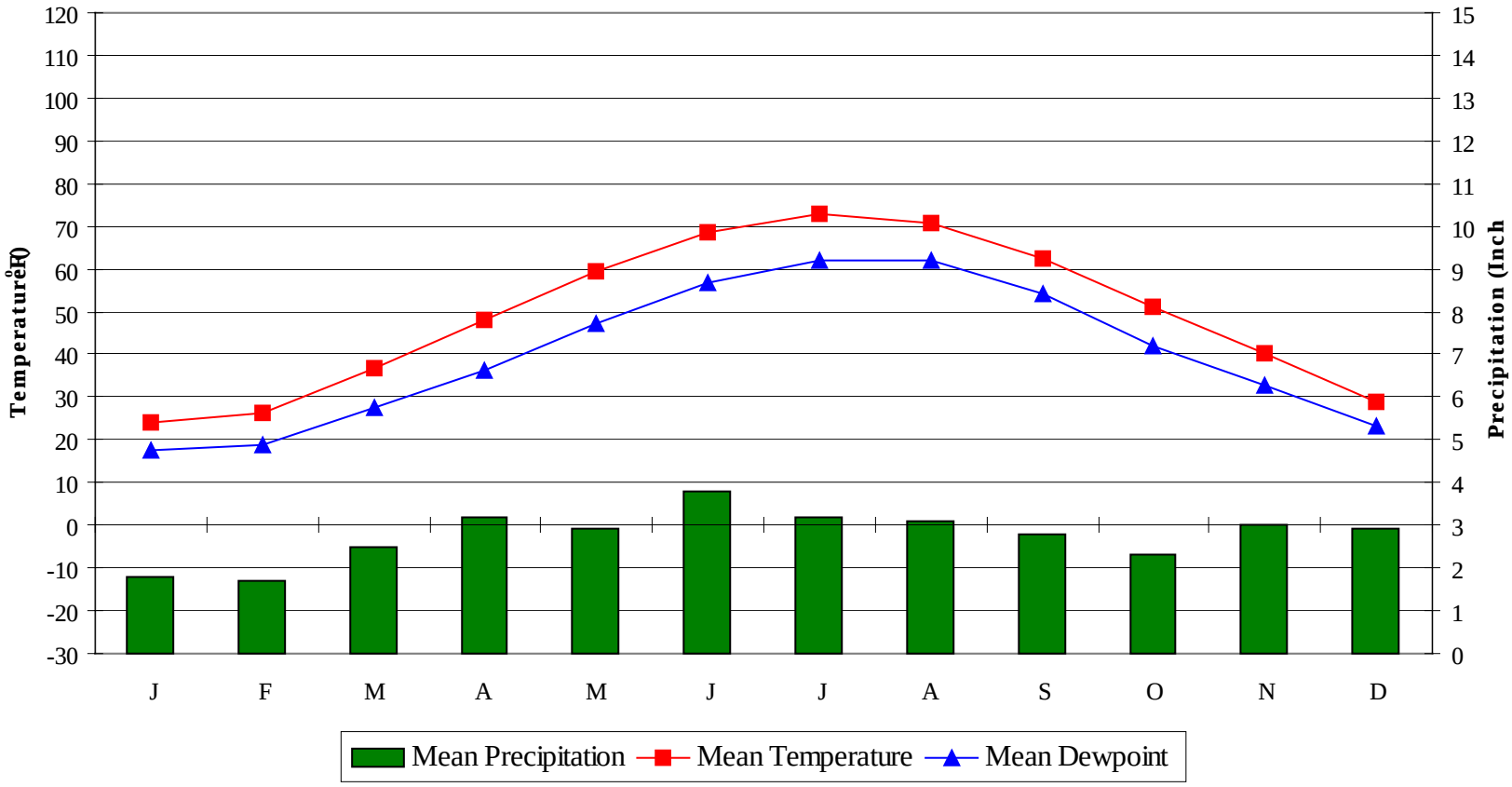
Other Site Data

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
6	2.8	90	1.5 + 0.5
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 (#)**
51.7	N/A	10	62

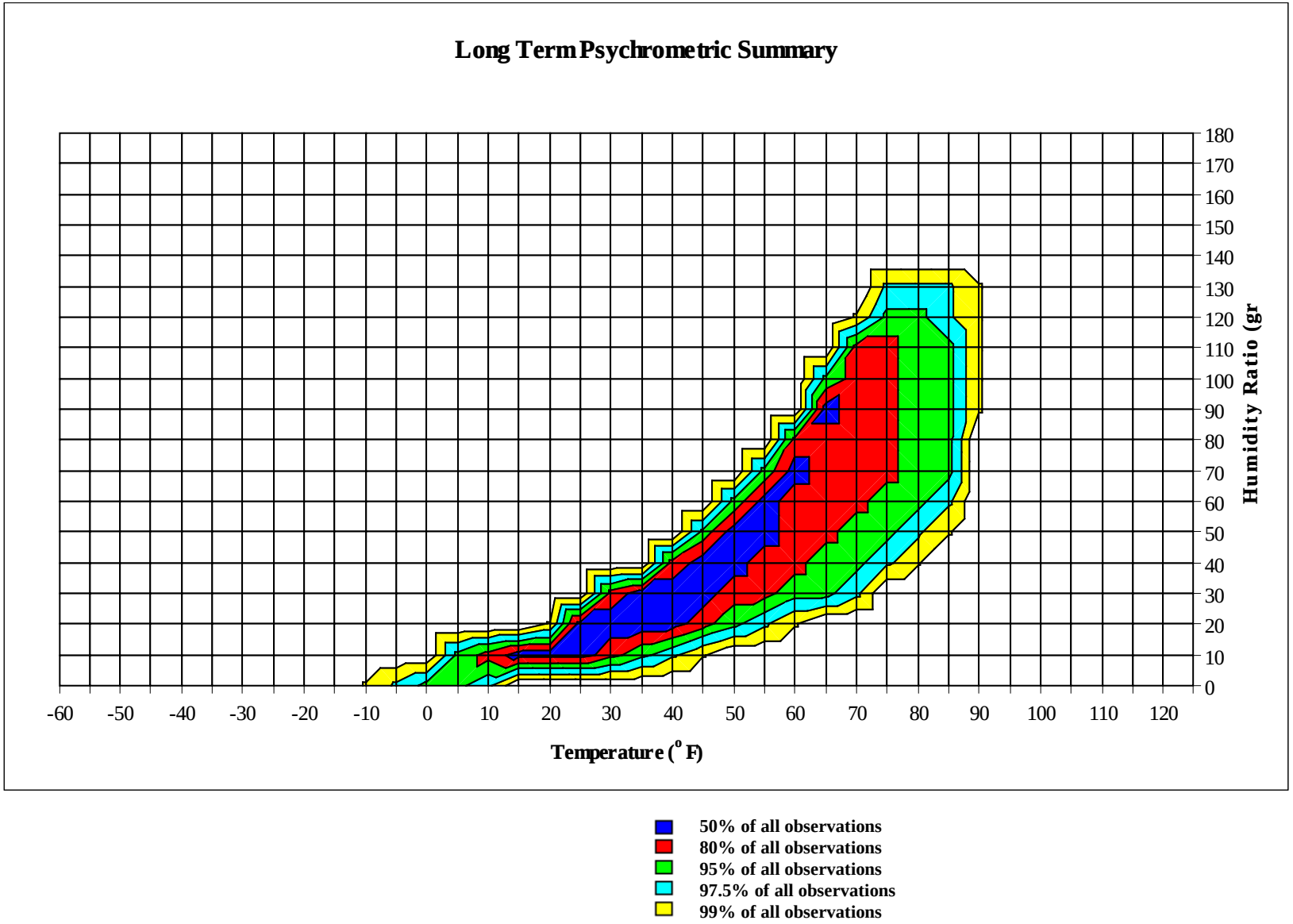
*Note: Temperatures at greater depths can be estimated by adding 1.5^oF per 100 feet additional depth.

TOLEDO **OH** WMO No. 725360

Average Annual Climate

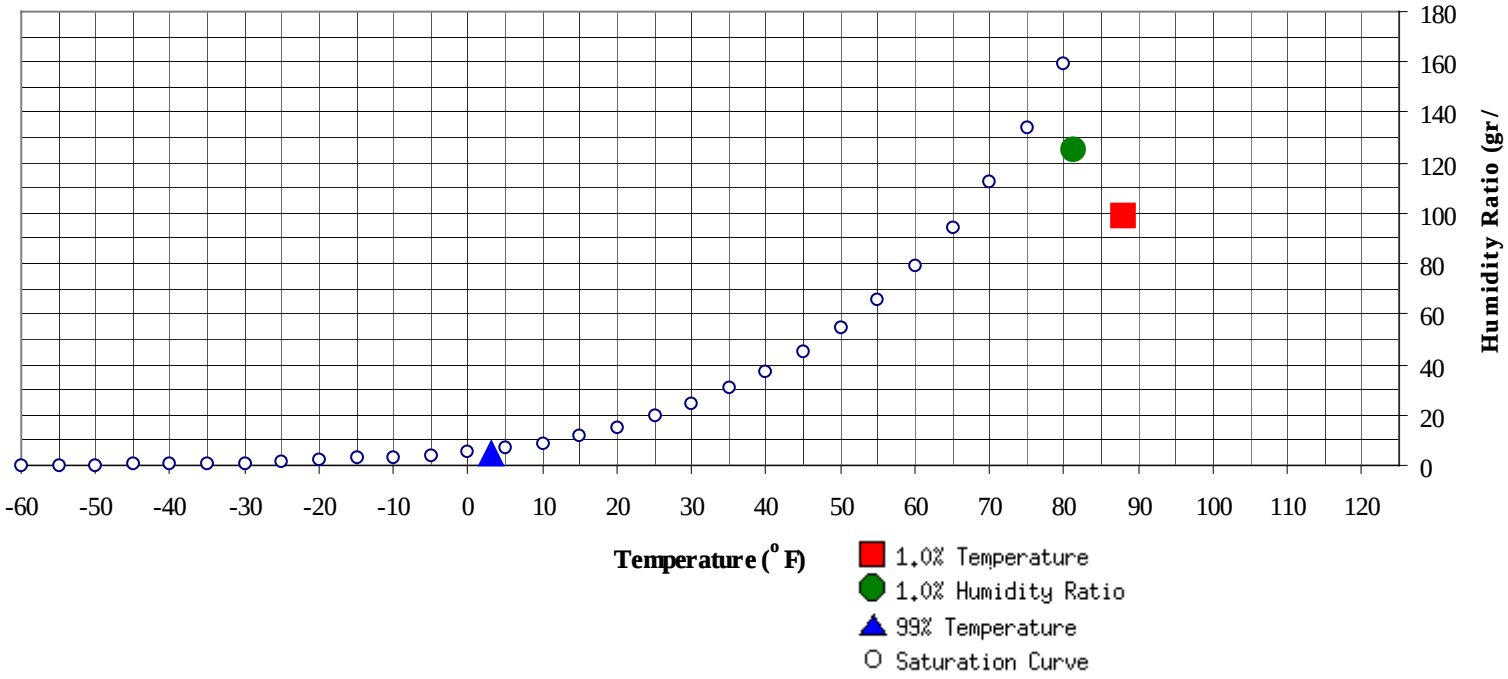


TOLEDO **OH** WMO No. 725360



TOLEDO **OH** WMO No. 725360

Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
99% Dry Bulb	3	4.6	1.4

		MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
1.0% Humidity Ratio	(gr/lb)				
	125.3	81.2	75.3	73	39.1

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	88	99.1	72.6	36.7

TOLEDO OH WMO No. 725360

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

Period of Record = 1973 to 1996

Temperature Range (°F)	January Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	February Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	March Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79												2	0	2	60.6
70 / 74												4	2	7	57.8
65 / 69		0		0	58.0		0	0	0	61.0	0	6	4	11	56.5
60 / 64		1	0	1	56.4		1	0	2	51.5	3	9	7	19	53.6
55 / 59	1	1	2	4	53.3	0	3	2	5	49.8	7	13	10	31	50.6
50 / 54	2	3	4	9	48.3	2	5	4	11	46.1	8	22	17	47	46.2
45 / 49	4	6	4	14	42.8	4	10	7	20	42.5	13	26	20	59	41.9
40 / 44	8	11	11	30	39.0	9	20	14	43	38.2	20	39	35	94	37.9
35 / 39	18	32	22	72	34.0	21	32	33	86	34.1	40	48	48	135	33.7
30 / 34	44	48	50	142	30.0	44	38	38	120	30.1	57	38	46	141	29.5
25 / 29	35	40	39	113	25.2	30	34	34	97	24.6	40	24	32	96	24.6
20 / 24	35	34	34	103	20.3	32	30	34	97	20.1	29	11	15	54	20.2
15 / 19	33	30	31	94	15.6	22	22	24	67	15.5	15	6	7	27	15.4
10 / 14	26	20	24	70	10.9	21	15	17	53	10.7	9	2	3	14	10.8
5 / 9	17	10	13	39	6.2	18	9	9	36	6.2	4	1	1	5	6.2
0 / 4	12	6	7	25	1.3	13	3	6	22	1.2	1		0	1	1.8
-5 / -1	7	2	4	13	-2.9	6	1	2	9	-3.0	1			1	-3.1
-10 / -6	4	2	2	9	-7.3	3	0	0	3	-7.1	0			0	-6.0
-15 / -11	2	1	1	4	-12.2	1			1	-10.8					
-20 / -16	1	0	0	2	-16.7										
-25 / -21	0			0	-20.0										

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.

TOLEDO OH WMO No. 725360

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)
100 / 104												0	0	0	75.0
95 / 99												1	1	2	73.8
90 / 94							2	0	2	69.7	0	8	3	11	71.9
85 / 89		1	0	1	65.1		10	3	13	69.3	0	23	10	34	70.4
80 / 84		5	2	7	63.4	0	20	9	30	66.6	1	42	23	66	68.4
75 / 79		7	4	11	61.7	2	25	14	40	64.1	9	53	35	97	66.1
70 / 74	1	13	8	22	59.0	7	34	24	64	61.5	31	52	50	133	64.3
65 / 69	5	19	12	37	56.5	19	41	35	95	58.6	54	35	45	134	61.8
60 / 64	13	27	19	59	53.6	35	42	44	121	55.3	54	18	37	109	57.9
55 / 59	16	29	27	72	49.8	43	35	42	120	51.8	42	7	22	71	53.8
50 / 54	21	38	35	94	45.7	49	24	38	111	47.8	28	2	11	41	49.7
45 / 49	33	37	42	111	42.2	39	12	26	77	43.7	14	0	2	17	45.5
40 / 44	50	31	42	124	38.4	31	3	12	47	39.7	5		0	5	41.2
35 / 39	43	20	27	90	34.0	17	0	3	20	35.1	0			0	38.1
30 / 34	33	9	15	57	29.7	5		0	5	30.8					
25 / 29	19	2	5	26	25.2	0			0	25.7					
20 / 24	6	1	1	8	20.7										
15 / 19	1	0	0	1	16.2										
10 / 14	1	0		1	11.2										
5 / 9	0			0	8.0										
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															

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.

TOLEDO OH WMO No. 725360

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)
100 / 104		0	0	1	78.1										
95 / 99		3	1	4	75.3		1	0	1	78.9		0		0	75.0
90 / 94	0	14	6	20	75.5		9	2	11	76.4		3	1	3	73.1
85 / 89	1	36	18	55	72.9	0	25	9	34	73.8	0	10	2	12	71.7
80 / 84	5	69	39	112	70.1	2	58	26	86	70.6	0	23	9	33	69.2
75 / 79	21	64	49	135	68.2	12	67	47	126	68.8	3	35	17	55	67.1
70 / 74	54	43	59	157	66.5	44	52	60	156	66.9	14	45	32	92	64.8
65 / 69	61	16	44	121	63.4	60	26	51	138	63.7	34	47	42	123	61.8
60 / 64	56	5	21	82	59.6	64	8	32	104	59.9	37	39	46	122	57.7
55 / 59	32	0	8	40	55.3	36	2	14	52	55.5	45	25	39	109	53.6
50 / 54	13		2	15	50.8	20	0	5	25	51.0	47	11	29	86	49.9
45 / 49	2		0	2	46.9	7		1	8	46.9	30	2	14	47	45.6
40 / 44	0			0	39.0	1		0	1	42.4	19	0	7	27	41.0
35 / 39						0			0	37.7	8		2	10	37.0
30 / 34											2		0	2	32.2
25 / 29											0		0	0	25.7
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															
-25 / -21															

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.

TOLEDO OH WMO No. 725360

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)
100 / 104															
95 / 99															
90 / 94															
85 / 89		0		0	69.0										
80 / 84	0	3	1	4	64.5										
75 / 79	0	9	2	11	63.0		1		1	62.0					
70 / 74	1	18	7	27	60.6	0	2	0	3	58.6					
65 / 69	6	27	16	49	58.3	1	6	3	10	58.7	0	0	0	1	61.4
60 / 64	18	37	29	85	55.7	7	13	11	31	56.5	1	2	1	4	57.5
55 / 59	26	43	34	103	51.5	13	18	15	46	52.8	2	4	5	11	53.4
50 / 54	37	47	47	131	47.5	17	26	19	61	47.7	6	6	6	18	49.0
45 / 49	40	34	44	118	43.6	21	34	28	83	43.1	6	10	6	22	43.5
40 / 44	44	21	37	101	39.5	32	41	40	112	38.7	10	22	14	46	39.0
35 / 39	38	7	22	67	35.2	42	44	45	131	33.9	31	47	39	116	34.5
30 / 34	25	1	9	35	31.1	48	37	47	132	29.7	59	59	65	183	30.3
25 / 29	9	0	3	11	26.4	36	12	24	72	25.2	44	36	42	122	25.2
20 / 24	3		1	3	21.5	15	3	7	25	20.9	30	26	28	85	20.4
15 / 19	1		0	1	16.8	6	1	2	9	16.3	20	16	17	52	15.7
10 / 14						2	0	1	3	11.3	16	10	11	37	11.0
5 / 9						0			0	8.0	11	5	8	23	6.4
0 / 4											6	3	5	14	1.6
-5 / -1											2	1	1	4	-2.9
-10 / -6											3	0	1	4	-7.6
-15 / -11											1	0	0	2	-12.0
-20 / -16											0	0		0	-16.4
-25 / -21															

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.

TOLEDO OH WMO No. 725360

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

Period of Record = 1973 to 1996

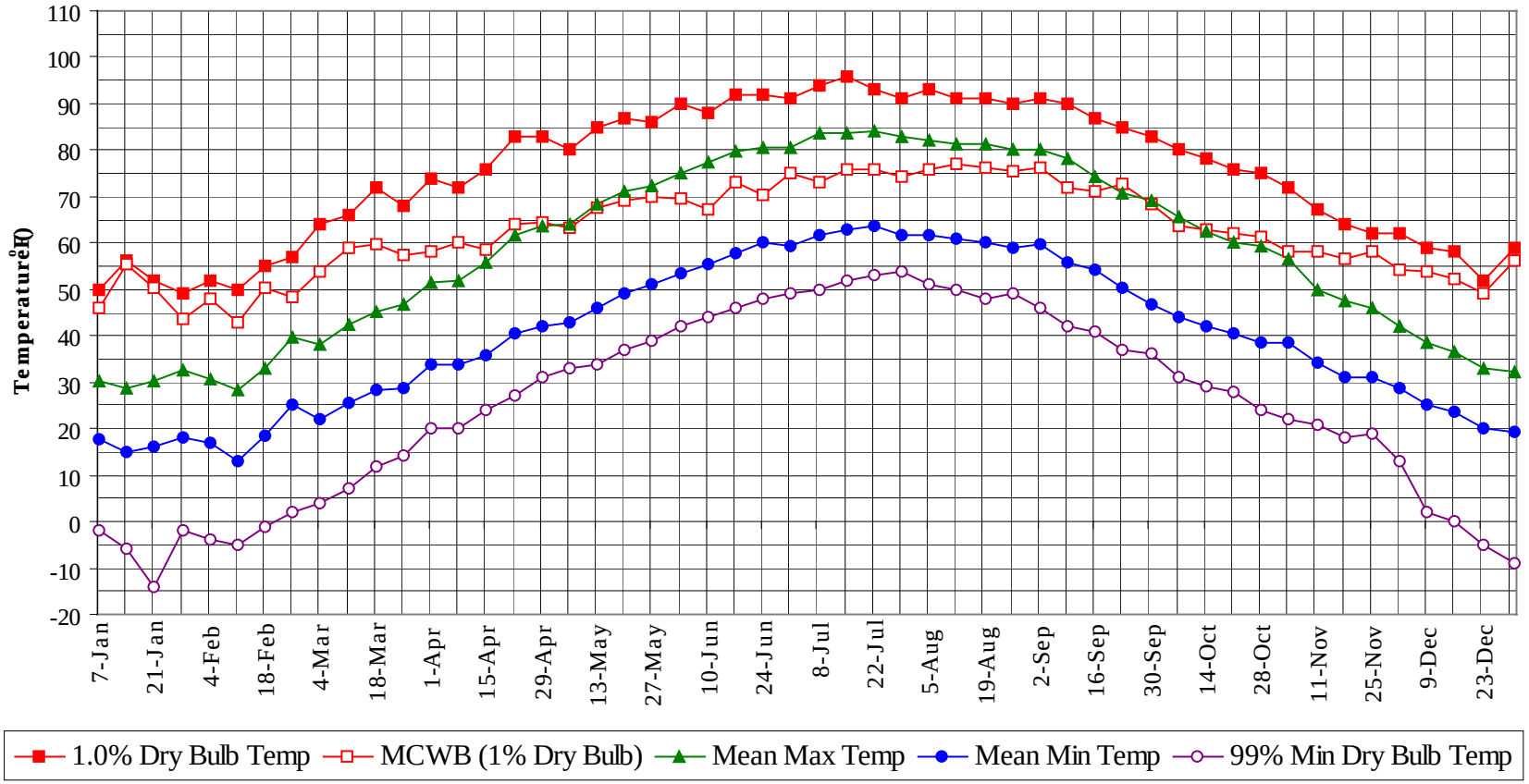
Annual Totals

Temperature Range (°F)	Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
100 / 104		1	0	1	76.9
95 / 99		6	2	7	75.5
90 / 94	0	35	11	47	74.5
85 / 89	1	105	43	149	72.1
80 / 84	8	219	108	335	69.3
75 / 79	47	261	166	475	67.2
70 / 74	152	261	242	655	64.8
65 / 69	240	222	251	713	61.4
60 / 64	286	201	249	736	57.1
55 / 59	261	181	219	661	52.6
50 / 54	251	185	215	651	47.9
45 / 49	213	172	194	580	43.3
40 / 44	230	189	214	633	38.8
35 / 39	261	230	241	732	34.2
30 / 34	318	229	272	820	30.0
25 / 29	214	148	180	541	25.0
20 / 24	151	105	120	376	20.3
15 / 19	98	74	82	254	15.6
10 / 14	75	48	55	178	10.8
5 / 9	50	24	31	104	6.2
0 / 4	32	13	17	62	1.3
-5 / -1	16	4	7	27	-2.9
-10 / -6	10	3	3	16	-7.3
-15 / -11	4	2	2	7	-12.0
-20 / -16	1	0	0	2	-16.7
-25 / -21	0			0	-20.0

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.

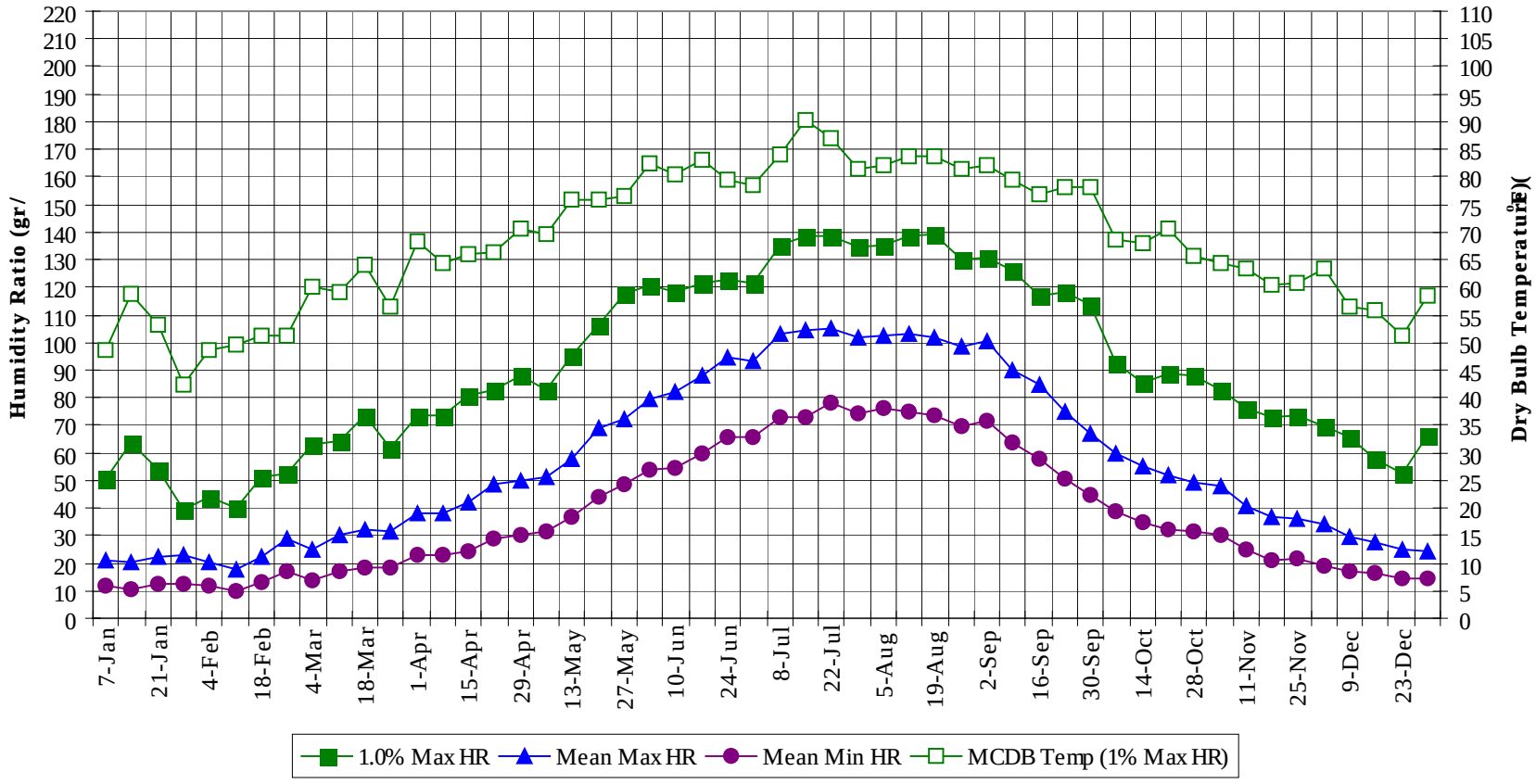
TOLEDO OH WMO No. 725360

Annual Summary of Temperatures



TOLEDO OH WMO No. 725360

Long Term Humidity and Dry Bulb Temperature Summary



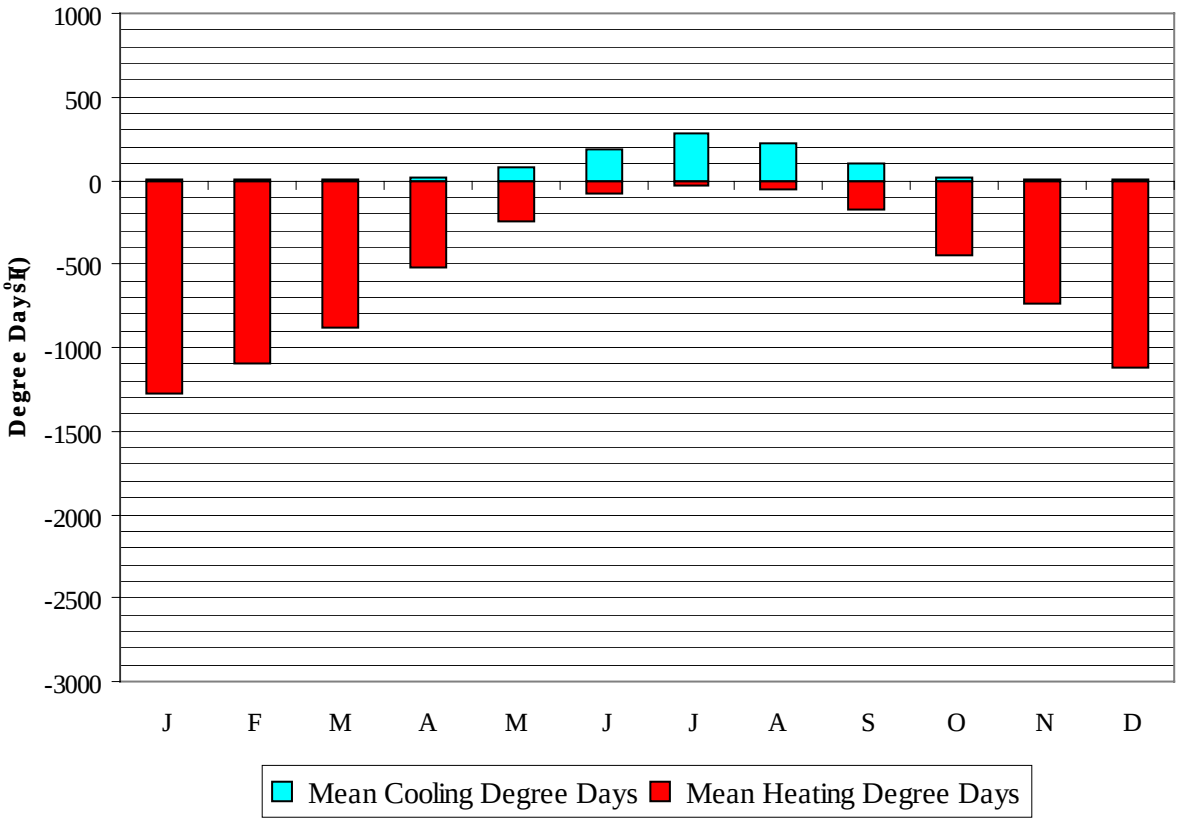
TOLEDO OH WMO No. 725360

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	50.0	46.0	30.4	17.7	-2.0	50.4	48.7	21.1	12.0
14-Jan	56.0	55.5	28.7	15.1	-6.0	63.7	58.9	20.2	10.8
21-Jan	52.0	50.1	30.2	16.0	-14.0	53.9	53.2	22.0	12.4
28-Jan	49.0	43.8	32.5	18.2	-2.0	39.2	42.5	22.8	12.3
4-Feb	52.0	47.9	30.6	16.9	-4.0	44.1	48.4	20.7	11.6
11-Feb	50.0	42.7	28.3	13.0	-5.0	39.9	49.7	17.8	9.6
18-Feb	55.0	50.4	32.8	18.3	-1.0	51.1	51.3	22.6	12.9
25-Feb	57.0	48.3	39.8	25.1	2.0	52.5	51.2	28.7	17.0
4-Mar	64.0	54.0	38.1	22.2	4.0	63.0	60.2	24.9	14.0
11-Mar	66.0	59.0	42.6	25.5	7.0	64.4	59.0	29.9	16.8
18-Mar	72.0	59.7	45.3	28.1	12.0	73.5	64.2	32.2	18.1
25-Mar	68.0	57.4	46.9	28.7	14.0	61.6	56.4	31.8	18.1
1-Apr	74.0	58.0	51.6	34.0	20.0	73.5	68.3	38.3	23.1
8-Apr	72.0	60.2	51.7	33.7	20.0	73.5	64.3	37.9	22.8
15-Apr	76.0	58.4	55.7	35.9	24.0	80.5	66.1	41.9	24.1
22-Apr	83.0	63.9	61.8	40.4	27.0	82.6	66.5	48.8	28.8
29-Apr	83.0	64.4	63.5	42.0	31.0	88.2	70.6	50.2	30.3
6-May	80.0	63.2	63.9	43.0	33.0	82.6	69.6	51.0	31.2
13-May	85.0	67.5	68.4	46.2	34.0	95.2	75.9	57.6	36.6
20-May	87.0	69.0	71.1	49.1	37.0	106.4	76.0	68.8	44.0
27-May	86.0	69.9	72.3	51.0	39.0	117.6	76.6	72.2	48.7
3-Jun	90.0	69.5	74.9	53.5	42.0	121.1	82.4	79.6	54.0
10-Jun	88.0	67.2	77.5	55.4	44.0	118.3	80.4	82.1	54.6
17-Jun	92.0	72.9	79.9	57.8	46.0	121.8	83.0	87.8	59.9
24-Jun	92.0	70.2	80.7	59.9	48.0	122.5	79.5	94.2	65.4
1-Jul	91.0	75.0	80.6	59.4	49.0	121.8	78.5	93.2	65.6
8-Jul	94.0	73.3	83.7	61.6	50.0	135.1	84.2	102.9	73.2
15-Jul	96.0	75.7	83.6	62.9	52.0	138.6	90.4	104.6	73.0
22-Jul	93.0	76.0	84.1	63.6	53.0	138.6	87.0	105.1	78.1
29-Jul	91.0	74.2	83.0	61.8	54.0	134.4	81.6	101.8	73.9
5-Aug	93.0	75.9	82.3	61.7	51.0	135.1	81.9	102.6	76.2
12-Aug	91.0	77.1	81.3	61.0	50.0	138.6	83.6	103.3	75.1
19-Aug	91.0	76.1	81.2	60.1	48.0	139.3	83.9	101.9	73.5
26-Aug	90.0	75.4	80.3	59.0	49.0	130.2	81.3	98.7	69.9
2-Sep	91.0	76.2	80.0	59.6	46.0	130.9	82.2	100.2	71.8
9-Sep	90.0	72.1	78.1	55.9	42.0	126.0	79.5	89.7	63.5
16-Sep	87.0	71.0	74.4	54.2	41.0	116.9	76.8	84.4	58.0
23-Sep	85.0	72.6	70.7	50.5	37.0	118.3	78.2	75.0	50.8
30-Sep	83.0	68.4	69.2	46.9	36.0	113.4	78.3	67.1	45.0
7-Oct	80.0	63.5	65.8	43.9	31.0	92.4	68.5	60.0	38.5
14-Oct	78.0	63.0	62.4	41.9	29.0	85.4	68.0	55.0	35.0
21-Oct	76.0	62.2	60.0	40.4	28.0	88.9	70.7	52.0	32.3
28-Oct	75.0	61.4	59.1	38.4	24.0	88.2	65.6	49.4	31.3
4-Nov	72.0	58.0	56.5	38.5	22.0	82.6	64.4	47.7	30.4
11-Nov	67.0	58.1	49.9	34.1	21.0	76.3	63.4	40.8	24.8
18-Nov	64.0	56.7	47.6	31.0	18.0	72.8	60.4	36.6	21.0
25-Nov	62.0	58.1	45.9	31.1	19.0	73.5	60.8	36.0	21.5
2-Dec	62.0	54.2	42.3	28.8	13.0	69.3	63.4	34.2	19.0
9-Dec	59.0	53.7	38.3	25.1	2.0	65.8	56.5	29.3	17.3
16-Dec	58.0	52.2	36.7	23.5	0.0	58.1	55.7	27.4	16.2
23-Dec	52.0	49.2	33.2	20.2	-5.0	52.5	51.1	24.6	14.2
31-Dec	59.0	56.0	32.1	19.4	-9.0	66.5	58.5	24.6	14.2

TOLEDO OH WMO No. 725360

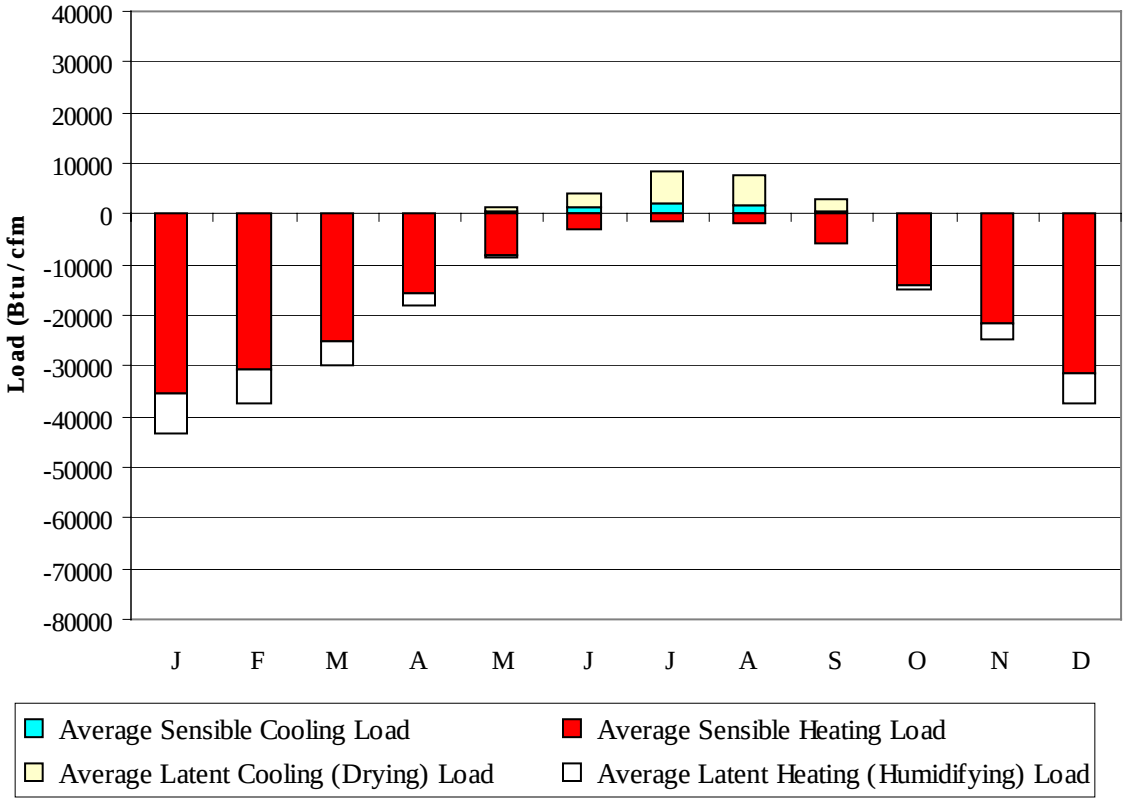
Degree Days, Heating and Cooling
(Base 65°F)



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1275
FEB	0	1099
MAR	4	876
APR	20	526
MAY	78	246
JUN	187	73
JUL	280	30
AUG	225	48
SEP	99	170
OCT	18	452
NOV	2	742
DEC	0	1114
ANN	912	6651

TOLEDO OH WMO No. 725360

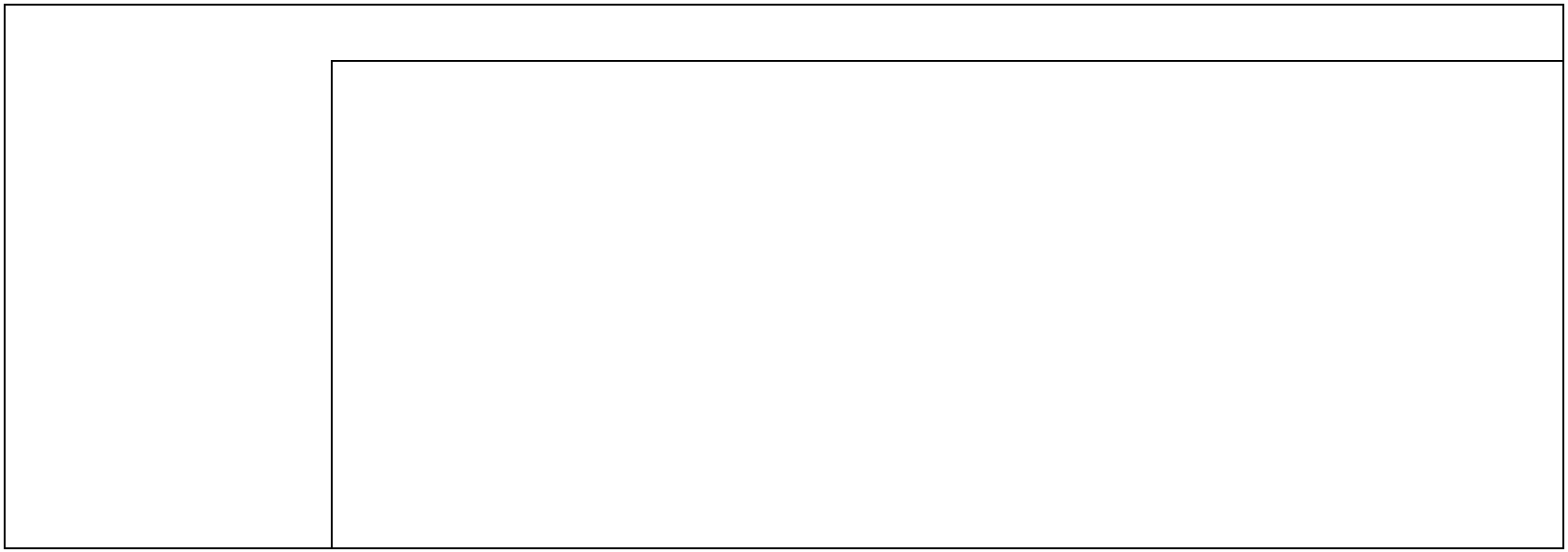
Average Ventilation and Infiltration Loads
(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)



	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	-35465	0	-7708
FEB	0	-30684	0	-6703
MAR	3	-25063	2	-4780
APR	90	-15763	27	-2155
MAY	476	-8132	786	-375
JUN	1295	-2859	2791	-12
JUL	2249	-1371	6155	0
AUG	1523	-2024	6084	0
SEP	534	-5870	2202	-51
OCT	44	-13910	106	-878
NOV	0	-21543	6	-3111
DEC	0	-31298	0	-5943
ANN	6214	-193982	18159	-31716

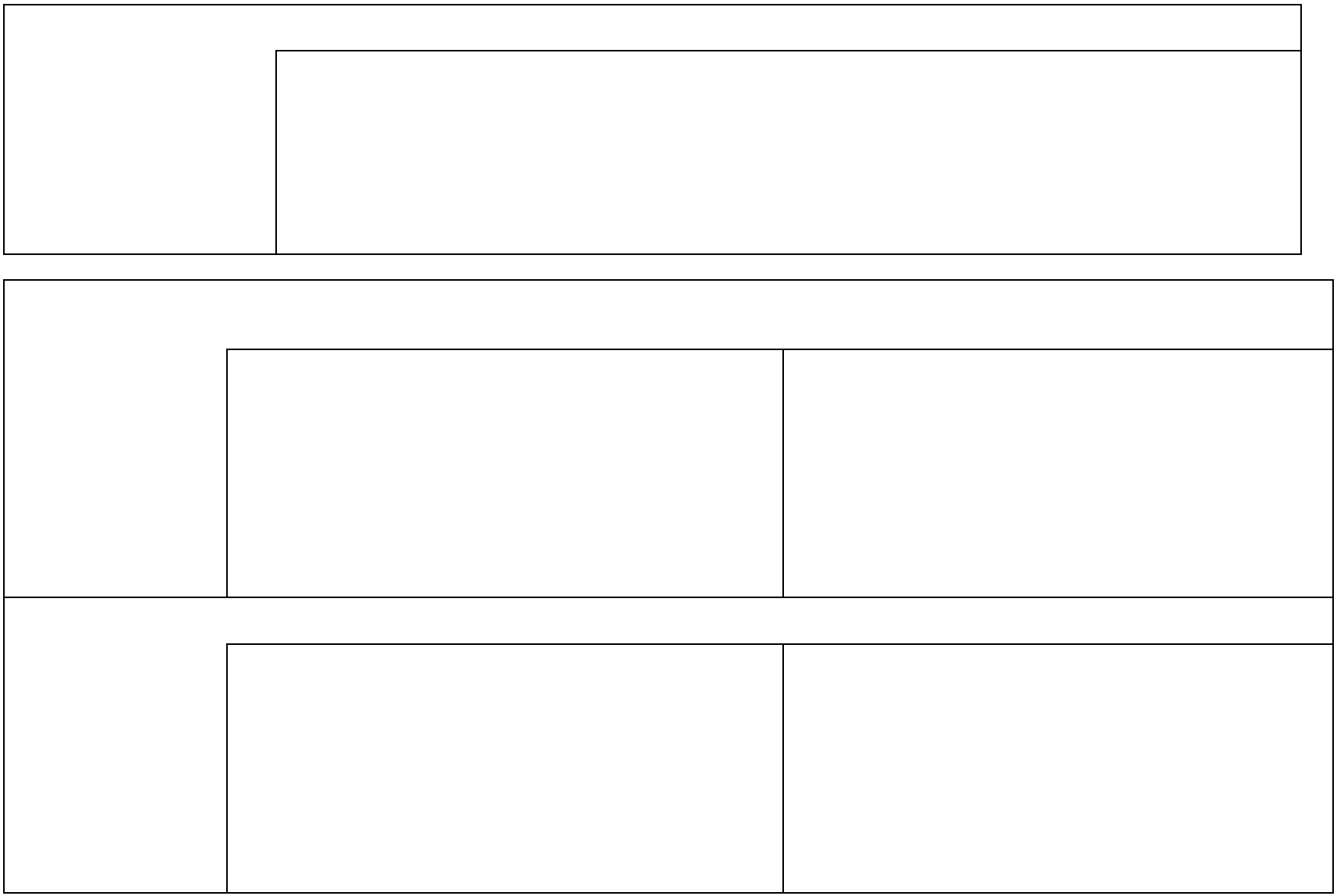
Average Annual Solar Radiation – Nearest Available Site

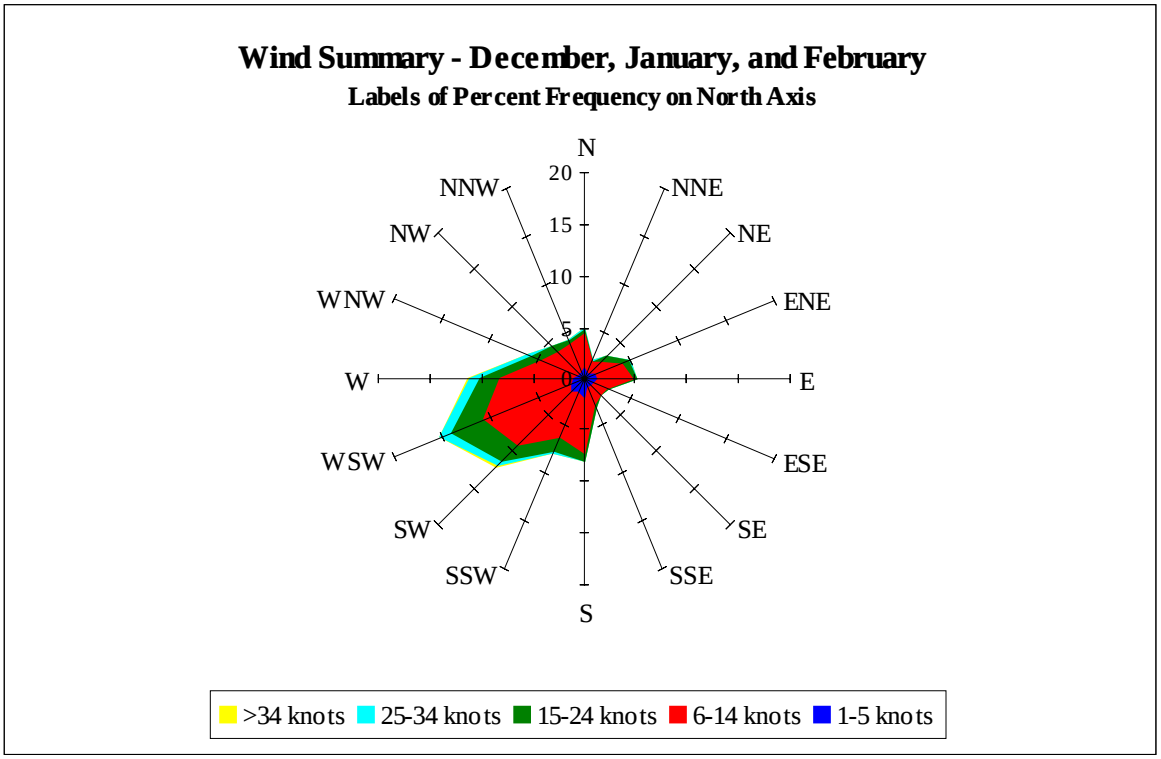
(Source: National Renewable Energy Laboratory, Golden CO, 1995)



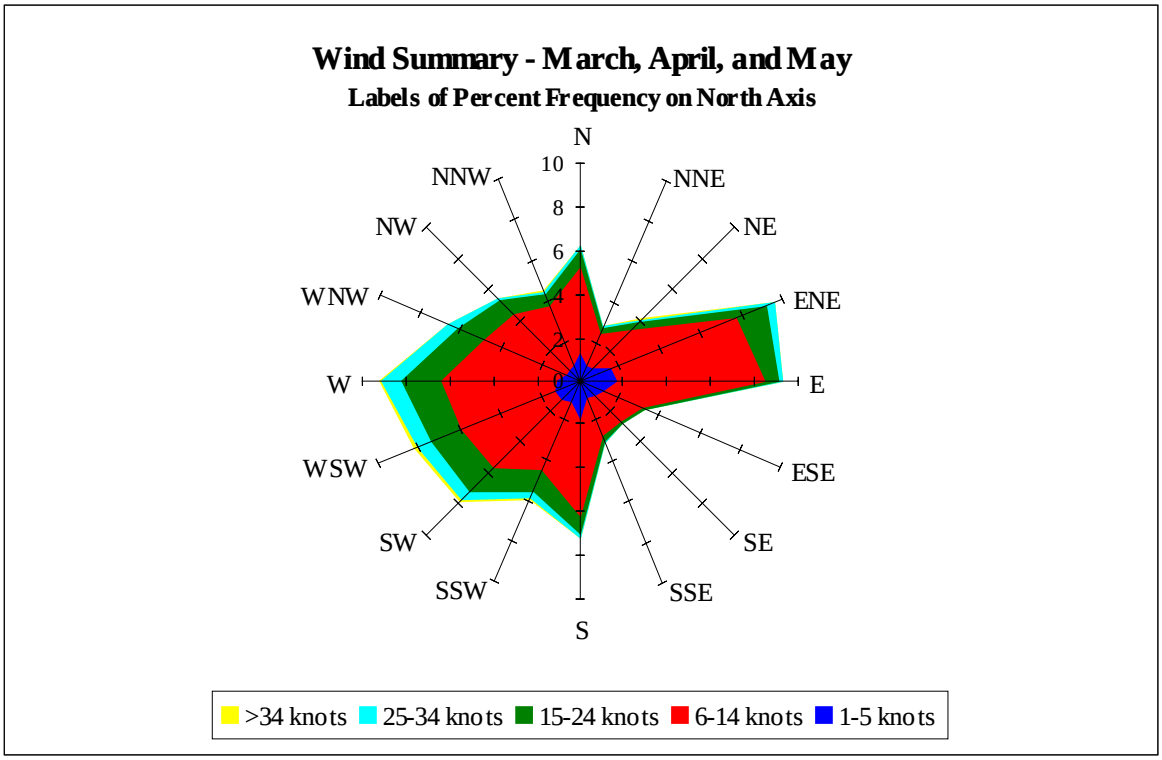
Average Annual Solar Heat and Illumination – Nearest Available Site

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

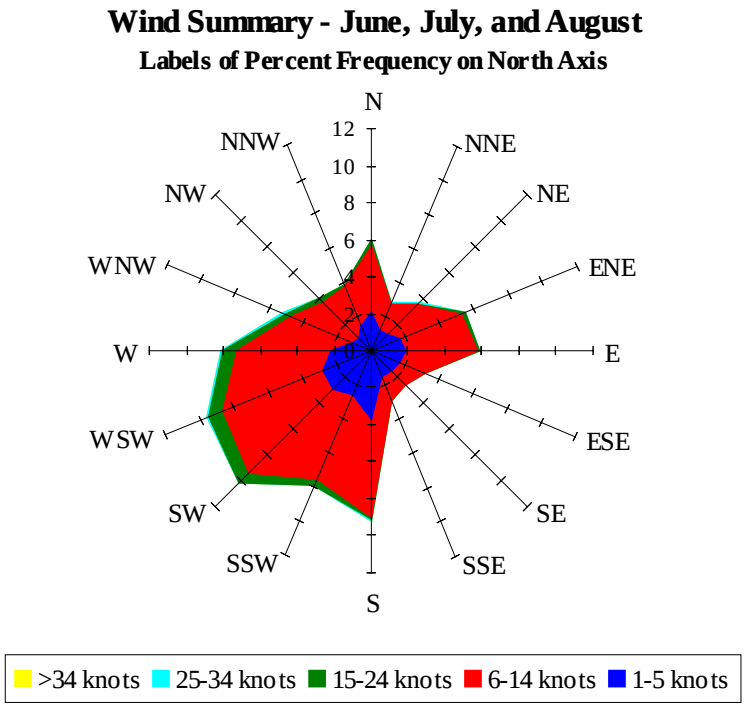




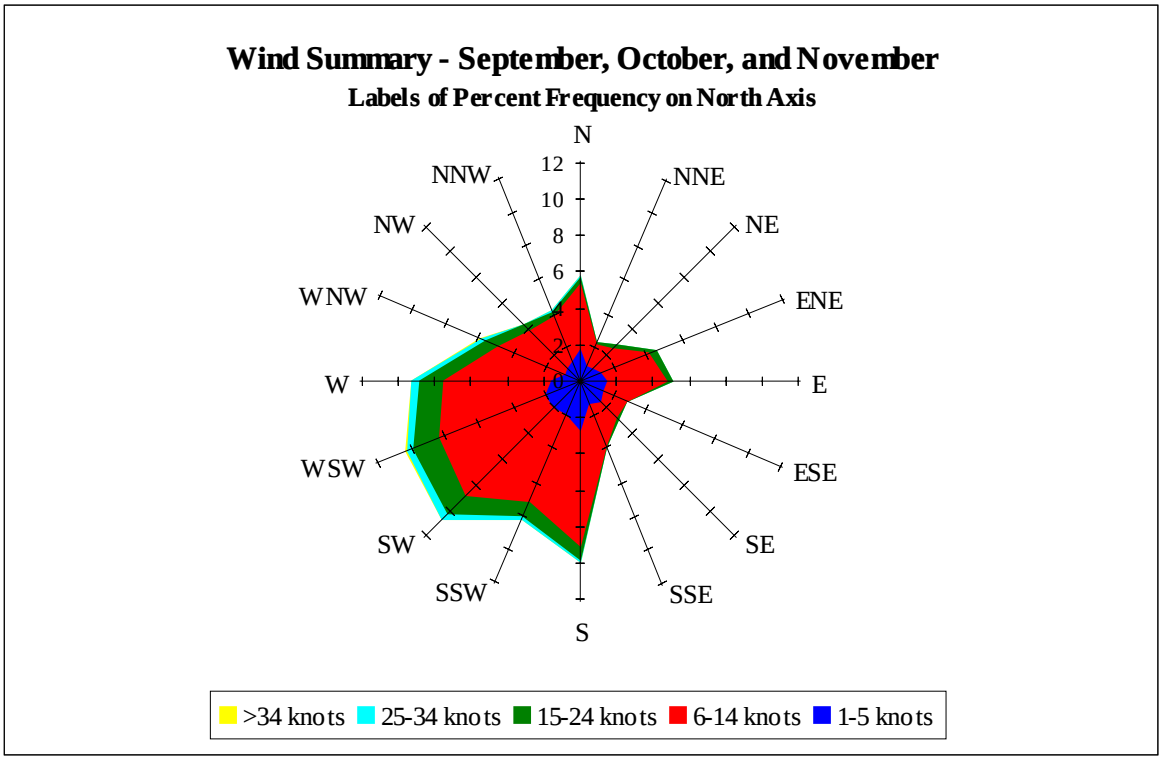
Percent Calm = 4.14



Percent Calm = 4.93



Percent Calm = 9.64



Percent Calm = 7.73