

BELGRADE, YUGOSLAVIA

Latitude = 44.82 N

Longitude = 20.28 E

Period of Record = 1973 to 1996

WMO No. 132720

Elevation = 325 feet

Average Pressure = 29.65 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	95	71	76	7.7	S
0.4% Occurrence	91	71	82	7.2	S
1.0% Occurrence	88	70	81	7.0	S
2.0% Occurrence	84	68	79	6.8	SE
Mean Daily Range	17	-	-	-	-
97.5% Occurrence	23	22	15	6.1	W
99.0% Occurrence	18	18	12	6.0	W
99.6% Occurrence	13	12	9	6.0	W
Median of Extreme Lows	9	9	8	5.4	SW
	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	76	89	112	5.7	W
0.4% Occurrence	73	87	99	5.9	S
1.0% Occurrence	71	84	92	6.3	S
2.0% Occurrence	70	82	89	6.4	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	120	84	0.80	5.8	NE
0.4% Occurrence	104	80	0.69	5.2	W
1.0% Occurrence	98	77	0.65	5.5	W
2.0% Occurrence	92	74	0.61	5.8	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		23	435	40	534

Other Site Data

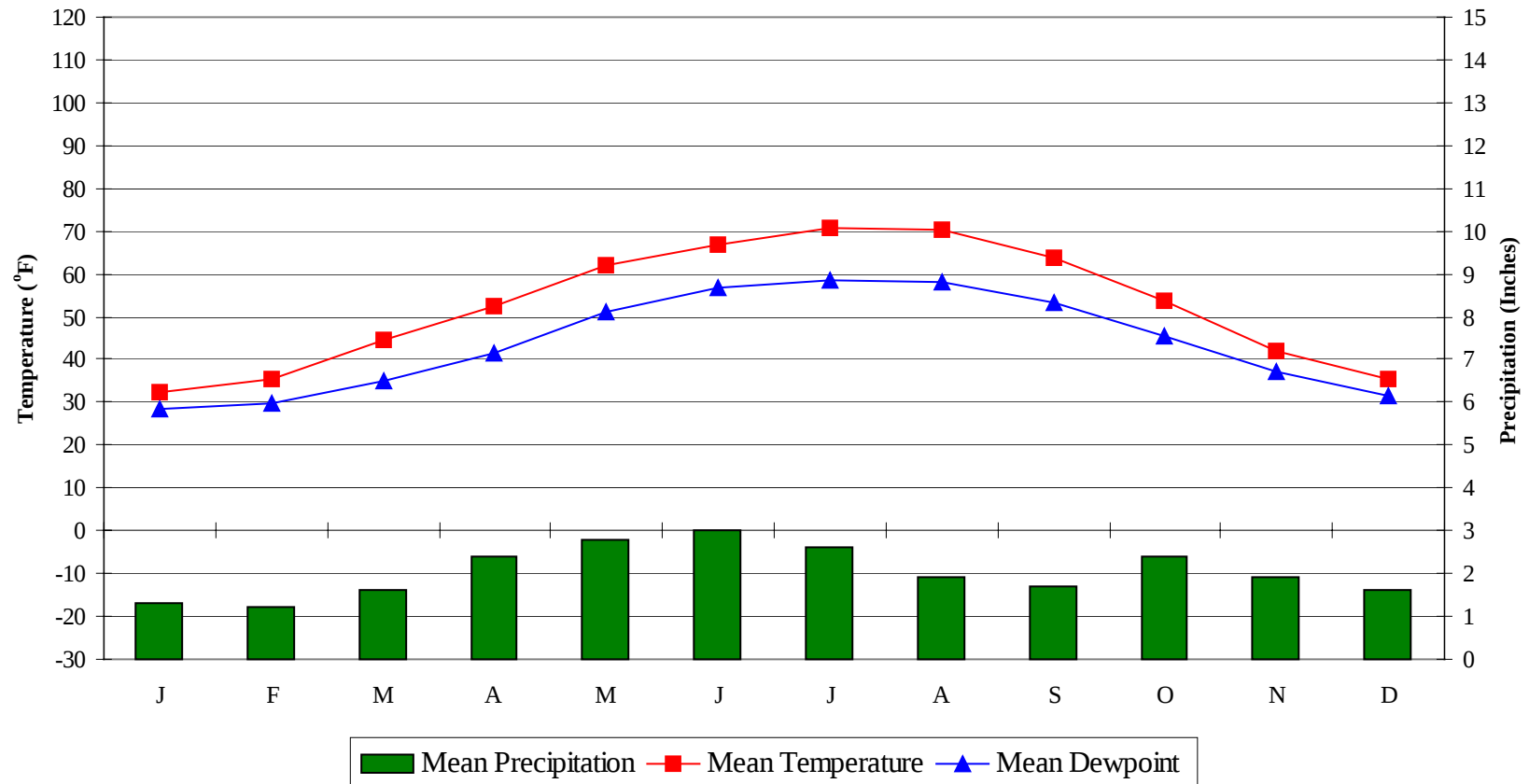
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
7	N/A	N/A	0.4 + 0.4
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
54.9	N/A	N/A	42

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

BELGRADE, YUGOSLAVIA

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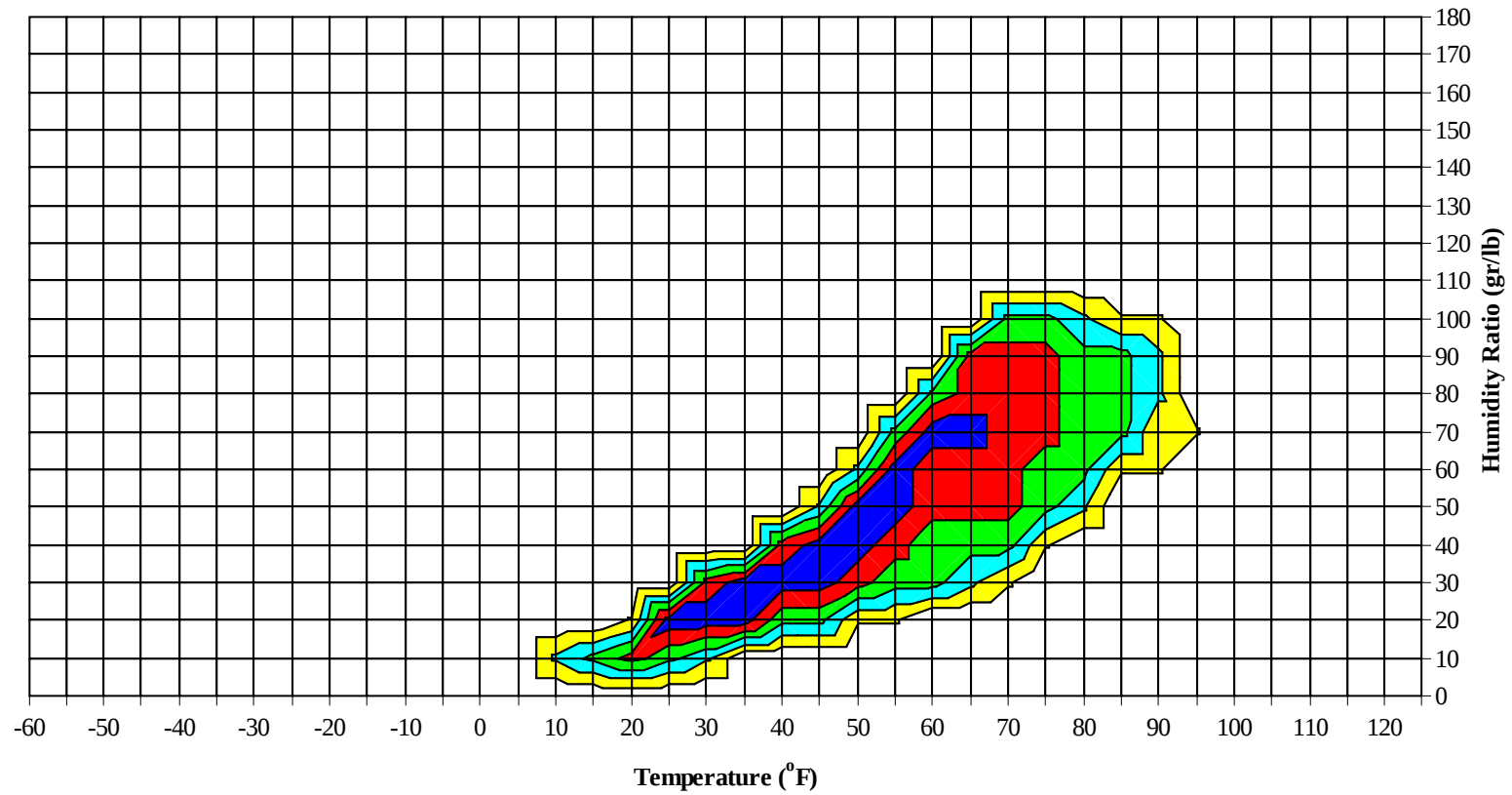
Average Annual Climate



BELGRADE, YUGOSLAVIA

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Long Term Psychrometric Summary

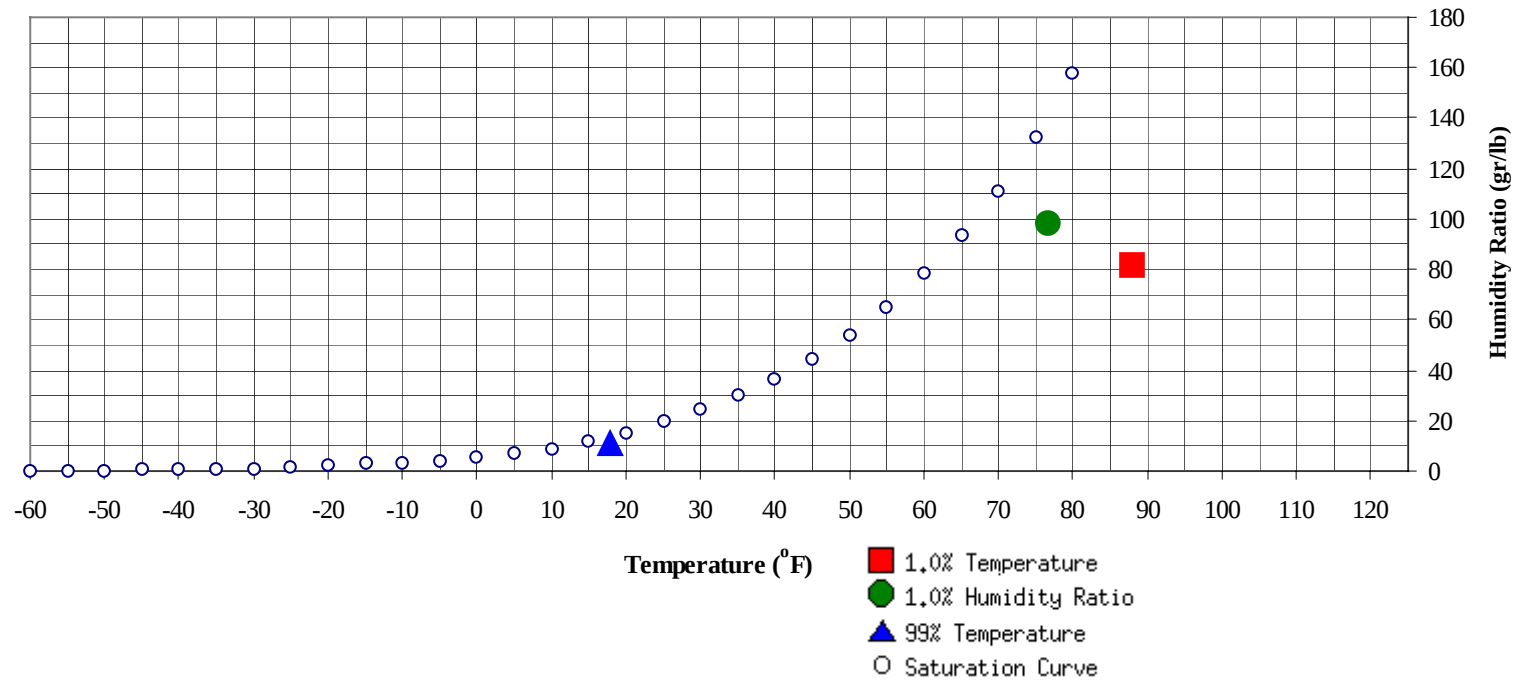


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

BELGRADE, YUGOSLAVIA

WMO No. 132720

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	18	11.4	6.1	Ratio	98	76.7	69.5	66.2	33.7

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
88	81.3	69.9	33.9	

BELGRADE, YUGOSLAVIA

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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		
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89															
80 / 84												0		0	64.2
75 / 79											4	0		4	58.8
70 / 74							0		0	57.3	8	2		10	56.0
65 / 69		0		0	54.0		1	0	1	54.8		11	3	14	53.9
60 / 64		1		1	52.8	0	5	1	6	52.6	1	26	12	39	51.4
55 / 59	0	5	1	6	49.7	1	11	3	15	49.2	7	36	23	66	48.8
50 / 54	2	13	6	21	46.6	4	18	10	32	46.2	23	39	36	99	45.9
45 / 49	9	23	17	49	42.9	12	30	24	66	42.5	39	43	49	131	42.3
40 / 44	15	28	22	65	39.2	19	31	28	78	39.0	40	30	34	104	38.9
35 / 39	40	50	48	138	35.2	46	45	47	138	35.1	64	31	51	145	35.2
30 / 34	76	62	73	211	30.9	58	47	60	164	30.6	51	13	26	90	30.9
25 / 29	56	39	44	139	26.0	47	22	31	100	25.8	15	4	7	26	25.7
20 / 24	21	14	19	54	21.5	20	7	10	37	21.0	4	1	2	7	20.9
15 / 19	18	8	10	36	16.9	10	4	6	20	16.8	3	1	1	5	16.8
10 / 14	7	4	6	17	11.7	4	1	2	7	11.6	1	0	1	2	11.2
5 / 9	4	1	2	7	7.2	3	1	1	5	6.8	1			1	7.5
0 / 4	0	0	0	0	1.5	1	0	0	1	2.2	0			0	3.0
-5 / -1	0	0	0	0	-2.3										
-10 / -6	0		0	0	-8.7										
-15 / -11	0			0	-12.8										
-20 / -16	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.

BELGRADE, YUGOSLAVIA

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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		
105 / 109															
100 / 104															
95 / 99												1	0	1	73.8
90 / 94							0	0	0	68.9		4	1	5	71.5
85 / 89							2	0	2	67.3		14	3	17	69.4
80 / 84		3	0	3	61.6	0	17	4	21	65.6	1	38	12	51	67.8
75 / 79		9	2	11	59.3	1	43	13	57	63.0	5	54	28	87	65.4
70 / 74	0	24	7	31	56.7	7	58	30	95	60.5	18	53	43	113	63.3
65 / 69	2	24	11	37	54.9	14	38	33	85	58.8	31	31	41	103	61.5
60 / 64	9	44	27	80	52.7	44	38	63	144	56.7	80	29	65	174	59.2
55 / 59	25	46	43	114	49.9	76	28	55	159	53.6	72	14	35	121	55.3
50 / 54	49	40	55	144	47.3	68	18	36	122	49.9	28	3	11	42	51.0
45 / 49	63	30	52	145	43.8	31	5	12	48	45.3	5	0	1	6	46.1
40 / 44	47	14	26	87	40.0	6	0	1	7	40.8	0			0	40.7
35 / 39	37	5	14	56	36.6	2		0	2	36.4					
30 / 34	9	1	2	12	31.8	0			0	31.0					
25 / 29	0			0	27.3										
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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WMO No. 132720

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		
105 / 109		0		0	79.0										
100 / 104		0	0	0	73.1		0	0	0	70.2					
95 / 99		4	1	5	71.5		7	1	8	70.6		0		0	70.0
90 / 94		16	5	21	71.3		18	5	23	70.4		4	0	4	69.4
85 / 89	0	29	9	38	69.9	0	25	8	33	69.4		7	1	8	68.2
80 / 84	2	53	24	79	68.1	2	51	23	76	67.7	0	32	6	38	66.2
75 / 79	11	58	39	108	65.9	10	58	39	107	65.7	1	45	16	62	64.0
70 / 74	32	48	58	137	63.9	29	45	56	130	63.8	5	48	33	87	61.9
65 / 69	49	21	44	113	62.4	50	21	44	115	62.4	14	35	36	85	60.0
60 / 64	86	16	48	149	59.7	83	17	46	147	59.7	57	36	64	157	58.1
55 / 59	54	4	18	76	55.5	56	5	20	81	55.5	81	22	49	152	54.5
50 / 54	14	0	2	16	51.5	17	1	4	22	51.5	56	8	28	92	50.4
45 / 49	1			1	47.2	2		0	2	46.9	23	1	5	29	45.7
40 / 44											3		1	4	41.2
35 / 39											1		0	1	36.4
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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BELGRADE, YUGOSLAVIA

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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		
105 / 109															
100 / 104															
95 / 99															
90 / 94															
85 / 89		0		0	64.5										
80 / 84	0	4	0	4	64.6		0		0	66.3					
75 / 79	0	15	1	16	62.8		0		0	66.5					
70 / 74	0	30	7	37	60.2		3		3	59.5					
65 / 69	4	28	12	44	58.1	0	5	0	5	57.4		1		1	55.8
60 / 64	15	45	35	95	55.9	0	15	3	18	54.4	0	3	1	4	53.4
55 / 59	39	43	51	133	52.7	8	26	16	50	51.5	1	10	3	14	50.1
50 / 54	56	43	57	156	49.0	21	32	27	80	48.1	5	18	9	32	47.1
45 / 49	61	26	47	134	44.6	33	45	43	121	44.2	17	30	24	71	43.3
40 / 44	36	9	19	64	40.4	42	38	45	125	40.2	24	34	30	88	39.8
35 / 39	25	4	13	42	36.2	58	40	55	153	36.1	54	56	56	166	35.7
30 / 34	11	1	4	16	31.4	51	25	36	112	31.3	72	54	67	193	31.2
25 / 29	3	0	0	3	27.3	19	8	11	38	26.1	40	26	33	99	26.0
20 / 24	0			0	23.0	7	2	3	12	21.5	16	10	13	39	21.7
15 / 19						2	0	1	3	17.4	13	6	9	28	16.9
10 / 14						0	0	0	0	11.3	6	1	2	9	12.4
5 / 9											1		0	1	7.5
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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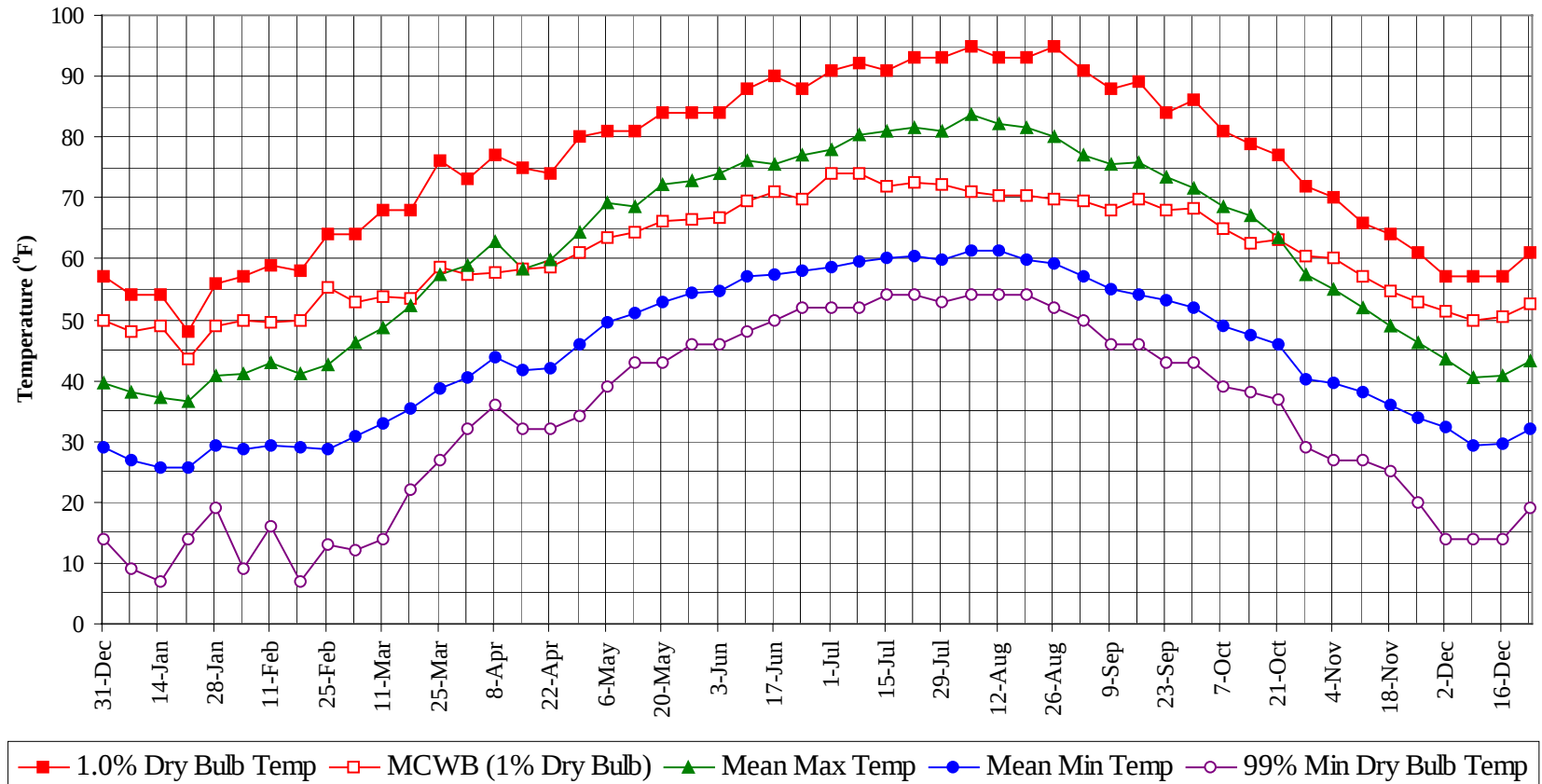
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

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		
105 / 109	0			0	79.0
100 / 104	1			0	1 71.8
95 / 99	11			2	13 71.1
90 / 94	43			10	53 70.7
85 / 89	0	78	21	99	69.4
80 / 84	5	197	70	271	67.3
75 / 79	28	286	139	453	64.8
70 / 74	91	316	236	643	62.3
65 / 69	163	217	224	603	60.4
60 / 64	373	276	364	1013	57.6
55 / 59	418	251	319	987	53.1
50 / 54	341	235	281	857	48.5
45 / 49	296	233	274	803	43.7
40 / 44	230	185	206	621	39.7
35 / 39	325	232	285	842	35.6
30 / 34	328	203	270	801	31.0
25 / 29	179	99	128	406	25.9
20 / 24	69	34	47	150	21.4
15 / 19	46	20	28	94	16.9
10 / 14	19	6	11	36	11.8
5 / 9	8	1	4	13	7.1
0 / 4	2	0	0	2	1.9
-5 / -1	0	0	0	0	-2.3
-10 / -6	0		0	0	-8.7
-15 / -11	0			0	-12.8
-20 / -16	0			0	-15.0

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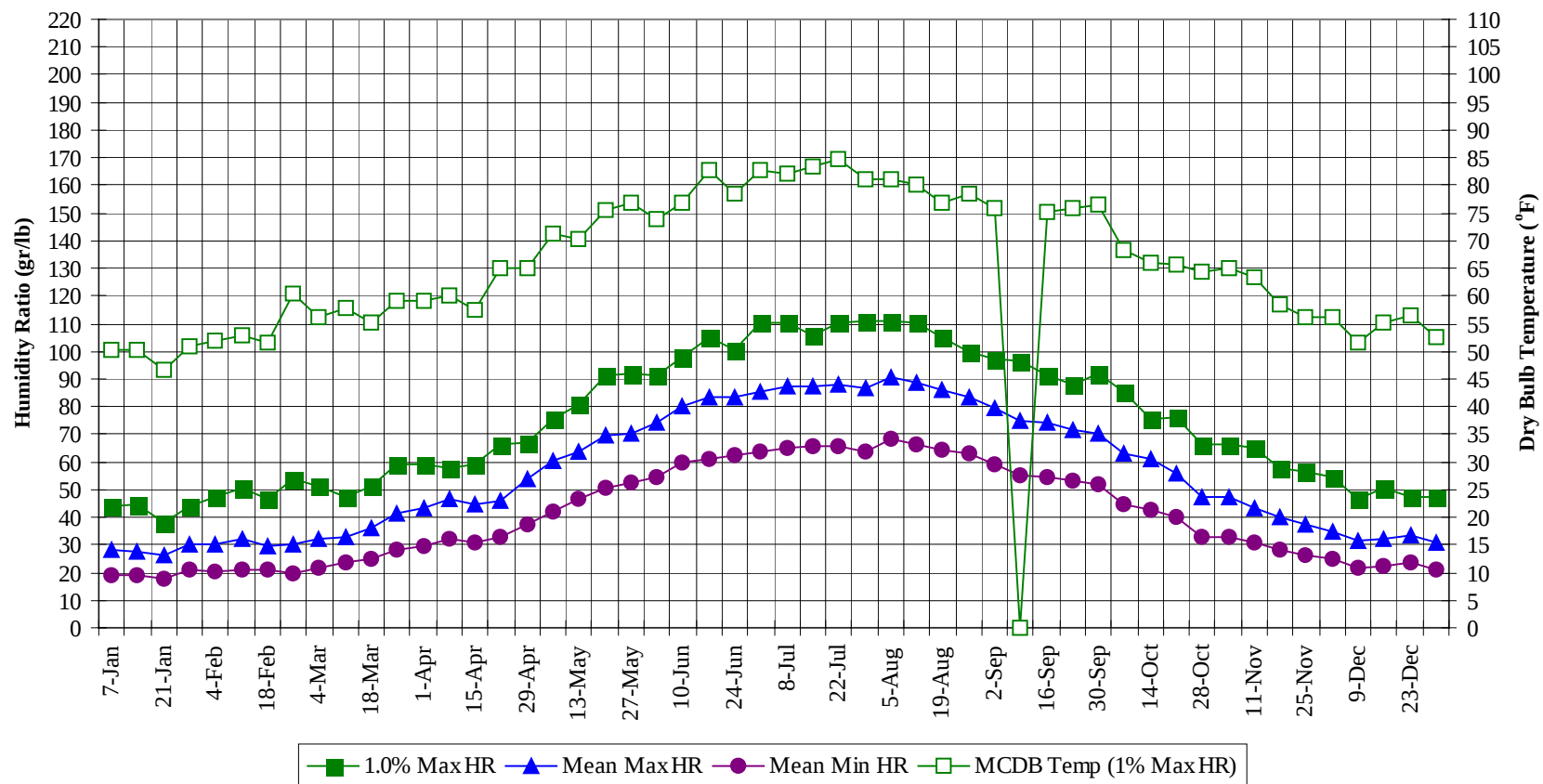
Annual Summary of Temperatures



BELGRADE, YUGOSLAVIA

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Long Term Humidity and Dry Bulb Temperature Summary



BELGRADE, YUGOSLAVIA

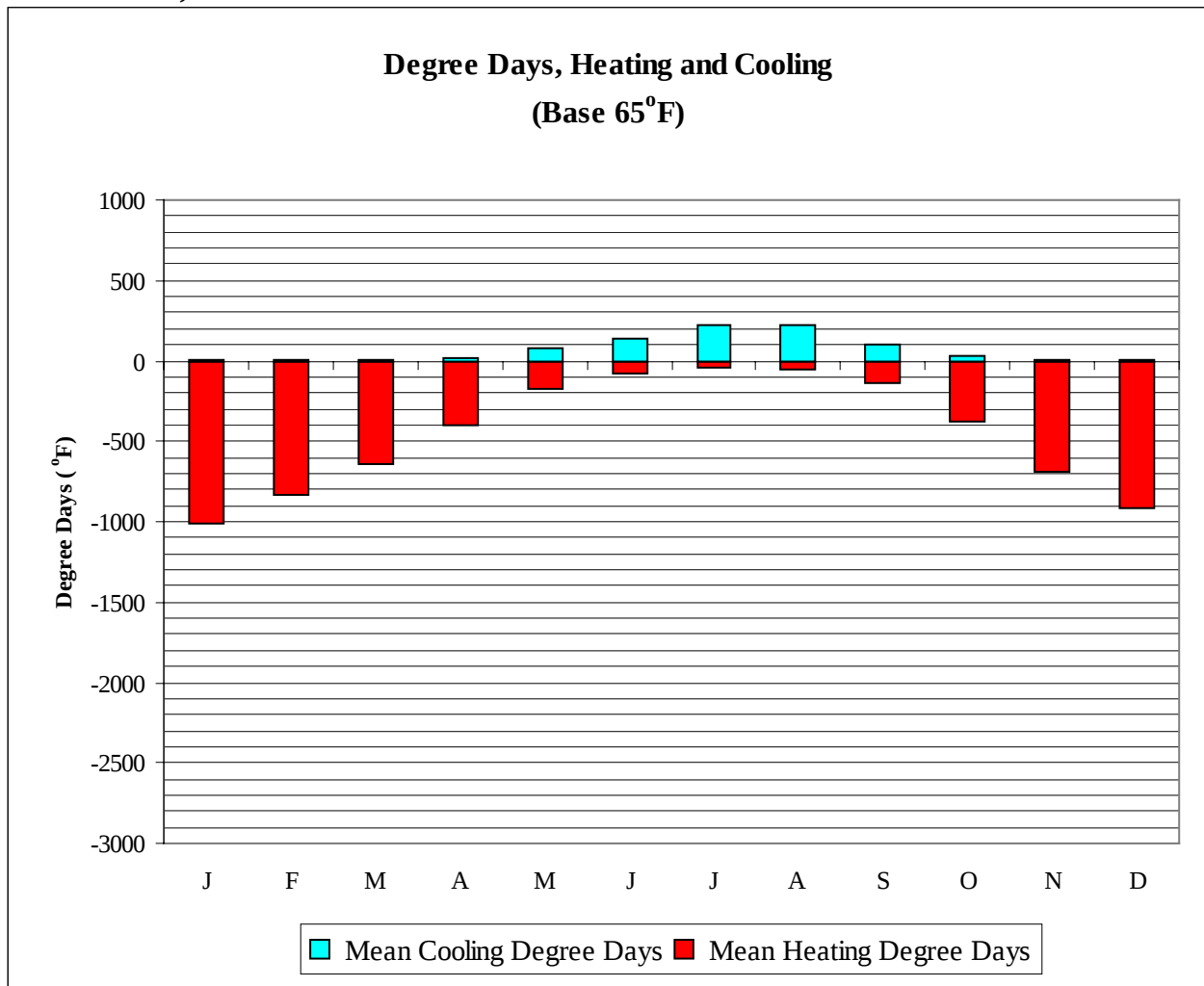
WMO No. 132720

Long Term Dry Bulb Temperature and Humidity Summary

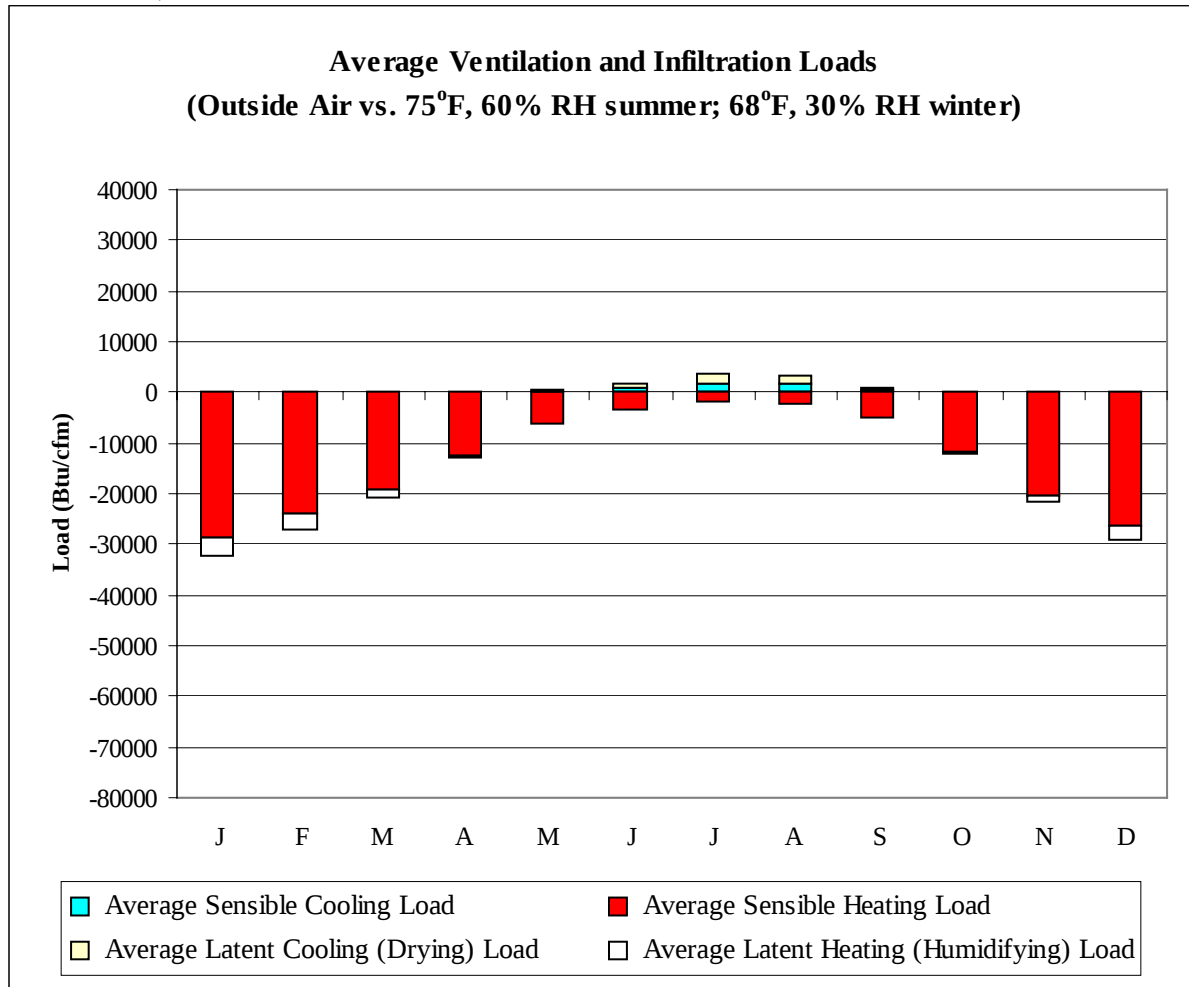
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	54.0	48.0	38.0	26.8	9.0	44.1	50.1	28.4	19.1
14-Jan	54.0	49.1	37.0	25.5	7.0	44.8	50.2	27.5	18.8
21-Jan	48.0	43.4	36.6	25.7	14.0	37.8	46.8	26.5	17.9
28-Jan	56.0	48.8	40.7	29.4	19.0	44.1	51.0	30.3	21.2
4-Feb	57.0	49.9	41.2	28.7	9.0	47.6	51.9	30.1	20.6
11-Feb	59.0	49.5	43.0	29.3	16.0	50.4	52.8	32.0	21.2
18-Feb	58.0	50.0	41.2	29.1	7.0	46.9	51.4	29.7	20.8
25-Feb	64.0	55.1	42.6	28.6	13.0	53.9	60.5	30.0	20.0
4-Mar	64.0	52.9	46.2	30.9	12.0	51.1	56.2	32.0	21.7
11-Mar	68.0	53.7	48.6	33.0	14.0	47.6	57.7	33.1	23.3
18-Mar	68.0	53.5	52.4	35.3	22.0	51.1	55.3	36.0	24.9
25-Mar	76.0	58.5	57.3	38.6	27.0	58.8	59.2	41.4	27.9
1-Apr	73.0	57.4	59.0	40.4	32.0	58.8	59.2	43.4	29.4
8-Apr	77.0	57.8	62.8	43.9	36.0	58.1	60.0	46.4	32.2
15-Apr	75.0	58.4	58.4	41.6	32.0	58.8	57.4	44.5	31.2
22-Apr	74.0	58.5	59.9	42.1	32.0	66.5	65.1	45.8	32.9
29-Apr	80.0	61.2	64.4	46.0	34.0	67.2	65.0	53.9	37.7
6-May	81.0	63.5	69.3	49.4	39.0	75.6	71.2	60.3	41.8
13-May	81.0	64.2	68.6	51.0	43.0	80.5	70.2	63.7	46.8
20-May	84.0	66.2	72.3	53.0	43.0	91.0	75.5	69.8	50.5
27-May	84.0	66.4	72.8	54.3	46.0	91.7	77.0	70.4	52.3
3-Jun	84.0	66.8	74.1	54.8	46.0	91.0	73.9	74.1	54.2
10-Jun	88.0	69.4	76.0	57.0	48.0	98.0	76.7	80.2	59.7
17-Jun	90.0	70.9	75.6	57.5	50.0	105.0	82.6	83.5	61.2
24-Jun	88.0	69.8	77.1	57.9	52.0	100.8	78.3	83.6	62.6
1-Jul	91.0	73.9	78.0	58.7	52.0	110.6	82.9	85.6	64.0
8-Jul	92.0	74.0	80.4	59.6	52.0	110.6	82.0	87.6	65.1
15-Jul	91.0	71.8	81.1	60.0	54.0	105.7	83.6	87.5	65.9
22-Jul	93.0	72.4	81.6	60.4	54.0	110.6	84.8	88.1	65.8
29-Jul	93.0	72.2	81.1	59.7	53.0	111.3	81.1	86.4	63.8
5-Aug	95.0	71.1	83.8	61.5	54.0	111.3	81.0	90.6	68.1
12-Aug	93.0	70.3	82.3	61.2	54.0	110.6	80.2	88.7	66.6
19-Aug	93.0	70.3	81.5	59.9	54.0	105.0	76.8	86.0	64.2
26-Aug	95.0	69.7	80.2	59.3	52.0	100.1	78.4	83.3	63.2
2-Sep	91.0	69.4	77.0	57.2	50.0	97.3	75.7	79.4	59.4
9-Sep	88.0	68.0	75.5	54.9	46.0	96.3	.	74.8	55.3
16-Sep	89.0	69.8	75.9	54.0	46.0	91.0	75.1	74.0	54.6
23-Sep	84.0	68.0	73.4	53.0	43.0	88.2	76.0	71.6	53.2
30-Sep	86.0	68.2	71.6	52.1	43.0	91.7	76.4	70.0	51.6
7-Oct	81.0	64.8	68.6	48.9	39.0	85.4	68.4	62.8	44.7
14-Oct	79.0	62.6	67.2	47.5	38.0	75.6	65.9	60.8	42.6
21-Oct	77.0	63.2	63.3	45.9	37.0	76.3	65.7	56.1	40.0
28-Oct	72.0	60.4	57.4	40.2	29.0	66.5	64.2	47.2	33.0
4-Nov	70.0	60.1	54.9	39.6	27.0	66.5	64.9	47.2	32.9
11-Nov	66.0	57.2	52.0	37.9	27.0	65.1	63.3	43.1	30.9
18-Nov	64.0	54.7	48.8	35.8	25.0	58.1	58.3	40.1	28.4
25-Nov	61.0	52.8	46.1	33.9	20.0	56.7	56.1	37.6	26.3
2-Dec	57.0	51.4	43.4	32.2	14.0	54.6	56.0	34.7	24.8
9-Dec	57.0	50.0	40.5	29.3	14.0	46.9	51.7	31.7	21.9
16-Dec	57.0	50.5	40.9	29.5	14.0	50.4	55.1	32.0	22.1
23-Dec	61.0	52.5	43.3	32.1	19.0	47.6	56.5	33.6	23.8
31-Dec	57.0	50.0	39.6	29.0	14.0	47.6	52.4	30.9	21.3

BELGRADE, YUGOSLAVIA

WMO No. 132720



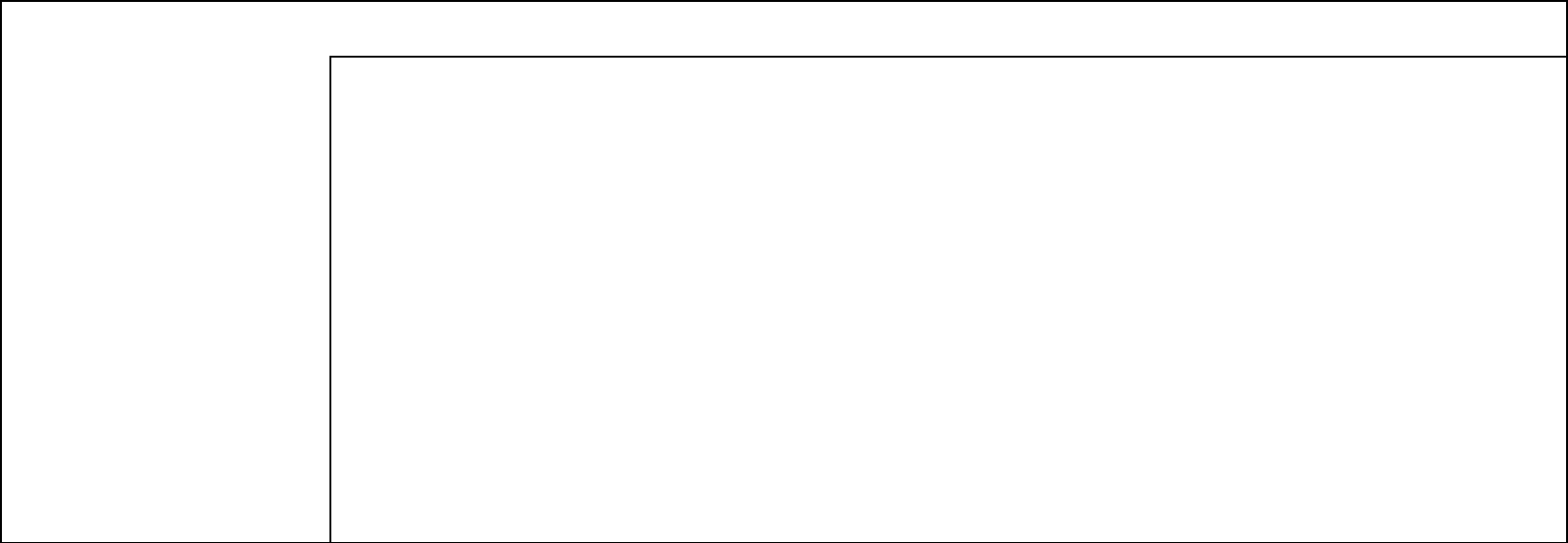
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1008
FEB	0	837
MAR	5	645
APR	18	397
MAY	78	175
JUN	140	80
JUL	223	44
AUG	217	51
SEP	99	139
OCT	24	375
NOV	1	694
DEC	0	922
ANN	805	5367



	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	-28526	0	-3864
FEB	0	-23890	0	-3136
MAR	7	-19072	0	-1751
APR	37	-12397	2	-332
MAY	286	-6188	93	-14
JUN	846	-3277	928	0
JUL	1739	-2029	1823	0
AUG	1732	-2235	1594	0
SEP	568	-5110	258	-5
OCT	58	-11862	16	-222
NOV	1	-20309	1	-1282
DEC	0	-26297	0	-2846
ANN	5274	-161192	4715	-13452

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

No Solar Radiation
Data Available

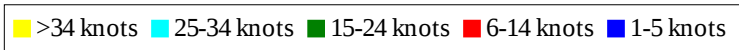
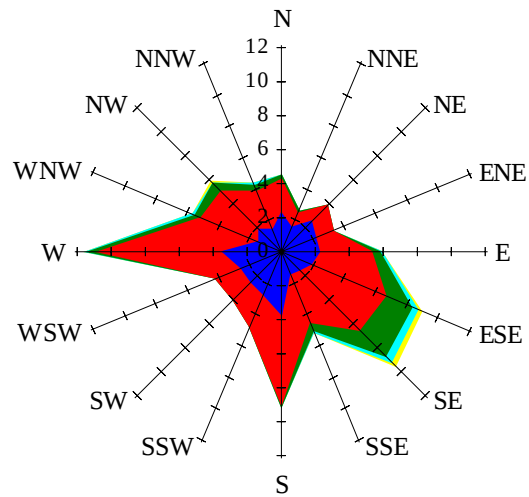


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

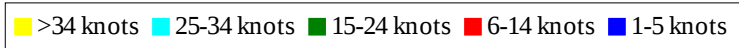
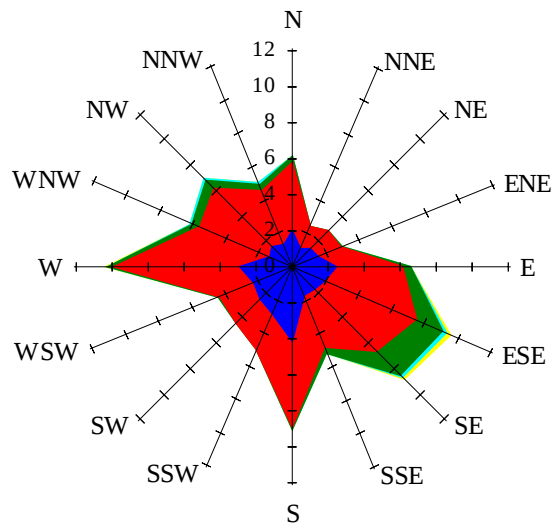
Labels of Percent Frequency on North Axis



Percent Calm = 8.29

Wind Summary - March, April, and May

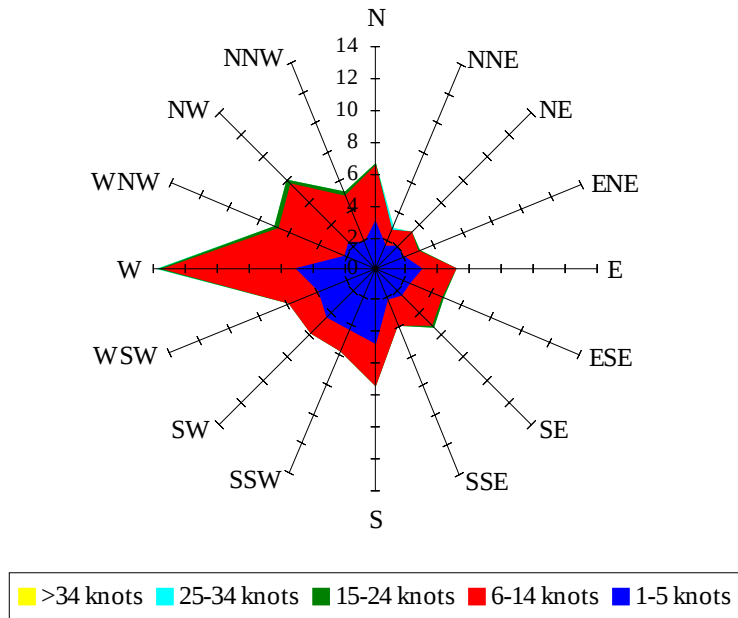
Labels of Percent Frequency on North Axis



Percent Calm = 5.49

Wind Summary - June, July, and August

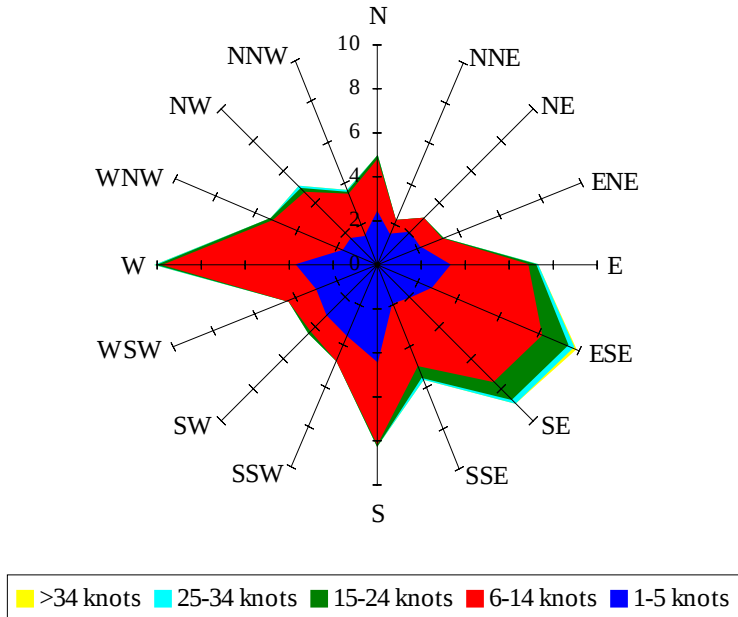
Labels of Percent Frequency on North Axis



Percent Calm = 8.01

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 9.71